THE USE OF SIMILARITY INDICIES TO ASSESS THE SPATIAL DIFFERENCES OF THE PHYTOPLANKTON COMMUNITIES IN LAKE RAY ROBERTS, TEXAS

THESIS

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

Kenneth E. Banks, B.S.
Denton, Texas
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A study of the phytoplankton communities of Lake Ray Roberts was conducted at three sampling sites on two sampling dates during the summer of 1995, assessing both community structure and chlorophyll a concentrations. Eight similarity indices were then used to characterize and compare the communities of these sites. Both community similarity and chlorophyll a concentrations were evaluated using a minimum detectable difference equation to determine the amount of change that must occur in these parameters in order to be deemed statistically significant. The Bray-Curtis Index was shown to be the most adequate index evaluated, and was subsequently used in conjunction with bootstrap analysis to determine the similarity between the three sampling sites.

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CHAPTER I

INTRODUCTION:

According to the provisions of the Clean Water Act, programs must be implemented which "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Clean Water Act 1972). To comply with the statutory requirements of this act, States must adopt biological criteria as a part of overall water quality standards. In order to meet this goal, the initial phase of this program directs State adoption of biological criteria as a part of overall State water quality standards. This directive immediately poses a challenge to the analyst in choosing both the organisms to evaluate and the methods for evaluation.

Although many State water quality agencies have concentrated efforts towards the use of fish and benthic macroinvertebrates as the main taxa for biological assessment, other taxa have been considered valuable for determining water quality. The use of algal communities, for example, has long been considered a valuable tool for biological characterization of water quality (Plafkin 1989). In addition, the analysis of algae is essential in studies of eutrophication and primary productivity of a water body.

Although algal community analyses offer the potential for valuable information, there are disadvantages. Economic issues and time constraints, for example, often restrict the amount of data that can be obtained for the analysis of this diverse taxa. However, since algal community analysis offers considerable information for the management of water quality, a study of the optimal number of samples and the interrelation of both algal community structure and chlorophyll a values should be considered.

Biological Studies for Determining Water Quality

The Industrial Revolution showed the ability of humans to produce some very undesirable effects in the rivers and lakes associated with the burgeoning development. For example, Gameson and Wheeler (1975) state that the river Thames flowing through London once produced a stench so nauseating that sheets soaked in vinegar were hung in Parliament to partly offset the noxious air drifting in from the nearby river. Incidents such as this began to cause increasing societal concern over the degradation of water sources and the associated threats to human health. In order to deal with this problem, an entire industry developed to consolidate, treat, and release wastes generated by both household and industrial sources.

According to Karr (1989), the goal of this industry was to see that the streams' or lakes' ability to assimilate wastes was not exceeded, essentially using the philosophy that "dilution is the solution to pollution". As technology associated with this industry advanced, chemical and physical parameters became the primary regulatory measures used to assess water quality.

Although the use of chemical and physical parameters to assess water quality became common, many scientists believed that biological testing was a necessary component of a regulatory program, both to show the integrative effects of toxicants and to determine the presence of toxicants not detected by chemical or physical means. In order to accomplish this goal, techniques were developed which applied toxicological procedures to aquatic systems. The use of these techniques marked the beginnings of biological testing for water systems.

In the early stages of biological testing, approaches similar to mammalian toxicology were used, namely assessing the effects of pollution on a few "test species" in supervised laboratory conditions. Responses of the test species were then extrapolated to the multiple species or entire ecosystem being tested. Presently, biological testing is firmly entrenched in the use of laboratory based approach, with the use of test species being a very common means of assessing toxicity. However, some scientist question the validity of such an approach. For example, Cairns (1990) states that "biological testing, in the past, has relied primarily on single species toxicity testing in laboratory conditions which do not adequately reflect the actual environmental conditions". However, biological testing has developed into a field which encompasses both the analysis of entire communities of species as they are found in natural conditions as well as the use of more controlled laboratory testing to determine the quality of aquatic systems. This approach, known as biomonitoring (or bioassessment), attempts to encompass the best aspects of laboratory toxicity testing and community analysis.

Webster's dictionary defines monitor as "(1)to check and sometimes adjust for quality or fidelity; (2)to watch, observe, or check, especially for a special purpose; (3) to keep track of, regulate, or control (as a process or the operation of a machine)." Using the above definitions, biological monitoring can be defined as monitoring using biological information (Cairns 1990). Such information is usually used as a supplement to chemical and physical information, with the hopes of obtaining more inclusive information than that provided by physical and chemical analysis alone. Biological monitoring can therefore be considered as a method for using resident biological communities to show the consolidation of detrimental environmental effects. Plafkin et al. (1989) recognized the value of biological community studies and listed five advantages for using biomonitoring in the context of water quality management. These advantages are:

1. Biological communities reflect overall ecological integrity (i.e. chemical , physical, and biological integrity).

2. Biological communities integrate the effects of different pollution stressors and thus provide a holistic measure of aggregate impact. Communities also integrate the stresses over time and provide an ecological measure of fluctuating environmental conditions.

3. The status of biological communities is of direct interest to the public as a measure of a pollution free environment, while reductions in chemical pollution loadings are not as readily understood by the nonprofessional as positive environmental results.

4. Where criteria for specific ambient impacts do not exist (e.g. nonpoint source impacts that degrade

habitat), biological communities may be the only practical means of evaluation.

Many scientists recognize these advantages and give support to the analysis of community structure and population dynamics for studying the effects of pollution on aquatic systems. For example, Schindler (1987) states that the "widespread use of single-species bioassays, complicated models, and impact statement studies have been singularly unsuccessful at predicting the effects of anthropogenic stress on biological systems" and "studies of population dynamics, food-web organization, and taxonomic structure of communities have been more successful." In addition, Stein and Denison (1967) maintain that "biological indicators are better than chemical or physical features used alone" and "chemical observations measure conditions whereas biological observations measure effects."

Although numerous taxa have been suggested as a means of conducting biomonitoring (or bioassessment) studies, there is no general agreement as to which community is the "best" ecological indicator. For example, algae, fish, macroinvertebrate, zooplankton, and macrophyte communities have all been used for biomonitoring programs. Many early studies centered on fish communities, with the idea that if organisms higher on the food chain are well, the entire system must be well. However, Cairns (1990) states that "evidence has shown that many species of microorganisms and macroinvertebrates upon which the fish depend could be killed at concentrations of toxicants well below those causing deleterious effects in fish". Such evidence has led many scientists to promote the analysis of communities of primary and secondary producers in an effort to increase the detection sensitivity.

The Importance of Algae

Algae (or phytoplankton), being one of the primary producers of organic matter in aquatic systems, are extremely important to nearly all other forms of aquatic life. As a consequence of this fact, algae have considerable social and economic importance. For example, Fogg and Thake (1987) state that "there is practical value in understanding the growth and distribution of phytoplankton because fisheries ultimately depend on phytoplankton and unwanted phytoplankton growths may be a nuisance to those who use water either for the necessities of life or for recreation". In addition, understanding of the algal component of an aquatic system is necessary for understanding the eutrophication process. As stated by S. Cairns et. al (1994),"a better understanding of the eutrophication process will improve the ability to manage water as a multiple use resource". To the user of water, excessive algal growth is often undesirable, thus a form of pollution. Algae, therefore, offer substantial information for water quality management. Plafkin et al. (1989), recognizing this information potential, list five advantages for using algae in the context of water quality management. These advantages are:

1. Algae generally have rapid reproduction rates and short life cycles, making them valuable indicators of short term impacts.
2. As primary producers, algae are most directly affected by physical and chemical factors.
3. Sampling is relatively simple, inexpensive, requires few people, and creates minimal impact to resident biota.
4. Relatively standard methods exist for evaluation of functional and non-taxonomic structural (biomass, chlorophyll measurements) characteristics of algal communities.
5. Algal communities are sensitive to some pollutants which may not visibly affect other aquatic communities, or may only affect other communities at higher concentrations (i.e. herbicides).

Many scientists have recognized these advantages and have devoted much research into the area of phytoplankton community assemblages and biomass determinations. For example, the studies of Thunmark (1945) , Nygaard (1955), Hutchinson (1967), and Kilham (1980) all attempt to quantify the relationships between rare algal species to dominant algal species in relation to lake productivity. However, since phytoplankton are such a diverse and tolerant group of organisms, these indices have been, for the most part, unsuccessful for determining overall algal productivity. As stated by Wetzel (1983), "it is apparent that these indices, while having some value in determining species relationships, are much too superficial in physiological foundation to be of some significant use in evaluating productivity among lakes, or in elucidating causal mechanisms underlying the composite growth of algae."

Despite the advantages of using phytoplankton communities for the assessment the water quality of reservoirs, there has been relatively little effort towards using this taxa as an aspect of water quality management. One of the reasons for this situation is the lack of data on the phytoplankton component of reservoirs. According the Phillips et al. (1994), "reservoir phytoplankton ecology in general is poorly understood." Likewise, Wetzel (1983) states that "large voids exist in our knowledge of the many complex mechanisms that result in the wide array of planktonic algae communities."

One of the central problems in the analysis of phytoplankton, whether the analyst is interested in community structure or biomass, is the large variability usually encountered. Since algal communities are quite diverse and spatially heterogenous, there generally exists significant variability among the data, especially in community analysis. This variability arises, at least somewhat, from the fact that a great number of algae, despite taxonomic and physiological diversity, can exist in the same body of water. Thus, algae are somewhat unique in their ability to utilize resources. This unique quality is explained by Hutchinson's (1961) idea of the "paradox of the plankton", which states that the fundamental ecological principle of competitive exclusion predicts that a relatively homogenous environment, such as the surface or mixed layers of a lake, should contain very few species which have similar ecological requirements. Therefore, since all species of planktonic algae are essentially photoautotrophs with similar needs fulfilled by their mutually held surroundings, competition for resources should result in the limitation of all but the few species which are able to best use the limited resources. Since this situation does not occur, variation and diversity should be expected. Understanding the variation and subsequently defining the limits in which an analyst can describe this variation is, therefore, an important aspect of understanding phytoplankton communities.

Similarity, Bootstrapping, and Variability

According to Czarnecki (1979), researchers generally use a similarity measure to compare algal communities. Numerous similarity indices exist; however, the choice of a particular measure may influence interpretations. For example, Reinke (1986) conducted a study to compare some of the available similarity indices as applied to natural populations. This comparison considered both binary (present or absent) indices and quantitative (species weighted-biomass or numbers) indices, with both natural populations and a manipulated data set. Reinke concluded that certain indices are better suited for his data set, but may not be applicable to others stating "the most reliable evaluation of phytoplankton data would appear to be accomplished by a combination of techniques with a good understanding of the limitation of each technique". However, an important issue to consider in this context is the variance associated with a measure of similarity. Johnson and Millie (1982), for example, note that many researchers do not take (field) sampling variability into account when determining community similarity. In order to account for variability, and hence construct confidence intervals or ranges of values that may be encountered in repeated sampling, the Bootstrap method may be useful. The following paragraphs will examine the utility of these techniques.

The ability to obtain vast amounts of information on biological communities is an aspiration of almost every scientist who studies such communities. Data sets allow the analysis of trends and patterns; therefore studies that involve multiple replicate samples and frequent collection improve the ability to detect subtle changes in such trends and patterns. However, economic constraints and time factors generally play a large role in such studies. In addition, as outlined above, phytoplankton are usually temporally and spatially variable in both community composition and chlorophyll values. Consequently, scientists such as Fee (1976) have proclaimed the benefits of estimating *in situ* productivity with more easily measured variables such as chlorophyll a. However, these benefits can only exist within the context of variability. Limited data which contains substantial variance makes it difficult to determine changes in such values because the magnitude of the change necessary for statistical significance is very large. As an attempt to remedy this situation, several statistical techniques have been developed which allow the generation of "new" data sets from existing data.

The bootstrap procedure is an example of a widespread statistical resampling technique. Bootstrapping is designed to "resample" from existing data and estimate the confidence intervals for sample data based on these resampled data. According to Efron (1979), the method essentially samples with replacement replicates from each respective community. Such samples are called the bootstrap sample. Bootstrapping can be done indefinitely, with bootstrap samples being used to estimate the variance, confidence intervals, and bias of the samples. For certain types of data, such techniques offer a distinct advantage over parametric methods since the statistical inference is based on the distribution properties of a sample developed from existing data, and not the distributionally inferred properties of the population.

Purpose of This Investigation

It seems desirable to investigate more fully the balance between sampling effort vs. population aggregation for the phytoplankton communities of a reservoir system. Since the variance associated with the endpoints in many eutrophication models is rarely addressed (Armstrong et al, 1987), there is a need to investigate the amount of change necessary to determine significant difference. Inherent in this type of study is the similarity between the evaluated communities. Therefore, in order to make comparisons between respective communities, several similarity indices were evaluated for their ability to describe the phytoplankton communities of Ray Roberts reservoir, using the ability of the indicies to seperate the three sites and the associated variability. The three indicies thatshowed the most site seperation and lowest variability were used to develop a statistically based methodology that described the amount of change in the similarity of phytoplankton communities and chlorophyll a concentrations that will have to occur in order to be considered statistically significant. Once this was accomplished, the information was used to construct models which allow the determination of the power and significance associated with statistical similarity analyses of the phytoplankton communities and chlorophyll a values in relation to sample size. Using the above information, the minimum number of samples required to statistically separate three sampling sites on Lake Ray Roberts was determined using the similarity of the phytoplankton communities and bootstrap techniques.

CHAPTER II

MATERIALS AND METHODS:

Source of Samples

Lake Ray Roberts is large reservoir located in North Central Texas, approximately 10 miles (16.1 km) north of Denton, Texas. The area climate is considered humid sub-tropic, with continental influences producing hot summers and relatively mild winters. Consequently, Lake Ray Roberts circulates freely in the winter and stratifies directly in the summer and is thus considered a warm monomictic lake. Annual precipitation averages about 34 inches (86.36 cm) a year, with May being the wettest month and January being the driest. Construction on Lake Ray Roberts was essentially completed in July 1987, when deliberate impoundment was initiated by the Corps of Engineers. The reservoir has conservation and flood pools containing 29,350 and 36,900 acres, respectively. The total watershed above the dam is 692 square miles, and occupies portions of Denton, Cooke, and Grayson counties. This watershed can be divided into three main physiographic regions, each with its own characteristic soil and vegetation (see figure 1).

The Eastern Cross Timbers physiographic region occupies most of the drainage basins for the eastern arm of the lake,

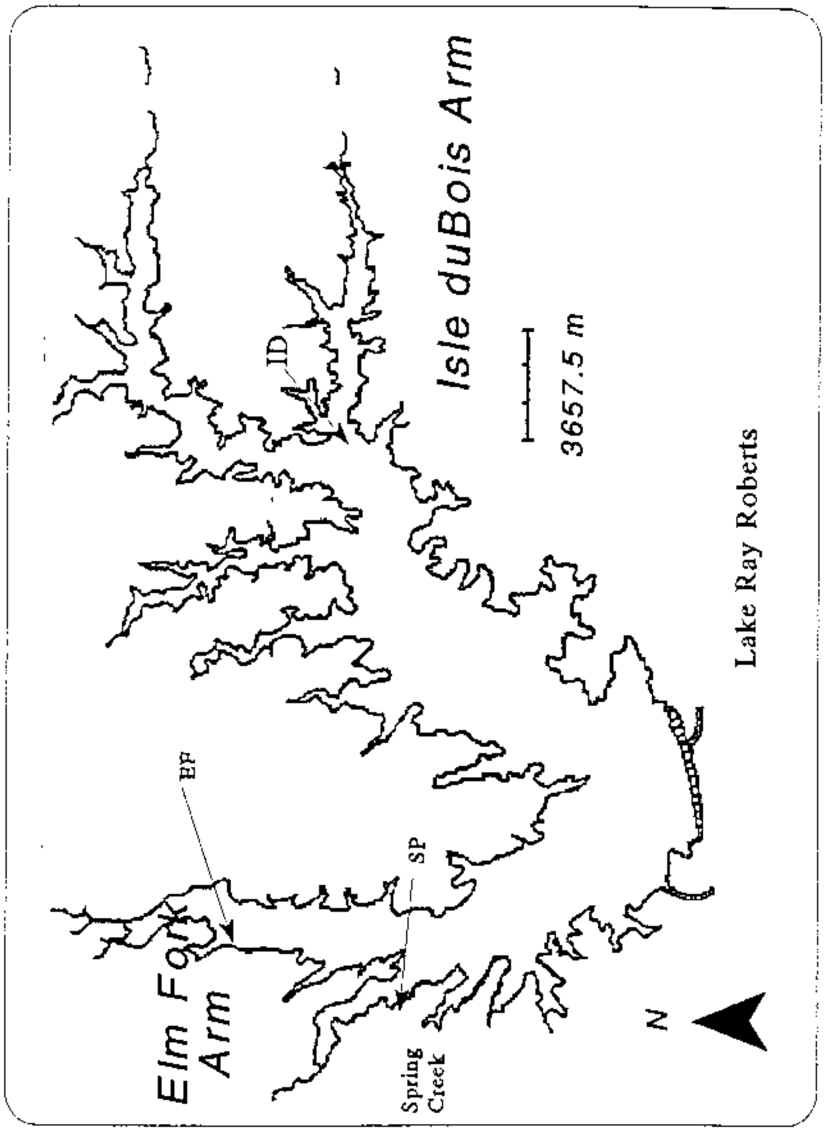

Figure 1. Map of Lake Ray Roberts Showing Sampling Sites

a significant portion of the drainage basin of the western arm, and a large portion of the drainage basin of the reservoirs main body. Topography of this region has a rolling character determined by the Woodbine formation, which consists of a mixture of slightly acidic sands, clays, and sandstones. Soils possess a characteristic reddish brown or grey color and are characterized as moderately to highly infiltrateable. The Grand Prairie physiographic region occupies the remaining portions of the western arm of the lake and possesses soils that are dark, slightly alkaline, and have a high organic and clay content. The Blackland Prairie physiographic region occupies the remaining portions of the eastern arm of the lake. Soils of this region are grey- brown calcareous waxy clays. Landuse for all regions is mainly cropland, pastureland, and oldfield (Institute of Applied Sciences, 1995).

Field Samples and Analysis:

Three sampling stations were chosen on Lake Ray Roberts (Fig. 1). Each of these stations correspond closely to the sample stations of the 1989 - 1990 Ray Roberts Study conducted by the University of North Texas and are located within different physiographical regions (Institute of Applied Sciences, 1995). All samples were taken from pelagic zones in order to minimize littoral influence.

Station 1, referred to in the study as the Elm Fork Arm (Site EF), is located on the upper portion of the western arm of the lake, which receives inflow from the Elm Fork of the Trinity River. The drainage basin of this area has the Grand Prairie soil type, which possesses high organic content. The Elm Fork also receives a considerable amount of nutrients from the Gainesville, Texas sewage treatment plant effluent. Samples were taken in the timbered part of the Elm Fork arm, approximately 300 meters south of the Farm Market Road 922 bridge.

Station 2, referred to in this study as Spring Creek (Site SP) is located at the inflow of Spring Creek on the western arm of the lake. The drainage basin of this area also has the highly organic Grand Prairie soil type. Spring Creek also receives nutrient input from sewage oxidation ponds operated by the city of Sanger, Texas. Samples were taken at the inflow, which is located approximately 100 meters northwest of the Farm Market Road 3002 bridge.

Station 3, referred to in this study as the Isle du Bois Arm (Site ID) is located on the eastern arm of the lake, in the timbered section of the Isle du Bois arm. The drainage basin of this area is composed of both Eastern Crosstimber and Blackland Prairie soil types, both of which possess less organic content than the Grand Prairie. Samples were taken directly east of Wolf Island.

Each station was sampled in mid-July and mid-August 1995, with 15 water samples collected at each site. Algal community structure and chlorophyll analyses were conducted for each sample using the following techniques.

Algal Community Analysis:

One liter samples were collected from each station for the determination of algal community composition. Each sample was collected at approximately 1 meter below the surface (grab sampling) and immediately treated with four milliliters of Lugol's solution. After transferring the samples to the laboratory, a 50 milliliter subsample was filtered through a 0.45 micron filter under slight vacuum (approxiamtely 10 mm Hg). The filter was then removed and rehydrated with 6 milliliters of de-ionized water and scraped to remove algae. The sample was mixed and one milliliter of the scraped algae was then removed, placed in a Sedgewick-Rafter counting chamber, and viewed under a microscope having a 10X ocular fitted with a Whipple grid. Identification to genus level at 200X magnification was accomplished, with a total of five random fields being analyzed. Identification of small cells was accomplished by switching to 800X magnification as needed. All community analysis were based on total cell counts per taxa, using the taxonomic keys of Smith (1950) and Prescott (1978).

Chlorophyll *a* And Pheophytin *a*:

Chlorophyll *a* analysis was conducted as soon as the samples were transported to the lab. Sample bottles were shaken to suspend the plankton and a 200 milliliter sample was removed, placed in a suction filter apparatus, and filtered through a 0.45 micron glass fiber filter under slight vacuum (approximately 10 mm Hg). The filter was removed, folded, and placed in glass vials containing 7 milliliters of aqueous acetone solution. The vials were then covered with aluminum foil (to prevent exposure to light) and stored at -4°C for 24 hours ± 6 hours.

A Beckman Spectrophotometer was used to determine chlorophyll *a* and pheophyton *a* content of each sample. A syringe filter was used to transfer 3 milliliters of the extracted sample to a cuvette. The light energy absorbed at both 750 and 664 nm wavelengths were then recorded. Immediately afterwards, the sample was acidified for 90 seconds using 0.1 milliliters of HCL and the light energy absorbed at 750 and 665 nm wavelengths was again recorded. This procedure allowed the calculation of both chlorophyll *a* and pheophyton *a* (Standard Methods 16th ed.).

Statistical Analysis

The analysis of several similarity indices and their associated variability was conducted on the taxa abundance data of each phytoplankton sample. Chlorophyll a values generated from the Ray Roberts samples were also analyzed in a similar fashion. Using the three sites, these data were evaluated for both sensitivity and power with respect to sample size.

The similarity indices used were both binary and quantitative in order to determine the most appropriate index (or indicies) for this system. The binary indices used in this study are the following:

1. Sorenson's Index (ISS)(Dice, 1945)

   ISS = 2C/(A+B+2C)

   C = number of genera in common

   A = number of genera unique to sample A

   B = number of genera unique to sample B

2. Jaccard's Index (ISJ)(Jaccard, 1902)

   ISJ = C/(A + B + C)

   C = number of genera in common

   A = number of genera unique to sample A

   B = number of genera unique to sample B

Quantitative indices used are the following

1. Percent Similarity (PS)(Whitaker 1952)

   $PS = \sum \min (I_a / N_a, I_b / N_b)$

   I_a = Number of the *I*th genus of sample A

I_b = Number of the *I*th genus of sample B

N = Total number of individuals

2. Stander's Index (SI)(Johnson and Millie, 1982)

SI = ∑ *Xia Xib* / (sqrt Xia^2)(sqrt Xib^2)

Xia = Number of the *i*th genus in sample A

Xib = Numbers of the *i*th genus in sample B

3. Coefficient of Similarity (Pinkham and Pearson, 1976)

CS = 1/k ∑ Min (P*ia*, P*ib*) / Max (P*ia*, P*ib*)

P*ia* = Numbers of the *i*th genus in sample A

P*ib* = Numbers of the *i*th genus in sample B

K = Total number of genera

4. Mod 1 (Reinke 1986)

M1 =∑(Min (I*a*, I*b*) / Max (I*a*, I*b*) * (Min % (I*a*, I*b*))

I*a* = Numbers of the *i*th genus in sample A

I*b* = Numbers of the *i*th genus in sample B

5. Mod 2 (Reinke 1986)

M2 = ((Mod I) * (N - (A + B))/N)

A = Number of genera unique to Sample A

B = Number of genera unique to Sample B

N = total number of genera

6. Bray-Curtis Correlation Coef. (Bray and Curtis, 1957)

BC = 2w/(a+b)

w = Sumk{min{xavg(k,i),xavg(k,j)}]

a = Sumk[xavg(k,i)]

b = Sumk[xavg(k,j)]

Sumk = sum over k

where xavg(k,i) = the average (over replicate samples) abundance of taxon k in samples drawn from community i.

History and Attributes of Indicies

Each index chosen for this study has been used in various aspects of aquatic biology. However, each index has an unique set of attributes and historical uses. The following paragraphs give a brief history and a summary of the inherent attributes of each index.

Sorenson's Index is also known as Dice's Index, and has been used in a variety of ecological applications. Pielou (1977), for example, states that this index is well accepted for eclogical use. In two seperate studies, Janson and Vegelius (1981) and Hubalek (1982) used a criterion system to evaluate a large number of similarity indicies. Both studies supported thge use of Sorenson's Index for ecological research. Although Sorenson's index is analogous Jaccard's Index, it gives more weight to the number of genera common to both sites.

Jaccard's index was included because it is the oldest and most simple similarity index (Washington, 1984). This index simply expresses the number of genera in common divided by the number of genera unique to each respective site. As a measure of community composition, this index, like Sorenson's, only takes into account the number of genera and not the abundance of each genus. Consequently, this index cannot detect changes in the numbers of organisms.

The Percent Similarity index was first discussed by Whitaker in 1952, and was later used by Whitaker and Fairbanks (1958) to compare the communities of small lakes and ponds. This index is quantitative in nature, and thus uses both the type(genus) of organism present as well as the actual numbers of each genera. Brock (1977) has noted that this index is not sensitive to large differences in population size, as long as the differences are proportional.

Stander's Index has been used by Johnson and Millie (1982) to compare algae community assemblages. In addition, Reinke (1986) used this index for evaluation of changes in a small test data set. Reinke noted that the use of the square root function of this particular index causes the algorithm to be very sensitive to the dominant group or groups of organisms.

The Coefficient of Similarity was developed by Pinkham and Pearson (1976) for use in pollution biology. Although this index is widely used, it does possess notable weaknesses. For example, Brock (1977) points out that this algorithm is heavily influenced by numerically abundant organism and may be "too sensitive to rare species".

The Model 1 Index was developed by Reinke (1986), and is a modification of the the Percent Similarity index. This modification causes the index to be more sensitive to rare species and proportional changes. Reinke (1986) showed that the additional algorithm caused the index to be much more sensitive to proportional changes in community composition.

The Model 2 index was also developed by Reinke (1986) through a modification of the Percent Similarity Index. The difference between Reinke's Model 1 and Model 2 index is the addition of an algorithm designed to make the index more sensitive to the gain or loss of a genera.

The Bray-Curtis index was originally used for ordination of forest communities (Bray and Curtis, 1957). However, it has been used quite often in aquatic community analysis. Burlington (1962), for example, used this index to evaluate river macroinvetrebrate communities. The algorithm of this index uses both quantitative measures and contains components for comparing individual taxon present at each site and the taxa the sites have in common.

After evaluation of all indices, three were chosen as the best indicies for these data based on low index variability and the ability to statistically seperate the three sampling sites. The three indicies and chlorophyll values were then used to develop a predictive range for determining significant change. This range was developed using the Minimum Detectable Difference (MDD) algorithm (Zar 1984), which allows the setting of both the level of significance and power. The MDD algorithm chosen for this purpose (S. Cairns 1994) is:

$$G = \sqrt{s^2 / n} \; (t_{\alpha,v} + t_{\beta,v})$$

G = Minimum Detectable Difference

s^2 = variance

n = sample size

α = level of significance

v = degree of freedom

β = power of the statistic

Use of this equation allows the determination of the appropriate number of samples, the minimum detectable difference associated with this number, the power associated with this number, and the level of significance.

Additional community analysis was conducted using the bootstrap analysis portion of SIGTREE software (Nemec, 1987). This procedure allowed the assessment of the probabilities associated with the similarity analysis and was used to determine the effect of sample size on detecting differences in communities.

CHAPTER III

RESULTS

Phytoplankton Community Composition

July 1995

The results of the phytoplankton community structure and total cells per milliliter are summarized in Figure 2 and Table 1. Actual number of organisms for both sampling dates and all sampling sites are listed in Appendices A and B. All numbers are in units of cells per milliliter.

For the July sampling date, the Spring Creek area (Site SP) had the highest numbers of cells per milliliter, with a total count of 44,583 cells per milliliter and a standard deviation of 5,405. The community observed in the Elm Fork of the lake (Site EF) had a lower overall number of organisms per milliliter (38,946), but possessed a higher standard deviation value of 5,988 indicating a more variable community. The Isle du Bois Arm of the lake (Site ID) had the lowest overall number of cells per milliliter (27,445) with a standard deviation of 4,506.

In all sites, the community was dominated by large numbers of blue-green algae(cyanophytes), which comprised 94

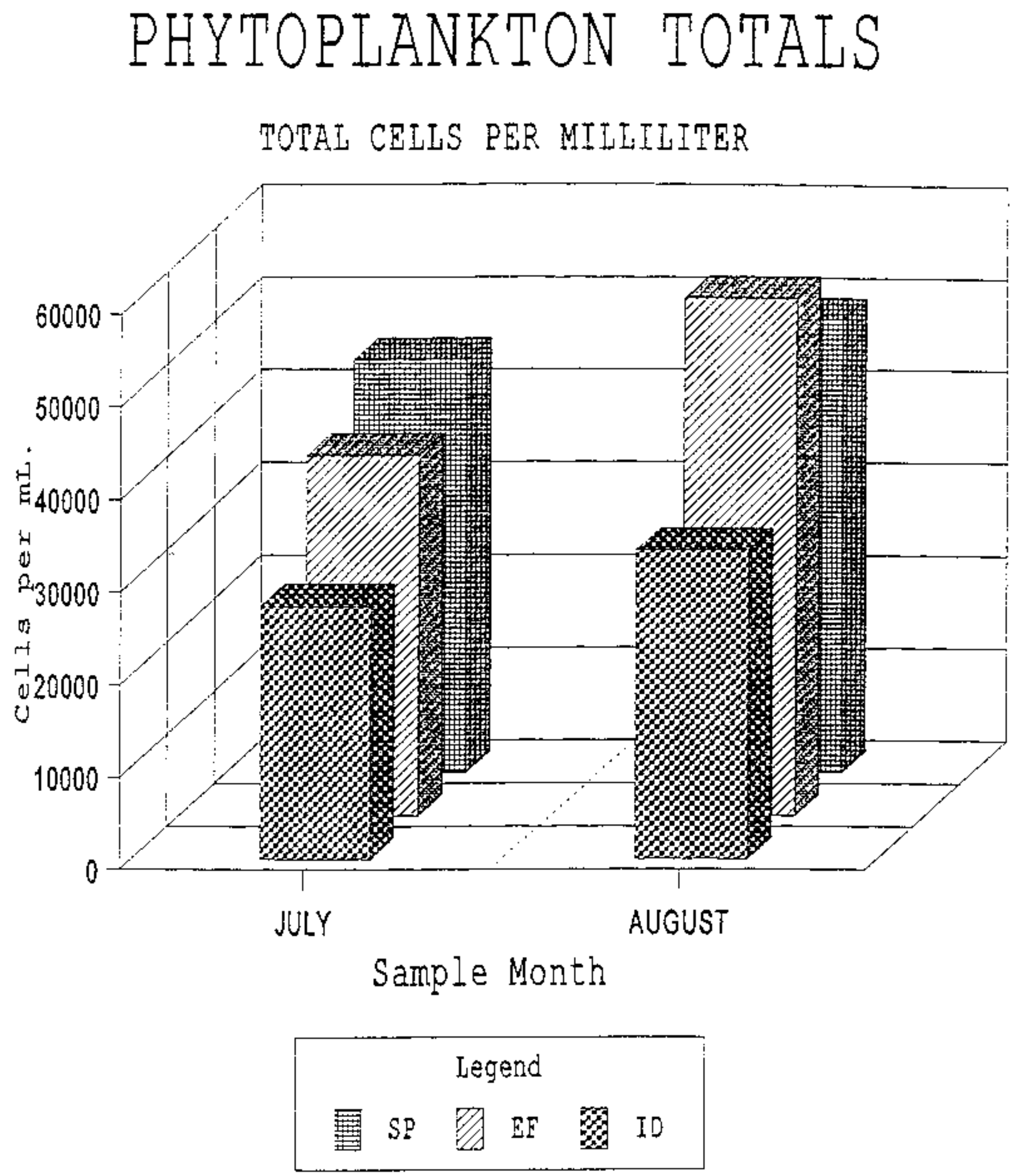

Figure 2. Mean number of algal cells per milliliter at each sampling site for the months of July and August 1995.

Table 1. Mean number of phytoplankton taxa of each algal phylum by sites in July and August 1995 (organisms per ml. with standard deviation below).

Phylum	EF	ID	SP
Chlorophyta	1349	980	1183
	298	167	239
Chrysophyta	481	211	311
	86	76	96
Cryptophyta	263	59	283
	147	39	143
Cyanophyta	36829	26143	42669
	5890	4490	5355
Euglenophyta	8	0	51
	10	0	38
Pyrophyta	16	52	87
	16	24	51

August 1995

Chlorophyta	1155	852	948
	308	225	229
Chrysophyta	405	585	319
	96	192	98
Cryptophyta	411	192	435
	140	123	118
Cyanophyta	53913	31737	47231
	4824	5625	3956
Euglenophyta	11	9	44
	18	13	31
Pyrophyta	76	44	60
	54	30	30

Table 2. Presence (P), Absence (A), and Rare (R) genera listing for all phytoplankton observed during the July and August sampling periods. Listed alphabetically by Phyla (J = July, A = August).

Genus	J-EF	J-ID	J-SP	A-EF	A-ID	A-SP
Ankistrodesmus	P	R	R	P	R	R
Arthrodesmus	A	R	P	P	R	R
Carteria	P	P	P	P	P	P
Chlamydomonas	P	P	P	P	P	P
Chlorococcum	P	R	P	A	R	A
Chlorogonium	P	P	R	A	A	A
Chodatella	A	R	R	P	A	P
Closteriopsis	A	A	A	R	A	A
Closterium	P	P	P	P	A	R
Coccomonas	P	P	P	A	P	R
Coelastrum	R	A	A	R	R	R
Cosmarium	P	P	P	P	P	P
Crucigenia	R	P	R	P	P	P
Dictyosphaerium	P	A	P	P	P	P
Eudorina	A	A	R	R	R	R
Franceia	P	P	R	P	P	P
Kirchineriella	R	A	R	P	A	R
Micractinium	A	A	R	A	A	A
Oocystis	A	P	R	R	R	R
Pachycladon	P	P	A	A	R	A
Pandorina	R	R	P	R	R	R
Pediastrum	R	R	R	A	R	R
Scenedesmus	P	P	P	P	P	P

Table 2. Continued

Genus	J-EF	J-ID	J-SP	A-EF	A-ID	A-SP
Schroderia	R	R	R	P	R	A
Selenastrum	P	P	P	P	P	P
Spondylomorum	P	P	P	P	A	A
Staurastrum	P	P	P	P	P	P
Tetraedron	P	A	R	A	R	A
Tetrastrum	R	A	R	R	A	A
Trachelomonas	P	P	P	P	R	R
Treubaria	P	P	P	P	P	P
Achnathes	R	R	A	R	A	R
Cyclotella	P	P	P	P	A	P
Fragilaria	P	A	P	A	R	P
Gomphonema	P	R	P	A	A	A
Melosira	R	A	R	P	A	P
Meridion	A	A	P	A	A	A
Navicula	A	A	R	A	A	A
Nitzchia	P	P	P	P	P	P
Rhopalodia	P	P	P	P	P	P
Synedra	A	R	R	P	A	P
Chroomonas	A	A	R	A	A	A
Cryptomonas	P	P	P	P	P	P
Rhodomonas	P	P	P	P	P	P
Anabaena	P	P	P	P	P	P
Aphanocapsa	P	P	P	P	P	P
Gleocapsa	A	A	R	A	A	A
Merismopedia	R	R	A	P	P	P
Microcystis	A	R	A	A	R	A
Oscillatoria	P	P	P	P	P	P

Table 2. Continued

Genus	J-EF	J-ID	J-SP	A-EF	A-ID	A-SP
Phacus	R	R	P	P	R	P
Rhaphidiopsis	P	P	P	P	R	P
Spirulina	A	R	A	A	R	A
Euglena	P	A	P	P	P	P
Euglenomorpha	A	A	P	A	A	A
Ceratium	A	R	A	R	R	A
Gymnodinium	R	P	P	P	P	P
Peridinium	P	P	P	P	P	P

to 96 percent of the total number of cells counted. This dominance was most pronounced at Site SP, which had an average of 42,669 blue-green cells per milliliter and a standard deviation of 5,355 cells per milliliter (CV 12.5). Site EF possessed the next highest and most variable percent dominance, with an average blue green cell count of 36,829 cells per milliliter and a standard deviation of 5,890 cells (CV 16.0). ID had the lowest overall blue-green dominance, possessing 26,143 and a standard deviation of 4,490 cells per milliliter (CV 17.2).

For the July sampling date, the dominance of blue green algae was due to the presence of one genera, *Aphanocapsa*. This small colonial cyanophyte was common to all sampling sites on this sampling date. Site SP possessed the highest numbers of this organism, which ranged from a low of 31,120 cells to a high of 48,640 cells per milliliter. EF exhibited similar values, with a low of 24,640 cells to a high of 40,960 cells per milliliter. Site ID was also dominated by this genus, possessing a low of 16,960 cells to a high of 34,560 cells per milliliter.

Several other cyanophytes were present in relatively high numbers in all of the samples. For example, the filamentous cyanophyte *Anabaena* was found in relatively large numbers in all samples, with the highest densities occurring in the Elm Fork Arm of the lake. Site EF had an average of 2,779 *Anabaena* cells per milliliter, with a standard deviation of 678 cells (CV 24.2). Spring Creek and the Isle du-Bois arm also exhibited substantial populations of *Anabaena*. Site ID had an average of 709 Anabaena cells per milliliter, with a standard deviation of 259 cells (CV 36.5). Spring Creek possessed lowest and most variable *Anabaena* population, having an average of 483 *Anabaena* cells per milliliter and a standard deviation of 324 cells (CV 67.1).

Oscillatoria was also a common cyanophyte observed in the July sampling date. The Elm Fork Arm exhibited both the highest and most variable number of this genus, with an average of 2,645 cells per milliliter and a standard deviation of 948 cells (CV 35.8). The Isle du Bois Arm possessed the next highest concentration of this organism, with an average of 1,884 cells per milliliter and a standard deviation of 476 cells (CV 25.3). Spring Creek had the lowest number of *Oscillatoria*, with an average of 1,869 cells per milliliter and a standard deviation of 454 cells (CV 24.3).

During the July sampling date, several genera of the Phylum Cyanophyta were unique to one or two sampling sites. For example, the Genus *Gleocapsa,* a small colonial cyanophyte, was only observed in the Spring Creek area of the lake. However, only two of the fifteen samples taken at Site SP contained *Gleocapsa*, indicating that it is relatively rare at this site. In addition , the genus *Merismopedia* was observed in small concentrations in both the Isle du Bois and Elm Fork Arms (21 and 69 cells per milliliter respectively). However, *Merismopedia* was not observed in the Spring Creek area during this sampling period. Likewise, a small population of the genus *Microcystis* was observed in the Isle du-Bois Arm of the lake (56 cells per milliliter). However, this organisms was only observed in one sample taken at site ID, indicating that it is rare at this site. *Microcystis* were not observed in the Elm Fork Arm or in Spring Creek. Similarly, the genus *Spirulina* was only observed in the Isle du Bois arm of the lake. Although this genus averaged 9 cells per milliliter, it was observed in only one sample, indicating its scarcity at this site.

The phylum Chlorophyta was represented by 31 genera that were observed in at least one of the three sampling site during the July sampling date. Of all the sites, the Elm Fork of the lake had the highest number of Chlorophyta cells and the most sample variability with an average of 1349 cells per milliliter and a standard deviation of 298 cells (CV 22.1). Spring Creek possessed 1183 cells per milliliter, with a standard deviation of 239 cells (CV 20.2). The lowest overall number of chlorophytes was observed in the Isle-du Bois arm , which had an average of 980 cells per milliliter and a standard deviation of 167 cells (CV 17.0) .

The dominant chlorophyta taxa observed in the Elm Fork Arm of the lake was the colonial chlorophyte *Dictyosphaerium*, which had an average of 383 cells per milliliter. This genus was found in all but one of the 15 replicate samples and thus appears to be relatively common in this area of the lake. Spring Creek also had a relatively large number of this organism, averaging 126 cells per milliliter. However, *Dictyosphaerium* was not observed in the Isle du Bois arm of the lake during the July sampling date. Site EF possessed a small population of the colonial cyanophyte *Coelastrum*, which was not observed in any of the other sampling sites. However, this organism was observed in only one sample and is likely a rare genus for this site.

The chlorophyte community observed in the Isle du Bois Arm of the lake was dominated by the genus *Cosmarium*, which had an average density of 175 cells per milliliter. *Cosmarium* was also observed in relatively large numbers in both the Spring Creek and Elm Fork sampling site (171 and 124 cells per milliliter respectively), making it a very common chlorophyte for this lake. Chlorophytes of the genera *Spondylomorum* and *Starastrum* also dominated the community at Site ID, with densities of 106 and 100 cells per milliliter, respectively. Both the Elm Fork Arm of the lake and Spring Creek shared several genera of chlorophytes that were not observed in the Isle du Bois Arm. For example, the genera *Dictyosphaerium*, *Kirchineriella*, *Tetraedron*, and *Tetrastrum* were observed in various numbers at Sites EF and SP, but were absent from ID.

The Spring Creek sample sites possesed chlorophyte communities that were dominated by the genus *Chlamydomonas*, which had an average of 275 organisms per milliliter. *Chlamydomonas* was a dominant taxa at all three sites. The Spring Creek station possessed the highest number of this genus, with a mean density of 275 cells per milliliter. The Elm Fork also had a relatively large number of *Chlamydomonas*, with a mean of 248 cells per milliliter. This genus was also present in relatively large numbers in the

Isle du Bois arm of the lake, which had a mean of 145 cells per milliliter. Spring Creek also had a relatively large concentration of *Cosmarium* ($\bar{x}$ = 171 cells per milliliter) and *Dictyosphaerium* ($\bar{x}$ = 125 cells per milliliter). *Eudorina*, a colonial chlorophyte, were only observed in the Spring Creek area. However, only one sample from the Spring Creek site possessed this organism, indicating that it was relatively rare for this area of the lake during this sampling period.

Phylum Chrysophyta had ten genera that were observed in at least one of the three sample sites. The Elm Fork of the lake had the highest number of chrysophytes, with an average of 481 cells per milliliter and a standard deviation of 86 cells (CV 17.9). Spring Creek possessed 311 chrysophyte cells per milliliter and a standard deviation of 96 cells (CV 30.9), indicating more variability in chrysophytes as compared to the Elm Fork Arm. The Isle du Bois Arm had the lowest overall Crysophyte density and the most sample variability, with an average of 211 cells per milliliter and a standard deviation of 76 cells (CV 36.0).

The Crysophyte community of the Elm Fork Arm was dominated by the genera *Fragilaria*, which had a mean density of 213 cells per milliliter. *Rhopalodia* and *Nitzschia* were also prevalent, with a mean of 115 and 105 cells per milliliter, respectively. The genus *Synedra* was observed in both the Isle-du Bois Arm and Spring Creek. *Synedra*, however, were not observed in Site EF during this sampling period.

Spring Creek's Crysophyte community was also dominated by *Fragilaria*, with an average density of 100 cells per milliliter. *Nitzschia* and *Rhopalodia* were also common, with an average of 51 and 49 cells per milliliter, respectively. The genus *Meridion* and *Navicula*, although present in relatively small numbers, were found only at Spring Creek during this sampling period.

The Crysophyte community observed in the Isle du Bois Arm was dominated by the genus *Rhopalodia*, with a mean density of 89 cells per milliliter. *Nitzschia* were also common, with a mean density of 84 cells per milliliter. Although *Fragilaria* was the dominant genus observed in both EF and SP, it was not observed in the Isle du Bois Arm.

Phylum Cryptophyta had only three genera observed in at least one site during the July sampling date. Spring Creek possessed the highest overall densities of this phyla, with an average of 283 cells per milliliter and a standard deviation of 143 cells (CV 50.5). The Elm Fork site possessed an average of 263 cells per milliliter, with a standard deviation of 147 cells (CV 55.9). Site ID had the lowest overall densities, with an average of 59 cells per milliliter and a standard deviation of 39 cells (CV 66.1).

The cryptophyte community observed in the Elm Fork Arm was dominated by the genus *Cryptomonas*, which had an overall density of 236 cells per milliliter. *Rhodomonas* were also present, with an average density of 27 cells per milliliter. *Cryptomonas* likewise dominated the cryptophyte communities of both Spring Creek and the Isle du Bois Arm, with a mean density of 255 and 51 cells per milliliter, respectively. *Rhodomonas* were observed in relatively low densities at both Site SP and Site ID, with and average of 27 and 8 cells per milliliter, respectively.

Organisms in phylum Euglenophyta were realtively rare at all sampling sites during the July sampling date. Spring Creek had the highest density of euglenophytes, with an average density of 51 cells per milliliter and a standard deviation of 38 cells. Spring Creek's euglenophyte community was dominated by the genus *Euglena*, which had an average of 39 cells per milliliter. Site SP was also the only site in the lake that possessed the genus *Euglenomorpha*, which made a small portion (24 percent) of the total euglenophytes observed at this site. The Elm Fork Arm had a density of only 8 Euglenophytes per milliliter, which all belonged to the genus *Euglena*. No Euglenophytes were observed in the Isle du Bois Arm.

Organisms in Phylum Pyrophyta were also rare at all sites during the July sampling date. Spring Creek possessed the highest density of pyrophytes, with an average density of 87 organisms per milliliter and a standard deviation of 51 cells (CV 58.6). The pyrophyte community at this site was dominated by *Peridinium,* with an average of 50 cells per milliliter, and *Gymnodinium,* with an average of 37 cells per milliliter. The Isle du Bois Arm of the lake had the next highest concentration of pyrophytes, with an average of 52 cells per milliliter and a standard deviation of 24 cells (CV 46.2). Site ID's pyrophyte community was also composed of *Peridinium* and *Gymnodinium,* with an average of 34 and 17 cells per milliliter, respectively. In addition, the Isle du Bois Arm was the only site of the July sampling date that had a population of *Ceratium.* However, this organism was observed in only one sample, and is likely a rare genus for this site. The Elm Fork Arm had the lowest overall pyrophyte density, with an average of only 16 cells per milliliter and a standard deviation of 16 cells (CV 100). Site EF's pyrophyte community, like the other sites, was made up of two genera, *Peridinium* and *Gymnodinium.* *Peridinium* was the dominant taxa, with an average of 12 cells per milliliter, while *Gymnodinium* were relatively rare, with an average of only 4 cells per milliliter.

Phytoplankton Community Composition

August 1995

For the August sampling date, the total number of cells per milliliter increased for all of the three sampling sites. This increase was most pronounced at site EF, which increased from an average of 38,946 cells per milliliter and a standard deviation of 5,988 (CV 15.4) cells to an average of 55,971 cells per milliliter and a standard deviation of 4,979 cells (CV 8.9). Although the number of cells per milliliter increased at this site, the standard deviation decreased, indicating a less variable community. The communities observed at Spring Creek increased slightly from an average of 44,583 cells per milliliter and a standard deviation of 5,988 (CV 13.4) cells to an average of 49,036 cells per milliliter and a standard deviation of 4,036 cells (8.2). Spring Creek, like the Elm Fork, increased in total cell number but decreased in standard deviation, indicating a less variable community. The Isle du Bois Arm, however, had a slight increase in total cells per milliliter and a relatively large increase in variability. ID increased from an average of 27,445 cells per milliliter with a standard deviation of 4,506 to an average of 33,419 cells per milliliter and a standard deviation 5,728 (CV 17.1).

In all sites the communities were dominated by large numbers of blue-green algae, a situation similar to the July community structure. Cyanophytes comprised 95 to 96 percent of the total number of cells counted. This dominance was most pronounced in the Elm Fork of the lake, which had an average of 53,913 cells per milliliter and a standard deviation of 4,824 cells (CV 9.0). Spring Creek possessed the next highest percent dominance, with an average of 47,231 cells per milliliter and a standard deviation of 3,956 cells (CV 8.4). The Isle du Bois Arm had the lowest overall blue-green dominance, possessing 31,737 cells per milliliter , with a standard deviation of 5,625 cells (CV 17.7).

Several other cyanophytes were present in relatively high numbers in all of the samples. For example, *Anabaena* were found in relatively high numbers in all of the samples, a situation similar to the July sampling period. The highest densities of this organism occurred in the Isle du Bois Arm of the lake, which had an average of 447 cells per milliliter, a substantial decrease from the July density values. The Elm Fork Arm had an average of 408 cells per milliliter, which was also a considerable decrease from the July density values. Spring Creek maintained the smallest *Anabaena* populations observed in the lake, with an average of 252 cells per milliliter.

Oscillatoria, as in the July sampling period, were common to all of the sites in the lake. The Isle du Bois Arm had the highest and most variable numbers of this genus, with an average of 5,877 cells per milliliter and a standard deviation of 1820 cells (CV 31.0). The Elm Fork Arm possessed the next highest densities of this organism, with an average of 4,759 cells per milliliter and a standard deviation of 971 cells (CV 20.4). Spring Creek possessed the lowest overall numbers of *Oscillatoria*, with an average density of 3,435 cells per milliliter and a standard deviation of 691 cells (CV 20.0). In all sites, the numbers of *Oscillatoria* increased considerably from those observed in July.

During the August sampling period, as in July, there were several genera of the phylum Cyanophyta that were unique to one sampling site. For example , the genus *Microcystis* was only observed in the Isle du Bois arm of the lake, a situation similar to the July sampling period. However, *Microcystis* had an average density of 32 cells per milliliter, a decrease from the numbers observed in July. As in the July sampling period, this organism was only observed in one of the fifteen samples taken in the Isle du Bois arm, indicating that it is rare at this site. The genus *Spirulina* was also unique to the Isle du Bois Arm, a situation similar to the observations of the July sampling date. This organism averaged 11 cells per milliliter, but was observed in only one sample, indicating its relative scarcity at this site.

The Phylum Chlorophyta was represented by 29 genera that were observed in at least one of the three sampling sites during the August sampling date. The Elm Fork arm had the highest overall chlorophyte densities, with an average of 1155 cells per milliliter and a standard deviation of 308 cells (CV 26.7). Spring Creek possessed a slightly smaller population, with an average of 948 cells per milliliter and a standard deviation of 229 cells (CV 24.2). The Isle du Bois Arm, as in the July sampling period, had the lowest overall chlorophyte densities, averaging 852 cells per milliliter with a standard deviation of 225 cells (CV 26.4). Generally, the numbers of chlorophytes observed at all sites did not differ substantially from their July counterparts.

Three genera made up the dominant chlorophyte taxa in the Elm Fork Arm of the lake. Both *Starastrum* and *Scenedesmus* had the highest overall densities, with an average of 159 cells per milliliter each. *Chlamydomonas* were also very common, averaging 156 cells per milliliter. As in the July sampling date, all of the lake sites had a substantial population of this organism, showing that it was a consistently common genera for the summer months. A large number of chlorophytes of the genus *Crucigenia* were also prevalent in the Elm Fork arm, with an average density of 75 cells per milliliter. *Closterium, Spondylomorum,* and *Tetrastrum* were three genera of chlorophytes that were observed only at site EF during the August sampling date. However, the relatively low densities (8, 20, and 5 cells per milliliter respectively) of these organisms indicate that they are relatively rare for this site.

The chlorophyte community observed in the Isle du-Bois Arm of the lake was dominated by the genus *Dictyospaerium,* which had an average density of 170 cells per milliliter. It is interesting to note that this chlorophyte was completely absent from the July samples taken at Site ID. Chlorophytes of the genus *Starastrum* and *Chlamydomonas* also dominated the chlorophyte community at this site, averaging 143 and 135 cells per milliliter, respectively. Although the chlorophytes *Pachycladon* and *Tetraedron* were unique to the Isle du Bois samples, their mean densities (3 and 2 cells per milliliter, respectively) indicate these organisms are rare for this section of the lake.

Spring Creek's chlorophyte population was dominated by the genus *Chlamydomonas,* which had an average of 215 cells per milliliter. This dominance was very similar to the July samples, with both sampling dates exhibiting *Chlamydomonas* densities of approximately 23 percent of the total number of chlorophytes. Spring Creek also had a relatively large number of *Cosmarium* (196 cells per milliliter) and *Dictyosphaerium* (111 cells per milliliter), a situation similar to the communities observed in the July sampling date. *Starastrum* and *Scenedesmus* were also prevalent, with an overall mean density of 102 and 98 cells per milliliter, respectively. *Eudorina,* which were observed only in Spring Creek during the July sampling date, were observed at all sites during the August sampling dates.

Phylum Chrysophyta had seven genera that were observed in at least one of the three sampling sites. The Isle du Bois Arm of the lake had the highest overall number of chrysophytes, with a mean density of 585 cells per milliliter and a standard deviation of 192 cells. Site EF had the next highest density of chrysophytes, with a mean of 405 cells per milliliter and a standard deviation of 96 cells (CV 23.7). Spring Creek had the lowest overall Crysophyte densities, with an average of 319 cells per milliliter and a standard deviation of 98 cells (CV 30.7).

The Crysophyte community observed in the Elm Fork Arm was dominated by the genus *Nitzschia,* which had an average of 151 cells per milliliter. *Melosira* and *Rhopalodia* were also prevalent, with a mean of 101 and 69 cells per milliliter, respectively. The genus *Synedra,* which was not observed in the Elm Fork during the July sampling date, had a small mean population of 69 cells per milliliter in the August sampling date.

Spring Creek's Crysophyte community was dominated by the genus *Rhopalodia,* which had a mean density of 65 cells per milliliter. *Melosira* were also prevalent, with an average of 57 cells per milliliter. A relatively small, though consistent, population of *Synedra* was also observed at this site, with a mean density of 29 cells per milliliter.

The number of chrysophytes observed in the Isle du Bois Arm during the August sampling date was substantially higher than the numbers observed in the July sampling date. Chrysophytes increased from an average of 211 cells per milliliter in July to an average of 585 cells per milliliter in August. The August chrysophyte community was almost exclusively comprised of the genus *Nitzschia,* which had a mean density of 353 cells per milliliter, and the genus *Rhopalodia* which had a mean density of 227 cells per milliliter. The genus *Fragilaria,* although present in small numbers (4 cells per milliliter), was only found in the Isle du Bois Arm during the August sampling date. *Achnathes, Melosira,* and *Synedra,* which were observed in both the Elm Fork Arm and Spring Creek, were not observed in the Isle du Bois Arm during this sampling date.

Phylum Cryptophyta had only two genera observed in at least one site during the August sampling date. Spring Creek, as in the July sampling period, had the highest overall densities of this phylum, with an average of 435 cells per milliliter and a standard deviation of 118 cells

(CV 27.1). Although the overall densities of this phylum increased at Spring Creek, the standard deviation decreased, indicating a less variable community. The Elm Fork Arm had an average density of 411 cells per milliliter and a standard deviation of 140 cells (CV 34.1). Site ID possessed the lowest and most variable numbers of Cryptophyta, with an average of 192 cells per milliliter and a standard deviation of 123 cells (CV 64.1).

The cryptophyte community in the Elm Fork Arm of the lake was dominated by *Cryptomonas*, which had a mean of 271 cells per milliliter. *Rhodamonas* were also present in large numbers, with a mean of 140 cells per milliliter. *Cryptomonas* also dominated the cryptophyte communities of both Spring Creek and the Isle du Bois Arm, with a mean density of 297 and 104 cells per milliliter, respectively. *Rhodomonas* were observed in relatively high densities in both Spring Creek and the Isle du Bois Arm, with an average density of 137 and 88 cells per milliliter, respectively.

Organisms in the phylum Euglenophyta were rare at all sampling sites during the August sampling date. Spring Creek had the highest overall density of euglenophytes, with an average of 44 cells per milliliter and a standard deviation of 31 cells (CV 70.5). The August euglenophyte community of Spring Creek was composed exclusively of the genus *Euglena*, which were observed in thirteen of the fifteen samples. The Elm Fork Arm of the lake had a mean density of 11 euglenophytes per milliliter, with a standard deviation of 18 cells (CV 163.6). All of the Elm Fork euglenophytes were of the genus *Euglena.* A small population of euglenophytes was observed in the Isle du Bois Arm of the lake, which had a mean density of 9 cells per milliliter and a standard deviation of 13 cells per milliliter (CV 144.4). As in the other sites, the euglenophyte community of Site ID was composed exclusively of *Euglena*.

Organisms in the phylum Pyrophyta were also rare at all sites during the August sampling date. It is interesting to note that the pyrophyte communities of both Spring Creek and the Isle du Bois Arm had an overall decrease in total pyrophytes, while density of pyrophytes in the Elm Fork Arm increased almost five-fold. Consequently, the Elm Fork Arm had the highest overall density of pyrophytes, with an average of 76 cells per milliliter and a standard deviation of 54 cells (CV 71.1). This community was dominated by *Gymnodinium*, which had a mean density of 53 cells per milliliter. *Peridinium* were also relatively common, with an average of 17 cells per milliliter. Although the Isle du Bois Arm of the lake was the only site in the July sampling date that possessed *Ceratium*, this genus was not observed in the August sampling date. The Elm Fork Arm and Spring Creek, however, both had small populations of this organism.

Spring Creek had the next highest concentration of pyrophytes, with a mean density of 60 cells per milliliter an a standard deviation of 30 cells (CV 50.0). This community, like that of the Elm Fork Arm, was dominated by *Gymnodinium* and *Peridinium*. *Gymnodinium* had the largest overall density, with an average of 43 cells per milliliter. *Peridinium* were also prevalent, with an average of 17 cells per milliliter. The Isle du Bois Arm had the lowest overall pyrophyte density, with an average of 44 cells per milliliter and a standard deviation of 30 cells (CV 68.2). This community, like the communities of the other two sites, was composed almost exclusively by *Gymnodinium* and *Peridinium*.

The Isle du Bois community, however, was dominated by *Peridinium*, which had a mean density of 25 cells per milliliter. *Gymnodinium* were present in smaller numbers, with a mean density of 16 cells per milliliter.

Chlorophyll a and Pheophytin Values
July 1995

The results of the chlorophyll a and pheophytin analysis are summarized in Tables 3, 4, 5, and 6. Actual chlorophyll and pheophytin concentrations for each sampling site and each date are listed in Appendix C.

Spring Creek possessed the highest and least variable chlorophyll a concentrations for the month of July, with an average concentration of 33.89 μg per liter and a standard deviation of 1.56 μg (CV 4.6). The Elm Fork Arm possessed the next highest and most variable chlorophyll a concentrations, with an average of 31.96 μg per liter and a standard deviation of 2.15 μg (CV 6.7). Isle du Bois had the lowest overall concentration of chlorophyll a, with an average of 20.68 μg per liter and a standard deviation of 0.99 μg (CV 4.8).

Pheophytin followed a similar trend, with the highest overall concentrations observed in Spring Creek ,which had an average concentration of 23.65 μg per liter and a standard deviation of 1.15 μg (CV 4.9). The Elm Fork Arm possessed the next highest and most variable pheophytin concentrations, with an average concentration of 22.43 μg per liter and a standard deviation of 1.77 μg (CV 7.9). Site ID had the lowest overall concentration of pheophytin, with an average of 15.14 μg per liter and a standard deviation of 1.42 μg (CV 9.4).

Chlorophyll a and Pheophytin Values

August 1995

The Elm Fork Arm of the lake had the highest average overall chlorophyll a concentrations for the August sampling date, with an average concentration of 64.85 μg per liter and a standard deviation of 1.79 μg(CV 2.8). These concentrations reflect a more than two-fold increase from the concentrations observed in the July sampling date. Although the total chlorophyll a concentrations increased at this site, the standard deviation decreased, indicating a less variable phytoplankton community. Spring Creek possessed the next highest chlorophyll a concentrations, with an average of 53.33 μg per liter and a standard deviation of 2.58 μg (CV 4.8). The Isle du Bois Arm had the lowest overall chlorophyll a concentrations, with an average of 33.89 μg per liter and a standard deviation of 0.97μg (CV 2.9). Although the overall chlorophyll a concentrations of this site increased from the concentrations observed in the July sampling date, the standard deviation decreased, indicating a less variable phytoplankton community.

Pheophytin followed a similar trend, with the highest overall concentrations observed in the Elm Fork Arm. Site EF had an average pheophytin concentration of 38.38 μg per liter and a standard deviation of 1.34 μg (CV 3.5). Spring

Table 3. Chlorophyll a concentrations (μg/L) for July 1995, by sample sites.

Site	Minimum	Maximun	Mean	Std. dev.
EF	28.97	36.45	31.96	2.154
ID	19.63	22.43	20.68	0.991
SP	30.84	37.38	33.89	1.558

Table 4. Pheophytin concentrations (μg/L) for July 1995, by sample sites.

Site	Minimum	Maximun	Mean	Std. dev.
EF	18.69	25.23	22.43	1.766
ID	13.08	17.76	15.14	1.422
SP	22.43	26.17	23.65	1.154

Table 5. Chlorophyll a concentrations (μg/L) for August 1995, by sample sites.

Site	Minimum	Maximum	Mean	Std. dev.
EF	62.61	68.22	64.85	1.794
ID	32.71	36.45	33.89	0.965
SP	49.53	57.94	53.33	2.583

Table 6. Pheophytin concentrations (μg/L) for August 1995, by sample sites.

Site	Minimum	Maximum	Mean	Std. dev.
EF	36.45	41.12	38.38	1.343
ID	20.56	24.30	22.12	1.154
SP	27.10	36.45	33.58	2.355

Creek possessed the next highest and most variable pheophytin concentrations, with an average of 33.58 μg per liter and a standard deviation of 2.36 μg (CV 7.0). Site ID possessed the lowest overall pheophytin concentrations, with an average concentration of 22.12 μg per liter and a standard deviation of 1.15 μg (CV 5.2).

Index Comparisons

The results of the respective index calculations are summarized in Tables 7 through 11. Actual index values for both sampling dates and all possible site comparisons are listed in Appendices D and E. In this analysis there are three variables of interest: the sampling sites, the community composition, and the sampling dates. In order to analyze these parameters in a two-dimensional data matrix, one parameter must be held constant and the other two must be used to make up each axis of the data matrix. Since the object of this study was to analyze the differences between sites, the sampling dates were held constant and each individual sampling site and it's respective community was used to construct the data matrix. In order to make different indices comparable, all indices were scaled to range from 0.0000 to 1.0000. All index numbers are in units of percent similarity.

Internal Comparisons of Indices

July 1995

In order to determine the similarity index or indices that best represent the differences between the Elm Fork Arm, Spring Creek, and the Isle du Bois Arm, a matrix of similarity values that represent all possible comparisons between replicates within each respective site was generated for each index and each date. Thus, a replicate of a particular site was compared to all other replicates from the same site and the same date. The purpose of this initial analysis was to determine the average similarity of each site as compared to itself. Table 7 summarizes the results of this analysis for the month of July. The actual numbers of all internal comparisons for the month of July are listed in Appendix D.

The percent similarity index showed a relatively high similarity value for all internal comparisons during the month of July. The internal comparison of Spring Creek showed both the highest similarity value and the least variability, with an average of 0.9635 and a standard deviation of 0.0137 (CV 1.42). The Elm Fork had the next highest value, with an average of 0.9418 and a standard deviation of 0.0274 (CV 2.91). Isle du Bois had both the lowest overall similarity and the most variability, with an average of 0.9332 and a standard deviation of 0.0328 (CV

3.52). Comparisons of average internal similarity for all of the indices shows that the percent similarity index has the second highest internal similarity value, second only to Stander's Index.

The Bray-Curtis Correlation Coefficient gave moderately high, though somewhat variable, internal similarity values for the July sampling period. Spring Creek possessed the highest average internal similarity, with an average of 0.9148 and a standard deviation of 0.0512 (CV 5.60). The Elm Fork Arm had the next highest internal similarity, with an average of 0.8886 and a standard deviation of 0.0667 (CV 7.51). This index, like the percent similarity, showed the Isle du Bois Arm to have the least amount of internal similarity ($\bar{x}$ = 0.8805) and the most variability (std. = 0.0767) (CV 8.71).

The Coefficient of Similarity Index gave the lowest overall internal similarity values for the July sampling date, and was second only to Model 2 for index variability. Site ID had the lowest and most variable values, with an mean internal similarity of 0.5119 and a standard deviation of 0.1505 (CV 29.4). Spring Creek's internal comparison was also very low and variable, with an mean of 0.5142 and a standard deviation of 0.1466 (CV 28.5). The community at the Elm Fork Arm gave the highest and least variable values for this index, with an mean of 0.5643 and a standard deviation of 0.1343 (CV 23.8).

The Jaccard's Index calculations for the July sampling period shows that this index has more difference between the minimum and maximum values than any of the other indices evaluated. Consequently, Jaccard's index had relatively high index variability, being exceeded in variability only by the Coefficient of Similarity and the Model 2 index. The Elm Fork Arm exhibited the highest and least variable internal similarity for this index, with an average of 0.6493 and a standard deviation of 0.1147 (CV 17.7). Spring Creek had the next highest internal similarity value, with an average of 0.6286 and a standard deviation of 0.1347 (CV 21.5). The Isle Du Bois Arm had the lowest and most variable mean internal similarity, with an average of 0.5969 and a standard deviation of 0.1309 (CV 21.9).

The Model 1 Index gave a relatively low internal similarity and was somewhat variable, being exceeded in variability only by Jaccard's index, the Coefficient of Similarity, and the Model 2 index. Spring Creek possessed the highest and least variable similarity value using this index, with an average similarity of 0.8315 and a standard deviation of 0.0882 (CV 10.6). The Elm Fork Arm of the lake had the next highest internal similarity, with an average similarity of 0.7757 and a standard deviation of 0.1132 (CV 14.6). As in all the other indices, the Isle du Bois Arm

Table 7. Internal comparisons of all indicies for July 1995

Index	Site	Minimum	Maximum	Mean	Std. Dev.
Percent Similarity	EF/EF	0.8579	0.9765	0.9418	0.0274
Percent Similarity	ID/ID	0.8472	0.9771	0.9332	0.0328
Percent Similarity	SP/SP	0.9290	0.9846	0.9635	0.0137
Bray-Curtis	EF/EF	0.7117	0.9701	0.8886	0.0667
Bray-Curtis	ID/ID	0.6594	0.9774	0.8805	0.0767
Bray-Curtis	SP/SP	0.7753	0.9853	0.9148	0.0512
Coefficient of Similarity	EF/EF	0.3515	0.7096	0.5643	0.1343
Coefficient of Similarity	ID/ID	0.3031	0.6724	0.5119	0.1505
Coefficient of Similarity	SP/SP	0.3199	0.6663	0.5142	0.1466
Jaccord's Index	EF/EF	0.4839	0.7778	0.6493	0.1147
Jaccord's Index	ID/ID	0.3793	0.7778	0.5969	0.1309
Jaccord's Index	SP/SP	0.3889	0.8966	0.6286	0.1347
Model 1 Index	EF/EF	0.5139	0.9097	0.7757	0.1132
Model 1 Index	ID/ID	0.4205	0.9427	0.7558	0.1347
Model 1 Index	SP/SP	0.6117	0.9580	0.8315	0.0882
Model 2 Index	EF/EF	0.1904	0.7954	0.4699	0.1793
Model 2 Index	ID/ID	0.3392	0.8140	0.5971	0.1495
Model 2 Index	SP/SP	0.4355	0.8475	0.6689	0.1245
Sorenson's Index	EF/EF	0.5151	0.8750	0.7486	0.1022
Sorenson's Index	ID/ID	0.5500	0.8750	0.7401	0.0918
Sorenson's Index	SP/SP	0.5600	0.9455	0.7629	0.0961
Stander's Index	EF/EF	0.9868	0.9999	0.9983	0.0020
Stander's Index	ID/ID	0.9902	0.9999	0.9984	0.0018
Stander's Index	SP/SP	0.9990	0.9999	0.9997	0.0002

had the lowest and most variable internal similarity, with an average of 0.7558 and a standard deviation of 0.1347 (CV 17.8).

The Model 2 index had the lowest and most variable internal similarity of all the indices calculated for the July sampling date. Spring Creek had the highest and least variable Model 2 index value, with an average internal similarity of 0.6689 and a standard deviation of 0.1245 (CV 18.6). The Isle du Bois Arm had the next highest internal similarity, with an average of 0.5971 and a standard deviation of 0.1495 (CV 25.0). For this index, the Elm Fork Arm had the lowest and most variable internal similarity, with an average of 0.4699 and a standard deviation of 0.1793 (CV 38.2).

Sorenson's index also had a relatively low internal similarity, but was less variable than the Coefficient of Similarity, Jaccard's Index, the Model 1 index, and the Model 2 index. Spring Creek had the highest internal similarity for this index, with an average of 0.7629 and a standard deviation of 0.0961 (CV 12.6). The Elm Fork Arm possessed the next highest and most variable index values, with an average of 0.7486 and a standard deviation of 0.1022 (CV 13.7). Site ID had the lowest overall internal similarity, with an average of 0.7401 and a standard deviation of 0.0918 (CV 12.4).

Stander's index gave the highest and least variable internal similarity values for the July sampling date. Spring Creek had the highest and least variable values using this index, with an average of 0.9997 and a standard deviation of 0.0002 (CV 0.02). The Isle du Bois Arm of the lake had the next highest average internal similarity, with an average of 0.9984 and a standard deviation of 0.0018 (CV 0.18). Site EF had the lowest and most variable internal similarity, with an average of 0.9983 and a standard deviation of 0.0020 (CV 0.20).

Internal Comparisons of Indices
August 1995

Table 8 summarizes the results of all the internal comparisons for the August sampling date. Actual index values are listed in Appendix E.

As in the previous month, the Percent Similarity index yielded a relatively high similarity value for all internal comparisons for the August sampling date. As in the previous month, Spring Creek had the highest internal similarity value, with an average of 0.9658 and a standard deviation of 0.0141 (CV 1.5). The Elm Fork had the next highest and least variable similarity values, with an average similarity of 0.9606 and a standard deviation of 0.0190 (CV 2.0). The Isle du Bois Arm of the lake had the lowest overall similarity and the most variability, with an average of 0.9181 and a standard deviation of 0.0567 (CV 6.2).

The internal comparisons using the Bray-Curtis Correlation Coefficient gave a moderately high, though somewhat variable, internal similarity for the August sampling date. This index had the third lowest variability when compared to the other indices, being surpassed only by the Percent Similarity index and Stander's index. Spring Creek possessed the highest and least variable internal similarity, with an average of 0.9407 and a standard deviation of 0.0357 (CV 3.8). The Elm Fork Arm had the next highest internal similarity, with an average of 0.9372 and a standard deviation of 0.0371 (CV 4.0). As in the previous month, this index showed the Isle du Bois Arm to have the lowest and most variable internal similarity, with an average of 0.8757 and a standard deviation of 0.0687 (CV 7.9).

The internal comparisons of the Coefficient of Similarity Index had the lowest overall internal similarity values for the month of August, and was the most internally variable of the eight indices. Isle du Bois had the lowest and most variable values, with an average internal similarity of 0.4195 and a standard deviation of 0.1550 (CV 37.0). The Elm Fork Arm had the next highest values for this index, with an average internal similarity of 0.5557 and a standard deviation of 0.1370 (CV 24.7). Spring Creek's community gave the highest and least variable values for this index, with an average of 0.5642 and a standard deviation of 0.1349 (CV 23.9).

The Jaccard's index calculations for the August sampling date shows that this index has more difference between the minimum and maximum values than any other index, a situation similar to that observed in July. Consequently, Jaccard's index had a relatively high index variability, being exceeded in variability only by the Coefficient of Similarity. The Elm Fork Arm exhibited the highest and least variable internal similarity for this index, with an average of 0.6313 and a standard deviation of 0.1287 (CV 20.4) . Spring Creek had the next highest internal similarity value, with an average of 0.6295 and a standard deviation of 0.1321 (CV 21.0). The Isle du Bois Arm had the lowest and most variable internal similarity values for this index, with an average of 0.5614 and a standard deviation of 0.1430 (CV 25.5).

As in the previous month, the Model 1 index gave a relatively low internal similarity and was somewhat variable, being exceeded in variability only by Jaccard's index, the Coefficient of Similarity, and the Model 2 index. Similar to the July sampling date, Spring Creek possessed

Table 8. Internal comparisons of all indices for August 1995

Index	Site	Minimum	Maximum	Mean	Std. Dev.
Percent Similarity	EF/EF	0.9010	0.9821	0.9606	0.0190
Percent Similarity	ID/ID	0.7155	0.9796	0.9181	0.0567
Percent Similarity	SP/SP	0.9298	0.9842	0.9658	0.0141
Bray-Curtis	EF/EF	0.8548	0.9864	0.9372	0.0371
Bray-Curtis	ID/ID	0.7243	0.9746	0.8757	0.0687
Bray-Curtis	SP/SP	0.8483	0.9910	0.9407	0.0357
Coefficient of Similarity	EF/EF	0.3773	0.6885	0.5557	0.1370
Coefficient of Similarity	ID/ID	0.2964	0.6213	0.4915	0.1550
Coefficient of Similarity	SP/SP	0.3487	0.7241	0.5642	0.1349
Jaccard's Index	EF/EF	0.4242	0.8000	0.6313	0.1287
Jaccard's Index	ID/ID	0.3704	0.7778	0.5614	0.1430
Jaccard's Index	SP/SP	0.3793	0.8462	0.6295	0.1321
Model 1 Index	EF/EF	0.7248	0.9642	0.8597	0.0705
Model 1 Index	ID/ID	0.5060	0.9239	0.7482	0.1192
Model 1 Index	SP/SP	0.7167	0.9608	0.8685	0.0673
Model 2 Index	EF/EF	0.5110	0.8424	0.6779	0.1193
Model 2 Index	ID/ID	0.3243	0.7270	0.5625	0.1444
Model 2 Index	SP/SP	0.4157	0.8333	0.6903	0.1200
Sorenson's Index	EF/EF	0.5958	0.8889	0.7660	0.0889
Sorenson's Index	ID/ID	0.5405	0.8750	0.7097	0.1038
Sorenson's Index	SP/SP	0.5500	0.9167	0.7649	0.0928
Stander's Index	EF/EF	0.9976	0.9999	0.9996	0.0004
Stander's Index	ID/ID	0.9342	0.9999	0.9938	0.0103
Stander's Index	SP/SP	0.9976	0.9999	0.9996	0.0004

the highest and least variable values using this index, with an average of 0.8685 and a standard deviation of 0.0673 (CV 7.8). Likewise, the Elm Fork Arm had the next highest internal similarity, with an average similarity of 0.8597 and a standard deviation of 0.0705 (CV 8.2). As in all the other indices calculated for the August sample date, the Isle du Bois Arm had the lowest and most variable internal similarity, with an average of 0.7482 and a standard deviation of 0.1192 (CV 15.9).

Unlike the July sampling date, the Model 2 Index did not exhibit the lowest and most variable internal similarity, being exceeded in this respect by both the Coefficient of Similarity and Jaccard's Index. Spring Creek had the highest Model 2 Index value, with an average internal similarity of 0.6903 and a standard deviation of 0.1200 (CV 17.4). The Elm Fork Arm had the next highest internal similarity, with an average value of 0.6779 and a standard deviation value of 0.1193 (CV 17.6). For this index and this month, the Isle du Bois Arm had the lowest and most variable internal similarity, with an average of 0.5625 and a standard deviation of 0.1444 (CV 25.7).

Sorenson's Index also had a relatively low internal similarity, but was less variable than the Coefficient of Similarity, Jaccard's Index, the Model 1 Index, and the Model 2 Index. The Elm Fork Arm of the lake had the highest internal similarity for this index, with an average of 0.7660 and a standard deviation of 0.0889 (CV 11.6). Spring Creek possessed the next highest internal similarity value, with an average of 0.7649 and a standard deviation of 0.0928 (CV 12.1). Site ID had the lowest and most variable internal index values, with an average of 0.7097 and a standard deviation of 0.1038 (CV 14.6).

As in the July sampling date, Stander's Index gave the highest and least variable internal similarity. Both Spring Creek and the Elm Fork Arm had the same internal similarity and standard deviation, exhibiting an average internal similarity of 0.9996 and a standard deviation of 0.0004 (CV 0.04). The Isle du Bois Arm of the lake had the lowest overall internal similarity values for this index, with an average of 0.9938 and a standard deviation of 0.0103 (CV 1.04).

External Comparisons of Indices

July 1995

In order to assess the differences between the communities at the respective sampling sites, a matrix of similarity values that represents all possible comparisons of the replicates at each sampling site to the replicates of every other sampling site was generated. The purpose of this analysis was to determine the average similarity of each site compared to every other site. Such an analysis allows the determination of both the similarity between the respective sampling sites and the variability associated with this similarity. Table 9 summarizes the between site comparisons of all indices for the July sampling date. Actual values are listed in Appendix D.

The Percent Similarity Index showed relatively high and invariable index values for the external comparisons made during the July sampling period. The largest and least variable difference was observed in the comparison between the Elm Fork Arm and Spring Creek, which had an average similarity of 0.8768 and a standard deviation of 0.0294 (CV 3.4). The next highest similarity value was observed in the comparison between the Elm Fork and the Isle du Bois Arm, which had an average similarity of 0.8929 and a standard deviation of 0.0298 (CV 3.3). This index had a relatively large similarity value for the comparison between Spring Creek and the Isle du Bois Arm, which had an average similarity value of 0.9090 and a standard deviation of 0.0335 (CV 3.7). Overall, for the July sampling date, the Percent Similarity Index gave a relatively high and invariable similarity values for the between site comparisons, being exceeded in both respects only by the Stander's Index.

The Bray-Curtis Correlation Coefficient showed a moderate difference between sites and also possessed a relatively low index variability. The greatest difference in community composition using this index was observed in the comparison between Spring Creek and the Isle du Bois Arm of the lake, which had an average similarity of 0.7329 and a standard deviation of 0.0945 (CV 12.9). The Elm Fork and Isle du Bois Arms of the lake were also quite different, with an average similarity of 0.7990 and a standard deviation of 0.0879 (CV 11.0). This index showed the Elm Fork Arm and Spring Creek communities were the most similar and least variable, with an average similarity of 0.8236 and a standard deviation of 0.0711 (CV 8.6).

The Coefficient of Similarity had the lowest overall between-site index values for the July sample date. However, this index also had the lowest overall internal similarity for this sample date. According to this index, the communities present at the Elm Fork and Isle du Bois Arms were the most different and least variable, with an average similarity of 0.4157 and a standard deviation of 0.0724 (CV 17.4). Spring Creek and the Isle du Bois Arm of the lake were also quite different, with an average similarity of 0.4247 and a standard deviation of 0.0737 (CV 17.4). The most similar communities, as determined by this index, were those of the Elm Fork Arm and Spring Creek, which had an average of 0.4302 and a standard deviation of 0.0766 (CV

Table 9. Between site comparisons of all indices for July 1995

Index	Site	Minimum	Maximum	Mean	Std. Dev.
Percent Similarity	EF/ID	0.8148	0.9438	0.8929	0.0298
Percent Similarity	EF/SP	0.7996	0.9546	0.8768	0.0294
Percent Similarity	ID/SP	0.8306	0.9760	0.9090	0.0335
Bray-Curtis	EF/ID	0.5469	0.9497	0.7990	0.0879
Bray-Curtis	EF/SP	0.6578	0.9536	0.8236	0.0711
Bray-Curtis	ID/SP	0.5387	0.9804	0.7329	0.0945
Coefficient of Similarity	EF/ID	0.2635	0.6202	0.4157	0.0724
Coefficient of Similarity	EF/SP	0.2158	0.6420	0.4302	0.0766
Coefficient of Similarity	ID/SP	0.2470	0.6075	0.4247	0.0737
Jaccard's Index	EF/ID	0.3438	0.7200	0.5026	0.0732
Jaccard's Index	EF/SP	0.3429	0.7241	0.5384	0.0787
Jaccard's Index	ID/SP	0.3333	0.7143	0.4898	0.0703
Model 1 Index	EF/ID	0.4634	0.8754	0.6918	0.0079
Model 1 Index	EF/SP	0.4084	0.8879	0.6605	0.0135
Model 1 Index	ID/SP	0.3133	0.9357	0.5159	0.0129
Model 2 Index	EF/ID	0.3128	0.6475	0.4746	0.0054
Model 2 Index	EF/SP	0.2641	0.7160	0.4430	0.0077
Model 2 Index	ID/SP	0.2003	0.6402	0.3656	0.0068
Sorenson's Index	EF/ID	0.3939	0.8372	0.6442	0.0835
Sorenson's Index	EF/SP	0.4000	0.8400	0.6745	0.0825
Sorenson's Index	ID/SP	0.5000	0.8333	0.6546	0.0825
Stander's Index	EF/ID	0.9863	0.9996	0.9966	0.0023
Stander's Index	EF/SP	0.9858	0.9995	0.9951	0.0026
Stander's Index	ID/SP	0.9891	0.9999	0.9980	0.0020

17.8).

Jaccard's Index also had relatively low index values for between site similarity, with only the Coefficient of Similarity and the Model 2 Index giving lower overall values. According to this index, the communities of Spring Creek and the Isle du Bois Arms of the lake were the most different and least variable, with an average of 0.4898 and a standard deviation of 0.0703 (CV 14.4). The Elm Fork and Isle du Bois Arms of the lake were also quite different, with an average similarity of 0.5026 and a standard deviation of 0.0732 (CV 14.6). This index showed the communities of Spring Creek and the Elm Fork Arm to be the most similar and most variable, with an average of 0.5384 and a standard deviation of 0.0787 (CV 14.6).

The Model 1 Index showed a moderate difference between sites and possessed a relatively low variability for this sampling date, being exceeded in variability by all indices except Stander's and Model 2. This index showed the communities of Spring Creek and the Isle du Bois Arm to be the most different, with an average similarity of 0.5159 and a standard deviation of 0.0129 (CV 2.5). This index also detected a substantial, though variable, difference between the communities present at Spring Creek and the Isle du Bois Arm, showing an average similarity of 0.6605 and a standard deviation of 0.0135 (CV 2.0). The greatest amount of similarity and the least amount of variation was between the communities of the Elm Fork and Isle du Bois Arms, which had an average similarity of 0.6918 and a standard deviation of 0.0079 (CV 1.1).

The Model 2 index showed a large average difference between sites, and was a relatively invariable index for the July sampling date, with only the Stander's Index showing less index variability. The large differences between sites, however, must be considered in light of the fact that the Model 2 Index gave the lowest internal comparisons for the July sampling date. This index showed the greatest difference between the communities of Spring Creek and Isle du Bois, which had an average similarity of 0.3656 and a standard deviation of 0.0068 (CV 1.9). Spring Creek and the Elm Fork were also quite different, with an average similarity of 0.4430 and a standard deviation of 0.0077 (CV 1.7). The greatest degree of similarity and least amount of variability was observed in the communities of the Elm Fork and Isle ddu BoisArms of the lake, which had an average similarity of 0.4746 and a standard deviation of 0.0054 (CV 1.1).

Sorenson's Index showed a moderate difference between sites and was relatively variable, being exceeded in variability only by the Coefficient of Similarity and Jaccard's Index for this month. This index showed that the greatest and most variable difference existed between the Elm Fork and Isle du Bois Arms of the lake, which had an average similarity of 0.6442 and a standard deviation of 0.0835 (CV 13.0). Spring Creek and the Isle du Bois Arm of the lake were also quite different, with an average similarity of 0.6546 and a standard deviation of 0.0825 (CV 12.6). This index showed that the communities of Spring Creek and the Elm Fork Arm were the most similar, having an average similarity of 0.6745 and a standard deviation of 0.0825 (CV 12.2).

Stander's Index showed essentially no difference between sites, and had very low index variability. This index showed the most difference and variability between the Elm Fork and Spring Creek, with an average of 0.9951 and a standard deviation of 0.0026 (CV 0.3). The next largest difference for this index was between the communities of the Elm Fork and Isle du Bois Arms, which had an average similarity of 0.9966 and a standard deviation of 0.0023 (CV 0.2). Spring Creek and the Isle du Bois Arm of the lake were the most similar and least variable sites for this index, with an average of 0.9980 and a standard deviation of 0.0020 (CV 0.2).

External Comparisons of Indices

August 1995

Table 10 summarizes the external comparisons of all indices for the August sampling date. Actual index values are listed in Appendix E.

The Percent Similarity Index showed relatively high and invariable index values for between site comparisons during August. The greatest difference between communities using this index was observed in the comparison between Spring Creek and the Isle du Bois Arm, which had an average similarity of 0.8464 and a standard deviation of 0.0413 (CV 4.9). The next highest similarity value was observed in the comparison between the Elm Fork Arm and the Isle du Bois Arm, which had an average similarity of 0.8589 and a standard deviation of 0.0404 (CV 4.7) . This index had a very high similarity value for the comparison between the community of the Elm Fork Arm and Spring Creek, which had an average of 0.9555 and a standard deviation of 0.0157 (CV 1.6). Overall, for the August sampling date, the Percent Similarity index gave relatively high and invariable similarity values for the between site comparisons, being exceeded in both respects only by Stander's Index.

The Bray Curtis correlation coefficient showed a moderate difference between sites and also possessed relatively low index variability. The greatest difference in community composition using this index was observed in the comparison between the Elm Fork and the Isle du Bois

Arms of the lake, which had an average similarity of 0.6962 and a standard deviation of 0.0767 (CV 11.0). Spring Creek and the Isle ddu BoisArm of the lake were also quite different, with an average similarity of 0.7309 and a standard deviation of 0.0742 (CV 10.2). The Elm Fork Arm of the lake and Spring Creek were the most similar, with an average similarity of 0.9115 and a standard deviation of 0.0464 (CV 5.1).

The Coefficient of Similarity had very low index values for between site similarity, with only the Model 2 index giving lower overall index values. However, this must be considered in light of the fact that the Coefficient of Similarity also had the lowest overall internal similarity for the August sampling period. According to this index, the communities present at Spring Creek and the Isle du Bois Arm were the most different and least variable, with an average similarity value of 0.3939 and a standard deviation of 0.0640 (CV 16.3). The Elm Fork and Isle du Bois Arms of the lake were also quite different, with an average similarity of 0.4103 and a standard deviation of 0.0718 (CV 17.5). The most similar communities, as determined by this index, were those of the Elm Fork Arm and Spring Creek, which had an average of 0.4985 and a standard deviation of 0.0709 (CV 14.2).

Jaccard's Index also had relatively low index values

Table 10. Between site comparisons of all indices for August 1995

Index	Site	Minimum	Maximum	Mean	Std. Dev.
Percent Similarity	EF/ID	0.7153	0.9351	0.8589	0.0404
Percent Similarity	EF/SP	0.8981	0.9798	0.9555	0.0157
Percent Similarity	ID/SP	0.7204	0.9377	0.8464	0.0413
Bray-Curtis	EF/ID	0.5432	0.8780	0.6952	0.0767
Bray-Curtis	EF/SP	0.7782	0.9805	0.9115	0.0464
Bray-Curtis	ID/SP	0.5547	0.9242	0.7309	0.0742
Coefficient of Similarity	EF/ID	0.2375	0.6197	0.4103	0.0718
Coefficient of Similarity	EF/SP	0.3302	0.7176	0.4985	0.0709
Coefficient of Similarity	ID/SP	0.2266	0.6014	0.3939	0.0640
Jaccard's Index	EF/ID	0.3030	0.7273	0.4682	0.0715
Jaccard's Index	EF/SP	0.3667	0.8519	0.5717	0.0919
Jaccard's Index	ID/SP	0.3000	0.7619	0.5081	0.0816
Model 1 Index	EF/ID	0.2856	0.7340	0.4750	0.0932
Model 1 Index	EF/SP	0.6166	0.9513	0.8154	0.0745
Model 1 Index	ID/SP	0.2881	0.8055	0.5033	0.1044
Model 2 Index	EF/ID	0.1667	0.5669	0.3149	0.0714
Model 2 Index	EF/SP	0.3699	0.8472	0.6087	0.0852
Model 2 Index	ID/SP	0.2061	0.6096	0.3528	0.0797
Sorenson's Index	EF/ID	0.4657	0.8421	0.6346	0.0650
Sorenson's Index	EF/SP	0.5366	0.9200	0.7232	0.0735
Sorenson's Index	ID/SP	0.4615	0.8649	0.6700	0.0719
Stander's Index	EF/ID	0.9478	0.9985	0.9875	0.0101
Stander's Index	EF/SP	0.9963	0.9999	0.9994	0.0006
Stander's Index	ID/SP	0.9438	0.9983	0.9849	0.0112

for between site similarity, with only the Coefficient of Similarity and the Model 2 index giving lower overall values. According to this index, the communities of the Elm Fork and Isle du Bois Arms are the most different, with an average of 0.4682 and a standard deviation of 0.0715 (CV 15.3). Spring Creek and the Isle du Bois Arm were also quite different, with an average index value of 0.5081 and a standard deviation of 0.0819 (CV 16.1). The Elm Fork Arm and Spring Creek had the most similarity, although this comparison showed the most index variability, with an average value of 0.5717 and a standard deviation of 0.0919 (CV 16.1).

The Model 1 Index showed a moderate difference between sites and was the most variable index assessed in the August sampling date. This index showed the communities of the Elm Fork and Isle du Bois Arms to be the most different, with an average similarity of 0.4750 and a standard deviation of 0.0932 (CV 19.6). The comparison of Spring Creek and the Isle du Bois Arm showed these sites were also quite different and variable, with an average similarity of 0.5033 and a standard deviation of 0.1044 (CV 20.7). This index showed the communities of the Elm Fork Arm and Spring Creek were the most similar and least variable, with an average of 0.8154 and a standard deviation of 0.0745 (CV 9.1).

The Model 2 Index showed a large average difference between sites, and was a relatively variable index, being surpassed in variability only by Jaccard's Index and the Model 1 Index. The large difference between sites should be considered in light of the fact that the Model 2 index gave one of the lowest internal comparisons for the August sampling date, being exceeded in this respect by only the Coefficient of Similarity and Jaccard's Index. The Model 2 index showed the greatest difference between the communities of the Elm Fork and Isle du Bois Arms, which had an average similarity of 0.3149 and a standard deviation of 0.0714 (CV 22.7). Spring Creek and the Isle du Bois Arm were also quite different, with an average similarity of 0.3528 and a standard deviation of 0.0797 (CV 22.6). This index showed the Elm Fork Arm and Spring Creek were the most similar and variable sites, with an average of 0.6087 and a standard deviation of 0.0852 (CV 14.0).

Sorenson's Index showed a moderate difference between sites, and had relatively low index variability. This index, like most of the other indices, showed the most difference between the Elm Fork and Isle du Bois Arms, with an average of 0.6346 and a standard deviation of 0.0650 (CV 10.2). This index also shows a large difference between Spring Creek and the Isle du Bois Arm of the lake, with an average of 0.6700 and a standard deviation of 0.0719 (CV 10.7). Spring Creek and the Elm Fork Arm were the most similar and variable sites, with an average of 0.7232 and a standard deviation of 0.0735 (CV 10.2).

Stander's Index showed essentially no differences between sites, and had very low index variability. This index showed the most difference between the Isle du Bois Arm and Spring Creek, with an average of 0.9849 and a standard deviation of 0.0112 (CV 1.1). The next largest difference for this index was between the communities at the Elm Fork and Isle du Bois Arms, which had an average similarity of 0.9875 and a standard deviation of 0.0101 (CV 1.0). Spring Creek and the Elm Fork were the most similar sites, with an average of 0.9994 and a standard deviation of 0.0006 (0.1).

Internal Index Values Versus External Index Values

One of the most important aspects of the respective indices is the ability to give a high internal similarity value (all replicates of a particular site compared to each other) and a lower external similarity value (all replicates of a particular site compared to the replicates at all other sites). Such an ability indicates that the index can show the communities at different sites are less similar, but can show that the communities within the sites are more similar. Thus, the index that gives a high internal similarity value and a lower external values can more readily show differences that exist between the sites. In order to determine which indices showed the greatest degree of difference, all external comparisons for each month were subtracted from all internal values. The results of this analysis are summarized in Table 11 and Figure 3.

Examination of the table shows that the Percent Similarity Index possessed a relatively small difference between internal and external values, being exceeded in this respect only by the Stander's Index. The smallest difference was observed in the July sampling date, which had a difference of 0.1598. August possessed a slightly higher difference, with a value of 0.1837.

The Bray-Curtis Coefficient had a relatively large difference between the internal and external values, being exceeded in this respect by the Model 1, Model 2, and Jaccard indices for the July sampling date. This difference was even more pronounced for the August sampling date, with only the Model 1 and Model 2 indices surpassing the Bray-Curtis values. As in the Percent Similarity Index, the least amount of difference was observed in July, which had a difference of 0.3284. August differences were slightly higher, possessing a value of 0.4160.

The Coefficient of Similarity possessed a very consistent difference value between the two sampling dates. Unlike the preceding indices, the largest difference for this index was observed in the July sampling date, which had a difference of 0.3198. The values for August were slightly smaller, with a difference of 0.3087.

Jaccard's Index was relatively consistent between the two sampling dates. Like the Coefficient of Similarity, this index had the highest overall difference in the month of July, which possessed a difference of 0.3440. The August sampling date had a somewhat smaller value, with a difference of 0.2742.

The Model 1 Index had the largest difference between the internal and external index values for all indices evaluated and both sampling periods. The lowest values were observed in July, which had a difference of 0.4948. August values were considerably higher, with a difference of 0.6827.

The Model 2 Index differences were slightly lower than the Model 1 Index, and were the second largest differences of all indices evaluated and both sampling conditions. The lowest values were observed in the July sampling date, which had a difference of 0.4527. August values were considerably higher, with a difference of 0.6543.

Sorenson's Index differences were relatively low, with only the Percent Similarity and Stander's Indices exhibiting lower values. The greatest difference between internal and external values was observed in the July sampling date, which had a difference of 0.2783. August values were slightly lower, with a difference of 0.2128.

Stander's Index differences were the lowest of all indices for both sampling dates. The lowest values were observed in July, which had a difference of only 0.0067. August values were considerably higher, with a difference of 0.0212.

Determination of the "Best" Index for the Ray Roberts Phytoplankton

The best index for describing the Ray Roberts phytoplankton communities must be the one which exceeds all of the other indices for a variety of criteria. The criteria which were deemed to be the most important for identifying the best index were the following:

1. The lowest amount of variability when determining the internal index comparisons. In other words, the variability associated with the within site comparisons must be as small as possible.
2. The largest amount of difference between the internal comparisons and external comparisons of index values. This will indicate an index that can detect the similarity between the samples

taken at a particular location, while detecting the differences between the comparisons of samples taken at a different location.

3. The most consistency between months for the above parameters.

In order to determine which index best fulfilled the above requirements, a ranking system was developed for each of the above parameters for each sample date. For the variability parameter, the variance of each index was ranked on a scale of 1 to 8, with the least variable index receiving the highest score. The difference between the internal and external index comparisons was treated in a similar fashion, with the largest difference receiving the highest score. Table 12 summarizes the results of this analysis.

Examination of Table 12 shows that two indices are clearly superior in meeting the above requirements. The highest overall index score was obtained for the Bray-Curtis Correlation Coefficient, which received a score of 23. The Model 1 Index had a slightly lower score of 22, due mainly to the high relative variance this index exhibited during the August sampling date. Model 2 also performed reasonably well, obtaining an overall score of 20. Although Model 2 performed well in detecting differences between the individual sites, it was quite variable, thus receiving a lower overall score. Of all the indices evaluated, the Bray-Curtis, Model 1, and Model 2 indices perform the best for the above evaluation criteria using the Ray Roberts phytoplankton data.

Minimum Detectable Difference

In order to determine the power, significance, and associated sample sizes needed to detect a significant change in the similarity analysis of the phytoplankton, the Minimum Detectable Difference formula (Zar, 1984) was employed. Chlorophyll a concentrations were also analyzed in a similar fashion. The goal of this analysis was to determine the sample size and the associated minimum detectable difference that must be observed in order to detect statistically significant changes between the communities of each sampling site, using both the analysis of chlorophyll a concentrations and the similarity indices. Since the formula is intended for use with a *t* test, it is ideal for detecting changes between these two parameters under the null hypothesis of no difference, provided the samples are normally distributed and the variance does not change significantly between comparisons. The Shapiro-Wilks test for normality showed that the index values of the Bray-Curtis, Model 1, and Model 2 indices for this study were

Table 11. External comparisons subtracted from internal comparisons for all index values by date.

Index	July 1995	August 1995
Percent Similarity	0.1598	0.1837
Bray-Curtis Coefficient	0.3284	0.4160
Coefficient of Similarity	0.3198	0.3087
Jaccard's Index	0.3440	0.2742
Model 1 Index	0.4948	0.6827
Model 2 Index	0.4527	0.6543
Sorenson's Index	0.2783	0.2128
Stander's Index	0.0067	0.0212

Table 12. Ranking values for index variability and internal versus external comparisons.

Index	July Variance	July internal vs. external	August Variance	August internal vs. external	Total
Percent Similarity	7	2	7	2	18
Bray - Curtis	6	5	6	6	23
Coeff. of similarity	1	4	5	5	15
Jaccard's	2	6	2	4	14
Model 1	5	8	1	8	22
Model 2	3	7	3	7	20
Sorenson's	4	3	4	3	14
Stander's	8	1	8	1	18

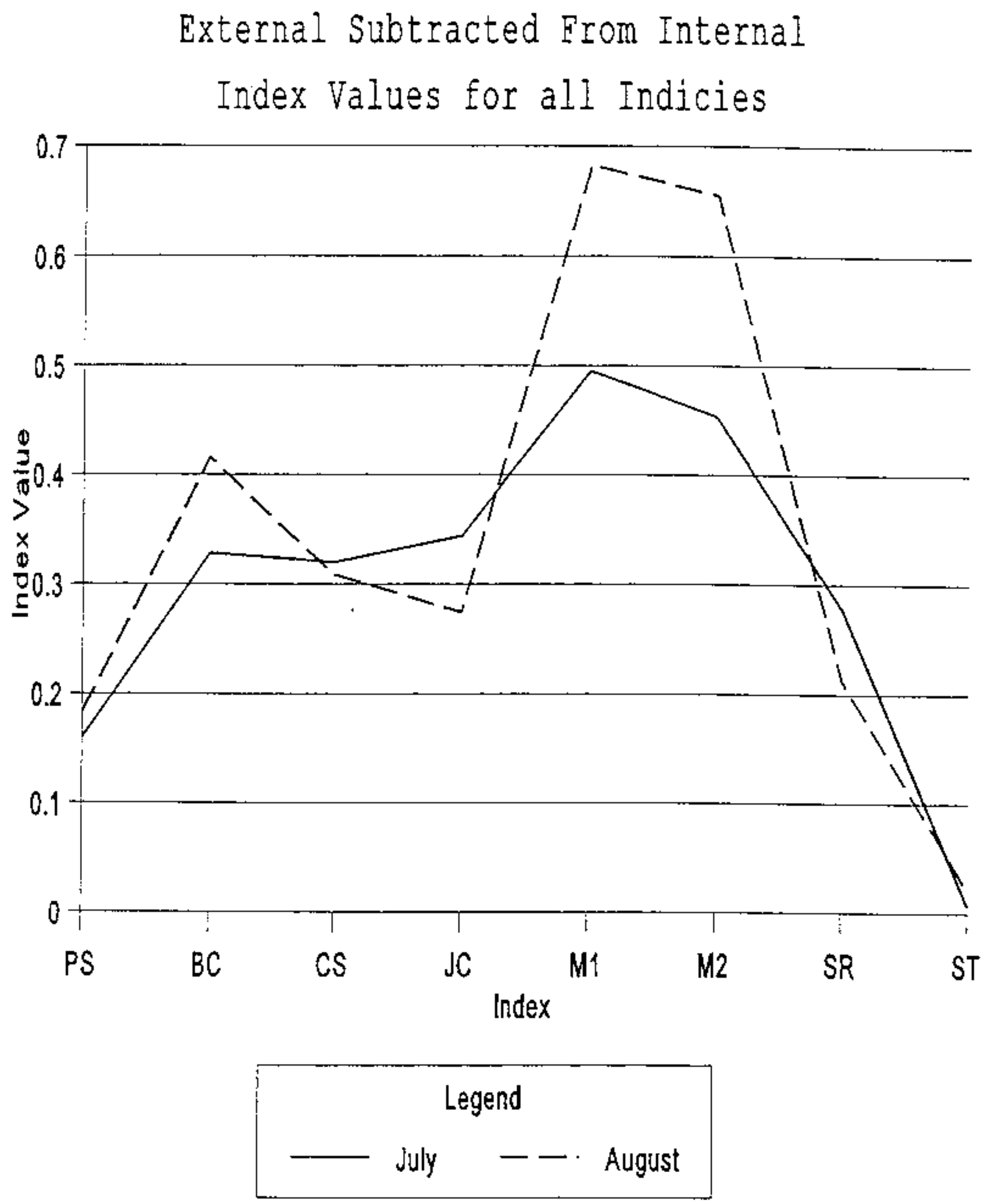

Figure 3. External comparisons subtracted from internal comparisons for all index values by date. PS = Percent similarity, BC = Bray Curtis, CS = Coefficient of Similarity, JC = Jaccard, M1 = Model 1, M2 = Model 2, SR = Sorenson, ST = Standers.

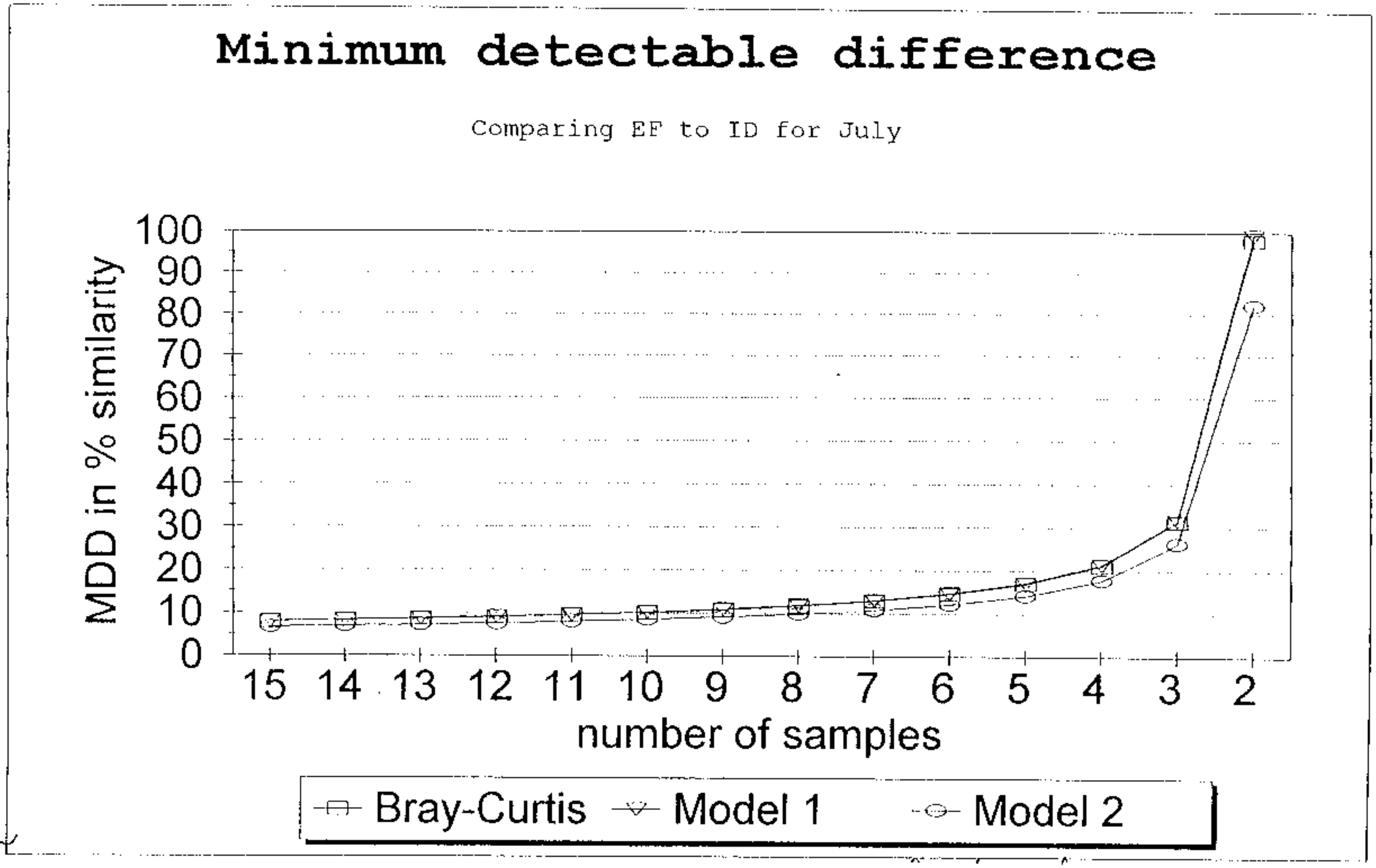

Figure 4. Minimum Detectable Difference as a function of sample size, comparing the phytoplankton communities at EF and ID for July using the Bray-Curtis, Model 1 and Model 2 indicies.

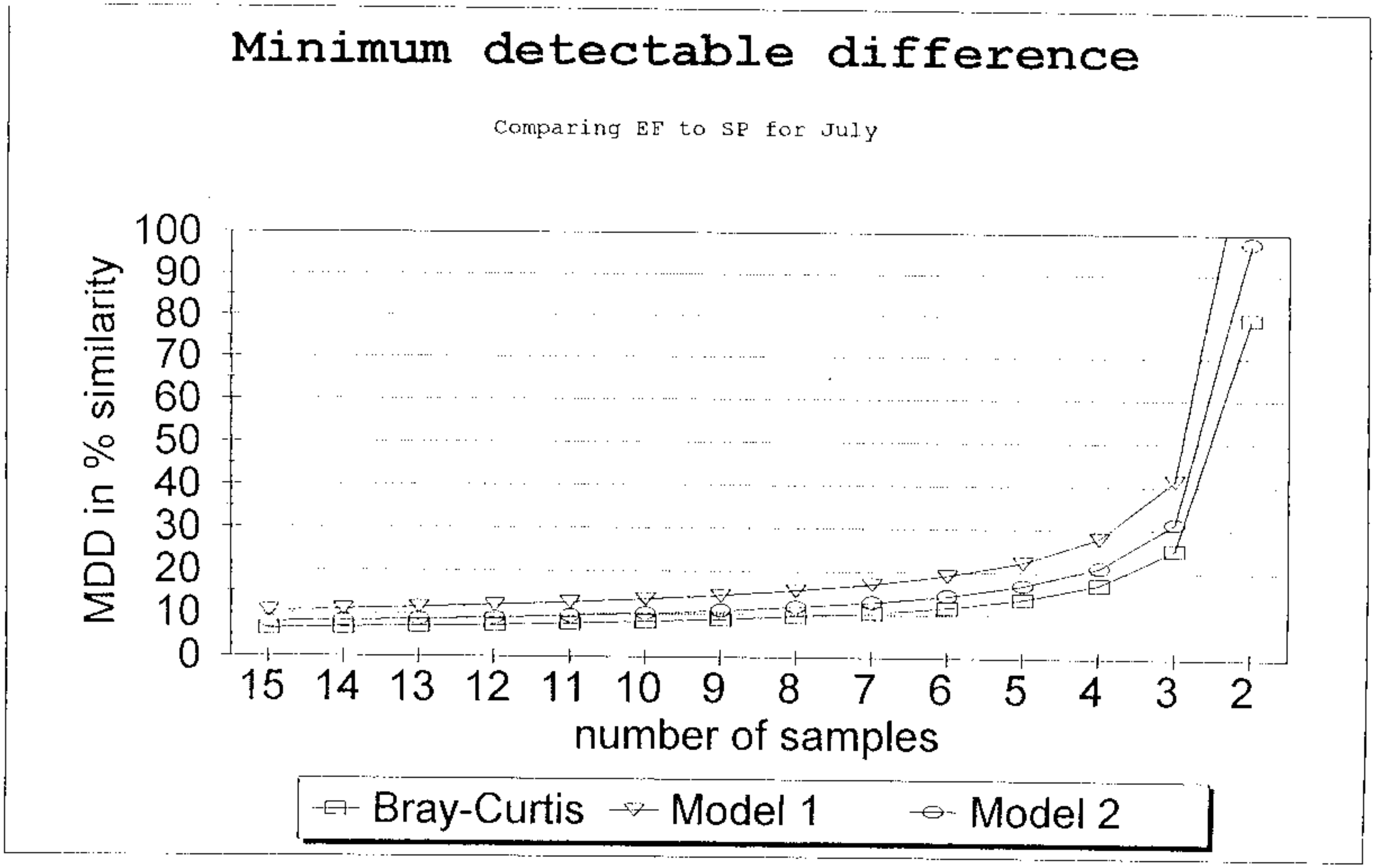

Figure 5. Minimum Detectable Difference as a function of sample size, comparing the phytoplankton communities at EF and SP for July using the Bray-Curtis, Model 1 and Model 2 indicies.

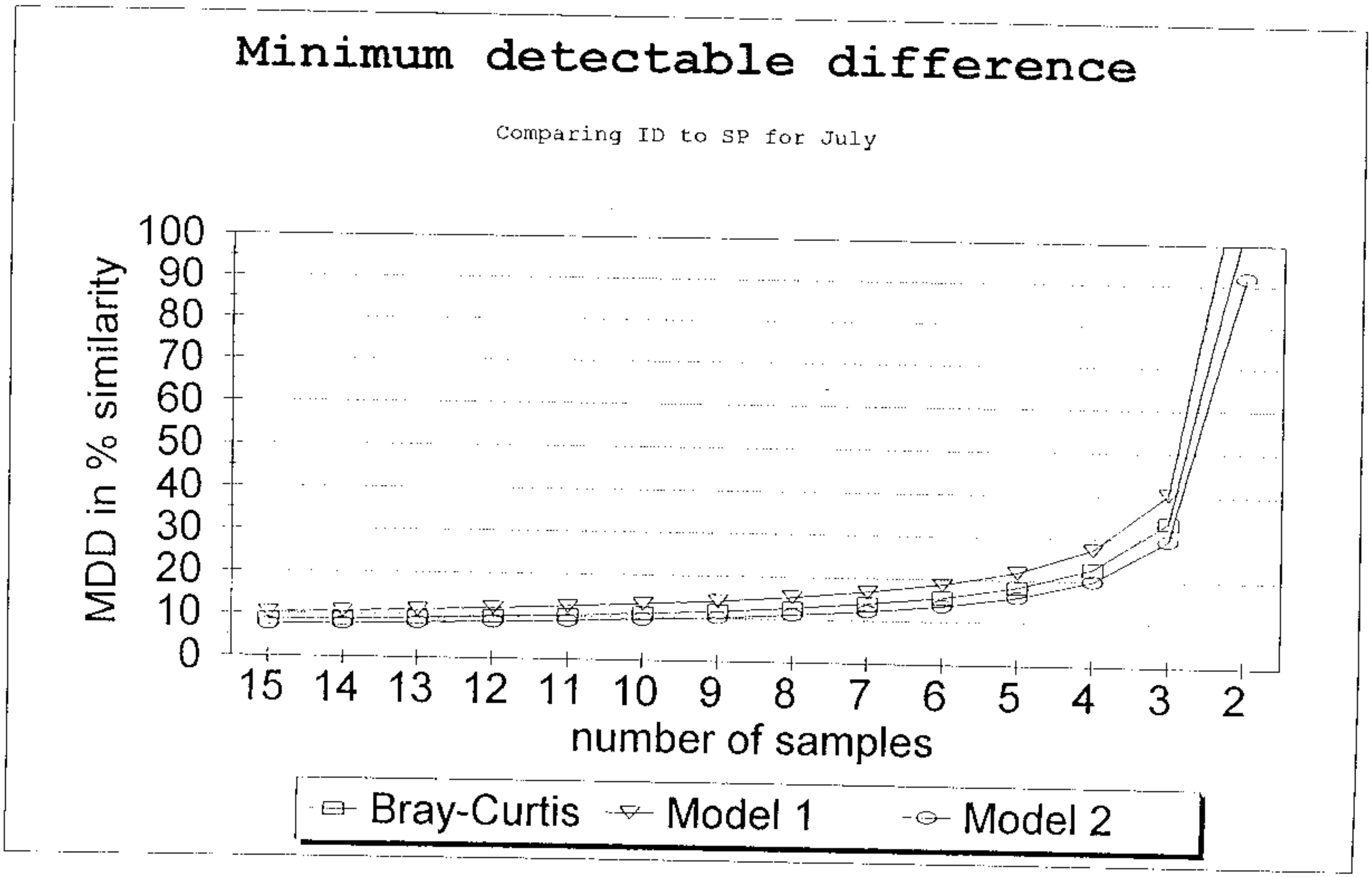

Figure 6. Minimum Detectable Difference as a function of sample size, comparing the phytoplankton communities at ID and SP for July using the Bray-Curtis, Model 1 and Model 2 indicies.

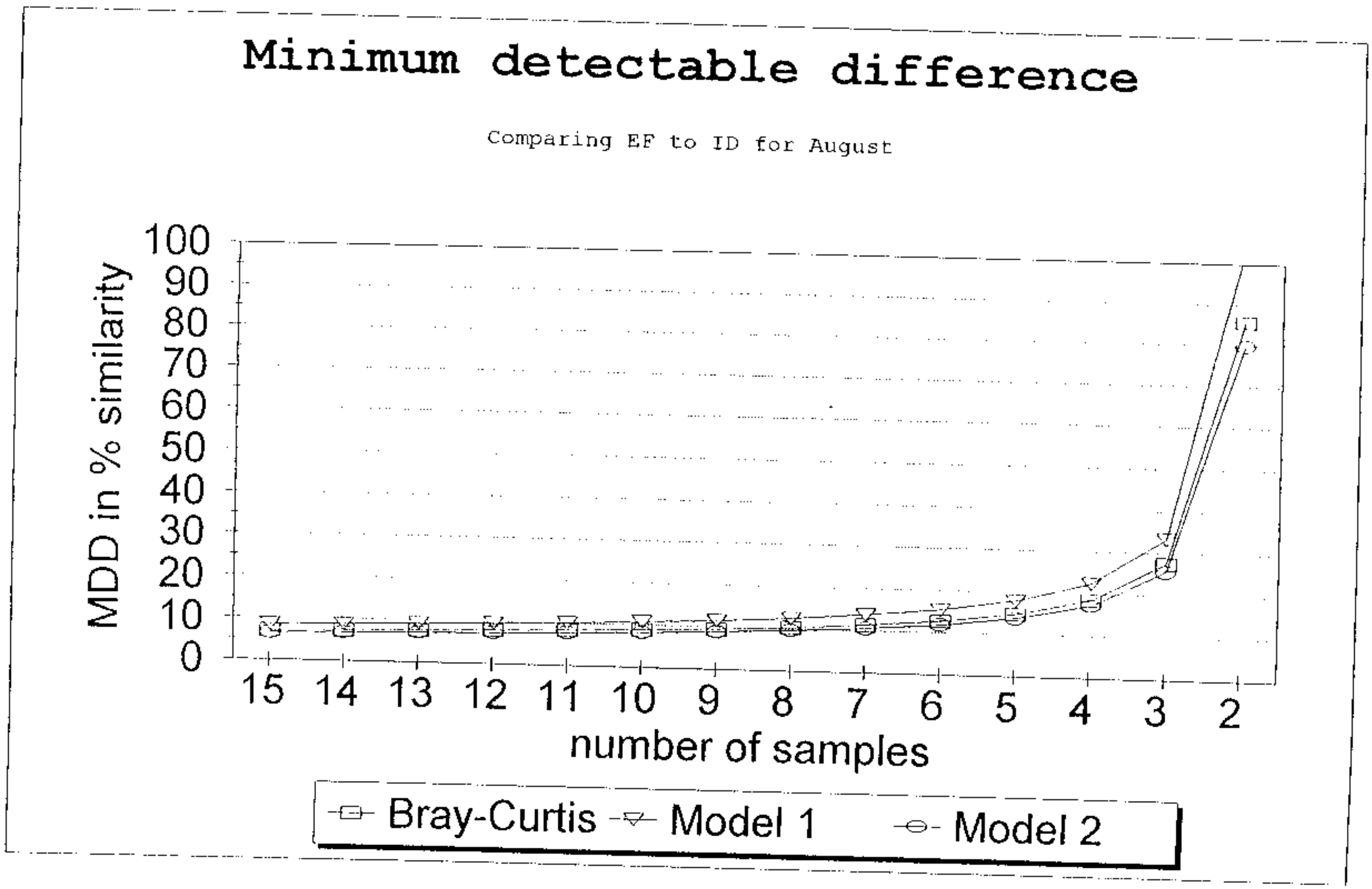

Figure 7. Minimum Detectable Difference as a function of sample size, comparing the phytoplankton communities at EF and ID for August using the Bray-Curtis, Model 1 and Model 2 indicies.

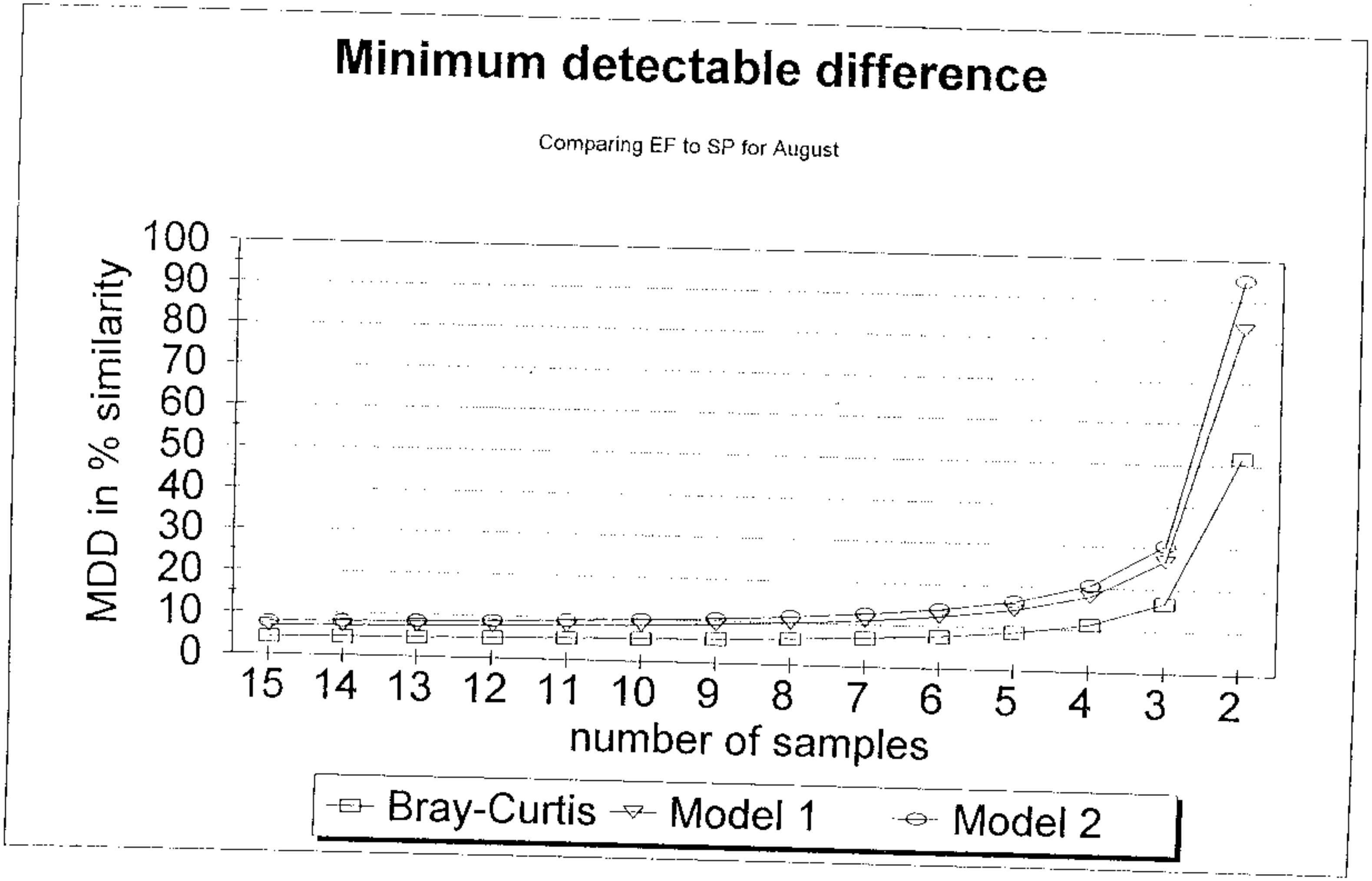

Figure 8. Minimum Detectable Difference as a function of sample size, comparing the phytoplankton communities at EF and SP for August using the Bray-Curtis, Model 1 and Model 2 indicies.

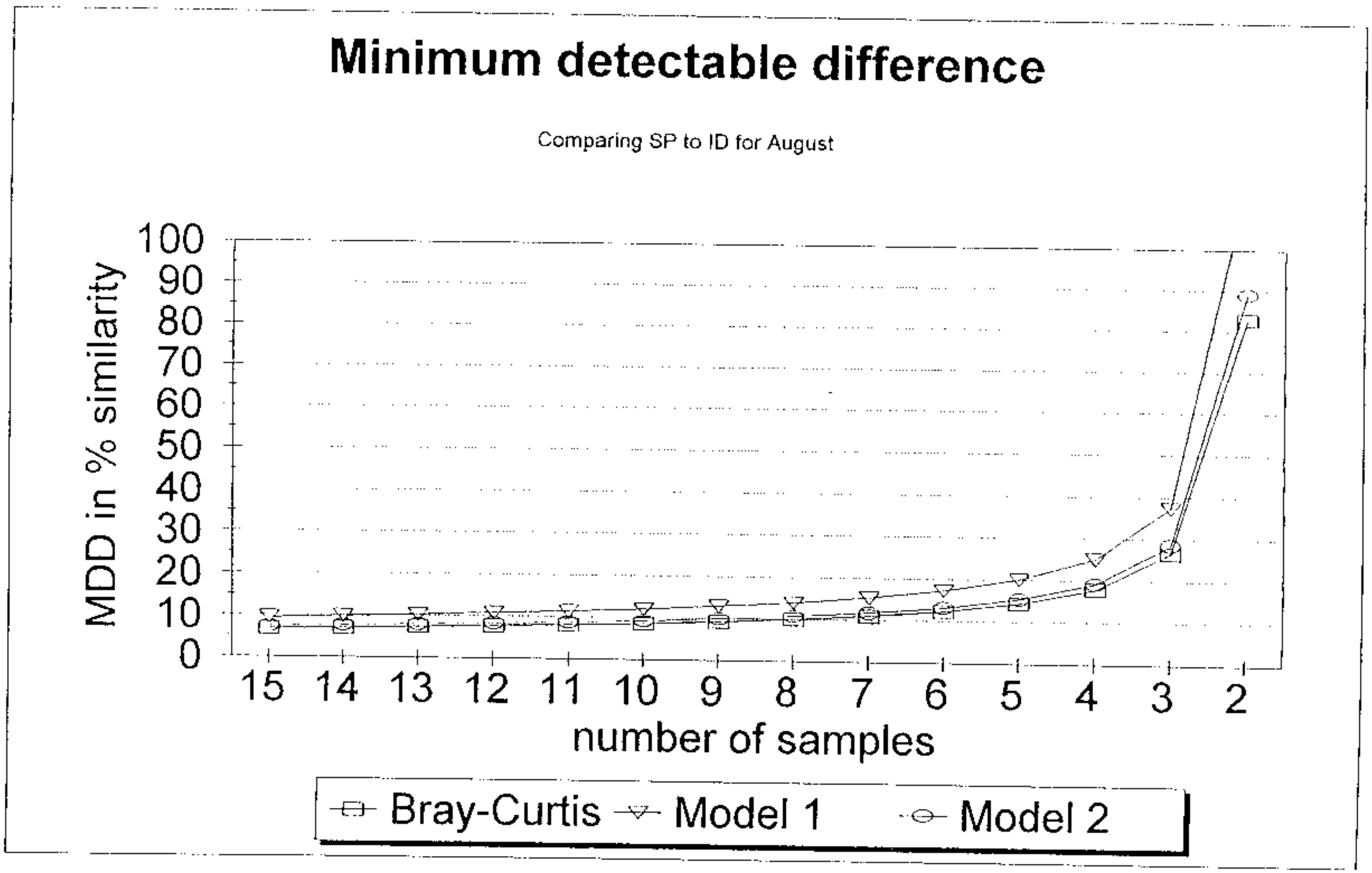

Figure 9. Minimum Detectable Difference as a function of sample size, comparing the phytoplankton communities at SP and ID for August using the Bray-Curtis, Model 1 and Model 2 indicies.

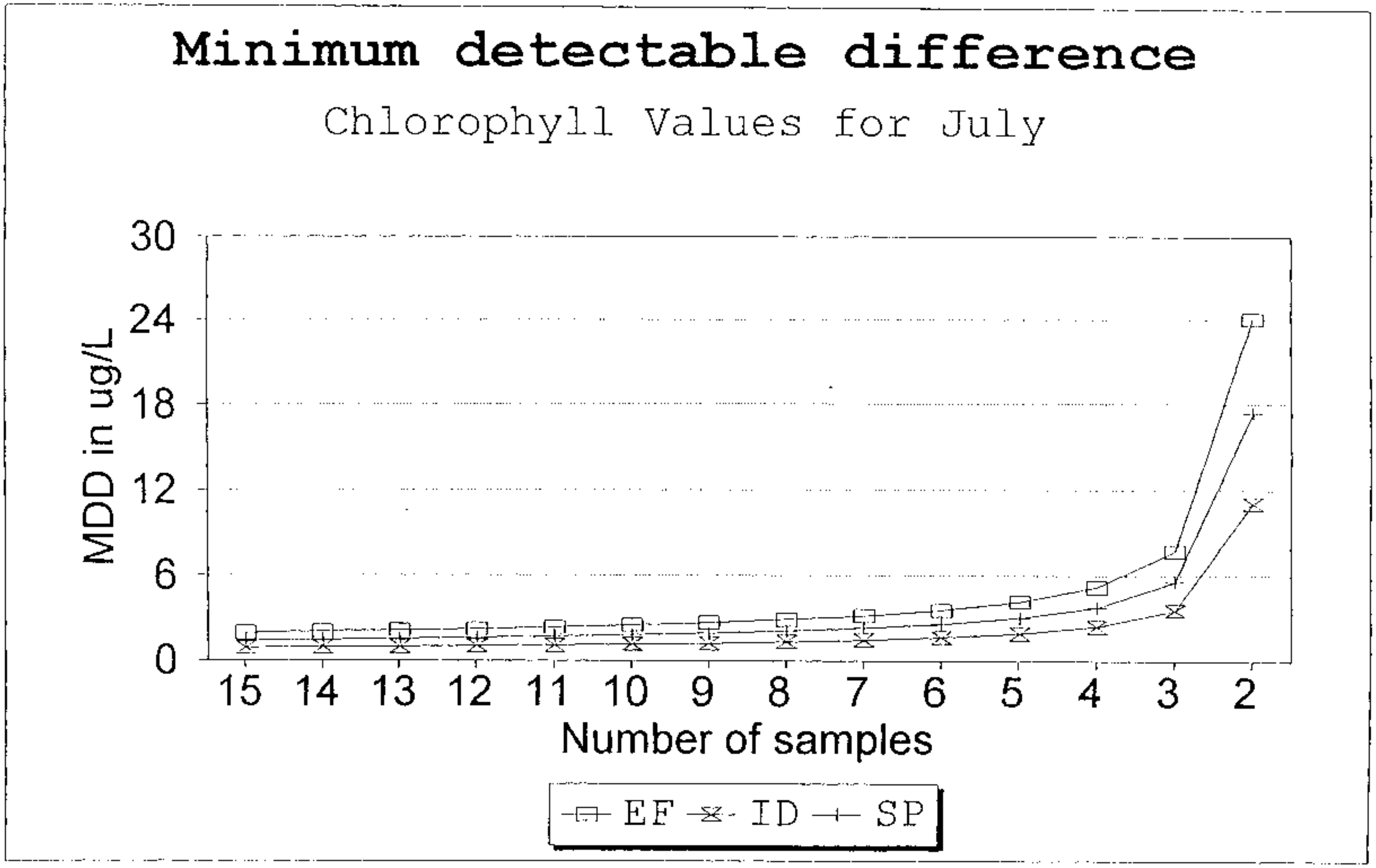

Figure 10. Minimum Detectable Difference as a function of sample size, comparing the chlorophyll concentrations of all three sites during July.

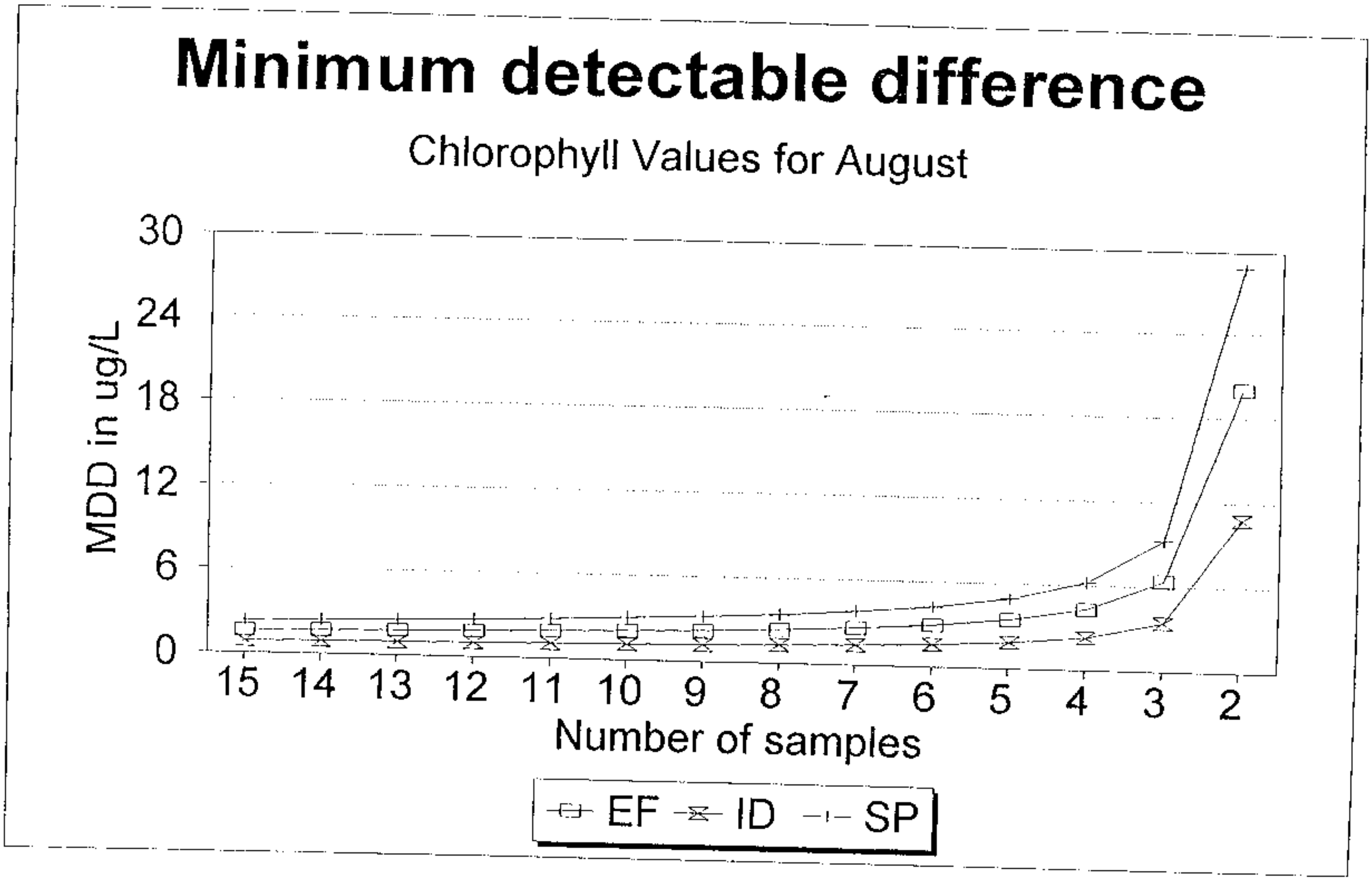

Figure 11. Minimum Detectable Difference as a function of sample size, comparing the chlorophyll concentrations of all three sites during August.

normally distributed for both sampling periods. Analysis of the chlorophyll values yielded similar results. Since the MDD equation allows one to set both the level of significance (α) and the power of the test (β) , the α level was set at 0.05 β level was set at 0.10. The MDD equation also has the option of choosing a one-tailed or two-tailed analysis. Since the goal of this research is to detect only significant differences (not directional changes) between the respective sites, a two-tailed analysis was chosen. The results of the minimum detectable difference analysis are summarized in Figures 4 through 11.

Figure 4 summarizes the changes in percent similarity that must be observed for a given number of samples in order to be considered statistically significant. This analysis is used to determine how small a minimum detectable difference can be detected using a *t* test with an α level of 0.05, a β level of 0.1, and a sample of size n, using the variance generated from the data of this study. For example, observation of Figure 3 illustrates that if one wished to:

1. Test at the ∝ = 0.05 level of significance
2. Have a 90 percent chance of detecting a significantly different mean index value using the comparison of the communities of the Elm Fork and Isle du Bois Arms during July. (A 10 percent

chance of committing a Type II error).

3. Have an analysis sensitive enough to detect a change in index value of 10 percent or less.

at least 11 replicate samples must be taken using the Bray-Curtis Index.

Again, it must be stressed that the equation is based on a *t* test and thus assumes that the data are normally distributed and possesses homogeneous variance between comparisons. Consequently, the correctness of this assumption will have to be tested.

Figure 4 summarizes the MDD values for each respective index in the comparison of the Elm Fork and Isle du Bois Arms of the lake for the July sampling date. All indices followed a very similar trend, with a large decrease in the amount of change needed to detect significant changes with increasing sample sizes. For these data, the Model 2 Index gave a slightly lower MDD value at smaller sample numbers. As the total number of samples increased, all indices gave essentially the same values.

Figure 5 summarizes the MDD values for each respective index in the comparison between Spring Creek and the Elm Fork Arm for the July Sampling date. For these data, the Bray-Curtis Index yielded a slightly lower MDD values, notwithstanding sample size. Model 2 gave values slightly higher than those of the Bray-Curtis Index, with the differences between the two indices decreasing as the sample size increased. For the comparison of these two sites, the Model 1 index had the highest overall MDD values, with MDD values in excess of 42 percent for a sample size of three.

Figure 6 illustrates the MDD values generated by each index in the comparison of the Spring Creek and Isle du Bois communities. This comparison had the highest overall MDD values for the Bray-Curtis and Model 2 indices, and yielded slightly lower MDD values for the Model 1 index. As in the previous comparisons, the MDD values decrease dramatically with sample size for all indices and all indices gave similar values at increased sample size.

Figure 7 shows the comparison between the communities present at the Elm Fork and Isle du Bois Arms of the lake for the August sampling date. For this comparison, the Model 2 and Bray-Curtis Indices yielded essentially the same results, and differed less than two MDD value (in percent similarity) from their July counterparts for sample sizes of 6 or greater. The Model 1 index gave slightly higher MDD values, but still differed less than one MDD value (in percent similarity) from it's July counterpart.

Figure 8 illustrates the comparison between the communities of Spring Creek and the Elm Fork Arm. For this comparison, the Bray-Curtis Index clearly obtained the lowest overall MDD values for all sample sizes. The Model 1 and Model 2 indices were essentially the same at sample sizes of four or greater. Although these MDD values were similar to their July counterparts, the comparison of SP and EF gave the greatest difference in MDD values between the two months. This difference was most pronounced in the Bray Curtis Index, which had a difference in MDD values of 4 (in percent similarity) for sample sizes of six or greater.

Figure 9 shows the comparison between Spring Creek and the Isle du Bois Arm of the lake. For this comparison, the Bray-Curtis and Model 2 indices yielded essentially the same values. The Model 1 Index gave slightly higher values, but still differed less than one MDD value (in percent similarity) from it's July counterparts for sample sizes of six or greater.

Figure 10 and 11 illustrate the MDD values derived from the variance of the chlorophyll samples for the July and August sampling dates. This analysis is used to determine how small a minimum detectable difference (in µg/L) can be detected using a *t* test with an α level of 0.05 and a β level of 0.1 using a sample of size n, based on the variance generated from the chlorophyll samples of this study. For example, observation of Figure 10 shows that if one wished to:

1. Test at the $\alpha = 0.05$ level of significance.
2. Have a 90 percent chance of detecting a

significantly difference mean chlorophyll value from the values observed at Spring Creek during July (A 10 percent chance of committing a Type II error).

3. Detect changes in chlorophyll values of at least 4 µg/L

at least 3 replicate samples must be taken.

As in the previous analysis, this equation assumes normality and homogeneity of variance between the chlorophyll values of this study and any other study used for comparison. Thus, the correctness of these assumptions must be tested.

As seen in Figure 10, the lowest overall MDD values observed during July was generated from the variance associated with the chlorophyll concentrations of the Isle ddu BoisArm. Spring Creek possessed an intermediate MDD value, giving lower values than those of the Elm Fork Arm. Although the overall chlorophyll concentrations observed during the July sampling period were the highest at Spring Creek, the variability associated with these concentrations was exceeded by the variability of the Elm Fork samples. As seen in Figure 9, the Elm Fork gave the highest overall MDD values for this month, due to the relatively large variability associated with the chlorophyll concentrations of this site.

Figure 11 illustrates the MDD values for each sampling site during the August sampling period. As in the previous month, the Isle du Bois Arm had the lowest overall MDD values for this month. Although the Elm Fork Arm had the highest overall chlorophyll concentrations for this month, the variability associated with these concentrations was smaller than that observed at Spring Creek. This situation is reflected in Figure 11, with the Elm Fork Arm giving lower overall MDD values than Spring Creek. The Spring Creek chlorophyll concentrations had the most variability for this month, and consequently gave the highest overall MDD values.

Bootstrapping the Bray-Curtis Index

Tables 13 and 14 summarize the results for the bootstrapping analysis of the Bray-Curtis Index for each date using SIGTREE software (Nemec 1987). This program conducts an agglomerative, hierarchical cluster analysis of the data and uses the bootstrap to estimate the statistical significance of the data clusters (Nemec 1987). The null hypothesis tested by this analysis is that the clusters linked at the particular level of similarity are sufficiently alike that they can be considered to represent a common community . Consequently, the alternate hypothesis states that the two clusters represent different communities and should be considered as two statistically distinct groups. Since one of the main goals of this research was to determine the amount of samples needed in order to detect a significant difference between the sites, the bootstrap was performed on successively smaller replicates for each site. Thus, the initial analysis used all of the samples taken at each individual site (n = 15 at each site), with 500 bootstrap simulations conducted to determine the probability of each site being significantly different from the others. A sample from each site was then randomly eliminated, and the bootstrap probabilities were recalculated. This process was continued until only one sample for each site remained. Such an analysis allows the determination of the minimum number samples that must be taken at each site in order to show the site to be significantly different from the others using the Bray-Curtis Index and 500 bootstrap simulations.

Table 13 illustrates the similarities that existed between the three sampling areas during the July sampling date, along with their respective bootstrap probabilities. As expected, the largest probabilities are associated with the smallest sample sizes and the increase in sample size increases the ability to gain statistical significance. Although both of the sites were relatively similar to the Elm Fork for this sample date, statistical significance was gained for both sites at a sample size of six or greater. It is interesting to note that the bootstrap probabilities

Table 13. Number of samples and associated bootstrap probabilities using the Bray-Curtis Correlation Coefficient with 500 bootstrap simulations for July 1995.

Number of Samples	Similarity of EF to ID	Bootstrap Probability	Similarity of EF to SP	Bootstrap Probability
1	0.76688	0.41600	0.83816	0.51600
2	0.82212	0.18200	0.85401	0.15400
3	0.85019	0.09400	0.88560	0.13400
4	0.86301	0.06400	0.83477	0.05000
5	0.86721	0.04000	0.84251	0.02400
6	0.82608	0.00000	0.88641	0.04400
7	0.79887	0.00000	0.88801	0.01800
8	0.79348	0.00000	0.88970	0.00600
9	0.78327	0.00000	0.87692	0.00200
10	0.79040	0.00000	0.86662	0.00000
11	0.78152	0.00000	0.84969	0.00000
12	0.77353	0.00000	0.84861	0.00000
13	0.78300	0.00000	0.84429	0.00000
14	0.78809	0.00000	0.85118	0.00000
15	0.78361	0.00000	0.84584	0.00000

Table 14. Number of samples and associated bootstrap probabilities using the Bray-Curtis Correlation Coefficient with 500 bootstrap simulations for August 1995.

Number of Samples	Similarity of EF to ID	Bootstrap Probability	Similarity of EF to SP	Bootstrap Probability
1	0.74333	0.42600	0.948	0.48600
2	0.76988	0.04800	0.96069	0.60000
3	0.78269	0.00800	0.97381	0.50000
4	0.77321	0.00200	0.9815	0.55270
5	0.77894	0.00000	0.96981	0.27800
6	0.77907	0.00000	0.97265	0.30200
7	0.77719	0.00000	0.95192	0.07800
8	0.76043	0.00000	0.95006	0.05400
9	0.74832	0.00000	0.95141	0.03400
10	0.74373	0.00000	0.94819	0.02200
11	0.7487	0.00000	0.89201	0.00200
12	0.74646	0.00000	0.93972	0.00000
13	0.7379	0.00000	0.93835	0.00000
14	0.73124	0.00000	0.93047	0.00000
15	0.78361	0.00000	0.84584	0.00000

associated with the comparison of six samples per site were greater than that observed using five samples per site. This is likely due to a random combination of more similar sites due to the elimination process outlined above, which would produce a greater bootstrap probability due to the greater similarity between sites. Observation of the actual Bray-Curtis Correlation Coefficient shows that as the number of samples taken increases, the corresponding similarity between the sites decreased. This reflects the expected ability of the index to show greater differences between sites through the analysis of more communities.

Table 14 illustrates a similar, though more pronounced situation for the August sampling period. As seen in the previous month, the largest probabilities are associated with the smallest number of samples. Although all of the sites were relatively similar, comparison to the previous month shows the similarity between the Elm Fork and Isle du Bois Arms decreased and the similarity between Spring Creek and the Elm Fork Arm increased. Evaluation of the bootstrap probabilities for this sample date shows that the increase in similarity between Spring Creek and the Elm Fork caused larger probabilities. Consequently, a larger number of samples was required (at least nine samples per site) in order to show statistical difference between these areas. As in the previous month, the bootstrap probabilities associated with the comparison of six samples per site was greater than that observed using five samples of sites. Again, this is likely due to a random combination of more similar sites due to the elimination process outlined above.

An opposite situation was observed in the comparison between the Elm Fork and Isle du Bois Arms, which were determined to be statistically different using only two samples per site. The ability of the cluster analysis to statistically separate these sites was due to the greater differences between the communities of these sites for this sampling period. As in the previous sampling period, observation of the actual Bray-Curtis Correlation Coefficients for the comparison between the Elm Fork and Isle du Bois Arms shows that as the number of samples taken increases, the corresponding similarity between the sites decreases. However, the comparison of the communities of the Elm Fork and Spring Creek shows that as the sample numbers increase, the similarity between these sites increases until 9 or more samples are compared. This is likely due to the great degree of similarity between these sites. Consequently, the samples were more difficult to separate into statistically distinct groups using the Bray-Curtis statistic and associated bootstrap analysis.

CHAPTER IV

DISCUSSION

Comparison of Similarity Indices

The ultimate utility of any index is it's ability to describe a system consistently and accurately. However, this description will depend somewhat on the aspects of the system that are deemed to be most important by the analyst. Since the definition of similarity depends on the endpoints of the experimental design, an index must be evaluated for it's ability to show differences between these endpoints. In order to assess the various similarity indices, the endpoints of this experiment were chosen to be the differences in phytoplankton communities between three sampling sites on Lake Ray Roberts. Since a comparison between several different types of indices was desired, no weight was given to any assessment parameter. For example, the presence or absence of a particular genus of algae was deemed to be just as important as the proportional changes between two common genera. Thus, any differences that were detected between the sites were only due to the community comparison generated by the indices on actual cell counts.

Eight community similarity indices were evaluated using the phytoplankton communities at three sites on Lake Ray Roberts. Since there is no generally accepted method for the determination of the most appropriate index for a system (Brock 1977), each index was individually evaluated for it's ability to analyze the phytoplankton of this lake. In order to address the advantages and weaknesses of each index, it is necessary to discuss each index both separately and comparatively. In this manner, the rationalization for choosing indices which warrant further use can be explained.

Jaccard's Index was one of the two binary indices evaluated in this study. Since this index is based on only presence or absence data, it is completely insensitive to changes in population size. Thus, at least for these data, this index places too much emphasis on the rare species in the samples. This situation is evident in the low internal similarity values observed in both sampling dates. Although the samples were taken from the same area, the presence of a few relatively rare organisms in different samples was enough to cause very low similarity values for this index. This situation, coupled with the loss of information due to the binary nature of the index, makes Jaccard's Index relatively weak in describing the communities of this study. Consequently, this index is not recommended for use on the Ray Roberts phytoplankton.

The second binary index evaluated was Sorenson's Index. This index, like Jaccard's, is completely insensitive to changes in population size, as long as the same species are present. However, Sorenson's Index places more weight on the number of species in common than does Jaccard's Index. Consequently, this index is not quite as sensitive to the prescence of rare species, a situation reflected in the higher degree of similarity (compared to Jaccard's Index) observed in the internal comparisons of both sampling periods. Sorenson's index, however, was relatively insensitive to differences between sites, mainly due to the large numbers of common genera. This inability to detect differences between sites, coupled with the high variability of similarity values, make this index inappropriate for analyzing the Ray Roberts phytoplankton.

The Percent Similarity Index was the first quantitative index (using both taxa richness and abundance) evaluated in this study. This index gave a relatively high and invariable internal comparisons between the two sampling period. Although this index is quantitative in nature, it is still relatively sensitive to the addition or loss of individual genera. The large amount of common genera, however, somewhat diminished this sensitivity. In addition, Brock (1977) noted that this index is quite insensitive to large differences in population size as long as they are proportional. Observation of the comparisons between internal and external similarity values shows that this situation occurred in the communities comparisons of the three different sites for both sampling dates. Although the overall number of cells per milliliter differed substantially between the two sampling periods (at each site), the index values for each month were very similar. Since this index is insensitive to proportional changes, and thus cannot detect large changes in dominant genera, it is not recommended for use with the Ray Roberts phytoplankton communities.

Stander's Index showed extremely high similarity in both the internal and external comparisons of the communities of all sites. Since this index showed essentially no differences between all of the sites, it is quite ineffective in evaluating the phytoplankton in this system. As pointed out by Reinke (1986), the square root function of this index makes the similarity values heavily dependent on the dominant organism or group of organisms present in the community. Since all of the phytoplankton samples were completely dominated by Cyanophytes, this index showed essentially no difference between respective samples. Consequently, this index is not recommended for further use with this system.

The Model 1 Index (Reinke, 1986) is a modification of the Percent Similarity Index designed to be more sensitive to proportional changes. Comparison to all other indices shows that this index was the most sensitive to differences between sites. However, the Model 1 index was quite variable, especially for the August sampling date. This variability is due in part to the minimum percentage function of the equation, which makes this index sensitive to the differences in the numbers of abundant taxa. Thus, slight deviations in cell numbers can cause a substantial increase in sample variance. This is especially evident in the variability associated with the August index values. August phytoplankton communities were considerably more heterogenous than their July counterparts, with a large differences in the cyanophyte densities observed in both between site and within site comparisons. Although this index was somewhat variable, the ability to detect differences between sites was considerable. Consequently, this index is recommended for further use with the Ray Roberts phytoplankton.

A similar situation was observed using the Model 2 Index (Reinke, 1986). This index incorporates the proportional change modification of the Model 1 Index, but possesses an additional mathematical algorithm designed to detect the loss or gain of a genus. Overall, this index was suitable for detecting samples as being from the same site (internal comparisons) and was also relatively good at detecting differences between sites (external comparisons). The variance associated with this index was also relatively low for both sampling periods. The addition of the correction factor for the number of species caused this index to be more variable in internal comparisons than the Model 1 index for the July sampling date. This situation was due to the presence of more rare genera in the samples taken within site, and relatively fewer rare genera presence between the sites. For example, a particular genus may be observed in only five of the fifteen replicate samples taken at a site. Internal comparisons of these sites would give a lower similarity value and more variation. However, if the same genus is observed in five replicate samples of another site, and these two sites are compared, the variability associated with the index will be lower. In August, however, the situation was reversed. The internal comparisons showed less variability and the external comparisons more variability. This is reflected in the large difference between internal and external comparisons, as seen in Table 11 and Figure 3. Such a situation indicates that the number of genera in common between different samples taken at the same site was higher for this sampling date. This situation also indicates that the number of genera unique to a particular site increased from the previous month. Although somewhat variable, this index was able to show sizable differences between sites, and is thus recommended for further use with the Ray Roberts phytoplankton.

The Bray-Curtis Correlation Coefficient was determined to be the "best" overall similarity index evaluated in this study. This index possessed the best combination of low variability and the ability to demonstrate differences between the sites. A simpler way to consider the components of the Bray-Curtis equation ($BC = 2W/(a + b)$)is: a = the sum of the quantitative measures of the taxon of one site, b = the similar sum for the taxon of another site, and W = the sum of the lesser value for only those species which are in common between these two sites (Washington, 1984). Thus, the Bray-Curtis index uses both quantitative measures and contains components for comparing the individual taxon present at each site and the taxa the sites have in common. Since this index divides the sum of the individual genera within each community by the minimum number of genera that the communities have in common, it is somewhat sensitive to both rare genera and the total number of cells the community contains. This sensitivity is the reason this index performs well with the Ray Roberts phytoplankton data sets. Consequently, the Bray-Curtis Index is recommended as the best similarity index to use for this system.

Minimum Detectable Difference

The minimum detectable difference analysis was conducted to determine the minimum detectable difference associated with a particular sample size and a set level of power and significance for both the similarity indices and the chlorophyll concentrations. As stated by Spellerberg (1991), one of the main utilities of similarity indices is the ability to both analyze data from various communities and to quantify differences between successive samples at the same site(s). Thus, the Minimum Detectable Difference equation was used to determine the minimum amount of change that must occur with each set of similarity and chlorophyll values in order to be deemed statistically significant. Consideration of this analysis in the context of similarity indices shows the amount of change that must occur between the sites in order to be considered statistically significant using a particular number of samples. As illustrated in Figures 4 through 11, the MDD values decreased rapidly with increasing sample size. However, since this analysis is based on a *t* test, the data used for this analysis must be normally distributed and possess homogeneity of variance. An additional point to consider is the biological/ecological relevance of the statistical difference between sites. For example, comparison of the communities between these sites during a different season from that assessed in this study would likely show enough of a change in the Bray-Curtis (or other index) values in the between site comparisons to be deemed statistically different. Chlorophyll values would likely yield similar results. Therefore, this analysis should not be used out of context without an understanding of these limitations. Additional data could partially remedy this situation, giving the ability to compare the relationship between the different sites during similar times of the year. However, environmental factors aside from seasonal variation should also be considered. Consequently, the MDD values from this study should be used with an understanding of the factors that may affect the outcome of this analysis.

Bootstrapping Analysis

The Bray-Curtis Correlation Coefficient was used in conjunction with bootstrap analysis to determine the effects of sample size on the detection of significant differences between each site. This was accomplished by conducting the Bray-Curtis Similarity analysis with the total number of samples analyzed at each sampling stations (15), using 500 bootstrap simulations to generate the probabilities associated with the degree of similarity. Since the uncertainty of the bootstrap probability is proportional to the number of bootstrap simulation (Nemec, 1987), the recommended number of bootstrap simulations (500) was chosen. After this initial analysis, a sample was randomly removed from each site and the analysis was conducted again. This process was continued until only one sample remained at each site. Observation of Tables 13 and 14 show the results of this analysis.

It is obvious from Tables13 and 14 that the optimal number of samples was different for each month and for each site to site comparison. In order to maximize the information obtained from the community analysis, it is recommended that the number of samples for each sampling site should be based on the largest number of samples required to gain statistical significance, regardless of the sites compared. However, in a situation like that observed in August, a different number of samples per site may be warranted. This will of course depend on the amount of resources allocated for the experiment and the ultimate goal of the analyst.

For the July sampling date, the minimum number of samples required in order to show statistical significance was six. This was required in order to separate the communities of Spring Creek and the Elm Fork Arm, which were relatively similar for this month (0.88641 using Bray-Curtis) . The Isle du Bois community was somewhat different from both Spring Creek and the Elm Fork Arm, and consequently required a smaller number of samples (5 total) in order to statistically separate these communities. Site ID was determined to have a Bray-Curtis Correlation value of 0.86721 when compared to the Elm Fork Arm.

The communities observed in the August sampling date showed a greater degree of similarity between the communities of the Elm Fork Arm and Spring Creek, and a lesser degree of similarity between these sites and the Isle du Bois arm. The similarity of the communities between the Elm Fork Arm and Spring Creek required a rather intensive sampling effort in order to show a statistically significant difference between these sites. As illustrated by Table 14, a total of at least nine samples per site is required to show these sites as being statistically different (Bray-Curtis Correlation value of 0.95141). Site ID, however, was quite different from both the Elm Fork Arm and Spring Creek. Consequently, bootstrap analysis of only two samples at Site ID was able to show this site as being statistically different from the Elm Fork Arm (Bray-Curtis Correlation value of 0.76988). This situation is mostly due to the large numbers of cyanophytes at the Elm Fork and Spring Creek, and the relatively small number of this phylum at the Isle du Bois Arm.

Site Specific Factors Affecting Algal Communities

The three sites chosen for evaluation in this study were shown to possess statistically distinct phytoplankton communities. In general, biological communities are comprised of populations of organisms that possess different tolerances and sensitivities. Thus, overall community structure reflects the sum total of all factors that influence these tolerances and sensitivities. Some authors have stated that there is no *a priori* reason why any biological index, whether diversity, biotic, or similarity, should correlate only, or primarily, with chemical data, as chemical differences are not mirrored uniformly by biological organisms or communities (Washington, 1984, Dean and Burlington, 1963). However, the response of phytoplankton to water quality changes, especially nutrients, is well documented for water bodies in North Texas (Kelly, 1975). Thus, although a biological organism reacts to all aspects of the environment, certain chemical parameters have a substantial impact on the phytoplankton communities. Consequently, the differences observed in the phytoplankton communities of the individual sites are likely due, at least in part, to differences in the water quality of each site. These site specific differences are well documented in the previous research conducted by the

University of North Texas (Institute of Applied Sciences, 1991 and 1995). Although water quality parameters were not assessed in this thesis, the trend of higher nutrient content in the western section of the lake (Sites EF and SP) was observed in both of the previous University of North Texas studies. This is likely due to both the physiographical differences between the two arms of the lake and in part to sewage waste water discharge into both Spring Creek and the Elm Fork Arm of the lake. Since the samples used in this study were taken within hours of each other, the differences in environmental factors such as temperature, solar radiation, wind dispersion, turbidity, etc. were minimized. Thus, the differences detected between the various communities were likely due to different water quality present at the different sites.

CONCLUSION

The different water qualities of the three study sites are likely responsible for different phytoplankton communities at each site, which were detected as being "different" using several similarity indices. Of the eight indices used, the Bray-Curtis Correlation Coefficient was shown to best represent the phytoplankton of Lake Ray Roberts, although the Model 1 and Model 2 indices also performed well for this system. Using the Bray-Curtis statistic in conjunction with bootstrap analysis showed that, for this study, a minimum of six samples per site in July and nine samples per site for August are recommeded. Although this study should serve as a baseline for future comparisons of these sites, the fact that the samples were collected only during July and August must be considered. Consequently, future comparisons of communities using the results of this research should be restricted to these months. Additional research could remedy this situation through the development of similarity models based on the phytoplankton communities present during each month. Analysis of smaller intervals of time would be even more valuable. Such research would be particularly useful in monitoring dynamics in phytoplankton communities during each season and on a yearly basis.

APPENDIX A

Phytoplankton Taxa Collected At All Sites During The July Sampling Date

Phylum / Genus	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8
Chlorophyta								
Actinastrum	0	0	0	0	0	0	0	0
Ankistrodesmus	0	20	0	0	40	0	0	0
Arthrodesmus	0	0	0	0	0	0	0	0
Carteria	0	20	0	40	0	20	0	20
Characium	0	0	0	0	0	0	0	0
Chlamydomonas	300	260	200	160	340	240	320	200
Chlorococcum	0	0	20	0	0	20	20	0
Chlorogonium	0	40	20	0	80	80	60	80
Chodatella	0	0	0	0	0	0	0	0
Closterium	0	60	20	60	40	140	0	20
Coccomonas	0	20	0	20	0	20	0	0
Coelastrum	0	0	0	0	160	0	0	0
Cosmarium	100	160	200	60	80	100	180	180
Crucigenia	0	0	0	120	0	0	0	0
Dictyosphaerium	480	0	260	400	440	480	360	380
Eudorina	0	0	0	0	0	0	0	0
Franceia	0	20	0	0	0	0	0	0
Kirchineriella	0	0	0	0	0	0	0	0
Micractinium	0	0	0	0	0	0	0	0
Oocystis	0	0	0	0	0	0	0	0
Pachycladon	0	20	20	0	20	0	0	0
Pandorina	0	0	0	0	0	0	0	0
Pediastrum	0	0	0	0	280	0	0	0
Scenedesmus	80	80	40	160	140	0	460	40
Schroderia	0	0	0	0	0	0	0	20
Selenastrum	80	80	120	120	260	160	120	120
Spondylomorum	0	0	0	0	0	0	0	0
Staurastrum	140	80	40	0	80	180	60	120
Tetraedron	0	0	0	0	0	0	0	0
Tetrastrum	0	0	0	80	0	0	0	0
Trachelomonas	20	0	20	0	0	0	0	20
Treubaria	20	60	80	80	60	0	20	40
Chrysophyta								
Achnanthes	0	0	0	0	20	0	0	0
Caloneis	0	0	0	0	0	0	0	0
Cyclotella	0	0	0	60	20	60	20	20
Fragalaria	240	80	220	180	240	280	320	260
Gomphonema	20	20	0	0	60	20	0	0
Melosira	0	0	0	0	0	0	0	0

Phylum / Genus	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8
Chrysophyta								
Meridion	0	0	0	0	0	0	0	0
Navicula	0	0	0	0	0	0	0	0
Nitzschia	40	140	120	80	40	120	120	120
Rhopalodia	140	140	180	140	100	60	180	120
Synedra	0	0	0	0	0	0	0	0
Cryptophyta								
Chroomonas	0	0	0	0	0	0	0	0
Cryptomonas	200	300	260	240	140	200	160	320
Rhodomonas	20	0	0	20	0	20	40	60
Cyanophyta								
Anabaena	2280	2320	4040	3040	2460	4340	3020	2941
Aphanocapsa	37120	29200	39040	24960	34440	40960	39680	32960
Gleocapsa	0	0	0	0	0	0	0	0
Merismopedia	0	0	720	0	0	0	0	0
Microcystis	0	0	0	0	0	0	0	0
Oscillatoria	2660	2020	2880	1960	3960	176	2340	2780
Phacus	0	0	0	0	20	0	0	40
Rhaphidiopsis	20	60	60	60	40	80	80	80
Spirulina	0	0	0	0	0	0	0	0
Euglenophyta								
Euglena	20	0	20	0	20	0	20	0
Euglenomorpha	0	0	0	0	0	0	0	0
Pyrophyta								
Ceratium	0	0	0	0	0	0	0	0
Gymnodinium	0	20	20	0	0	0	0	0
Peridinium	0	20	0	20	0	20	0	40

Phylum / Genus	EF9	EF10	EF11	EF12	EF13	EF14	EF15
Chlorophyta							
Actinastrum	0	0	0	0	0	0	0
Ankistrodesmus	0	0	0	0	20	20	40
Arthrodesmus	0	0	0	0	0	0	0
Carteria	0	0	0	0	0	20	0
Characium	0	0	0	0	0	0	0
Chlamydomonas	220	240	300	180	140	320	300
Chlorococcum	20	0	0	20	20	0	20
Chlorogonium	20	20	40	0	0	20	0
Chodatella	0	0	0	0	0	0	0
Closterium	40	40	40	20	20	100	40
Coccomonas	20	20	0	20	20	0	20
Coelastrum	0	0	0	0	0	0	0
Cosmarium	80	60	140	40	160	160	160
Crucigenia	0	0	0	0	0	0	0
Dictyosphaerium	380	760	160	560	160	280	640
Eudorina	0	0	0	0	0	0	0
Franceia	0	0	20	0	40	0	20
Kirchineriella	0	0	0	80	0	0	0
Micractinium	0	0	0	0	0	0	0
Oocystis	0	0	0	0	0	0	0
Pachycladon	20	0	0	0	0	0	0
Pandorina	240	0	0	0	0	0	0
Pediastrum	0	0	0	0	0	0	0
Scenedesmus	80	80	280	40	20	60	0
Schroderia	20	20	0	0	0	0	0
Selenastrum	100	20	20	200	180	140	140
Spondylomorum	80	240	0	0	140	0	40
Staurastrum	180	140	20	60	60	80	100
Tetraedron	20	0	40	0	20	0	20
Tetrastrum	0	0	0	80	0	0	0
Trachelomonas	0	0	0	0	0	40	0
Treubaria	0	60	0	40	0	40	20
Chrysophyta							
Achnanthes	0	0	0	20	0	0	0
Caloneis	0	0	0	0	0	0	0
Cyclotella	40	40	0	60	20	20	40
Fragalaria	220	240	160	240	180	160	180
Gomphonema	40	0	20	0	20	0	0
Melosira	0	80	0	0	0	0	0

Phylum / Genus	EF9	EF10	EF11	EF12	EF13	EF14	EF15
Meridion	0	0	0	0	0	0	0
Navicula	0	0	0	0	0	0	0
Nitzschia	140	80	80	100	220	120	60
Rhopalodia	80	140	60	20	120	160	80
Synedra	0	0	0	0	0	0	0
Cryptophyta							
Chroomonas	0	0	0	0	0	0	0
Cryptomonas	180	200	140	20	400	620	160
Rhodomonas	0	20	20	60	80	40	20
Cyanophyta							
Anabaena	2000	2400	2600	2040	2800	3340	2060
Aphanocapsa	27920	27200	24640	25920	27520	30400	27200
Gleocapsa	0	0	0	0	0	0	0
Merismopedia	0	0	0	0	0	0	320
Microcystis	0	0	0	0	0	0	0
Oscillatoria	3120	3920	4160	2020	2700	2640	2340
Phacus	0	0	0	0	0	0	0
Rhaphidiopsis	40	20	140	40	0	60	40
Spirulina	0	0	0	0	0	0	0
Euglenophyta							
Euglena	0	0	0	0	0	20	20
Euglenomorpha	0	0	0	0	0	0	0
Pyrophyta							
Ceratium	0	0	0	0	0	0	0
Gymnodinium	0	0	0	0	0	20	0
Peridinium	20	20	0	0	0	0	40

Phylum / Genus	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8
Chlorophyta								
Actinastrum	0	0	0	0	0	0	0	0
Ankistrodesmus	20	0	0	0	0	0	0	0
Arthrodesmus	0	0	0	0	0	0	0	0
Carteria	0	0	0	0	0	0	40	40
Characium	0	0	0	0	0	0	0	0
Chlamydomonas	100	100	160	180	220	260	140	140
Chlorococcum	0	0	0	0	0	0	0	0
Chlorogonium	0	0	0	0	0	120	40	60
Chodatella	0	0	0	0	0	0	0	20
Closterium	120	120	80	80	0	100	0	0
Coccomonas	0	0	0	0	0	60	0	20
Coelastrum	0	0	0	0	0	0	0	0
Cosmarium	220	180	240	300	140	120	60	220
Crucigenia	260	160	0	0	0	0	140	0
Dictyosphaerium	0	0	0	0	0	0	0	0
Eudorina	0	0	0	0	0	0	0	0
Franceia	0	20	0	20	0	0	0	0
Kirchineriella	0	0	0	0	0	0	0	0
Micractinium	0	0	0	0	0	0	0	0
Oocystis	0	40	100	0	0	0	80	0
Pachycladon	0	0	0	0	40	0	20	0
Pandorina	0	0	0	0	0	0	0	0
Pediastrum	0	0	0	160	0	0	0	0
Scenedesmus	180	0	140	40	0	80	200	80
Schroderia	0	0	0	0	0	0	0	0
Selenastrum	0	0	0	80	20	220	0	100
Spondylomorum	120	400	0	0	160	0	300	240
Staurastrum	160	200	80	80	60	120	20	20
Tetraedron	0	0	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0	0	0
Trachelomonas	80	60	40	20	20	0	0	20
Treubaria	0	0	0	0	80	40	0	0
Chrysophyta								
Achnanthes	0	0	0	0	0	0	0	0
Caloneis	0	0	0	0	0	0	0	0
Cyclotella	20	20	20	40	80	40	60	20
Fragalaria	0	0	0	0	0	0	0	0
Gomphonema	0	0	0	0	0	0	0	0
Melosira	20	0	0	0	0	0	0	0

Phylum / Genus	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8
Meridion	0	0	0	0	0	0	0	0
Navicula	0	0	0	0	0	0	0	0
Nitzschia	60	100	80	40	200	100	60	40
Rhopalodia	40	20	100	80	80	60	180	120
Synedra	0	0	0	0	20	0	0	0
Cryptophyta								
Chroomonas	0	0	0	0	0	0	0	0
Cryptomonas	40	100	80	40	80	40	40	60
Rhodomonas	0	0	0	0	0	40	0	40
Cyanophyta								
Anabaena	780	380	380	480	740	720	980	560
Aphanocapsa	27960	26880	34560	22080	29120	23360	19200	21440
Gleocapsa	0	0	0	0	0	0	0	0
Merismopedia	0	0	0	0	0	0	0	0
Microcystis	0	0	0	0	840	0	0	0
Oscillatoria	740	2020	1580	2180	1080	2020	2360	1960
Phacus	0	0	0	0	20	0	0	0
Rhaphidiopsis	40	0	0	80	0	0	20	0
Spirulina	0	0	0	0	0	0	0	0
Euglenophyta								
Euglena	0	0	0	0	0	0	0	0
Euglenomorpha	0	0	0	0	0	0	0	0
Pyrophyta								
Ceratium	0	0	0	0	0	0	0	0
Gymnodinium	0	0	0	60	0	40	20	60
Peridinium	60	20	20	0	60	20	20	40

Phylum / Genus	ID9	ID10	ID11	ID12	ID13	ID14	ID15
Chlorophyta							
Actinastrum	0	0	0	0	0	0	0
Ankistrodesmus	0	20	0	0	0	20	0
Arthrodesmus	0	20	0	0	0	0	0
Carteria	0	0	20	0	20	0	20
Characium	0	0	0	0	0	0	0
Chlamydomonas	180	200	220	100	80	60	40
Chlorococcum	0	0	0	20	0	20	40
Chlorogonium	40	100	160	0	0	0	0
Chodatella	0	0	0	0	0	0	0
Closterium	20	20	20	0	20	40	60
Coccomonas	0	0	0	0	20	40	0
Coelastrum	0	0	0	0	0	0	0
Cosmarium	80	140	80	260	340	120	120
Crucigenia	180	0	80	0	0	0	0
Dictyosphaerium	0	0	0	0	0	0	0
Eudorina	0	0	0	0	0	0	0
Franceia	20	0	0	20	20	0	0
Kirchineriella	0	0	0	0	0	0	0
Micractinium	0	0	0	0	0	0	0
Oocystis	0	0	0	120	0	80	160
Pachycladon	0	0	0	20	20	0	20
Pandorina	0	0	0	0	0	160	0
Pediastrum	0	0	0	0	0	0	0
Scenedesmus	0	220	100	160	240	40	240
Schroderia	0	0	20	0	0	0	0
Selenastrum	200	0	40	60	100	0	60
Spondylomorum	100	200	0	0	0	0	60
Staurastrum	60	60	140	120	140	80	160
Tetraedron	0	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0	0
Trachelomonas	0	20	0	20	20	0	20
Treubaria	60	60	0	0	20	20	0
Chrysophyta							
Achnanthes	0	0	0	0	0	20	0
Caloneis	0	0	0	0	0	0	0
Cyclotella	40	20	20	0	20	0	80
Fragalaria	0	0	0	0	0	0	0
Gomphonema	0	0	0	0	20	0	0
Melosira	0	0	0	0	0	0	0

Phylum / Genus	ID9	ID10	ID11	ID12	ID13	ID14	ID15
Meridion	0	0	0	0	0	0	0
Navicula	0	0	0	0	0	0	0
Nitzschia	60	120	120	20	80	40	140
Rhopalodia	120	160	80	100	80	40	80
Synedra	0	0	0	0	0	0	0
Cryptophyta							
Chroomonas	0	0	0	0	0	0	0
Cryptomonas	40	0	20	0	40	140	40
Rhodomonas	0	0	0	0	20	0	20
Cyanophyta							
Anabaena	880	740	1020	1080	660	200	1040
Aphanocapsa	18560	26560	16960	18560	22480	24640	19280
Gleocapsa	0	0	0	0	0	0	0
Merismopedia	0	320	0	0	0	0	0
Microcystis	0	0	0	0	0	0	0
Oscillatoria	2180	1960	2780	1880	2060	1820	1640
Phacus	0	0	0	0	0	0	0
Rhaphidiopsis	0	20	20	20	0	60	20
Spirulina	0	140	0	0	0	0	0
Euglenophyta							
Euglena	0	0	0	0	0	0	0
Euglenomorpha	0	0	0	0	0	0	0
Pyrophyta							
Ceratium	20	0	0	0	0	0	0
Gymnodinium	0	0	0	40	0	20	20
Peridinium	40	60	20	20	20	40	60

Phylum / Genus	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8
Chlorophyta								
Actinastrum	0	0	0	0	0	0	0	0
Ankistrodesmus	0	0	0	20	0	0	0	0
Arthrodesmus	0	0	0	0	0	0	0	0
Carteria	0	20	0	20	0	0	0	0
Characium	0	0	0	0	0	0	0	0
Chlamydomonas	300	480	380	200	20	220	240	260
Chlorococcum	0	0	20	0	0	40	0	20
Chlorogonium	0	0	0	0	0	0	0	0
Chodatella	0	0	0	0	0	0	20	0
Closterium	20	0	20	20	40	60	0	0
Coccomonas	20	0	0	80	20	40	40	0
Coelastrum	0	0	0	0	0	0	0	0
Cosmarium	360	140	140	160	260	160	100	180
Crucigenia	240	0	0	60	0	0	0	0
Dictyosphaerium	0	0	0	0	0	0	0	240
Eudorina	0	0	240	0	0	0	0	0
Franceia	0	0	0	0	20	0	0	0
Kirchineriella	0	80	0	0	0	0	0	0
Micractinium	0	0	0	0	0	0	0	0
Oocystis	0	0	0	0	40	0	0	0
Pachycladon	20	0	0	0	0	0	0	0
Pandorina	0	300	0	240	200	0	160	20
Pediastrum	0	0	0	0	0	0	0	0
Scenedesmus	80	0	80	80	80	360	0	200
Schroderia	0	0	20	0	20	0	0	0
Selenastrum	120	20	20	140	120	140	140	60
Spondylomorum	0	0	60	0	0	0	0	60
Staurastrum	20	20	40	140	60	100	20	80
Tetraedron	0	20	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0	0	80
Trachelomonas	80	80	120	40	60	40	20	20
Treubaria	100	0	80	100	40	0	40	40
Chrysophyta								
Achnanthes	0	0	0	0	0	0	0	0
Caloneis	0	0	0	0	0	0	0	0
Cyclotella	0	60	40	40	20	40	20	80
Fragalaria	0	0	0	0	0	160	180	120
Gomphonema	0	20	60	80	20	40	40	40
Melosira	0	0	0	0	0	0	20	0

Phylum / Genus	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8
Chrysophyta								
Meridion	0	40	120	140	260	0	0	0
Navicula	0	0	0	0	0	0	0	0
Nitzschia	80	20	20	20	60	60	60	80
Rhopalodia	20	20	0	60	40	40	80	40
Synedra	20	0	0	0	0	0	0	0
Cryptophyta								
Chroomonas	0	0	20	0	0	0	0	0
Cryptomonas	480	120	220	520	300	60	240	300
Rhodomonas	80	0	0	40	0	40	20	100
Cyanophyta								
Anabaena	740	400	800	300	280	80	500	160
Aphanocapsa	48640	33920	37040	40320	34880	39360	46240	36480
Gleocapsa	0	0	0	0	0	0	0	0
Merismopedia	0	0	0	0	0	0	0	0
Microcystis	0	0	0	0	0	0	0	0
Oscillatoria	1860	1120	1640	2680	1900	1900	2400	1880
Phacus	60	20	0	40	0	20	20	40
Rhaphidiopsis	40	0	60	40	60	60	0	40
Spirulina	0	0	0	0	0	0	0	0
Euglenophyta								
Euglena	0	40	20	0	60	100	20	40
Euglenomorpha	0	20	20	0	20	20	40	20
Pyrophyta								
Ceratium	0	0	0	0	0	0	0	0
Gymnodinium	20	60	100	0	40	100	60	20
Peridinium	60	40	80	20	100	60	20	60

Phylum / Genus	SP9	SP10	SP11	SP12	SP13	SP14	SP15
Chlorophyta							
Actinastrum	0	0	0	0	0	0	0
Ankistrodesmus	0	0	0	0	0	0	0
Arthrodesmus	20	0	0	20	20	40	20
Carteria	20	20	20	0	80	20	0
Characium	0	0	0	0	0	0	0
Chlamydomonas	240	320	200	400	120	220	520
Chlorococcum	0	0	20	0	0	0	20
Chlorogonium	0	0	0	0	0	0	20
Chodatella	0	0	0	0	0	0	0
Closterium	0	0	0	0	0	0	40
Coccomonas	40	0	0	0	40	20	20
Coelastrum	0	0	0	0	0	0	0
Cosmarium	240	260	120	20	200	60	160
Crucigenia	0	0	0	0	0	0	0
Dictyosphaerium	320	200	120	120	200	360	320
Eudorina	0	0	0	0	0	0	0
Franceia	40	0	0	0	20	0	0
Kirchineriella	0	0	0	0	0	0	0
Micractinium	0	0	0	0	20	0	0
Oocystis	0	0	0	60	40	0	0
Pachycladon	0	0	0	0	0	0	0
Pandorina	0	160	220	240	0	0	0
Pediastrum	0	0	0	320	0	0	0
Scenedesmus	100	120	40	80	0	0	80
Schroderia	20	0	0	0	0	0	0
Selenastrum	20	80	80	20	60	40	40
Spondylomorum	0	60	0	60	180	0	80
Staurastrum	40	60	20	100	40	40	40
Tetraedron	0	0	0	0	0	0	0
Tetrastrum	0	0	0	80	0	0	0
Trachelomonas	60	100	20	60	100	0	40
Treubaria	40	20	20	40	20	20	60
Chrysophyta							
Achnanthes	0	0	0	0	0	0	0
Caloneis	0	0	0	0	0	0	0
Cyclotella	0	20	40	20	40	40	0
Fragalaria	100	100	140	100	260	140	200
Gomphonema	20	60	60	60	20	0	60
Melosira	0	0	0	0	0	0	0

Phylum / Genus	SP9	SP10	SP11	SP12	SP13	SP14	SP15
Chrysophyta							
Meridion	0	0	0	0	0	0	0
Navicula	0	0	0	0	20	0	0
Nitzschia	20	60	40	60	0	80	100
Rhopalodia	140	60	60	0	80	20	80
Synedra	0	0	0	0	0	0	0
Cryptophyta							
Chroomonas	0	0	0	0	0	0	0
Cryptomonas	160	160	200	160	320	240	340
Rhodomonas	0	0	40	0	0	40	40
Cyanophyta							
Anabaena	240	920	500	260	620	1280	160
Aphanocapsa	43840	40640	46080	37120	44120	31120	43200
Gleocapsa	0	320	0	0	480	0	0
Merismopedia	0	0	0	0	0	0	0
Microcystis	0	0	0	0	0	0	0
Oscillatoria	2320	1820	1600	940	2160	1520	2300
Phacus	40	20	20	0	0	40	0
Rhaphidiopsis	0	40	60	40	120	40	40
Spirulina	0	0	0	0	0	0	0
Euglenophyta							
Euglena	20	80	20	80	20	0	80
Euglenomorpha	0	20	20	0	0	0	0
Pyrophyta							
Ceratium	0	0	0	0	0	0	0
Gymnodinium	60	20	20	0	0	40	20
Peridinium	80	60	20	20	20	60	40

APPENDIX B

Phytoplankton Taxa Collected At All Sites During The August Sampling Date

Phylum/Genus	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8
Chlorophyta								
Ankistrodesmus	20	20	20	0	20	0	20	0
Arthrodesmus	0	0	0	20	20	0	20	0
Carteria	0	0	0	0	20	20	20	0
Chlamydomonas	200	180	200	100	60	240	120	300
Chlorococcum	0	0	0	0	0	0	0	0
Chodatella	20	0	20	20	40	0	0	0
Closteriopsis	0	0	0	0	0	20	0	0
Closterium	0	0	0	0	20	0	20	40
Coccomonas	0	0	0	0	0	0	0	0
Coelastrum	0	160	0	0	0	0	0	0
Cosmarium	40	20	60	80	160	60	140	160
Crucigenia	0	0	0	160	160	0	0	0
Dictyosphaerium	0	0	0	320	240	480	80	80
Eudorina	0	0	0	0	0	0	0	0
Franceia	0	20	0	0	20	0	0	0
Kirchneriella	0	40	40	0	0	0	0	0
Oocystis	0	0	0	60	0	0	0	0
Pachycladon	0	0	0	0	0	0	0	0
Pandorina	0	120	0	200	0	0	0	0
Pediastrum	0	0	0	0	0	0	0	0
Scenedesmus	120	80	80	160	380	0	160	140
Schroderia	0	60	0	0	0	0	20	20
Selenastrum	40	0	40	20	0	220	120	100
Spondylomorum	20	0	40	0	0	20	0	220
Starastrum	80	160	80	200	240	220	240	140
Tetraedron	0	0	0	0	0	0	0	0
Tetrastrum	0	0	80	0	0	0	0	0
Trachelomonas	20	20	0	20	0	20	0	0
Treubaria	0	0	0	60	40	40	60	0
Chrysophyta								
Achnanthes	0	0	0	0	0	0	0	0
Cyclotella	60	20	40	40	40	40	60	20
Fragalaria	0	0	0	0	0	0	0	0
Melosira	260	140	220	0	40	120	40	120
Meridion	0	0	0	0	0	0	0	0
Nitzchia	240	180	140	180	120	120	220	120
Rhopalodia	40	60	120	80	40	0	40	80
Synedra	20	0	0	60	20	40	80	60

Phylum/Genus	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8
Cryptophyta								
Cryptomonas	120	140	140	200	320	200	380	160
Rhodamonas	80	100	140	60	240	100	180	100
Cyanophyta								
Anabaena	200	520	320	0	660	440	280	0
Aphanocapsa	44160	42880	48000	46080	52160	40960	52160	50880
Merismopedia	0	480	0	480	0	800	0	320
Microcystis	0	0	0	0	0	0	0	0
Oscillatoria	2780	3100	3920	4080	5000	4440	5540	4660
Phacus	0	20	0	20	0	20	20	0
Rhaphidiopsis	180	120	0	0	80	120	120	60
Spirulina	0	0	0	0	0	0	0	0
Euglenophyta								
Euglena	0	0	20	0	0	20	0	0
Euglenomorpha	0	0	0	0	0	0	0	0
Pyrophyta								
Ceratium	20	0	0	40	0	0	0	0
Gymnodinium	0	60	40	100	0	0	40	100
Peridinium	0	0	80	0	0	20	0	0

Phylum/Genus	EF9	EF10	EF11	EF12	EF13	EF14	EF15
Chlorophyta							
Ankistrodesmus	40	0	20	0	0	0	0
Arthrodesmus	20	0	20	0	0	20	20
Carteria	20	40	0	20	0	20	0
Chlamydomonas	140	80	100	180	180	100	160
Chlorococcum	0	0	0	0	0	0	0
Chodatella	0	0	0	20	40	20	0
Closteriopsis	0	0	0	0	0	0	0
Closterium	0	0	40	0	0	0	0
Coccomonas	0	0	0	0	0	0	0
Coelastrum	0	0	0	0	0	0	0
Cosmarium	140	220	100	20	260	220	120
Crucigenia	160	160	0	80	80	160	160
Dictyosphaerium	460	140	220	100	460	360	240
Eudorina	0	0	0	0	0	0	160
Franceia	20	0	0	60	0	0	60
Kirchneriella	80	0	0	0	0	0	60
Oocystis	0	0	0	0	0	0	0
Pachycladon	0	0	0	0	0	0	0
Pandorina	0	0	0	0	0	0	0
Pediastrum	0	0	0	0	0	0	0
Scenedesmus	160	240	100	200	120	280	160
Schroderia	0	60	40	20	0	0	0
Selenastrum	80	100	60	60	180	40	80
Spondylomorum	0	0	0	0	0	0	0
Starastrum	160	60	140	200	160	200	100
Tetraedron	0	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0	0
Trachelomonas	0	0	20	0	0	0	0
Treubaria	20	20	20	60	20	0	60
Chrysophyta							
Achnanthes	0	0	20	0	0	0	0
Cyclotella	40	60	40	40	60	40	60
Fragalaria	0	0	0	0	0	0	0
Melosira	0	80	160	100	0	100	140
Meridion	0	0	0	0	0	0	0
Nitzchia	180	120	200	100	120	160	60
Rhopalodia	80	100	100	100	80	40	80
Synedra	40	60	40	40	80	40	0

Phylum/Genus	EF9	EF10	EF11	EF12	EF13	EF14	EF15
Cryptophyta							
Cryptomonas	360	260	380	360	280	320	440
Rhodamonas	160	200	60	140	200	140	200
Cyanophyta							
Anabaena	500	420	200	760	600	200	1020
Aphanocapsa	50880	47680	49600	53760	48320	54400	42240
Merismopedia	640	380	0	0	880	400	320
Microcystis	0	0	0	0	0	0	0
Oscillatoria	5520	4540	5700	6120	5620	4940	5420
Phacus	0	20	20	20	0	0	20
Rhaphidiopsis	200	100	240	260	180	380	140
Spirulina	0	0	0	0	0	0	0
Euglenophyta							
Euglena	0	60	20	0	40	0	0
Euglenomorpha	0	0	0	0	0	0	0
Pyrophyta							
Ceratium	0	0	20	0	0	0	0
Gymnodinium	20	180	60	40	60	60	40
Peridinium	0	20	40	40	0	20	40

Phylum/Genus	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8
Chlorophyta								
Ankistrodesmus	0	0	0	0	20	0	0	0
Arthrodesmus	0	20	0	0	0	0	0	0
Carteria	0	0	0	0	40	0	20	0
Chlamydomonas	180	40	40	120	100	180	180	120
Chlorococcum	0	0	0	0	20	0	0	0
Chodatella	0	0	0	0	0	0	0	0
Closteriopsis	0	0	0	0	0	0	0	0
Closterium	20	0	0	0	0	0	0	0
Coccomonas	0	0	0	20	0	40	0	20
Coelastrum	0	0	0	0	280	0	0	0
Cosmarium	80	160	20	40	160	100	80	60
Crucigenia	0	0	20	20	20	0	0	240
Dictyosphaerium	160	380	240	200	160	240	0	240
Eudorina	0	0	340	360	0	0	0	0
Franceia	0	0	20	0	0	20	0	0
Kirchneriella	0	0	0	0	0	0	0	0
Oocystis	0	160	0	0	0	40	0	0
Pachycladon	0	20	0	0	0	0	0	0
Pandorina	200	0	120	0	0	0	0	0
Pediastrum	0	0	0	0	0	100	0	0
Scenedesmus	120	240	40	160	0	180	0	80
Schroderia	0	20	0	0	0	0	0	0
Selenastrum	0	0	0	0	80	0	0	20
Spondylomorum	0	0	0	0	0	0	0	0
Starastrum	140	140	120	180	140	100	220	140
Tetraedron	20	0	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0	0	0
Trachelomonas	20	20	0	0	0	0	20	0
Treubaria	0	0	0	60	20	40	20	20
Chrysophyta								
Achnanthes	0	0	0	0	0	0	0	0
Cyclotella	0	0	0	0	0	20	0	0
Fragalaria	20	0	0	0	0	0	0	0
Meiosira	0	0	0	0	0	0	0	0
Meridion	0	0	0	0	0	0	0	0
Nitzchia	300	160	380	420	580	380	440	520
Rhopalodia	180	340	240	120	280	300	300	160
Synedra	0	0	0	0	0	0	0	0

Phylum/Genus	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8
Cryptophyta								
Cryptomonas	20	40	40	40	380	0	80	80
Rhodamonas	0	0	0	40	20	180	60	200
Cyanophyta								
Anabaena	440	120	40	1300	300	920	740	80
Aphanocapsa	26240	29440	33920	26560	33280	25920	23360	20160
Merismopedia	0	160	640	0	0	0	0	0
Microcystis	0	0	0	0	0	0	0	0
Oscillatoria	6260	7260	6640	5080	7540	5360	490	4900
Phacus	0	0	0	20	0	20	0	0
Rhaphidiopsis	0	0	0	20	0	0	0	0
Spirulina	0	0	0	160	0	0	0	0
Euglenophyta								
Euglena	0	0	0	20	0	0	0	0
Euglenomorpha	0	0	0	0	0	0	0	0
Pyrophyta								
Ceratium	20	0	0	0	0	0	0	0
Gymnodinium	0	0	0	20	20	0	40	20
Peridinium	0	40	20	60	20	40	40	0

Phylum/Genus	ID9	ID10	ID11	ID12	ID13	ID14	ID15
Chlorophyta							
Ankistrodesmus	0	0	0	20	0	0	0
Arthrodesmus	0	0	0	0	0	0	0
Carteria	0	0	0	0	0	20	20
Chlamydomonas	140	160	220	100	180	100	160
Chlorococcum	0	0	0	0	0	0	0
Chodatella	0	0	0	0	0	0	0
Closteriopsis	0	0	0	0	0	0	0
Closterium	0	0	0	20	0	0	0
Coccomonas	0	20	20	20	20	0	0
Coelastrum	0	40	0	0	0	120	0
Cosmarium	20	40	100	40	20	40	40
Crucigenia	80	80	0	80	0	0	0
Dictyosphaerium	360	200	160	0	120	0	80
Eudorina	0	0	0	0	0	260	0
Franceia	0	20	0	20	0	0	0
Kirchneriella	0	0	0	0	0	0	0
Oocystis	0	0	0	240	0	0	0
Pachycladon	0	0	0	0	0	0	20
Pandorina	0	0	0	0	0	0	0
Pediastrum	0	0	0	0	80	0	0
Scenedesmus	40	120	0	120	0	0	0
Schroderia	0	0	0	0	0	0	0
Selenastrum	40	0	40	0	20	0	0
Spondylomorum	0	0	0	0	0	0	0
Starastrum	80	160	240	60	80	240	100
Tetraedron	0	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0	0
Trachelomonas	0	20	0	0	40	40	0
Treubaria	0	0	20	20	0	0	0
Chrysophyta							
Achnanthes	0	0	0	0	0	0	0
Cyclotella	0	0	0	0	0	0	0
Fragalaria	0	20	20	0	0	0	0
Melosira	0	0	0	0	0	0	0
Meridion	0	0	0	0	0	0	0
Nitzchia	200	200	460	120	340	260	540
Rhopalodia	80	200	340	100	340	180	240
Synedra	0	0	0	0	0	0	0

Phylum/Genus	ID9	ID10	ID11	ID12	ID13	ID14	ID15
Cryptophyta							
Cryptomonas	60	120	200	20	160	80	240
Rhodamonas	80	100	180	160	60	120	120
Cyanophyta							
Anabaena	520	440	500	60	440	380	420
Aphanocapsa	23680	22400	26240	29440	18320	21040	18240
Merismopedia	0	0	320	380	0	240	380
Microcystis	0	0	0	0	0	0	480
Oscillatoria	8200	5700	7100	5680	5000	5560	7380
Phacus	0	20	0	0	0	0	0
Rhaphidiopsis	60	0	60	0	0	0	0
Spirulina	0	0	0	0	0	0	0
Euglenophyta							
Euglena	40	0	20	20	20	0	20
Euglenomorpha	0	0	0	0	0	0	0
Pyrophyta							
Ceratium	0	0	0	0	0	0	20
Gymnodinium	0	0	20	0	40	20	60
Peridinium	0	20	20	60	0	20	40

Phylum/Genus	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9
Chlorophyta									
Ankistrodesmus	0	0	0	0	0	0	0	0	40
Arthrodesmus	0	0	0	0	0	0	0	0	20
Carteria	20	0	0	0	0	0	0	40	20
Chlamydomonas	260	180	160	140	200	220	100	240	220
Chlorococcum	0	0	0	0	0	0	0	0	0
Chodatella	0	0	20	0	0	0	20	0	0
Closteriopsis	0	0	0	0	0	0	0	0	0
Closterium	0	0	0	0	0	0	0	0	60
Coccomonas	0	0	0	0	0	0	0	0	40
Coelastrum	0	0	0	0	0	0	0	0	0
Cosmarium	160	140	120	160	180	200	220	220	280
Crucigenia	80	0	40	0	0	60	0	20	0
Dictyosphaerium	160	0	0	0	240	140	160	240	160
Eudorina	0	0	0	0	240	0	0	0	320
Franceia	0	20	0	0	0	0	0	20	0
Kirchneriella	0	0	0	0	0	0	0	0	0
Oocystis	0	0	0	0	80	0	0	0	0
Pachycladon	0	0	0	0	0	0	0	0	0
Pandorina	0	0	0	0	0	0	0	0	0
Pediastrum	0	0	0	160	0	0	0	0	0
Scenedesmus	160	160	200	220	0	80	80	0	120
Schroderia	0	0	0	0	0	0	0	0	0
Selenastrum	20	100	0	0	40	0	0	40	40
Spondylomorum	0	0	0	0	0	0	0	0	0
Starastrum	60	40	100	80	80	60	100	140	100
Tetraedron	0	0	0	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0	0	0	0
Trachelomonas	0	0	0	0	20	0	0	0	0
Treubaria	0	0	0	0	0	40	0	60	0
Chrysophyta									
Achnanthes	0	0	0	0	40	20	20	0	0
Cyclotella	0	20	20	40	40	0	20	20	0
Fragalaria	0	0	0	0	0	0	0	0	0
Melosira	0	80	0	0	100	100	80	120	0
Meridion	0	0	0	0	0	0	0	0	0
Nitzchia	160	140	60	200	140	220	100	40	260
Rhopalodia	100	40	60	80	80	100	100	60	40
Synedra	80	20	80	0	60	40	80	40	0

Phylum/Genus	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9
Cryptophyta									
Cryptomonas	420	180	400	240	240	100	260	300	420
Rhodamonas	20	120	220	200	180	80	180	120	180
Cyanophyta									
Anabaena	100	260	160	360	400	120	160	520	160
Aphanocapsa	41280	41280	48000	46720	45440	41280	36480	44800	48960
Merismopedia	640	640	380	0	380	1120	400	480	1520
Microcystis	0	0	0	0	0	0	0	0	0
Oscillatoria	3580	3300	3180	3340	3760	3140	4000	3880	3520
Phacus	0	0	20	0	0	0	0	20	40
Rhaphidiopsis	140	40	260	260	120	60	0	20	80
Spirulina	0	0	0	0	0	0	0	0	0
Euglenophyta									
Euglena	100	20	20	60	20	40	0	40	60
Euglenomorpha	0	0	0	0	0	0	0	0	0
Pyrophyta									
Ceratium	0	0	0	0	0	0	0	0	0
Gymnodinium	40	80	40	20	60	20	0	20	100
Peridinium	40	0	20	0	20	0	40	0	20

Phylum/Genus	SP10	SP11	SP12	SP13	SP14	SP15
Chlorophyta						
Ankistrodesmus	0	0	20	20	0	0
Arthrodesmus	0	0	0	0	0	0
Carteria	20	40	20	40	0	20
Chlamydomonas	220	300	340	240	160	240
Chlorococcum	0	0	0	0	0	0
Chodatella	20	0	20	0	0	0
Closteriopsis	0	0	0	0	0	0
Closterium	0	0	0	0	0	0
Coccomonas	0	0	0	20	0	0
Coelastrum	0	0	0	160	160	120
Cosmarium	240	260	280	300	80	100
Crucigenia	0	0	0	0	0	0
Dictyosphaerium	320	0	0	0	120	120
Eudorina	0	0	0	0	0	180
Franceia	40	0	20	20	20	20
Kirchneriella	0	0	0	0	80	0
Oocystis	0	0	0	0	0	0
Pachycladon	0	0	0	0	0	0
Pandorina	0	160	0	0	0	320
Pediastrum	0	0	0	0	0	0
Scenedesmus	0	0	160	0	160	120
Schroderia	0	0	0	0	0	0
Selenastrum	40	0	0	0	0	0
Spondylomorum	0	0	0	0	0	0
Starastrum	140	200	140	120	100	60
Tetraedron	0	0	0	0	0	0
Tetrastrum	0	0	0	0	0	0
Trachelomonas	0	0	0	0	20	20
Treubaria	40	40	20	20	0	0
Chrysophyta						
Achnanthes	0	0	0	0	0	0
Cyclotella	20	20	20	20	20	0
Fragalaria	0	0	0	0	0	0
Melosira	80	80	60	120	0	40
Meridion	0	0	0	0	0	0
Nitzchia	140	180	60	140	200	120
Rhopalodia	120	120	20	40	20	0
Synedra	40	0	0	0	0	0

Phylum/Genus	SP10	SP11	SP12	SP13	SP14	SP15
Cryptophyta						
Cryptomonas	140	240	420	340	400	360
Rhodamonas	140	180	140	80	140	80
Cyanophyta						
Anabaena	560	240	460	120	160	0
Aphanocapsa	40640	41920	44800	43280	39680	37120
Merismopedia	1120	640	160	320	1160	1280
Microcystis	0	0	0	0	0	0
Oscillatoria	3500	2980	4980	3860	2620	1880
Phacus	0	20	0	0	0	0
Rhaphidiopsis	40	0	0	0	120	0
Spirulina	0	0	0	0	0	0
Euglenophyta						
Euglena	40	40	80	100	40	0
Euglenomorpha	0	0	0	0	0	0
Pyrophyta						
Ceratium	0	0	0	0	0	0
Gymnodinium	60	40	80	20	40	20
Peridinium	20	20	0	40	40	0

APPENDIX C

Chlorophyll *a* And Pheophytin Concentrations For All Sites During The July And August Sampling Dates

July 1995

SITE	Chlorophyll	Pheophytin
ID1	19.62	14.95
ID2	20.56	17.76
ID3	22.43	15.89
ID4	21.49	14.02
ID5	20.56	14.95
ID6	20.56	16.82
ID7	20.56	17.76
ID8	19.62	14.95
ID9	20.56	14.95
ID10	22.43	14.95
ID11	19.62	14.02
ID12	19.62	14.95
ID13	21.49	14.95
ID14	21.49	13.08
ID15	19.62	13.08
EF1	32.71	22.43
EF2	31.77	22.43
EF3	33.64	23.36
EF4	33.64	23.36
EF5	30.84	21.49
EF6	28.97	19.62
EF7	29.90	21.49
EF8	36.45	25.23
EF9	33.64	23.36
EF10	33.64	25.23
EF11	32.71	22.43
EF12	29.90	22.43
EF13	28.97	18.69
EF14	32.71	23.36
EF15	29.90	21.49
SP1	37.38	26.17
SP2	34.58	22.43
SP3	35.51	22.43
SP4	33.64	24.30
SP5	32.71	23.36
SP6	30.84	22.43
SP7	32.71	22.43
SP8	34.58	24.30
SP9	34.58	25.23
SP10	31.77	23.36

August 1995

SITE	Chlorophyll	Pheophytin
ID1	33.64	21.49
ID2	35.51	23.36
ID3	33.64	21.49
ID4	33.64	20.56
ID5	33.64	20.56
ID6	33.64	21.49
ID7	32.71	23.36
ID8	32.71	20.56
ID9	34.58	22.43
ID10	36.45	24.30
ID11	33.64	21.49
ID12	33.64	23.36
ID13	33.64	22.43
ID14	33.64	22.43
ID15	33.64	22.43
EF1	67.28	40.18
EF2	68.22	41.12
EF3	63.55	37.38
EF4	63.55	37.38
EF5	64.48	38.31
EF6	66.35	37.38
EF7	66.35	37.38
EF8	63.55	36.45
EF9	64.48	37.38
EF10	67.28	38.31
EF11	64.48	37.38
EF12	64.48	40.18
EF13	62.61	39.25
EF14	62.61	39.25
EF15	63.55	38.31
SP1	56.07	35.51
SP2	52.33	34.58
SP3	49.53	32.71
SP4	53.27	35.51
SP5	57.00	35.51
SP6	53.27	34.58
SP7	55.14	34.58
SP8	49.53	34.58
SP9	52.33	31.77
SP10	49.53	31.77

July 1995

SITE	Chlorophyll	Pheophytin
SP11	34.58	23.36
SP12	33.64	23.36
SP13	33.64	23.36
SP14	33.64	23.36
SP15	34.58	25.23

August 1995

SITE	Chlorophyll	Pheophytin
SP11	52.33	31.77
SP12	53.27	34.58
SP13	54.20	32.71
SP14	54.20	36.45
SP15	57.94	27.10

APPENDIX D

Index Values For All Communities Collected During The July Sampling Date

SORENSON'S INDEX
ALL POSSIBLE COMPARISONS
JULY 1995

	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.6977	0.8095	0.7317	0.7556	0.7317	0.8718	0.7907	0.6667	0.7442	0.8205	0.7619	0.7143	0.7200	0.5517
EF2	0.6977	1.0000	0.7660	0.7391	0.7600	0.7826	0.6818	0.7500	0.7600	0.7500	0.7727	0.6809	0.7234	0.6552	0.5625
EF3	0.8095	0.7660	1.0000	0.6667	0.7755	0.7111	0.8372	0.7660	0.7347	0.7234	0.7442	0.7391	0.6522	0.7407	0.5806
EF4	0.7317	0.7391	0.6667	1.0000	0.6667	0.8182	0.7619	0.8261	0.7083	0.8261	0.7143	0.8444	0.7111	0.6429	0.6000
EF5	0.7556	0.7600	0.7755	0.6667	1.0000	0.7083	0.7826	0.7600	0.7308	0.7200	0.7391	0.7347	0.6939	0.6667	0.5294
EF6	0.7317	0.7826	0.7111	0.8182	0.7083	1.0000	0.8095	0.8261	0.8333	0.8261	0.8095	0.8000	0.8000	0.6429	0.6552
EF7	0.8718	0.6818	0.8372	0.7619	0.7826	0.8095	1.0000	0.8182	0.7391	0.8182	0.8000	0.8372	0.7442	0.7600	0.6429
EF8	0.7907	0.7500	0.7660	0.8261	0.7600	0.8261	0.8182	1.0000	0.7600	0.8750	0.7727	0.7660	0.6809	0.7778	0.5625
EF9	0.6667	0.7600	0.7347	0.7083	0.7308	0.8333	0.7391	0.7600	1.0000	0.8400	0.7826	0.7347	0.8163	0.5152	0.6250
EF10	0.7442	0.7500	0.7234	0.8261	0.7200	0.8261	0.8182	0.8750	0.8400	1.0000	0.7727	0.8085	0.7660	0.6552	0.6667
EF11	0.8205	0.7727	0.7442	0.7143	0.7391	0.8095	0.8000	0.7727	0.7826	0.7727	1.0000	0.7442	0.8372	0.6296	0.5862
EF12	0.7619	0.6809	0.7391	0.8444	0.7347	0.8000	0.8372	0.7660	0.7347	0.8085	0.7442	1.0000	0.7826	0.6207	0.6333
EF13	0.7143	0.7234	0.6522	0.7111	0.6939	0.8000	0.7442	0.6809	0.8163	0.7660	0.8372	0.7826	1.0000	0.5667	0.7500
EF14	0.7200	0.6552	0.7407	0.6429	0.6667	0.6429	0.7600	0.7778	0.5152	0.6552	0.6296	0.6207	0.5667	1.0000	0.6129
EF15	0.5517	0.5625	0.5806	0.6000	0.5294	0.6552	0.6429	0.5625	0.6250	0.6667	0.5862	0.6333	0.7500	0.6129	1.0000
ID1	0.6316	0.6512	0.6190	0.6829	0.6222	0.6341	0.6154	0.6977	0.6667	0.7442	0.6154	0.6190	0.6667	0.5357	0.5000
ID2	0.5556	0.5854	0.5500	0.6154	0.5116	0.6154	0.5405	0.6341	0.6047	0.6341	0.5946	0.5500	0.6500	0.4138	0.4828
ID3	0.6471	0.6154	0.6316	0.6486	0.5854	0.6486	0.6286	0.7179	0.6341	0.6667	0.6286	0.6316	0.6316	0.5000	0.4138
ID4	0.7027	0.7143	0.7317	0.6500	0.6818	0.6500	0.6842	0.7143	0.6364	0.6667	0.7368	0.6829	0.6829	0.6154	0.4667
ID5	0.6316	0.6047	0.6190	0.5854	0.6222	0.5854	0.6154	0.6977	0.6222	0.6512	0.5128	0.5714	0.5714	0.4333	0.4516
ID6	0.6842	0.7907	0.7143	0.7805	0.6667	0.7805	0.7692	0.7907	0.7111	0.8372	0.7179	0.7619	0.7143	0.6538	0.5517
ID7	0.5641	0.7273	0.6512	0.6667	0.6087	0.6667	0.6500	0.6818	0.6957	0.6818	0.6000	0.5581	0.5581	0.5172	0.3939
ID8	0.6500	0.7111	0.6364	0.6977	0.5532	0.7442	0.6829	0.7556	0.6809	0.7556	0.6341	0.6364	0.6818	0.6071	0.4688
ID9	0.5789	0.6977	0.6190	0.6829	0.6222	0.6829	0.6667	0.6977	0.6667	0.7442	0.6667	0.6190	0.6667	0.4828	0.5517
ID10	0.6000	0.6667	0.6818	0.6047	0.6383	0.6047	0.6341	0.7111	0.6383	0.7111	0.5854	0.5909	0.5909	0.5517	0.5161
ID11	0.6316	0.7442	0.6667	0.7805	0.6667	0.7805	0.7179	0.8372	0.7556	0.7907	0.7179	0.6667	0.6190	0.5926	0.4516
ID12	0.6486	0.7143	0.7317	0.5500	0.5455	0.6000	0.6316	0.6190	0.6364	0.5714	0.6316	0.5854	0.5854	0.4483	0.4194
ID13	0.7317	0.8261	0.6667	0.7727	0.6667	0.7727	0.6667	0.7826	0.7083	0.7391	0.7143	0.7111	0.7556	0.5862	0.5484
ID14	0.6000	0.7556	0.6818	0.6512	0.6383	0.6512	0.6341	0.6222	0.6809	0.6667	0.5854	0.7273	0.6364	0.5000	0.5161
ID15	0.6667	0.7234	0.7391	0.7111	0.6122	0.7556	0.6977	0.7660	0.7347	0.7234	0.6512	0.6957	0.6957	0.6207	0.5313

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ALL POSSIBLE COMPARISONS
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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.7143	0.7660	0.7391	0.7556	0.6531	0.6667	0.6512	0.7660	0.6531	0.7234	0.6512	0.6957	0.6087	0.5667	0.4848
SP2	0.6190	0.5957	0.5652	0.5333	0.5714	0.6222	0.5581	0.6383	0.6122	0.5106	0.5581	0.5217	0.5652	0.4688	0.4000
SP3	0.6667	0.6400	0.6939	0.5833	0.6154	0.6250	0.6522	0.6800	0.6923	0.6800	0.5652	0.6122	0.6122	0.5152	0.4857
SP4	0.7111	0.7600	0.6122	0.7917	0.6923	0.7500	0.6522	0.8000	0.6923	0.5625	0.6522	0.6939	0.6939	0.6129	0.5294
SP5	0.6957	0.7451	0.6800	0.6531	0.6415	0.6531	0.6383	0.7059	0.7170	0.7059	0.6383	0.6400	0.6400	0.5455	0.5143
SP6	0.7727	0.7347	0.7500	0.7234	0.7059	0.8085	0.7556	0.7755	0.7451	0.7347	0.7111	0.7500	0.7500	0.6333	0.5938
SP7	0.7273	0.6531	0.6250	0.6383	0.6275	0.6809	0.6667	0.6939	0.6275	0.6939	0.5778	0.6250	0.6250	0.5313	0.5000
SP8	0.8085	0.6538	0.7451	0.7200	0.7037	0.7200	0.7917	0.7692	0.7407	0.7308	0.6667	0.7451	0.7059	0.6250	0.5882
SP9	0.7727	0.7755	0.7083	0.6809	0.6667	0.6809	0.6667	0.7755	0.6667	0.6939	0.6667	0.6250	0.6667	0.5806	0.5000
SP10	0.7826	0.7059	0.7200	0.6939	0.7170	0.6939	0.7234	0.7843	0.7170	0.5455	0.6383	0.6400	0.6400	0.6452	0.5143
SP11	0.8261	0.7059	0.7600	0.7347	0.7170	0.7755	0.8085	0.8235	0.7170	0.7059	0.6809	0.7200	0.6800	0.7000	0.5588
SP12	0.7727	0.6122	0.6667	0.6809	0.7059	0.6383	0.7111	0.6939	0.7059	0.6939	0.6222	0.6667	0.6250	0.5313	0.5000
SP13	0.6957	0.6667	0.6000	0.6531	0.6038	0.6939	0.6383	0.6667	0.6415	0.6667	0.5957	0.6000	0.6400	0.5000	0.5588
SP14	0.7317	0.7391	0.6667	0.8182	0.6667	0.8182	0.7619	0.8261	0.6667	0.7826	0.6667	0.7556	0.6667	0.6429	0.6000
SP15	0.8261	0.7843	0.8400	0.7347	0.7170	0.8163	0.8085	0.7843	0.7925	0.8235	0.7660	0.7600	0.7600	0.7000	0.6563

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.8333	0.8235	0.7568	0.6842	0.6842	0.7692	0.7000	0.7368	0.8000	0.7895	0.6486	0.6829	0.7000	0.7619
ID2	0.8333	1.0000	0.8750	0.7429	0.7222	0.6667	0.7568	0.6842	0.8333	0.6842	0.7222	0.6857	0.7179	0.6316	0.7500
ID3	0.8235	0.8750	1.0000	0.7879	0.7059	0.7647	0.7429	0.7222	0.7059	0.7222	0.7647	0.7273	0.7568	0.7222	0.7895
ID4	0.7568	0.7429	0.7879	1.0000	0.6486	0.7568	0.6842	0.7179	0.7027	0.6667	0.7568	0.7778	0.7500	0.6667	0.7805
ID5	0.6842	0.7222	0.7059	0.6486	1.0000	0.6842	0.6667	0.7000	0.7368	0.6500	0.6316	0.6486	0.7317	0.5500	0.7143
ID6	0.6842	0.6667	0.7647	0.7568	0.6842	1.0000	0.7179	0.8500	0.7895	0.7000	0.7895	0.6486	0.8293	0.7500	0.7619
ID7	0.7692	0.7568	0.7429	0.6842	0.6667	0.7179	1.0000	0.7805	0.7179	0.6829	0.8205	0.7368	0.6667	0.6829	0.8372
ID8	0.7000	0.6842	0.7222	0.7179	0.7000	0.8500	0.7805	1.0000	0.7000	0.6667	0.7500	0.6667	0.7907	0.6190	0.8182
ID9	0.7368	0.8333	0.7059	0.7027	0.7368	0.7895	0.7179	0.7000	1.0000	0.7000	0.7895	0.5946	0.7317	0.6000	0.6667
ID10	0.8000	0.6842	0.7222	0.6667	0.6500	0.7000	0.6829	0.6667	0.7000	1.0000	0.7000	0.6154	0.6512	0.6667	0.6818
ID11	0.7895	0.7222	0.7647	0.7568	0.6316	0.7895	0.8205	0.7500	0.7895	0.7000	1.0000	0.6486	0.7317	0.6500	0.7619
ID12	0.6486	0.6857	0.7273	0.7778	0.6486	0.6486	0.7368	0.6667	0.5946	0.6154	0.6486	1.0000	0.7000	0.7179	0.8293
ID13	0.6829	0.7179	0.7568	0.7500	0.7317	0.8293	0.6667	0.7907	0.7317	0.6512	0.7317	0.7000	1.0000	0.6512	0.8000
ID14	0.7000	0.6316	0.7222	0.6667	0.5500	0.7500	0.6829	0.6190	0.6000	0.6667	0.6500	0.7179	0.6512	1.0000	0.7273
ID15	0.7619	0.7500	0.7895	0.7805	0.7143	0.7619	0.8372	0.8182	0.6667	0.6818	0.7619	0.8293	0.8000	0.7273	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.7143	0.6500	0.6842	0.7317	0.7619	0.8095	0.6977	0.7273	0.6667	0.6364	0.7143	0.7317	0.8000	0.7273	0.7826
SP2	0.5714	0.6000	0.6316	0.6341	0.6667	0.6190	0.6047	0.6818	0.5714	0.5000	0.6190	0.5854	0.6667	0.5455	0.6522
SP3	0.6667	0.6047	0.6341	0.6818	0.6222	0.6667	0.6087	0.6383	0.6222	0.6383	0.6667	0.6364	0.6667	0.6383	0.7347
SP4	0.7556	0.6512	0.6829	0.6818	0.6667	0.7556	0.6522	0.7234	0.6667	0.6809	0.7556	0.5909	0.8333	0.7234	0.7347
SP5	0.6522	0.6818	0.7143	0.7556	0.6087	0.7391	0.6383	0.6667	0.6522	0.6250	0.6957	0.7111	0.7755	0.7500	0.7200
SP6	0.6818	0.6190	0.7000	0.7442	0.6364	0.7727	0.6222	0.7391	0.5909	0.6087	0.6818	0.6977	0.7660	0.6957	0.7917
SP7	0.5909	0.5714	0.6000	0.6047	0.6818	0.7273	0.5333	0.7391	0.5909	0.5217	0.5455	0.5581	0.7234	0.6087	0.6250
SP8	0.6383	0.5778	0.6047	0.6522	0.6809	0.6809	0.6250	0.6939	0.5957	0.6122	0.5957	0.6522	0.6800	0.6531	0.7451
SP9	0.5455	0.5714	0.6000	0.6512	0.6364	0.6818	0.5778	0.6957	0.5909	0.5652	0.6364	0.6512	0.7660	0.6087	0.6250
SP10	0.6522	0.5909	0.6190	0.6667	0.6957	0.6522	0.6809	0.7083	0.6087	0.6250	0.6522	0.6222	0.6939	0.6250	0.7200
SP11	0.6087	0.5455	0.6190	0.6667	0.6522	0.6957	0.6383	0.7083	0.5652	0.5833	0.6522	0.6667	0.7347	0.6667	0.7600
SP12	0.6364	0.6190	0.6500	0.6512	0.6364	0.5909	0.6222	0.6087	0.5909	0.6522	0.5909	0.6047	0.6383	0.6087	0.6667
SP13	0.5652	0.6364	0.5714	0.5778	0.6087	0.5652	0.5957	0.6250	0.6087	0.5833	0.5652	0.5778	0.6939	0.5417	0.6400
SP14	0.5854	0.5641	0.5946	0.6500	0.6829	0.7805	0.6667	0.7442	0.6341	0.6047	0.6829	0.6000	0.7273	0.6512	0.7111
SP15	0.6522	0.5909	0.6190	0.6667	0.6087	0.7826	0.6383	0.7500	0.6522	0.7083	0.6522	0.6667	0.7347	0.7083	0.7600

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.6087	0.6531	0.8163	0.7200	0.7917	0.7083	0.7059	0.7083	0.6800	0.7200	0.5833	0.5600	0.7556	0.7600
SP2	0.6087	1.0000	0.6939	0.7347	0.7600	0.7500	0.7917	0.7451	0.7083	0.8000	0.8000	0.6250	0.6000	0.6667	0.6000
SP3	0.6531	0.6939	1.0000	0.6923	0.8302	0.7843	0.6667	0.7778	0.6667	0.7547	0.7547	0.7059	0.6038	0.5833	0.7547
SP4	0.8163	0.7347	0.6923	1.0000	0.7925	0.7843	0.7451	0.7407	0.7059	0.6061	0.7925	0.6667	0.6415	0.7500	0.7170
SP5	0.7200	0.7600	0.8302	0.7925	1.0000	0.8077	0.7692	0.7636	0.7692	0.7778	0.7778	0.7308	0.7037	0.6531	0.7407
SP6	0.7917	0.7500	0.7843	0.7843	0.8077	1.0000	0.8400	0.8679	0.7600	0.8077	0.8846	0.6800	0.6538	0.7660	0.8462
SP7	0.7083	0.7917	0.6667	0.7451	0.7692	0.8400	1.0000	0.8302	0.7600	0.8077	0.8462	0.6800	0.6538	0.7660	0.7308
SP8	0.7059	0.7451	0.7778	0.7407	0.7636	0.8679	0.8302	1.0000	0.7547	0.9091	0.9455	0.8302	0.6909	0.7600	0.8364
SP9	0.7083	0.7083	0.6667	0.7059	0.7692	0.7600	0.7600	0.7547	1.0000	0.8077	0.8077	0.7200	0.7692	0.8085	0.8077
SP10	0.6800	0.8000	0.7547	0.6061	0.7778	0.8077	0.8077	0.9091	0.8077	1.0000	0.9259	0.8077	0.7778	0.7755	0.7778
SP11	0.7200	0.8000	0.7547	0.7925	0.7778	0.8846	0.8462	0.9455	0.8077	0.9259	1.0000	0.7692	0.7037	0.8163	0.8148
SP12	0.5833	0.6250	0.7059	0.6667	0.7308	0.6800	0.6800	0.8302	0.7200	0.8077	0.7692	1.0000	0.7692	0.6809	0.7692
SP13	0.5600	0.6000	0.6038	0.6415	0.7037	0.6538	0.6538	0.6909	0.7692	0.7778	0.7037	0.7692	1.0000	0.7347	0.7407
SP14	0.7556	0.6667	0.5833	0.7500	0.6531	0.7660	0.7660	0.7600	0.8085	0.7755	0.8163	0.6809	0.7347	1.0000	0.7755
SP15	0.7600	0.6000	0.7547	0.7170	0.7407	0.8462	0.7308	0.8364	0.8077	0.7778	0.8148	0.7692	0.7407	0.7755	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.5357	0.6800	0.5769	0.6071	0.5769	0.7727	0.6538	0.5000	0.5926	0.6957	0.6154	0.5556	0.7200	0.5517
EF2	0.5357	1.0000	0.6207	0.5862	0.6129	0.6429	0.5172	0.6000	0.6129	0.6000	0.6296	0.5161	0.5667	0.6552	0.5625
EF3	0.6800	0.6207	1.0000	0.5000	0.6333	0.5517	0.7200	0.6207	0.5806	0.5667	0.5926	0.5862	0.4839	0.7407	0.5806
EF4	0.5769	0.5862	0.5000	1.0000	0.5000	0.6923	0.6154	0.7037	0.5484	0.7037	0.5556	0.7308	0.5517	0.6429	0.6000
EF5	0.6071	0.6129	0.6333	0.5000	1.0000	0.5484	0.6429	0.6129	0.5758	0.5625	0.5862	0.5806	0.5313	0.6667	0.5294
EF6	0.5769	0.6429	0.5517	0.6923	0.5484	1.0000	0.6800	0.7037	0.7143	0.7037	0.6800	0.6667	0.6667	0.6429	0.6552
EF7	0.7727	0.5172	0.7200	0.6154	0.6429	0.6800	1.0000	0.6923	0.5862	0.6923	0.6667	0.7200	0.5926	0.7600	0.6429
EF8	0.6538	0.6000	0.6207	0.7037	0.6129	0.7037	0.6923	1.0000	0.6129	0.7778	0.6296	0.6207	0.5161	0.7778	0.5625
EF9	0.5000	0.6129	0.5806	0.5484	0.5758	0.7143	0.5862	0.6129	1.0000	0.7241	0.6429	0.5806	0.6897	0.5152	0.6250
EF10	0.5926	0.6000	0.5667	0.7037	0.5625	0.7037	0.6923	0.7778	0.7241	1.0000	0.6296	0.6786	0.6207	0.6552	0.6667
EF11	0.6957	0.6296	0.5926	0.5556	0.5862	0.6800	0.6667	0.6296	0.6429	0.6296	1.0000	0.5926	0.7200	0.6296	0.5862
EF12	0.6154	0.5161	0.5862	0.7308	0.5806	0.6667	0.7200	0.6207	0.5806	0.6786	0.5926	1.0000	0.6429	0.6207	0.6333
EF13	0.5556	0.5667	0.4839	0.5517	0.5313	0.6667	0.5926	0.5161	0.6897	0.6207	0.7200	0.6429	1.0000	0.5667	0.7500
EF14	0.7200	0.6552	0.7407	0.6429	0.6667	0.6429	0.7600	0.7778	0.5152	0.6552	0.6296	0.6207	0.5667	1.0000	0.6129
EF15	0.5517	0.5625	0.5806	0.6000	0.5294	0.6552	0.6429	0.5625	0.6250	0.6667	0.5862	0.6333	0.7500	0.6129	1.0000
ID1	0.4615	0.4828	0.4483	0.5185	0.4516	0.4643	0.4444	0.5357	0.5000	0.5926	0.4444	0.4483	0.5000	0.5357	0.5000
ID2	0.3846	0.4138	0.3793	0.4444	0.3438	0.4444	0.3704	0.4643	0.4333	0.4643	0.4231	0.3793	0.4815	0.4138	0.4828
ID3	0.4783	0.4444	0.4615	0.4800	0.4138	0.4800	0.4583	0.5600	0.4643	0.5000	0.4583	0.4615	0.4615	0.5000	0.4138
ID4	0.5417	0.5556	0.5769	0.4815	0.5172	0.4815	0.5200	0.5556	0.4667	0.5000	0.5833	0.5185	0.5185	0.6154	0.4667
ID5	0.4615	0.4333	0.4483	0.4138	0.4516	0.4138	0.4444	0.5357	0.4516	0.4828	0.3448	0.4000	0.4000	0.4333	0.4516
ID6	0.5200	0.6538	0.5556	0.6400	0.5000	0.6400	0.6250	0.6538	0.5517	0.7200	0.5600	0.6154	0.5556	0.6538	0.5517
ID7	0.3929	0.5714	0.4828	0.5000	0.4375	0.5000	0.4815	0.5172	0.5333	0.5172	0.4286	0.3871	0.3871	0.5172	0.3939
ID8	0.4815	0.5517	0.4667	0.5357	0.3824	0.5926	0.5185	0.6071	0.5161	0.6071	0.4643	0.4667	0.5172	0.6071	0.4688
ID9	0.4074	0.5357	0.4483	0.5185	0.4516	0.5185	0.5000	0.5357	0.5000	0.5926	0.5000	0.4483	0.5000	0.4828	0.5517
ID10	0.4286	0.5000	0.5172	0.4333	0.4688	0.4333	0.4643	0.5517	0.4688	0.5517	0.4138	0.4194	0.4194	0.5517	0.5161
ID11	0.4615	0.5926	0.5000	0.6400	0.5000	0.6400	0.5600	0.7200	0.6071	0.6538	0.5600	0.5000	0.4483	0.5926	0.4516
ID12	0.4800	0.5556	0.5769	0.3793	0.3750	0.4286	0.4615	0.4483	0.4667	0.4000	0.4615	0.4138	0.4138	0.4483	0.4194
ID13	0.5769	0.7037	0.5000	0.6296	0.5000	0.6296	0.5000	0.6429	0.5484	0.5862	0.5556	0.5517	0.6071	0.5862	0.5484
ID14	0.4286	0.6071	0.5172	0.4828	0.4688	0.4828	0.4643	0.4516	0.5161	0.5000	0.4138	0.5714	0.4667	0.5000	0.5161
ID15	0.5000	0.5667	0.5862	0.5517	0.4412	0.6071	0.5357	0.6207	0.5806	0.5667	0.4828	0.5333	0.5333	0.6207	0.5313

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.5556	0.6207	0.5862	0.6071	0.4848	0.5000	0.4828	0.6207	0.4848	0.5667	0.4828	0.5333	0.4375	0.5667	0.4848
SP2	0.4483	0.4242	0.3939	0.3636	0.4000	0.4516	0.3871	0.4688	0.4412	0.3429	0.3871	0.3529	0.3939	0.4688	0.4000
SP3	0.5000	0.4706	0.5313	0.4118	0.4444	0.4545	0.4839	0.5152	0.5294	0.5152	0.3939	0.4412	0.4412	0.5152	0.4857
SP4	0.5517	0.6129	0.4412	0.6552	0.5294	0.6000	0.4839	0.6667	0.5294	0.5542	0.4839	0.5313	0.5313	0.6129	0.5294
SP5	0.5333	0.5938	0.5152	0.4848	0.4722	0.4848	0.4688	0.5455	0.5588	0.5455	0.4688	0.4706	0.4706	0.5455	0.5143
SP6	0.6296	0.5806	0.6000	0.5667	0.5455	0.6786	0.6071	0.6333	0.5938	0.5806	0.5517	0.6000	0.6000	0.6333	0.5938
SP7	0.5714	0.4848	0.4545	0.4688	0.4571	0.5161	0.5000	0.5313	0.4571	0.5313	0.4063	0.4545	0.4545	0.5313	0.5000
SP8	0.6786	0.4857	0.5938	0.5625	0.5429	0.5625	0.6552	0.6250	0.5882	0.5758	0.5000	0.5938	0.5455	0.6250	0.5882
SP9	0.6296	0.6333	0.5484	0.5161	0.5000	0.5161	0.5000	0.6333	0.5000	0.5313	0.5000	0.4545	0.5000	0.5806	0.5000
SP10	0.6429	0.5455	0.5625	0.5313	0.5588	0.5313	0.5667	0.6452	0.5588	0.5455	0.4688	0.4706	0.4706	0.6452	0.5143
SP11	0.7037	0.5455	0.6129	0.5806	0.5588	0.6333	0.6786	0.7000	0.5588	0.5455	0.5161	0.5625	0.5152	0.7000	0.5588
SP12	0.6296	0.4412	0.5000	0.5161	0.5455	0.4688	0.5517	0.5313	0.5455	0.5313	0.4516	0.5000	0.4545	0.5313	0.5000
SP13	0.5333	0.5000	0.4286	0.4848	0.4324	0.5313	0.4688	0.5000	0.4722	0.5000	0.4242	0.4286	0.4706	0.5000	0.5588
SP14	0.5769	0.5862	0.5000	0.6923	0.5000	0.6923	0.6154	0.7037	0.5000	0.6429	0.5000	0.6071	0.5000	0.6429	0.6000
SP15	0.7037	0.6452	0.7241	0.5806	0.5588	0.6897	0.6786	0.6452	0.6563	0.7000	0.6207	0.6129	0.6129	0.7000	0.6563

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.7143	0.7000	0.6087	0.5200	0.5200	0.6250	0.5385	0.5833	0.6667	0.6522	0.4800	0.5185	0.5385	0.6154
ID2	0.7143	1.0000	0.7778	0.5909	0.5652	0.5000	0.6087	0.5200	0.7143	0.5200	0.5652	0.5217	0.5600	0.4615	0.6000
ID3	0.7000	0.7778	1.0000	0.6500	0.5455	0.6190	0.5909	0.5652	0.5455	0.5652	0.6190	0.5714	0.6087	0.5652	0.6522
ID4	0.6087	0.5909	0.6500	1.0000	0.4800	0.6087	0.5200	0.5600	0.5417	0.5000	0.6087	0.6364	0.6000	0.5000	0.6400
ID5	0.5200	0.5652	0.5455	0.4800	1.0000	0.5200	0.5000	0.5385	0.5833	0.4815	0.4615	0.4800	0.5769	0.3793	0.5556
ID6	0.5200	0.5000	0.6190	0.6087	0.5200	1.0000	0.5600	0.7391	0.6522	0.5385	0.6522	0.4800	0.7083	0.6000	0.6154
ID7	0.6250	0.6087	0.5909	0.5200	0.5000	0.5600	1.0000	0.6400	0.5600	0.5185	0.6957	0.5833	0.5000	0.5185	0.7200
ID8	0.5385	0.5200	0.5652	0.5600	0.5385	0.7391	0.6400	1.0000	0.5385	0.5000	0.6000	0.5000	0.6538	0.4483	0.6923
ID9	0.5833	0.7143	0.5455	0.5417	0.5833	0.6522	0.5600	0.5385	1.0000	0.5385	0.6522	0.4231	0.5769	0.4286	0.5000
ID10	0.6667	0.5200	0.5652	0.5000	0.4815	0.5385	0.5185	0.5000	0.5385	1.0000	0.5385	0.4444	0.4828	0.5000	0.5172
ID11	0.6522	0.5652	0.6190	0.6087	0.4615	0.6522	0.6957	0.6000	0.6522	0.5385	1.0000	0.4800	0.5769	0.4815	0.6154
ID12	0.4800	0.5217	0.5714	0.6364	0.4800	0.4800	0.5833	0.5000	0.4231	0.4444	0.4800	1.0000	0.5385	0.5600	0.7083
ID13	0.5185	0.5600	0.6087	0.6000	0.5769	0.7083	0.5000	0.6538	0.5769	0.4828	0.5769	0.5385	1.0000	0.4828	0.6667
ID14	0.5385	0.4615	0.5652	0.5000	0.3793	0.6000	0.5185	0.4483	0.4286	0.5000	0.4815	0.5600	0.4828	1.0000	0.5714
ID15	0.6154	0.6000	0.6522	0.6400	0.5556	0.6154	0.7200	0.6923	0.5000	0.5172	0.6154	0.7083	0.6667	0.5714	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.5556	0.4815	0.5200	0.5769	0.6154	0.6800	0.5357	0.5714	0.5000	0.4667	0.5556	0.5769	0.6667	0.5714	0.6429
SP2	0.4000	0.4286	0.4615	0.4643	0.5000	0.4483	0.4333	0.5172	0.4000	0.3333	0.4483	0.4138	0.5000	0.3750	0.4839
SP3	0.5000	0.4333	0.4643	0.5172	0.4516	0.5000	0.4375	0.4688	0.4516	0.4688	0.5000	0.4667	0.5000	0.4688	0.5806
SP4	0.6071	0.4828	0.5185	0.5172	0.5000	0.6071	0.4839	0.5667	0.5000	0.5161	0.6071	0.4194	0.7143	0.5667	0.5806
SP5	0.4839	0.5172	0.5556	0.6071	0.4375	0.5862	0.4688	0.5000	0.4839	0.4545	0.5333	0.5517	0.6333	0.6000	0.5625
SP6	0.5172	0.4483	0.5385	0.5926	0.4667	0.6296	0.4516	0.5862	0.4194	0.4375	0.5172	0.5357	0.6207	0.5333	0.6552
SP7	0.4194	0.4000	0.4286	0.4333	0.5172	0.5714	0.3636	0.5862	0.4194	0.3529	0.3750	0.3871	0.5667	0.4375	0.4545
SP8	0.4688	0.4063	0.4333	0.4839	0.5161	0.5161	0.4545	0.5313	0.4242	0.4412	0.4242	0.4839	0.5152	0.4848	0.5938
SP9	0.3750	0.4000	0.4286	0.4828	0.4667	0.5172	0.4063	0.5333	0.4194	0.3939	0.4667	0.4828	0.6207	0.4375	0.4545
SP10	0.4839	0.4194	0.4483	0.5000	0.5333	0.4839	0.5161	0.5484	0.4375	0.4545	0.4839	0.4516	0.5313	0.4545	0.5625
SP11	0.4375	0.3750	0.4483	0.5000	0.4839	0.5333	0.4688	0.5484	0.3939	0.4118	0.4839	0.5000	0.5806	0.5000	0.6129
SP12	0.4667	0.4483	0.4815	0.4828	0.4667	0.4194	0.4516	0.4375	0.4194	0.4839	0.4194	0.4333	0.4688	0.4375	0.5000
SP13	0.3939	0.4667	0.4000	0.4063	0.4375	0.3939	0.4242	0.4545	0.4375	0.4118	0.3939	0.4063	0.5313	0.3714	0.4706
SP14	0.4138	0.3929	0.4231	0.4815	0.5185	0.6400	0.5000	0.5926	0.4643	0.4333	0.5185	0.4286	0.5714	0.4828	0.5517
SP15	0.4839	0.4194	0.4483	0.5000	0.4375	0.6429	0.4688	0.6000	0.4839	0.5484	0.4839	0.5000	0.5806	0.5484	0.6129

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.4375	0.4848	0.6897	0.5625	0.6552	0.5484	0.5455	0.5484	0.5152	0.5625	0.4118	0.3889	0.6071	0.6129
SP2	0.4375	1.0000	0.5313	0.5806	0.6129	0.6000	0.6552	0.5938	0.5484	0.6667	0.6667	0.4545	0.4286	0.5000	0.4286
SP3	0.4848	0.5313	1.0000	0.5294	0.7097	0.6452	0.5000	0.6364	0.5000	0.6061	0.6061	0.5455	0.4324	0.4118	0.6061
SP4	0.6897	0.5806	0.5294	1.0000	0.6563	0.6452	0.5938	0.5882	0.5455	0.6061	0.6563	0.5000	0.4722	0.6000	0.5588
SP5	0.5625	0.6129	0.7097	0.6563	1.0000	0.6774	0.6250	0.6176	0.6250	0.6364	0.6364	0.5758	0.5429	0.4848	0.5882
SP6	0.6552	0.6000	0.6452	0.6452	0.6774	1.0000	0.7241	0.7667	0.6129	0.6774	0.7931	0.5152	0.4857	0.6207	0.7333
SP7	0.5484	0.6552	0.5000	0.5938	0.6250	0.7241	1.0000	0.7097	0.6129	0.6774	0.7333	0.5152	0.4857	0.6207	0.5758
SP8	0.5455	0.5938	0.6364	0.5882	0.6176	0.7667	0.7097	1.0000	0.6061	0.8333	0.8966	0.7097	0.5278	0.6129	0.7188
SP9	0.5484	0.5484	0.5000	0.5455	0.6250	0.6129	0.6129	0.6061	1.0000	0.6774	0.6774	0.5625	0.6250	0.6786	0.6774
SP10	0.5152	0.6667	0.6061	0.6061	0.6364	0.6774	0.6774	0.8333	0.6774	1.0000	0.8621	0.6774	0.6364	0.6333	0.6364
SP11	0.5625	0.6667	0.6061	0.6563	0.6364	0.7931	0.7333	0.8966	0.6774	0.8621	1.0000	0.6250	0.5429	0.6897	0.6875
SP12	0.4118	0.4545	0.5455	0.5000	0.5758	0.5152	0.5152	0.7097	0.5625	0.6774	0.6250	1.0000	0.6250	0.5161	0.6250
SP13	0.3889	0.4286	0.4324	0.4722	0.5429	0.4857	0.4857	0.5278	0.6250	0.6364	0.5429	0.6250	1.0000	0.5806	0.5882
SP14	0.6071	0.5000	0.4118	0.6000	0.4848	0.6207	0.8207	0.6129	0.6786	0.6333	0.6897	0.5161	0.5806	1.0000	0.6333
SP15	0.6129	0.4286	0.6061	0.5588	0.5882	0.7333	0.5758	0.7188	0.6774	0.6364	0.6875	0.6250	0.5882	0.6333	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.9650	0.9445	0.9277	0.9405	0.9348	0.9711	0.9544	0.9430	0.9069	0.8873	0.9571	0.9269	0.9310	0.9492
EF2	0.9650	1.0000	0.9569	0.9361	0.9343	0.9262	0.9727	0.9635	0.9384	0.9097	0.8990	0.9570	0.9422	0.9466	0.9476
EF3	0.9445	0.9569	1.0000	0.9549	0.9363	0.9199	0.9503	0.9707	0.9394	0.9123	0.9129	0.9529	0.9572	0.9619	0.9594
EF4	0.9277	0.9361	0.9549	1.0000	0.9356	0.9134	0.9315	0.9555	0.9390	0.9273	0.9189	0.9455	0.9552	0.9691	0.9431
EF5	0.9405	0.9343	0.9363	0.9356	1.0000	0.8878	0.9344	0.9534	0.9765	0.9404	0.9255	0.9475	0.9499	0.9454	0.9569
EF6	0.9348	0.9262	0.9199	0.9134	0.8878	1.0000	0.9368	0.9212	0.8940	0.8637	0.8579	0.9163	0.9001	0.9093	0.9024
EF7	0.9711	0.9727	0.9503	0.9315	0.9344	0.9368	1.0000	0.9577	0.9353	0.9054	0.8985	0.9591	0.9304	0.9355	0.9448
EF8	0.9544	0.9635	0.9707	0.9555	0.9534	0.9212	0.9577	1.0000	0.9583	0.9307	0.9182	0.9680	0.9639	0.9674	0.9682
EF9	0.9430	0.9384	0.9394	0.9390	0.9765	0.8940	0.9353	0.9583	1.0000	0.9476	0.9239	0.9487	0.9566	0.9464	0.9615
EF10	0.9069	0.9097	0.9123	0.9273	0.9404	0.8637	0.9054	0.9307	0.9476	1.0000	0.9525	0.9246	0.9335	0.9285	0.9341
EF11	0.8873	0.8990	0.9129	0.9189	0.9255	0.8579	0.8985	0.9182	0.9239	0.9525	1.0000	0.8974	0.9313	0.9277	0.9096
EF12	0.9571	0.9570	0.9529	0.9455	0.9475	0.9163	0.9591	0.9680	0.9487	0.9246	0.8974	1.0000	0.9432	0.9430	0.9650
EF13	0.9269	0.9422	0.9572	0.9552	0.9499	0.9001	0.9304	0.9639	0.9566	0.9335	0.9313	0.9432	1.0000	0.9729	0.9525
EF14	0.9310	0.9466	0.9619	0.9691	0.9454	0.9093	0.9355	0.9674	0.9464	0.9285	0.9277	0.9430	0.9729	1.0000	0.9533
EF15	0.9492	0.9476	0.9594	0.9431	0.9569	0.9024	0.9448	0.9682	0.9615	0.9341	0.9096	0.9650	0.9525	0.9533	1.0000
ID1	0.9079	0.8985	0.8678	0.8503	0.8558	0.9050	0.9033	0.8730	0.8626	0.8262	0.8147	0.8754	0.8541	0.8523	0.8673
ID2	0.8985	0.9183	0.8902	0.8704	0.8812	0.8929	0.9106	0.9016	0.8907	0.8560	0.8389	0.9008	0.8853	0.8803	0.8958
ID3	0.8678	0.8902	0.8729	0.8503	0.8602	0.8882	0.9063	0.8770	0.8621	0.8257	0.8170	0.8783	0.8558	0.8565	0.8688
ID4	0.8503	0.8704	0.8503	0.8810	0.9208	0.8935	0.9257	0.9161	0.9173	0.8788	0.8707	0.9142	0.9023	0.8980	0.9113
ID5	0.8558	0.8812	0.8602	0.9208	0.8646	0.9008	0.9095	0.8822	0.8696	0.8353	0.8187	0.8849	0.8660	0.8602	0.8762
ID6	0.9050	0.8929	0.8882	0.8935	0.9008	0.9040	0.9356	0.9269	0.9191	0.8804	0.8704	0.9287	0.9105	0.9084	0.9223
ID7	0.9033	0.9106	0.9063	0.9257	0.9095	0.9356	0.9187	0.9300	0.9433	0.9213	0.9094	0.9204	0.9229	0.9126	0.9256
ID8	0.8730	0.9016	0.8770	0.9161	0.8822	0.9269	0.9300	0.9210	0.9147	0.8822	0.8662	0.9172	0.9120	0.8995	0.9135
ID9	0.8626	0.8907	0.8621	0.9173	0.8696	0.9191	0.9433	0.9147	0.9433	0.9165	0.8998	0.9356	0.9285	0.9167	0.9337
ID10	0.8262	0.8560	0.8257	0.8788	0.8353	0.8804	0.9213	0.8822	0.9165	0.8703	0.8566	0.9167	0.8953	0.8942	0.9157
ID11	0.8147	0.8389	0.8170	0.8707	0.8187	0.8704	0.9094	0.8662	0.8998	0.8566	0.9438	0.9023	0.9200	0.9165	0.9147
ID12	0.8754	0.9008	0.8783	0.9142	0.8849	0.9287	0.9204	0.9172	0.9356	0.9167	0.9023	0.9386	0.9289	0.9196	0.9344
ID13	0.8541	0.8853	0.8558	0.9023	0.8660	0.9105	0.9229	0.9120	0.9285	0.8953	0.9200	0.9289	0.9118	0.9006	0.9153
ID14	0.8523	0.8803	0.8565	0.8980	0.8602	0.9084	0.9126	0.8995	0.9167	0.8942	0.9165	0.9196	0.9006	0.8773	0.8931
ID15	0.8673	0.8958	0.8688	0.9113	0.8762	0.9223	0.9256	0.9135	0.9337	0.9157	0.9147	0.9344	0.9153	0.8931	0.9346

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.9119	0.9064	0.8747	0.8555	0.8583	0.8930	0.9034	0.8815	0.8605	0.8241	0.8136	0.8792	0.8584	0.8598	0.8691
SP2	0.9009	0.8884	0.8588	0.8341	0.8482	0.8868	0.8917	0.8623	0.8550	0.8107	0.8052	0.8675	0.8408	0.8434	0.8595
SP3	0.9225	0.9127	0.8825	0.8579	0.8709	0.8977	0.9133	0.8849	0.8735	0.8368	0.8264	0.8871	0.8625	0.8666	0.8813
SP4	0.9312	0.9224	0.8908	0.8720	0.8789	0.8904	0.9108	0.8998	0.8866	0.8435	0.8296	0.8969	0.8798	0.8805	0.8877
SP5	0.9166	0.9119	0.8797	0.8572	0.8646	0.8865	0.9087	0.8862	0.8731	0.8293	0.8191	0.8833	0.8639	0.8650	0.8762
SP6	0.9122	0.9009	0.8716	0.8523	0.8623	0.8887	0.9114	0.8774	0.8642	0.8235	0.8201	0.8828	0.8550	0.8568	0.8714
SP7	0.9228	0.9078	0.8824	0.8587	0.8692	0.8929	0.9120	0.8851	0.8738	0.8328	0.8213	0.8875	0.8642	0.8628	0.8779
SP8	0.9260	0.9113	0.8849	0.8680	0.8733	0.8954	0.9205	0.8935	0.8777	0.8397	0.8288	0.8948	0.8703	0.8716	0.8845
SP9	0.9245	0.9071	0.8828	0.8588	0.8702	0.8897	0.9153	0.8881	0.8708	0.8350	0.8237	0.8867	0.8635	0.8654	0.8793
SP10	0.9323	0.9169	0.8899	0.8651	0.8805	0.9065	0.9246	0.8942	0.8846	0.8425	0.8339	0.8949	0.8719	0.8742	0.8891
SP11	0.9091	0.8917	0.8692	0.8441	0.8553	0.8945	0.8996	0.8714	0.8613	0.8179	0.8089	0.8742	0.8497	0.8491	0.8632
SP12	0.8983	0.8816	0.8534	0.8319	0.8527	0.8891	0.8871	0.8575	0.8532	0.8108	0.7996	0.8645	0.8353	0.8392	0.8543
SP13	0.9246	0.9082	0.8860	0.8631	0.8695	0.8990	0.9157	0.8907	0.8751	0.8389	0.8268	0.8887	0.8726	0.8673	0.8829
SP14	0.9546	0.9335	0.9095	0.8941	0.9005	0.9310	0.9435	0.9206	0.9049	0.8691	0.8504	0.9232	0.8922	0.8960	0.9125
SP15	0.9282	0.9121	0.8875	0.8652	0.8760	0.8956	0.9197	0.8927	0.8793	0.8431	0.8315	0.8925	0.8696	0.8750	0.8873

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.9426	0.9595	0.9150	0.9478	0.9210	0.8786	0.9187	0.8890	0.9277	0.8505	0.8956	0.9249	0.9403	0.9039
ID2	0.9426	1.0000	0.9459	0.9468	0.9395	0.9477	0.9102	0.9514	0.9158	0.9502	0.8755	0.9178	0.9483	0.9630	0.9286
ID3	0.9595	0.9459	1.0000	0.9234	0.9422	0.9222	0.8742	0.9223	0.8816	0.9259	0.8472	0.8966	0.9238	0.9584	0.9011
ID4	0.9150	0.9468	0.9234	1.0000	0.9200	0.9694	0.9229	0.9730	0.9388	0.9508	0.9011	0.9534	0.9751	0.9404	0.9384
ID5	0.9478	0.9395	0.9422	0.9200	1.0000	0.9269	0.8804	0.9276	0.8959	0.9360	0.8521	0.8923	0.9230	0.9364	0.9050
ID6	0.9210	0.9477	0.9222	0.9694	0.9269	1.0000	0.9230	0.9732	0.9451	0.9623	0.9089	0.9439	0.9753	0.9408	0.9490
ID7	0.8786	0.9102	0.8742	0.9229	0.8804	0.9230	1.0000	0.9354	0.9675	0.9214	0.9426	0.9515	0.9280	0.8904	0.9451
ID8	0.9187	0.9514	0.9223	0.9730	0.9276	0.9732	0.9354	1.0000	0.9411	0.9644	0.8994	0.9486	0.9771	0.9373	0.9437
ID9	0.8890	0.9158	0.8816	0.9388	0.8959	0.9451	0.9675	0.9411	1.0000	0.9285	0.9386	0.9530	0.9376	0.9001	0.9447
ID10	0.9277	0.9502	0.9259	0.9508	0.9360	0.9623	0.9214	0.9644	0.9285	1.0000	0.8905	0.9325	0.9603	0.9393	0.9394
ID11	0.8505	0.8755	0.8472	0.9011	0.8521	0.9089	0.9426	0.8994	0.9386	0.8905	1.0000	0.9294	0.9046	0.8633	0.9205
ID12	0.8956	0.9178	0.8963	0.9534	0.8923	0.9439	0.9516	0.9486	0.9530	0.9325	0.9294	1.0000	0.9595	0.9127	0.9715
ID13	0.9249	0.9483	0.9238	0.9751	0.9230	0.9753	0.9280	0.9771	0.9376	0.9603	0.9046	0.9595	1.0000	0.9388	0.9547
ID14	0.9403	0.9630	0.9584	0.9404	0.9364	0.9408	0.8904	0.9373	0.9001	0.9393	0.8633	0.9127	0.9388	1.0000	0.9192
ID15	0.9039	0.9286	0.9011	0.9384	0.9050	0.9490	0.9451	0.9437	0.9447	0.9394	0.9205	0.9715	0.9547	0.9192	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.9623	0.9409	0.9732	0.9187	0.9474	0.9184	0.8696	0.9208	0.8830	0.9195	0.8438	0.8889	0.9177	0.9504	0.8911
SP2	0.9409	0.9283	0.9695	0.9072	0.9407	0.9091	0.8571	0.9071	0.8702	0.9076	0.8339	0.8753	0.9025	0.9454	0.8785
SP3	0.9732	0.9695	0.9588	0.9272	0.9539	0.9294	0.8777	0.9282	0.8915	0.9321	0.8536	0.8959	0.9225	0.9551	0.9006
SP4	0.9187	0.9072	0.9272	0.9351	0.9393	0.9378	0.8828	0.9345	0.8989	0.9362	0.8607	0.9052	0.9365	0.9760	0.9094
SP5	0.9474	0.9407	0.9539	0.9393	0.9365	0.9238	0.8707	0.9257	0.8847	0.9248	0.8464	0.8969	0.9265	0.9729	0.9028
SP6	0.9184	0.9091	0.9294	0.9378	0.9238	0.9206	0.8702	0.9198	0.8779	0.9221	0.8437	0.8935	0.9229	0.9551	0.8993
SP7	0.8696	0.8571	0.8777	0.8828	0.8707	0.8702	0.8710	0.9235	0.8843	0.9214	0.8443	0.8915	0.9211	0.9617	0.8939
SP8	0.9208	0.9071	0.9282	0.9345	0.9257	0.9198	0.9235	0.9241	0.8849	0.9287	0.8484	0.8928	0.9222	0.9616	0.9005
SP9	0.8830	0.8702	0.8915	0.8989	0.8847	0.8779	0.8843	0.8849	0.8824	0.9247	0.8447	0.8935	0.9214	0.9603	0.8951
SP10	0.9195	0.9076	0.9321	0.9362	0.9248	0.9221	0.9214	0.9287	0.9247	0.9344	0.8561	0.9014	0.9296	0.9562	0.9055
SP11	0.8438	0.8339	0.8536	0.8607	0.8464	0.8437	0.8443	0.8484	0.8447	0.8561	0.8306	0.8764	0.9055	0.9479	0.8805
SP12	0.8889	0.8753	0.8959	0.9052	0.8969	0.8935	0.8915	0.8928	0.8935	0.9014	0.8764	0.8646	0.8920	0.9406	0.8689
SP13	0.9177	0.9025	0.9225	0.9365	0.9265	0.9229	0.9211	0.9222	0.9214	0.9296	0.9055	0.8920	0.9202	0.9586	0.8977
SP14	0.9504	0.9454	0.9551	0.9760	0.9729	0.9551	0.9617	0.9616	0.9603	0.9562	0.9479	0.9406	0.9586	0.9436	0.9183
SP15	0.8911	0.8785	0.9006	0.9094	0.9028	0.8993	0.8939	0.9005	0.8951	0.9055	0.8805	0.8689	0.8977	0.9183	0.8948

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.9688	0.9651	0.9551	0.9622	0.9670	0.9732	0.9625	0.9697	0.9607	0.9699	0.9571	0.9584	0.9486	0.9621
SP2	0.9688	1.0000	0.9601	0.9443	0.9534	0.9605	0.9707	0.9514	0.9632	0.9550	0.9758	0.9701	0.9494	0.9358	0.9545
SP3	0.9651	0.9601	1.0000	0.9568	0.9660	0.9583	0.9604	0.9651	0.9594	0.9731	0.9542	0.9483	0.9646	0.9566	0.9658
SP4	0.9551	0.9443	0.9568	1.0000	0.9724	0.9544	0.9616	0.9630	0.9579	0.9572	0.9479	0.9383	0.9553	0.9481	0.9615
SP5	0.9622	0.9534	0.9660	0.9724	1.0000	0.9635	0.9690	0.9712	0.9675	0.9624	0.9538	0.9466	0.9647	0.9459	0.9690
SP6	0.9670	0.9605	0.9583	0.9544	0.9635	1.0000	0.9772	0.9730	0.9770	0.9567	0.9647	0.9555	0.9576	0.9444	0.9706
SP7	0.9732	0.9707	0.9604	0.9616	0.9690	0.9772	1.0000	0.9689	0.9807	0.9612	0.9776	0.9610	0.9654	0.9516	0.9713
SP8	0.9625	0.9514	0.9651	0.9630	0.9712	0.9730	0.9689	1.0000	0.9754	0.9682	0.9584	0.9536	0.9687	0.9589	0.9845
SP9	0.9697	0.9632	0.9594	0.9579	0.9675	0.9770	0.9807	0.9754	1.0000	0.9619	0.9666	0.9583	0.9651	0.9514	0.9788
SP10	0.9607	0.9550	0.9731	0.9572	0.9624	0.9567	0.9612	0.9682	0.9619	1.0000	0.9581	0.9498	0.9728	0.9634	0.9643
SP11	0.9699	0.9758	0.9542	0.9479	0.9538	0.9647	0.9776	0.9584	0.9666	0.9581	1.0000	0.9712	0.9562	0.9419	0.9582
SP12	0.9571	0.9701	0.9483	0.9383	0.9466	0.9555	0.9610	0.9536	0.9583	0.9498	0.9712	1.0000	0.9433	0.9290	0.9565
SP13	0.9584	0.9494	0.9646	0.9553	0.9647	0.9576	0.9654	0.9687	0.9651	0.9728	0.9532	0.9433	1.0000	0.9579	0.9692
SP14	0.9486	0.9358	0.9566	0.9481	0.9459	0.9444	0.9516	0.9589	0.9514	0.9634	0.9419	0.9290	0.9579	1.0000	0.9571
SP15	0.9621	0.9545	0.9658	0.9615	0.9690	0.9706	0.9713	0.9845	0.9788	0.9643	0.9582	0.9565	0.9692	0.9571	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.9997	0.9989	0.9981	0.9990	0.9968	0.9998	0.9995	0.9991	0.9970	0.9945	0.9997	0.9987	0.9986	0.9997
EF2	0.9997	1.0000	0.9995	0.9989	0.9988	0.9975	0.9998	0.9997	0.9989	0.9968	0.9948	0.9996	0.9993	0.9993	0.9995
EF3	0.9989	0.9995	1.0000	0.9996	0.9984	0.9974	0.9993	0.9996	0.9985	0.9970	0.9954	0.9993	0.9995	0.9996	0.9994
EF4	0.9981	0.9989	0.9996	1.0000	0.9980	0.9971	0.9987	0.9994	0.9981	0.9972	0.9958	0.9990	0.9995	0.9998	0.9988
EF5	0.9990	0.9988	0.9984	0.9980	1.0000	0.9933	0.9984	0.9993	0.9999	0.9992	0.9979	0.9992	0.9992	0.9987	0.9994
EF6	0.9968	0.9975	0.9974	0.9971	0.9933	1.0000	0.9980	0.9967	0.9937	0.9901	0.9868	0.9969	0.9956	0.9965	0.9961
EF7	0.9998	0.9998	0.9993	0.9987	0.9984	0.9980	1.0000	0.9995	0.9985	0.9961	0.9938	0.9996	0.9988	0.9989	0.9994
EF8	0.9995	0.9997	0.9996	0.9994	0.9993	0.9967	0.9995	1.0000	0.9994	0.9981	0.9964	0.9998	0.9998	0.9997	0.9997
EF9	0.9991	0.9989	0.9985	0.9981	0.9999	0.9937	0.9985	0.9994	1.0000	0.9992	0.9978	0.9993	0.9993	0.9988	0.9995
EF10	0.9970	0.9968	0.9970	0.9972	0.9992	0.9901	0.9961	0.9981	0.9992	1.0000	0.9992	0.9977	0.9986	0.9979	0.9982
EF11	0.9945	0.9948	0.9954	0.9958	0.9979	0.9868	0.9938	0.9964	0.9978	0.9992	1.0000	0.9955	0.9974	0.9966	0.9960
EF12	0.9997	0.9996	0.9993	0.9990	0.9992	0.9969	0.9996	0.9998	0.9993	0.9977	0.9955	1.0000	0.9993	0.9992	0.9998
EF13	0.9987	0.9993	0.9995	0.9995	0.9992	0.9956	0.9988	0.9998	0.9993	0.9986	0.9974	0.9993	1.0000	0.9998	0.9993
EF14	0.9986	0.9993	0.9996	0.9998	0.9987	0.9965	0.9989	0.9997	0.9988	0.9979	0.9966	0.9992	0.9998	1.0000	0.9991
EF15	0.9997	0.9995	0.9994	0.9988	0.9994	0.9961	0.9994	0.9997	0.9995	0.9982	0.9960	0.9998	0.9993	0.9991	1.0000
ID1	0.9982	0.9976	0.9958	0.9941	0.9949	0.9965	0.9981	0.9963	0.9952	0.9909	0.9871	0.9970	0.9946	0.9946	0.9966
ID2	0.9986	0.9977	0.9957	0.9939	0.9972	0.9931	0.9976	0.9969	0.9974	0.9945	0.9914	0.9974	0.9957	0.9951	0.9975
ID3	0.9983	0.9973	0.9952	0.9932	0.9956	0.9945	0.9977	0.9961	0.9958	0.9919	0.9882	0.9969	0.9944	0.9941	0.9967
ID4	0.9986	0.9978	0.9961	0.9946	0.9985	0.9919	0.9975	0.9974	0.9984	0.9963	0.9941	0.9978	0.9966	0.9958	0.9980
ID5	0.9982	0.9976	0.9957	0.9939	0.9953	0.9957	0.9979	0.9963	0.9956	0.9916	0.9879	0.9970	0.9948	0.9946	0.9967
ID6	0.9992	0.9986	0.9970	0.9956	0.9986	0.9937	0.9984	0.9981	0.9987	0.9963	0.9939	0.9985	0.9973	0.9967	0.9986
ID7	0.9983	0.9979	0.9970	0.9962	0.9994	0.9912	0.9974	0.9982	0.9994	0.9986	0.9973	0.9981	0.9981	0.9972	0.9984
ID8	0.9990	0.9982	0.9966	0.9951	0.9985	0.9929	0.9980	0.9978	0.9985	0.9963	0.9939	0.9981	0.9970	0.9962	0.9983
ID9	0.9986	0.9982	0.9972	0.9963	0.9995	0.9918	0.9977	0.9984	0.9994	0.9983	0.9969	0.9984	0.9982	0.9973	0.9987
ID10	0.9992	0.9985	0.9970	0.9953	0.9979	0.9943	0.9985	0.9978	0.9980	0.9953	0.9926	0.9982	0.9967	0.9962	0.9984
ID11	0.9957	0.9953	0.9948	0.9943	0.9985	0.9863	0.9944	0.9963	0.9984	0.9989	0.9988	0.9958	0.9968	0.9956	0.9965
ID12	0.9993	0.9991	0.9983	0.9974	0.9995	0.9940	0.9988	0.9991	0.9996	0.9981	0.9966	0.9991	0.9988	0.9982	0.9992
ID13	0.9990	0.9984	0.9968	0.9954	0.9986	0.9931	0.9982	0.9980	0.9986	0.9964	0.9942	0.9983	0.9972	0.9965	0.9984
ID14	0.9984	0.9974	0.9953	0.9934	0.9970	0.9927	0.9974	0.9965	0.9971	0.9940	0.9909	0.9972	0.9952	0.9946	0.9972
ID15	0.9996	0.9994	0.9984	0.9974	0.9991	0.9952	0.9992	0.9991	0.9992	0.9972	0.9952	0.9992	0.9985	0.9981	0.9992

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.9982	0.9979	0.9987	0.9984	0.9982	0.9978	0.9984	0.9931	0.9982	0.9988	0.9980	0.9973	0.9985	0.9995	0.9981
SP2	0.9974	0.9970	0.9980	0.9974	0.9973	0.9967	0.9975	0.9970	0.9971	0.9980	0.9970	0.9963	0.9975	0.9990	0.9970
SP3	0.9953	0.9947	0.9960	0.9952	0.9950	0.9943	0.9953	0.9947	0.9949	0.9961	0.9948	0.9940	0.9955	0.9976	0.9947
SP4	0.9934	0.9927	0.9942	0.9933	0.9931	0.9923	0.9934	0.9928	0.9929	0.9944	0.9928	0.9919	0.9937	0.9963	0.9927
SP5	0.9953	0.9947	0.9961	0.9966	0.9959	0.9953	0.9961	0.9957	0.9959	0.9963	0.9949	0.9939	0.9960	0.9973	0.9958
SP6	0.9952	0.9950	0.9955	0.9931	0.9938	0.9936	0.9943	0.9937	0.9938	0.9956	0.9950	0.9948	0.9947	0.9969	0.9936
SP7	0.9978	0.9974	0.9982	0.9974	0.9975	0.9971	0.9977	0.9974	0.9974	0.9984	0.9975	0.9969	0.9979	0.9992	0.9973
SP8	0.9961	0.9955	0.9968	0.9964	0.9961	0.9955	0.9963	0.9959	0.9960	0.9969	0.9957	0.9948	0.9965	0.9982	0.9959
SP9	0.9956	0.9950	0.9963	0.9968	0.9962	0.9954	0.9963	0.9959	0.9960	0.9965	0.9951	0.9941	0.9962	0.9975	0.9960
SP10	0.9914	0.9906	0.9925	0.9934	0.9924	0.9914	0.9925	0.9921	0.9923	0.9927	0.9906	0.9895	0.9925	0.9943	0.9922
SP11	0.9877	0.9867	0.9890	0.9901	0.9889	0.9877	0.9889	0.9884	0.9886	0.9892	0.9868	0.9852	0.9888	0.9910	0.9885
SP12	0.9969	0.9964	0.9975	0.9970	0.9968	0.9963	0.9971	0.9967	0.9968	0.9976	0.9965	0.9958	0.9972	0.9988	0.9967
SP13	0.9944	0.9937	0.9952	0.9950	0.9946	0.9937	0.9948	0.9942	0.9943	0.9954	0.9938	0.9928	0.9949	0.9969	0.9942
SP14	0.9943	0.9936	0.9951	0.9945	0.9942	0.9933	0.9944	0.9938	0.9939	0.9952	0.9936	0.9927	0.9946	0.9969	0.9938
SP15	0.9966	0.9962	0.9973	0.9971	0.9968	0.9962	0.9970	0.9966	0.9968	0.9975	0.9963	0.9955	0.9971	0.9986	0.9967

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.9986	0.9996	0.9973	0.9994	0.9980	0.9950	0.9978	0.9956	0.9987	0.9902	0.9967	0.9978	0.9986	0.9978
ID2	0.9986	1.0000	0.9994	0.9995	0.9987	0.9996	0.9981	0.9997	0.9984	0.9997	0.9949	0.9985	0.9995	0.9998	0.9989
ID3	0.9996	0.9994	1.0000	0.9985	0.9994	0.9989	0.9961	0.9987	0.9967	0.9993	0.9919	0.9973	0.9987	0.9996	0.9982
ID4	0.9973	0.9995	0.9985	1.0000	0.9976	0.9998	0.9990	0.9998	0.9993	0.9994	0.9971	0.9992	0.9998	0.9995	0.9992
ID5	0.9994	0.9987	0.9994	0.9976	1.0000	0.9983	0.9955	0.9980	0.9961	0.9988	0.9910	0.9969	0.9979	0.9987	0.9979
ID6	0.9980	0.9996	0.9989	0.9998	0.9983	1.0000	0.9989	0.9998	0.9993	0.9997	0.9966	0.9994	0.9998	0.9995	0.9996
ID7	0.9950	0.9981	0.9961	0.9990	0.9955	0.9989	1.0000	0.9991	0.9998	0.9984	0.9989	0.9995	0.9990	0.9976	0.9991
ID8	0.9978	0.9997	0.9987	0.9998	0.9980	0.9998	0.9991	1.0000	0.9993	0.9997	0.9967	0.9993	0.9999	0.9995	0.9994
ID9	0.9956	0.9984	0.9967	0.9993	0.9961	0.9993	0.9998	0.9993	1.0000	0.9986	0.9988	0.9996	0.9993	0.9981	0.9992
ID10	0.9987	0.9997	0.9993	0.9994	0.9988	0.9997	0.9984	0.9997	0.9986	1.0000	0.9954	0.9990	0.9996	0.9996	0.9994
ID11	0.9902	0.9949	0.9919	0.9971	0.9910	0.9966	0.9989	0.9967	0.9988	0.9954	1.0000	0.9979	0.9969	0.9946	0.9968
ID12	0.9967	0.9985	0.9973	0.9992	0.9969	0.9994	0.9995	0.9993	0.9996	0.9990	0.9979	1.0000	0.9995	0.9983	0.9998
ID13	0.9978	0.9995	0.9987	0.9998	0.9979	0.9998	0.9990	0.9999	0.9993	0.9996	0.9969	0.9995	1.0000	0.9995	0.9996
ID14	0.9986	0.9998	0.9996	0.9995	0.9987	0.9995	0.9976	0.9995	0.9981	0.9996	0.9946	0.9983	0.9995	1.0000	0.9987
ID15	0.9978	0.9989	0.9982	0.9992	0.9979	0.9996	0.9991	0.9994	0.9992	0.9994	0.9968	0.9998	0.9996	0.9987	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.9997	0.9996	0.9997	0.9988	0.9993	0.9993	0.9994	0.9993	0.9993	0.9997	0.9997	0.9996	0.9994	0.9994	0.9992
SP2	0.9991	0.9988	0.9993	0.9997	0.9995	0.9993	0.9995	0.9995	0.9995	0.9993	0.9990	0.9985	0.9994	0.9990	0.9995
SP3	0.9999	0.9998	0.9999	0.9997	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9997	0.9999	0.9994	0.9998
SP4	0.9980	0.9976	0.9984	0.9992	0.9988	0.9984	0.9987	0.9986	0.9987	0.9984	0.9978	0.9971	0.9985	0.9984	0.9987
SP5	0.9994	0.9994	0.9995	0.9989	0.9991	0.9991	0.9993	0.9992	0.9992	0.9995	0.9994	0.9992	0.9993	0.9993	0.9991
SP6	0.9986	0.9983	0.9989	0.9994	0.9991	0.9988	0.9991	0.9989	0.9990	0.9990	0.9983	0.9977	0.9989	0.9991	0.9990
SP7	0.9956	0.9949	0.9963	0.9972	0.9965	0.9959	0.9965	0.9962	0.9963	0.9963	0.9951	0.9941	0.9963	0.9969	0.9962
SP8	0.9984	0.9980	0.9987	0.9993	0.9990	0.9987	0.9990	0.9988	0.9989	0.9988	0.9981	0.9974	0.9989	0.9988	0.9989
SP9	0.9963	0.9957	0.9969	0.9977	0.9971	0.9965	0.9971	0.9968	0.9969	0.9969	0.9958	0.9948	0.9969	0.9974	0.9968
SP10	0.9991	0.9988	0.9993	0.9995	0.9993	0.9992	0.9994	0.9993	0.9993	0.9994	0.9989	0.9984	0.9993	0.9993	0.9993
SP11	0.9912	0.9903	0.9922	0.9938	0.9926	0.9917	0.9925	0.9922	0.9924	0.9922	0.9905	0.9891	0.9923	0.9932	0.9923
SP12	0.9970	0.9964	0.9975	0.9979	0.9975	0.9970	0.9975	0.9972	0.9973	0.9976	0.9965	0.9956	0.9974	0.9982	0.9972
SP13	0.9983	0.9979	0.9987	0.9992	0.9989	0.9986	0.9989	0.9988	0.9988	0.9987	0.9980	0.9973	0.9987	0.9988	0.9987
SP14	0.9993	0.9991	0.9994	0.9999	0.9998	0.9996	0.9997	0.9997	0.9997	0.9994	0.9992	0.9987	0.9995	0.9990	0.9997
SP15	0.9980	0.9975	0.9984	0.9985	0.9983	0.9979	0.9983	0.9981	0.9981	0.9985	0.9976	0.9969	0.9983	0.9990	0.9980

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.9999	0.9999	0.9995	0.9998	0.9998	0.9998	0.9998	0.9998	0.9999	0.9999	0.9997	0.9998	0.9995	0.9997
SP2	0.9999	1.0000	0.9998	0.9993	0.9996	0.9997	0.9997	0.9997	0.9997	0.9998	0.9999	0.9999	0.9997	0.9993	0.9997
SP3	0.9999	0.9998	1.0000	0.9996	0.9997	0.9997	0.9998	0.9997	0.9997	0.9999	0.9998	0.9996	0.9998	0.9997	0.9997
SP4	0.9995	0.9993	0.9996	1.0000	0.9999	0.9997	0.9998	0.9998	0.9998	0.9995	0.9994	0.9990	0.9997	0.9991	0.9998
SP5	0.9998	0.9996	0.9997	0.9999	1.0000	0.9998	0.9999	0.9999	0.9999	0.9997	0.9997	0.9994	0.9998	0.9993	0.9998
SP6	0.9998	0.9997	0.9997	0.9997	0.9998	1.0000	0.9999	0.9999	0.9999	0.9997	0.9998	0.9996	0.9998	0.9991	0.9999
SP7	0.9998	0.9997	0.9998	0.9998	0.9999	0.9999	1.0000	0.9999	0.9999	0.9998	0.9998	0.9996	0.9999	0.9995	0.9999
SP8	0.9998	0.9997	0.9997	0.9998	0.9999	0.9999	0.9999	1.0000	1.0000	0.9997	0.9998	0.9996	0.9998	0.9993	1.0000
SP9	0.9998	0.9997	0.9997	0.9998	0.9999	0.9999	0.9999	1.0000	1.0000	0.9998	0.9998	0.9995	0.9999	0.9993	1.0000
SP10	0.9999	0.9998	0.9999	0.9995	0.9997	0.9997	0.9998	0.9997	0.9998	1.0000	0.9998	0.9996	0.9999	0.9997	0.9997
SP11	0.9999	0.9999	0.9998	0.9994	0.9997	0.9998	0.9998	0.9998	0.9998	0.9998	1.0000	0.9999	0.9998	0.9994	0.9997
SP12	0.9997	0.9999	0.9996	0.9990	0.9994	0.9996	0.9996	0.9996	0.9995	0.9996	0.9999	1.0000	0.9995	0.9990	0.9995
SP13	0.9998	0.9997	0.9998	0.9997	0.9998	0.9998	0.9999	0.9998	0.9999	0.9999	0.9998	0.9995	1.0000	0.9995	0.9998
SP14	0.9995	0.9993	0.9997	0.9991	0.9993	0.9991	0.9995	0.9993	0.9993	0.9997	0.9994	0.9990	0.9995	1.0000	0.9993
SP15	0.9997	0.9997	0.9997	0.9998	0.9998	0.9999	0.9999	1.0000	1.0000	0.9997	0.9997	0.9995	0.9998	0.9993	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.5550	0.5779	0.5242	0.6398	0.5497	0.6049	0.6042	0.5820	0.6566	0.4918	0.4481	0.4541	0.6086	0.6560
EF2	0.5550	1.0000	0.5525	0.5823	0.4963	0.5338	0.4914	0.5251	0.5802	0.5252	0.5406	0.4036	0.5228	0.6265	0.5236
EF3	0.5779	0.5525	1.0000	0.4814	0.5024	0.4465	0.6590	0.6209	0.5584	0.4420	0.4226	0.4698	0.4767	0.6580	0.4951
EF4	0.5242	0.5823	0.4814	1.0000	0.4754	0.5682	0.5024	0.5445	0.5751	0.6394	0.4705	0.5606	0.4424	0.5242	0.5710
EF5	0.6398	0.4963	0.5024	0.4754	1.0000	0.4490	0.6045	0.5208	0.5200	0.5073	0.5072	0.4763	0.4204	0.5277	0.5212
EF6	0.5497	0.5338	0.4465	0.5682	0.4490	1.0000	0.5735	0.5685	0.6285	0.5364	0.4811	0.4741	0.4573	0.4851	0.5666
EF7	0.6049	0.4914	0.6590	0.5024	0.6045	0.5735	1.0000	0.6851	0.5374	0.4657	0.4713	0.5063	0.5321	0.7096	0.6610
EF8	0.6042	0.5251	0.6209	0.5445	0.5208	0.5685	0.6851	1.0000	0.5398	0.5255	0.4383	0.5185	0.5314	0.6434	0.4958
EF9	0.5820	0.5802	0.5584	0.5751	0.5200	0.6285	0.5374	0.5398	1.0000	0.6892	0.5168	0.5237	0.5611	0.4641	0.6126
EF10	0.6566	0.5252	0.4420	0.6394	0.5073	0.5364	0.4657	0.5255	0.6892	1.0000	0.5539	0.4874	0.4260	0.4656	0.5709
EF11	0.4918	0.5406	0.4226	0.4705	0.5072	0.4811	0.4713	0.4383	0.5168	0.5539	1.0000	0.3515	0.5092	0.4655	0.5889
EF12	0.4481	0.4036	0.4698	0.5606	0.4763	0.4741	0.5063	0.5185	0.5237	0.4874	0.3515	1.0000	0.5059	0.4427	0.5459
EF13	0.4541	0.5228	0.4767	0.4424	0.4204	0.4573	0.5321	0.5314	0.5611	0.4260	0.5092	0.5059	1.0000	0.5270	0.5896
EF14	0.6086	0.6265	0.6580	0.5242	0.5277	0.4851	0.7096	0.6434	0.4641	0.4656	0.4655	0.4427	0.5270	1.0000	0.5328
EF15	0.6560	0.5236	0.4951	0.5710	0.5212	0.5666	0.6610	0.4958	0.6126	0.5709	0.5889	0.5459	0.5896	0.5328	1.0000
ID1	0.2833	0.3718	0.2635	0.3585	0.3914	0.3290	0.2973	0.3796	0.4085	0.3762	0.2852	0.3216	0.3787	0.4274	0.4440
ID2	0.2715	0.4381	0.2890	0.4074	0.3077	0.3859	0.3440	0.4167	0.4207	0.4111	0.3494	0.3487	0.3913	0.4108	0.4510
ID3	0.3933	0.5298	0.4151	0.5273	0.5284	0.4095	0.4466	0.5436	0.4931	0.5015	0.3851	0.3762	0.4399	0.5605	0.4798
ID4	0.4251	0.5244	0.4689	0.4084	0.4407	0.3489	0.3801	0.5181	0.4482	0.3812	0.3845	0.4369	0.3881	0.4895	0.5221
ID5	0.3191	0.4049	0.3999	0.3349	0.3966	0.3141	0.3219	0.4374	0.4083	0.4165	0.3252	0.3285	0.3754	0.3433	0.3986
ID6	0.4028	0.5579	0.3639	0.4894	0.4482	0.5204	0.4371	0.5344	0.5297	0.5548	0.3840	0.5205	0.3841	0.5686	0.5259
ID7	0.3204	0.4836	0.3871	0.5241	0.3752	0.3173	0.3169	0.3270	0.4430	0.4768	0.3422	0.3383	0.2785	0.3651	0.3355
ID8	0.4253	0.4574	0.3671	0.4507	0.3495	0.3444	0.4267	0.5239	0.4162	0.4386	0.3370	0.3459	0.4279	0.4448	0.4229
ID9	0.3153	0.5019	0.3993	0.4664	0.4622	0.3384	0.3797	0.4938	0.4775	0.4925	0.3819	0.4828	0.4769	0.3891	0.5574
ID10	0.3943	0.4804	0.4623	0.3697	0.4463	0.2869	0.4353	0.5407	0.3770	0.4642	0.3277	0.3874	0.4579	0.4886	0.4531
ID11	0.4052	0.4935	0.3663	0.4549	0.4459	0.4491	0.3638	0.6202	0.6094	0.5888	0.3424	0.4287	0.3790	0.4552	0.4115
ID12	0.4289	0.5355	0.4613	0.3729	0.3793	0.3142	0.3308	0.4055	0.4877	0.3841	0.3087	0.3242	0.3594	0.3427	0.4641
ID13	0.5071	0.5664	0.3747	0.4727	0.3729	0.4504	0.4045	0.5103	0.4909	0.4443	0.4538	0.3884	0.4457	0.4048	0.5315
ID14	0.3610	0.4929	0.4075	0.3520	0.4422	0.3337	0.3668	0.3789	0.4451	0.3537	0.3280	0.4560	0.3778	0.4225	0.5352
ID15	0.4513	0.4687	0.3765	0.4134	0.3167	0.4159	0.3386	0.4041	0.4730	0.3853	0.3650	0.3193	0.2901	0.4011	0.4361

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.3755	0.4931	0.4735	0.4287	0.3605	0.3040	0.3556	0.4420	0.4117	0.3635	0.3370	0.4327	0.3497	0.4184	0.3985
SP2	0.3282	0.3054	0.2158	0.2391	0.2939	0.3240	0.2636	0.2970	0.3152	0.2385	0.3857	0.2598	0.2553	0.2838	0.3399
SP3	0.4472	0.3749	0.4778	0.3503	0.3783	0.3231	0.4460	0.3886	0.4249	0.4198	0.3545	0.3502	0.3396	0.3769	0.4106
SP4	0.4827	0.4903	0.4079	0.4699	0.3901	0.4587	0.3969	0.5556	0.4651	0.4270	0.3269	0.3860	0.4260	0.5384	0.4198
SP5	0.4443	0.5315	0.4093	0.4168	0.3563	0.3619	0.4276	0.4696	0.4363	0.4039	0.3987	0.3849	0.4184	0.4518	0.4346
SP6	0.4480	0.4210	0.3984	0.4640	0.4049	0.4664	0.5097	0.4459	0.4402	0.3715	0.4391	0.4153	0.3904	0.4799	0.5096
SP7	0.5926	0.3876	0.4353	0.4682	0.4393	0.4600	0.4834	0.4625	0.4331	0.4215	0.4216	0.3339	0.3814	0.4563	0.4839
SP8	0.5556	0.4804	0.5386	0.4885	0.4084	0.4332	0.5443	0.5341	0.4499	0.3780	0.4333	0.5013	0.4295	0.5145	0.4796
SP9	0.5575	0.4794	0.4340	0.3738	0.3813	0.3636	0.4586	0.4890	0.3649	0.4147	0.4316	0.2878	0.3784	0.4626	0.3879
SP10	0.5490	0.4882	0.4313	0.4080	0.4785	0.4019	0.5565	0.4739	0.4419	0.3507	0.4277	0.3524	0.3754	0.5183	0.4738
SP11	0.6420	0.4804	0.5686	0.4771	0.4273	0.5330	0.5788	0.5288	0.4805	0.3862	0.4558	0.4216	0.3974	0.5464	0.4828
SP12	0.4438	0.3591	0.2952	0.3823	0.4337	0.3049	0.3835	0.3525	0.4297	0.4071	0.3494	0.3535	0.2765	0.3861	0.3775
SP13	0.5139	0.4490	0.4222	0.4162	0.3145	0.4343	0.4974	0.4116	0.3891	0.3741	0.4355	0.3153	0.4582	0.3872	0.4588
SP14	0.4684	0.4719	0.3936	0.5362	0.4035	0.4656	0.4880	0.5335	0.4948	0.5090	0.3917	0.5231	0.3708	0.4901	0.5506
SP15	0.5399	0.5566	0.6170	0.4936	0.4421	0.4792	0.5656	0.5092	0.5835	0.5397	0.4902	0.4811	0.4883	0.5964	0.5387

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.5842	0.5823	0.4355	0.4005	0.4307	0.4282	0.4331	0.4408	0.5196	0.4049	0.3934	0.4780	0.4227	0.5008
ID2	0.5842	1.0000	0.6579	0.4497	0.3747	0.4773	0.4515	0.4517	0.4601	0.4318	0.4282	0.4313	0.5513	0.4093	0.4084
ID3	0.5823	0.6579	1.0000	0.5953	0.4922	0.5693	0.5084	0.5868	0.4666	0.5489	0.5163	0.5602	0.6269	0.5026	0.5367
ID4	0.4355	0.4497	0.5953	1.0000	0.4104	0.5432	0.3929	0.5901	0.5214	0.4173	0.4118	0.5252	0.5983	0.4583	0.5136
ID5	0.4005	0.3747	0.4922	0.4104	1.0000	0.4046	0.3490	0.4237	0.4459	0.5406	0.3489	0.3587	0.4119	0.3041	0.5187
ID6	0.4307	0.4773	0.5693	0.5432	0.4046	1.0000	0.4448	0.5494	0.5320	0.4766	0.5286	0.4339	0.5657	0.4444	0.5125
ID7	0.4282	0.4515	0.5084	0.3929	0.3490	0.4448	1.0000	0.5302	0.5576	0.4401	0.5169	0.5354	0.4576	0.3571	0.5767
ID8	0.4331	0.4517	0.5868	0.5901	0.4237	0.5494	0.5302	1.0000	0.4891	0.4657	0.4261	0.4817	0.5610	0.3560	0.4420
ID9	0.4408	0.4601	0.4666	0.5214	0.4459	0.5320	0.5576	0.4891	1.0000	0.5383	0.4931	0.3893	0.5199	0.3518	0.4379
ID10	0.5196	0.4318	0.5489	0.4173	0.5406	0.4766	0.4401	0.4657	0.5383	1.0000	0.5206	0.4297	0.4610	0.3634	0.4697
ID11	0.4049	0.4282	0.5163	0.4118	0.3489	0.5286	0.5169	0.4261	0.4931	0.5206	1.0000	0.4673	0.5645	0.3031	0.5543
ID12	0.3934	0.4313	0.5602	0.5252	0.3587	0.4339	0.5354	0.4817	0.3893	0.4297	0.4673	1.0000	0.6160	0.4325	0.6724
ID13	0.4780	0.5513	0.6269	0.5983	0.4119	0.5657	0.4576	0.5610	0.5199	0.4610	0.5645	0.6160	1.0000	0.3679	0.5957
ID14	0.4227	0.4093	0.5026	0.4583	0.3041	0.4444	0.3571	0.3560	0.3518	0.3634	0.3031	0.4325	0.3679	1.0000	0.4261
ID15	0.5008	0.4084	0.5367	0.5136	0.5187	0.5125	0.5767	0.4420	0.4379	0.4697	0.5543	0.6724	0.5957	0.4261	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.4662	0.4027	0.4363	0.3874	0.4475	0.4616	0.4166	0.4571	0.4130	0.3995	0.3737	0.4062	0.4611	0.3745	0.3762
SP2	0.3229	0.4117	0.4171	0.3522	0.4652	0.3240	0.3140	0.3950	0.2840	0.2470	0.2834	0.2987	0.3023	0.3237	0.2940
SP3	0.3969	0.3220	0.4263	0.4215	0.4669	0.4232	0.2946	0.3624	0.4389	0.4287	0.4163	0.4018	0.3001	0.4008	0.3599
SP4	0.4583	0.4549	0.5733	0.4800	0.3960	0.5994	0.3560	0.4499	0.4467	0.4494	0.5726	0.4411	0.4989	0.4546	0.3740
SP5	0.4684	0.5651	0.6075	0.5574	0.3330	0.4956	0.2985	0.4686	0.4355	0.3950	0.3950	0.4675	0.5235	0.5598	0.3413
SP6	0.4917	0.4340	0.5991	0.5481	0.4518	0.5719	0.3282	0.4726	0.4238	0.3888	0.3581	0.3951	0.4376	0.4784	0.4657
SP7	0.3579	0.4032	0.5255	0.4769	0.4515	0.5500	0.3685	0.5718	0.4190	0.3785	0.3920	0.3802	0.5002	0.3861	0.3325
SP8	0.4659	0.3867	0.5349	0.4728	0.5178	0.4807	0.3748	0.3987	0.3889	0.4639	0.3497	0.5102	0.4104	0.4984	0.5267
SP9	0.3038	0.3647	0.4909	0.4332	0.4145	0.4130	0.2972	0.4442	0.3470	0.3859	0.4003	0.4195	0.4028	0.3726	0.2794
SP10	0.5452	0.4072	0.5830	0.4785	0.4850	0.4603	0.4117	0.4591	0.4404	0.4430	0.4705	0.4475	0.4779	0.4808	0.4717
SP11	0.3361	0.3805	0.5222	0.5976	0.4613	0.5470	0.4352	0.5406	0.3792	0.3642	0.4247	0.4877	0.4849	0.5694	0.4573
SP12	0.4272	0.4574	0.5721	0.3547	0.3627	0.3972	0.3249	0.3089	0.3233	0.3708	0.3679	0.3278	0.3240	0.3901	0.2770
SP13	0.3696	0.5414	0.5041	0.4911	0.4034	0.4229	0.3822	0.4270	0.4384	0.3927	0.3498	0.4612	0.5054	0.3696	0.3102
SP14	0.3626	0.3501	0.4002	0.3824	0.4238	0.4944	0.3845	0.4267	0.3947	0.3732	0.4346	0.3454	0.4069	0.3796	0.4066
SP15	0.3775	0.3792	0.5193	0.4179	0.4198	0.5179	0.3528	0.4892	0.4451	0.4797	0.4159	0.4279	0.4039	0.5161	0.4481

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.3415	0.4437	0.5237	0.4995	0.4244	0.4016	0.5093	0.3951	0.5085	0.4428	0.3199	0.3324	0.5061	0.5345
SP2	0.3415	1.0000	0.5016	0.4197	0.4440	0.4345	0.4590	0.4367	0.5036	0.5039	0.5439	0.3861	0.3503	0.4138	0.3452
SP3	0.4437	0.5016	1.0000	0.4545	0.4990	0.4605	0.3813	0.4879	0.5011	0.5060	0.5121	0.4446	0.3812	0.4151	0.4874
SP4	0.5237	0.4197	0.4545	1.0000	0.4573	0.5098	0.4632	0.4388	0.4447	0.4575	0.5559	0.4231	0.3699	0.4662	0.4802
SP5	0.4995	0.4440	0.4990	0.4573	1.0000	0.5276	0.4759	0.4927	0.5226	0.5358	0.4381	0.4896	0.4369	0.4341	0.4750
SP6	0.4244	0.4345	0.4605	0.5098	0.5276	1.0000	0.5327	0.6121	0.4116	0.5488	0.5722	0.3768	0.3724	0.5071	0.5325
SP7	0.4016	0.4590	0.3813	0.4632	0.4759	0.5327	1.0000	0.5003	0.4866	0.5190	0.6663	0.3998	0.4693	0.4671	0.4483
SP8	0.5093	0.4367	0.4879	0.4388	0.4927	0.6121	0.5003	1.0000	0.4954	0.6297	0.5906	0.5270	0.3981	0.5844	0.6037
SP9	0.3951	0.5036	0.5011	0.4447	0.5226	0.4116	0.4866	0.4954	1.0000	0.5220	0.4669	0.4640	0.5264	0.5363	0.5225
SP10	0.5085	0.5039	0.5060	0.4575	0.5358	0.5488	0.5190	0.6297	0.5220	1.0000	0.6487	0.5922	0.4679	0.5875	0.5210
SP11	0.4428	0.5439	0.5121	0.5559	0.4381	0.5722	0.6663	0.5906	0.4669	0.6487	1.0000	0.4751	0.4723	0.6102	0.5056
SP12	0.3199	0.3861	0.4446	0.4231	0.4896	0.3768	0.3998	0.5270	0.4640	0.5922	0.4751	1.0000	0.3932	0.3973	0.5283
SP13	0.3324	0.3503	0.3812	0.3699	0.4369	0.3724	0.4693	0.3981	0.5264	0.4679	0.4723	0.3932	1.0000	0.4735	0.4557
SP14	0.5061	0.4138	0.4151	0.4662	0.4341	0.5071	0.4671	0.5844	0.5363	0.5875	0.6102	0.3973	0.4735	1.0000	0.5750
SP15	0.5345	0.3452	0.4874	0.4802	0.4750	0.5325	0.4483	0.6037	0.5225	0.5210	0.5056	0.5283	0.4557	0.5750	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.7666	0.8679	0.6342	0.8525	0.8226	0.8886	0.8399	0.7234	0.6761	0.5978	0.6820	0.6998	0.7597	0.7149
EF2	0.7665	1.0000	0.7017	0.7963	0.7712	0.6447	0.7223	0.8338	0.8662	0.8198	0.7352	0.8481	0.8614	0.8717	0.8688
EF3	0.8679	0.7017	1.0000	0.6268	0.7930	0.8638	0.9040	0.8176	0.6724	0.6298	0.5796	0.6251	0.6872	0.7601	0.6596
EF4	0.6342	0.7963	0.6268	1.0000	0.6681	0.5678	0.6200	0.7353	0.8049	0.8076	0.8519	0.8819	0.8472	0.7904	0.8360
EF5	0.8525	0.7712	0.7930	0.6681	1.0000	0.7245	0.7883	0.8783	0.7870	0.7677	0.6943	0.7005	0.7467	0.8025	0.7432
EF6	0.8226	0.6447	0.8638	0.5680	0.7245	1.0000	0.8794	0.7283	0.5996	0.5671	0.5139	0.5714	0.5969	0.6704	0.5875
EF7	0.8886	0.7223	0.9040	0.6200	0.7883	0.8794	1.0000	0.8036	0.6578	0.6201	0.5713	0.6369	0.6651	0.7310	0.6643
EF8	0.8399	0.8338	0.8176	0.7353	0.8783	0.7283	0.8036	1.0000	0.8022	0.7529	0.6841	0.7497	0.8177	0.8813	0.7859
EF9	0.7234	0.8662	0.6724	0.8049	0.7870	0.5996	0.6578	0.8022	1.0000	0.8884	0.7878	0.8571	0.9030	0.8345	0.9097
EF10	0.6761	0.8198	0.6298	0.8076	0.7677	0.5671	0.6201	0.7529	0.8884	1.0000	0.8582	0.8368	0.8744	0.7909	0.8856
EF11	0.5978	0.7352	0.5796	0.8519	0.6943	0.5139	0.5713	0.6841	0.7878	0.8582	1.0000	0.8010	0.8095	0.7317	0.7887
EF12	0.6820	0.8481	0.6251	0.8819	0.7005	0.5714	0.6369	0.7497	0.8571	0.8368	0.8010	1.0000	0.8534	0.7744	0.9064
EF13	0.6998	0.8614	0.6872	0.8472	0.7467	0.5969	0.6651	0.8177	0.9030	0.8744	0.8095	0.8534	1.0000	0.8708	0.9038
EF14	0.7597	0.8717	0.7601	0.7904	0.8025	0.6704	0.7310	0.8813	0.8345	0.7909	0.7317	0.7744	0.8708	1.0000	0.8270
EF15	0.7149	0.8688	0.6596	0.8360	0.7432	0.5875	0.6643	0.7859	0.9097	0.8856	0.7887	0.9064	0.9038	0.8270	1.0000
ID1	0.6583	0.8211	0.5945	0.7234	0.6625	0.6018	0.6112	0.7064	0.8179	0.7580	0.6792	0.7784	0.7981	0.7432	0.8050
ID2	0.8211	0.8338	0.6049	0.7945	0.6582	0.5770	0.6187	0.7175	0.8189	0.7945	0.7263	0.8565	0.8291	0.7549	0.8584
ID3	0.5945	0.6049	0.7463	0.6122	0.8184	0.7341	0.7674	0.8059	0.6732	0.6241	0.5602	0.6526	0.6630	0.7282	0.6701
ID4	0.7234	0.7945	0.6122	0.7604	0.5716	0.4727	0.5258	0.6124	0.7035	0.6752	0.7269	0.7682	0.7069	0.6437	0.7327
ID5	0.6625	0.6582	0.8184	0.5716	0.6958	0.6252	0.6455	0.7437	0.7940	0.7371	0.6587	0.7601	0.7801	0.7812	0.7834
ID6	0.6018	0.5770	0.7341	0.4727	0.6252	0.5078	0.5552	0.6450	0.7385	0.7126	0.7668	0.8241	0.7427	0.6817	0.7748
ID7	0.6112	0.6187	0.7674	0.5258	0.6455	0.5552	0.4634	0.5475	0.6425	0.6269	0.6662	0.6769	0.6397	0.5772	0.6590
ID8	0.7064	0.7175	0.8059	0.6124	0.7437	0.6450	0.5475	0.5938	0.6764	0.6578	0.7001	0.7504	0.6901	0.6213	0.7070
ID9	0.8179	0.8189	0.6732	0.7035	0.7940	0.7385	0.6425	0.6764	0.6207	0.6001	0.6365	0.6752	0.6233	0.5597	0.6430
ID10	0.7580	0.7945	0.6241	0.6752	0.7371	0.7126	0.6269	0.6578	0.6001	0.7964	0.7449	0.8753	0.8272	0.7542	0.8629
ID11	0.6792	0.7263	0.5602	0.7269	0.6587	0.7668	0.6662	0.7001	0.6365	0.7449	0.6297	0.5873	0.5806	0.5270	0.5793
ID12	0.7784	0.8565	0.6526	0.7682	0.7601	0.8241	0.6769	0.7504	0.6752	0.8753	0.5873	0.6725	0.6128	0.5519	0.6363
ID13	0.7981	0.8291	0.6630	0.7069	0.7801	0.7427	0.6397	0.6901	0.6233	0.8272	0.5806	0.6128	0.7187	0.6488	0.7425
ID14	0.7432	0.7549	0.7282	0.6437	0.7812	0.6817	0.5772	0.6213	0.5597	0.7542	0.5270	0.5519	0.6488	0.6915	0.7907
ID15	0.8050	0.8584	0.6701	0.7327	0.7834	0.7748	0.6590	0.7070	0.6430	0.8629	0.5793	0.6363	0.7425	0.7907	0.6500

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.6849	0.5530	0.6846	0.4519	0.5912	0.7349	0.7242	0.5899	0.4924	0.4550	0.4084	0.4807	0.4877	0.5369	0.4932
SP2	0.7951	0.7425	0.7176	0.5982	0.7995	0.7202	0.7394	0.8037	0.6776	0.6231	0.5653	0.6474	0.6580	0.7263	0.6702
SP3	0.8879	0.7098	0.8032	0.5761	0.7733	0.7905	0.8254	0.7574	0.6407	0.5931	0.5328	0.6162	0.6230	0.6877	0.6390
SP4	0.8499	0.6643	0.8484	0.5423	0.7283	0.8600	0.8763	0.7372	0.6213	0.5651	0.5040	0.5792	0.6157	0.6738	0.6072
SP5	0.8384	0.7614	0.7650	0.6206	0.8143	0.7413	0.7848	0.8135	0.6810	0.6243	0.5589	0.6594	0.6695	0.7340	0.6772
SP6	0.8403	0.6736	0.8408	0.5548	0.7279	0.8413	0.8848	0.7225	0.6059	0.5569	0.5080	0.5915	0.5955	0.6571	0.6095
SP7	0.7388	0.5801	0.7355	0.4788	0.6343	0.7786	0.7771	0.6330	0.5364	0.4909	0.4402	0.5090	0.5256	0.5747	0.5365
SP8	0.7761	0.7333	0.8044	0.6040	0.7882	0.7825	0.8269	0.7867	0.6564	0.6049	0.5476	0.6401	0.6473	0.7120	0.6562
SP9	0.7761	0.6128	0.7732	0.5022	0.6672	0.8172	0.8234	0.6670	0.5589	0.5154	0.4620	0.5343	0.5494	0.6058	0.5615
SP10	0.8247	0.6586	0.8180	0.5357	0.7168	0.8697	0.8727	0.7015	0.5971	0.5461	0.4971	0.5740	0.5800	0.6393	0.5963
SP11	0.7174	0.5671	0.7168	0.4649	0.6191	0.7801	0.7557	0.6118	0.5193	0.4740	0.4277	0.4961	0.5034	0.5521	0.5110
SP12	0.8683	0.6787	0.7818	0.5482	0.7632	0.7893	0.8038	0.7347	0.6251	0.5752	0.5172	0.5907	0.6002	0.6661	0.6135
SP13	0.7640	0.6086	0.7656	0.5000	0.6568	0.8138	0.8095	0.6605	0.5517	0.5092	0.4582	0.5331	0.5507	0.5937	0.5527
SP14	0.7739	0.8472	0.6938	0.7029	0.7699	0.6858	0.7183	0.8258	0.7817	0.7197	0.6402	0.7532	0.7504	0.8244	0.7708
SP15	0.7875	0.6252	0.7879	0.5138	0.6812	0.8320	0.8360	0.6806	0.5732	0.5255	0.4729	0.5466	0.5630	0.6220	0.5747

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.8779	0.7624	0.7024	0.8951	0.7552	0.5947	0.6918	0.5869	0.8586	0.5095	0.5922	0.7316	0.8065	0.6183
ID2	0.8779	1.0000	0.7357	0.7782	0.8404	0.8235	0.6537	0.7642	0.6398	0.9225	0.5543	0.6447	0.7950	0.8724	0.6633
ID3	0.7624	0.7357	1.0000	0.5980	0.7821	0.6252	0.4907	0.5837	0.4824	0.7082	0.4205	0.4987	0.6054	0.6856	0.5178
ID4	0.7041	0.7782	0.5980	1.0000	0.6849	0.9004	0.7936	0.9305	0.7938	0.7863	0.6835	0.7922	0.9427	0.8297	0.7952
ID5	0.8951	0.8404	0.7821	0.6849	1.0000	0.7353	0.5726	0.6741	0.5712	0.8411	0.4958	0.5658	0.7012	0.7758	0.6010
ID6	0.7552	0.8235	0.6252	0.9004	0.7353	1.0000	0.7521	0.8836	0.7578	0.8485	0.6600	0.7514	0.9270	0.8768	0.7730
ID7	0.5947	0.6537	0.4907	0.7936	0.5726	0.7521	1.0000	0.8188	0.9201	0.6727	0.8225	0.8947	0.7845	0.6848	0.9048
ID8	0.6918	0.7642	0.5837	0.9305	0.6741	0.8836	0.8188	1.0000	0.8057	0.7851	0.6929	0.8164	0.9202	0.8102	0.8245
ID9	0.5869	0.6398	0.4824	0.7938	0.5712	0.7578	0.9201	0.8057	1.0000	0.6652	0.8344	0.9251	0.7750	0.6766	0.8796
ID10	0.8586	0.9225	0.7082	0.7863	0.8411	0.8485	0.6727	0.7851	0.6652	1.0000	0.5763	0.6652	0.8148	0.8604	0.6879
ID11	0.5095	0.5543	0.4205	0.6835	0.4958	0.6600	0.8225	0.6929	0.8344	0.5764	1.0000	0.8238	0.6758	0.5848	0.7880
ID12	0.5922	0.6447	0.4987	0.7922	0.5658	0.7514	0.8947	0.8164	0.9251	0.6652	0.8238	1.0000	0.7912	0.6933	0.9186
ID13	0.7316	0.7950	0.6054	0.9427	0.7012	0.9270	0.7845	0.9202	0.7750	0.8148	0.6758	0.7912	1.0000	0.8424	0.8054
ID14	0.8065	0.8724	0.6856	0.8297	0.7758	0.8768	0.6848	0.8102	0.6766	0.8604	0.5848	0.6933	0.8424	1.0000	0.7183
ID15	0.6183	0.6633	0.5178	0.7952	0.6010	0.7730	0.9048	0.8245	0.8796	0.6879	0.7880	0.9186	0.8054	0.7183	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.5556	0.5310	0.6914	0.4366	0.5708	0.4651	0.3633	0.4308	0.3634	0.5226	0.3133	0.3670	0.4487	0.4938	0.3743
SP2	0.5310	0.7272	0.9357	0.5848	0.8031	0.6180	0.4787	0.5703	0.4725	0.6984	0.4120	0.4766	0.5897	0.6797	0.5001
SP3	0.6914	0.9357	0.8836	0.5567	0.7455	0.5984	0.4647	0.5477	0.4652	0.6748	0.4042	0.4668	0.5669	0.6403	0.4918
SP4	0.4366	0.5848	0.5567	0.5295	0.6643	0.5561	0.4428	0.5103	0.4367	0.6198	0.3991	0.4323	0.5337	0.5986	0.4425
SP5	0.5708	0.8031	0.7455	0.6643	0.7642	0.6276	0.4873	0.5867	0.4856	0.7079	0.4189	0.4999	0.6085	0.6973	0.5092
SP6	0.4651	0.6180	0.5984	0.5561	0.6276	0.5627	0.4389	0.5205	0.4352	0.6346	0.3767	0.4438	0.5420	0.6121	0.4599
SP7	0.3633	0.4787	0.4647	0.4428	0.4873	0.4389	0.3913	0.4520	0.3848	0.5432	0.3390	0.3779	0.4692	0.5241	0.3871
SP8	0.4308	0.5703	0.5477	0.5103	0.5867	0.5205	0.4520	0.5568	0.4665	0.6850	0.4058	0.4782	0.5792	0.6613	0.4942
SP9	0.3634	0.4725	0.4652	0.4367	0.4856	0.4352	0.3848	0.4665	0.4003	0.5719	0.3518	0.3998	0.4894	0.5512	0.4055
SP10	0.5226	0.6984	0.6748	0.6198	0.7079	0.6346	0.5432	0.6850	0.5719	0.6232	0.3799	0.4435	0.5311	0.5938	0.4560
SP11	0.3133	0.4120	0.4042	0.3991	0.4189	0.3767	0.3390	0.4058	0.3518	0.3799	0.3174	0.3699	0.4538	0.5210	0.3889
SP12	0.3670	0.4766	0.4668	0.4323	0.4999	0.4438	0.3779	0.4782	0.3998	0.4435	0.3699	0.4300	0.5330	0.6212	0.4492
SP13	0.4487	0.5897	0.5669	0.5337	0.6085	0.5420	0.4692	0.5792	0.4894	0.5311	0.4538	0.5330	0.4948	0.5457	0.4088
SP14	0.4938	0.6797	0.6403	0.5986	0.6973	0.6121	0.5241	0.6613	0.5512	0.5938	0.5210	0.6212	0.5457	0.7403	0.5870
SP15	0.3743	0.5001	0.4918	0.4425	0.5092	0.4599	0.3871	0.4942	0.4055	0.4560	0.3889	0.4492	0.4088	0.5870	0.4135

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.6678	0.7382	0.7813	0.6961	0.7820	0.9096	0.7259	0.8616	0.8042	0.9056	0.7191	0.8605	0.6117	0.8430
SP2	0.6678	1.0000	0.8627	0.7744	0.9040	0.8128	0.7011	0.8644	0.7330	0.7803	0.7154	0.8785	0.7171	0.8398	0.7379
SP3	0.7382	0.8627	1.0000	0.8564	0.8943	0.8899	0.7606	0.9338	0.7994	0.8806	0.7694	0.9268	0.8014	0.7997	0.8161
SP4	0.7813	0.7744	0.8564	1.0000	0.8264	0.9130	0.8327	0.8523	0.8713	0.9222	0.8154	0.8439	0.8590	0.7159	0.8856
SP5	0.6961	0.9040	0.8943	0.8264	1.0000	0.8516	0.7300	0.9224	0.7695	0.8229	0.7212	0.8740	0.7626	0.8307	0.7803
SP6	0.7820	0.8128	0.8899	0.9130	0.8516	1.0000	0.8261	0.8963	0.8664	0.9153	0.8193	0.8823	0.8463	0.7442	0.8719
SP7	0.9096	0.7011	0.7606	0.8327	0.7300	0.8261	1.0000	0.7599	0.9237	0.8319	0.9519	0.7567	0.9119	0.6377	0.8999
SP8	0.7259	0.8644	0.9338	0.8523	0.9224	0.8963	0.7599	1.0000	0.8060	0.8627	0.7550	0.9141	0.7970	0.8096	0.8248
SP9	0.8616	0.7330	0.7994	0.8713	0.7695	0.8664	0.9237	0.8060	1.0000	0.8775	0.9019	0.7983	0.9445	0.6714	0.9539
SP10	0.8042	0.7803	0.8806	0.9222	0.8229	0.9153	0.8319	0.8627	0.8775	1.0000	0.8363	0.8502	0.8809	0.7364	0.8886
SP11	0.9056	0.7154	0.7693	0.8154	0.7212	0.8193	0.9580	0.7550	0.9018	0.8363	1.0000	0.7732	0.9000	0.6433	0.8799
SP12	0.7191	0.8785	0.9268	0.8439	0.8740	0.8823	0.7567	0.9141	0.7983	0.8502	0.7732	1.0000	0.7736	0.7637	0.8047
SP13	0.8605	0.7171	0.8014	0.8590	0.7626	0.8463	0.9119	0.7970	0.9445	0.8809	0.9000	0.7736	1.0000	0.6700	0.9366
SP14	0.6117	0.8398	0.7997	0.7159	0.8307	0.7442	0.6377	0.8096	0.6714	0.7364	0.6433	0.7637	0.6700	1.0000	0.6840
SP15	0.8430	0.7379	0.8161	0.8856	0.7803	0.8718	0.8999	0.8248	0.9539	0.8886	0.8799	0.8047	0.9366	0.6840	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.2824	0.5025	0.3004	0.3590	0.3896	0.6548	0.4863	0.1904	0.3202	0.3775	0.3231	0.2578	0.4798	0.2634
EF2	0.2824	1.0000	0.4093	0.4645	0.4177	0.4298	0.3310	0.4864	0.5053	0.4782	0.4595	0.3534	0.4307	0.5448	0.4344
EF3	0.5025	0.4093	1.0000	0.2453	0.4137	0.4131	0.6289	0.4596	0.3216	0.3012	0.3024	0.2990	0.2092	0.5287	0.3155
EF4	0.3004	0.4645	0.2453	1.0000	0.2126	0.4129	0.3664	0.5347	0.3659	0.5873	0.4259	0.6414	0.3851	0.4671	0.4560
EF5	0.3590	0.4177	0.4137	0.2126	1.0000	0.3622	0.4851	0.5067	0.3935	0.3838	0.3738	0.3503	0.3159	0.4938	0.3144
EF6	0.3896	0.4298	0.4131	0.4129	0.3622	1.0000	0.5996	0.5297	0.4361	0.4124	0.3504	0.3636	0.3798	0.3961	0.3738
EF7	0.6548	0.3310	0.6289	0.3664	0.4851	0.5996	1.0000	0.5224	0.2960	0.4030	0.3428	0.4140	0.2993	0.5117	0.3653
EF8	0.4863	0.4864	0.4596	0.5347	0.5067	0.5297	0.5224	1.0000	0.4680	0.6274	0.4275	0.4373	0.3407	0.6977	0.3929
EF9	0.1904	0.5053	0.3216	0.3659	0.3935	0.4361	0.2960	0.4680	1.0000	0.6834	0.5151	0.4615	0.6252	0.3531	0.5598
EF10	0.3202	0.4782	0.3012	0.5873	0.3838	0.4124	0.4030	0.6274	0.6834	1.0000	0.5364	0.5579	0.5101	0.4943	0.5904
EF11	0.3775	0.4595	0.3024	0.4259	0.3738	0.3504	0.3428	0.4275	0.5151	0.5364	1.0000	0.3604	0.5262	0.3659	0.3549
EF12	0.3231	0.3534	0.2990	0.6414	0.3503	0.3636	0.4140	0.4373	0.4615	0.5579	0.3604	1.0000	0.4824	0.4040	0.5123
EF13	0.2578	0.4307	0.2092	0.3851	0.3159	0.3798	0.2993	0.3407	0.6252	0.5101	0.5262	0.4824	1.0000	0.6350	0.7954
EF14	0.4798	0.5448	0.5287	0.4671	0.4938	0.3961	0.5117	0.6977	0.3531	0.4943	0.3659	0.4040	0.6350	1.0000	0.4480
EF15	0.2634	0.4344	0.3155	0.4560	0.3144	0.3738	0.3653	0.3929	0.5598	0.5904	0.3549	0.5123	0.7954	0.4480	1.0000
ID1	0.4331	0.5729	0.3822	0.5293	0.4270	0.4110	0.3911	0.5257	0.5816	0.5993	0.4354	0.5004	0.5511	0.5358	0.5724
ID2	0.5729	0.5287	0.3478	0.5296	0.3521	0.3847	0.3512	0.4900	0.5332	0.5426	0.4515	0.4925	0.5596	0.4603	0.5989
ID3	0.3822	0.3478	0.4910	0.4302	0.4990	0.5159	0.5043	0.6199	0.4597	0.4481	0.3682	0.4293	0.4362	0.5041	0.4249
ID4	0.5293	0.5296	0.4302	0.5133	0.3897	0.3191	0.3597	0.4520	0.4637	0.4662	0.5356	0.5247	0.4827	0.4905	0.4829
ID5	0.4270	0.3521	0.4990	0.3897	0.4484	0.3965	0.4138	0.5534	0.5294	0.5142	0.3547	0.4524	0.4643	0.4906	0.5223
ID6	0.4110	0.3847	0.5159	0.3191	0.3965	0.4211	0.4413	0.5400	0.5579	0.6298	0.5702	0.6475	0.5481	0.5549	0.5854
ID7	0.3911	0.3512	0.5043	0.3597	0.4138	0.4413	0.3128	0.3982	0.4749	0.4559	0.4164	0.3935	0.3719	0.4066	0.4011
ID8	0.5257	0.4900	0.6199	0.4520	0.5534	0.5400	0.3982	0.4751	0.4893	0.5262	0.4611	0.4946	0.4862	0.4832	0.4813
ID9	0.5816	0.5332	0.4597	0.4637	0.5294	0.5579	0.4749	0.4893	0.4414	0.4745	0.4406	0.4341	0.4304	0.3775	0.4858
ID10	0.5993	0.5426	0.4481	0.4662	0.5142	0.6298	0.4559	0.5262	0.4745	0.6017	0.4542	0.5371	0.5076	0.5531	0.6243
ID11	0.4354	0.4515	0.3682	0.5356	0.3547	0.5702	0.4164	0.4611	0.4406	0.4542	0.4683	0.4055	0.3733	0.4044	0.3862
ID12	0.5004	0.4925	0.4293	0.5247	0.4524	0.6475	0.3935	0.4946	0.4341	0.5371	0.4055	0.4101	0.3737	0.3548	0.4049
ID13	0.5511	0.5596	0.4362	0.4827	0.4643	0.5481	0.3719	0.4862	0.4304	0.5076	0.3733	0.3737	0.5590	0.4937	0.5569
ID14	0.5358	0.4603	0.5041	0.4905	0.4905	0.5549	0.4066	0.4832	0.3775	0.5531	0.4044	0.3548	0.4937	0.4764	0.5720
ID15	0.5724	0.5989	0.4249	0.4829	0.5223	0.5854	0.4011	0.4813	0.4858	0.6243	0.3862	0.4049	0.5569	0.5720	0.4775

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.5055	0.4471	0.5209	0.3615	0.3981	0.5226	0.4884	0.4770	0.3416	0.3485	0.2754	0.3448	0.3075	0.3998	0.3422
SP2	0.4471	0.4739	0.4212	0.3456	0.4732	0.4801	0.4299	0.5472	0.4425	0.3447	0.3287	0.3518	0.3862	0.4790	0.4103
SP3	0.5209	0.4212	0.5737	0.3600	0.4908	0.5270	0.5563	0.5454	0.4682	0.4270	0.3127	0.3899	0.3942	0.4814	0.4424
SP4	0.3615	0.3456	0.3600	0.4519	0.5182	0.6808	0.5906	0.6193	0.4541	0.4295	0.3396	0.4137	0.4398	0.5255	0.4437
SP5	0.3981	0.4732	0.4908	0.5182	0.5378	0.5144	0.5176	0.6061	0.5140	0.4652	0.3686	0.4352	0.4419	0.5325	0.4856
SP6	0.5226	0.4801	0.5270	0.6808	0.5144	0.7160	0.6882	0.5898	0.4752	0.4319	0.3725	0.4559	0.4591	0.5230	0.4780
SP7	0.4884	0.4299	0.5563	0.5906	0.5176	0.6882	0.5353	0.4651	0.3576	0.3606	0.2641	0.3288	0.3395	0.4105	0.3787
SP8	0.4770	0.5472	0.5454	0.6193	0.6061	0.5898	0.4651	0.6354	0.5105	0.4653	0.3765	0.4895	0.4696	0.5614	0.5104
SP9	0.3416	0.4425	0.4682	0.4541	0.5140	0.4752	0.3576	0.5105	0.3945	0.3786	0.3183	0.3450	0.3777	0.4574	0.3964
SP10	0.3485	0.3447	0.4270	0.4295	0.4652	0.4319	0.3606	0.4653	0.3786	0.4069	0.3279	0.3788	0.3828	0.5139	0.4275
SP11	0.2754	0.3287	0.3127	0.3396	0.3686	0.3725	0.2641	0.3765	0.3183	0.3279	0.3003	0.3671	0.3524	0.4655	0.3857
SP12	0.3448	0.3518	0.3899	0.4137	0.4352	0.4559	0.3288	0.4895	0.3450	0.3788	0.3671	0.4061	0.3876	0.4758	0.4331
SP13	0.3075	0.3862	0.3942	0.4398	0.4419	0.4591	0.3395	0.4696	0.3777	0.3828	0.3524	0.3876	0.3634	0.4074	0.4171
SP14	0.3998	0.4790	0.4814	0.5255	0.5325	0.5230	0.4105	0.5614	0.4574	0.5139	0.4655	0.4758	0.4074	0.6631	0.6102
SP15	0.3422	0.4103	0.4424	0.4437	0.4856	0.4780	0.3787	0.5104	0.3964	0.4275	0.3857	0.4331	0.4171	0.6102	0.4771

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.7803	0.6727	0.5505	0.6595	0.5564	0.4880	0.5188	0.4633	0.7298	0.4290	0.4162	0.5353	0.6048	0.5006
ID2	0.7803	1.0000	0.6898	0.6003	0.6537	0.5947	0.5300	0.5631	0.5687	0.6797	0.4311	0.4789	0.6115	0.5969	0.5306
ID3	0.6727	0.6898	1.0000	0.4893	0.5981	0.5148	0.3926	0.4540	0.3689	0.5508	0.3463	0.3929	0.4908	0.5332	0.4360
ID4	0.5518	0.6003	0.4893	1.0000	0.4628	0.7057	0.5639	0.6919	0.5793	0.5444	0.5357	0.6382	0.7306	0.5744	0.6400
ID5	0.6595	0.6537	0.5981	0.4628	1.0000	0.5418	0.4111	0.5056	0.4510	0.5888	0.3393	0.3976	0.5473	0.4655	0.4579
ID6	0.5564	0.5947	0.5148	0.7057	0.5418	1.0000	0.5785	0.7953	0.6381	0.6364	0.5558	0.5280	0.8139	0.7015	0.6257
ID7	0.4880	0.5300	0.3926	0.5639	0.4111	0.5785	1.0000	0.6790	0.7078	0.4922	0.7171	0.7063	0.5604	0.5011	0.7996
ID8	0.5188	0.5631	0.4540	0.6919	0.5056	0.7953	0.6790	1.0000	0.6043	0.5608	0.5543	0.5862	0.7704	0.5401	0.7120
ID9	0.4633	0.5687	0.3689	0.5793	0.4510	0.6381	0.7078	0.6043	1.0000	0.4989	0.7026	0.6001	0.6049	0.4398	0.6283
ID10	0.7298	0.6797	0.5508	0.5444	0.5888	0.6364	0.4922	0.5608	0.4989	1.0000	0.4322	0.4435	0.5685	0.6146	0.5003
ID11	0.4290	0.4311	0.3463	0.5357	0.3393	0.5558	0.7171	0.5543	0.7026	0.4323	1.0000	0.5789	0.5274	0.4094	0.6379
ID12	0.4162	0.4789	0.3929	0.6382	0.3976	0.5280	0.7063	0.5862	0.6001	0.4435	0.5789	1.0000	0.5934	0.5333	0.8066
ID13	0.5353	0.6115	0.4908	0.7306	0.5473	0.8139	0.5604	0.7704	0.6049	0.5685	0.5274	0.5934	1.0000	0.5877	0.6801
ID14	0.6048	0.5969	0.5332	0.5744	0.4655	0.7015	0.5011	0.5401	0.4398	0.6146	0.4094	0.5333	0.5877	1.0000	0.5550
ID15	0.5006	0.5306	0.4088	0.6400	0.4579	0.6257	0.7996	0.7120	0.6283	0.5003	0.6379	0.8066	0.6801	0.5550	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.4233	0.3717	0.5094	0.3301	0.4620	0.3986	0.2703	0.3329	0.2596	0.3563	0.2387	0.2865	0.3789	0.3816	0.3092
SP2	0.3717	0.4727	0.6402	0.3851	0.5737	0.4120	0.3117	0.4147	0.2925	0.3810	0.2747	0.3022	0.4193	0.4017	0.3479
SP3	0.5094	0.6402	0.6034	0.3922	0.4970	0.4255	0.3031	0.3729	0.3102	0.4594	0.2874	0.3182	0.4016	0.4360	0.3814
SP4	0.3301	0.3851	0.3922	0.3730	0.4724	0.4449	0.3080	0.3908	0.3105	0.4483	0.3192	0.2751	0.4670	0.4585	0.3432
SP5	0.4620	0.5737	0.4970	0.4724	0.4984	0.4912	0.3318	0.4156	0.3378	0.4719	0.3096	0.3777	0.4967	0.5520	0.3870
SP6	0.3986	0.4120	0.4255	0.4449	0.4912	0.4604	0.2926	0.4074	0.2770	0.4139	0.2740	0.3303	0.4382	0.4524	0.3832
SP7	0.2703	0.3117	0.3031	0.3080	0.3318	0.2926	0.2261	0.3537	0.2449	0.3070	0.2003	0.2285	0.3594	0.3418	0.2580
SP8	0.3329	0.4147	0.3729	0.3908	0.4156	0.4074	0.3537	0.4091	0.2978	0.4474	0.2590	0.3327	0.4171	0.4589	0.3876
SP9	0.2596	0.2925	0.3102	0.3105	0.3378	0.2770	0.2449	0.2978	0.2547	0.3481	0.2399	0.2790	0.3957	0.3595	0.2704
SP10	0.3563	0.3810	0.4594	0.4483	0.4719	0.4139	0.3070	0.4474	0.3481	0.4154	0.2643	0.2957	0.3902	0.3959	0.3465
SP11	0.2387	0.2747	0.2874	0.3192	0.3096	0.2740	0.2003	0.2590	0.2399	0.2643	0.2208	0.2630	0.3520	0.3690	0.3111
SP12	0.2865	0.3022	0.3182	0.2751	0.3777	0.3303	0.2285	0.3327	0.2790	0.2957	0.2630	0.2800	0.3629	0.4051	0.3182
SP13	0.3789	0.4193	0.4016	0.4670	0.4967	0.4382	0.3594	0.4171	0.3957	0.3902	0.3520	0.3629	0.3636	0.3183	0.2780
SP14	0.3816	0.4017	0.4360	0.4585	0.5520	0.4524	0.3418	0.4589	0.3595	0.3959	0.3690	0.4051	0.3183	0.5165	0.4435
SP15	0.3092	0.3479	0.3814	0.3432	0.3870	0.3832	0.2580	0.3876	0.2704	0.3465	0.3111	0.3182	0.2780	0.4435	0.3308

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.4355	0.5122	0.6697	0.5290	0.6517	0.6822	0.5409	0.6462	0.5790	0.6883	0.4494	0.5163	0.4893	0.6744
SP2	0.4355	1.0000	0.6338	0.6006	0.7232	0.6435	0.5842	0.6780	0.5498	0.6555	0.6009	0.5857	0.4590	0.5972	0.4722
SP3	0.5122	0.6338	1.0000	0.6258	0.7762	0.7329	0.5369	0.7609	0.5643	0.6978	0.6097	0.6905	0.5141	0.4998	0.6467
SP4	0.6697	0.6006	0.6258	1.0000	0.6861	0.7518	0.6531	0.6629	0.6492	0.7308	0.6769	0.5957	0.5835	0.5667	0.6684
SP5	0.5290	0.7232	0.7762	0.6861	1.0000	0.7206	0.5896	0.7379	0.6215	0.6705	0.5876	0.6723	0.5649	0.5764	0.6069
SP6	0.6517	0.6435	0.7329	0.7518	0.7206	1.0000	0.7269	0.8117	0.6931	0.7745	0.7563	0.6353	0.5859	0.6017	0.7713
SP7	0.6822	0.5842	0.5369	0.6531	0.5896	0.7269	1.0000	0.6596	0.7390	0.7039	0.8420	0.5448	0.6313	0.5156	0.6922
SP8	0.5409	0.6780	0.7609	0.6629	0.7379	0.8117	0.6596	1.0000	0.6387	0.8157	0.7412	0.7934	0.5796	0.6477	0.7198
SP9	0.6462	0.5498	0.5643	0.6492	0.6215	0.6931	0.7390	0.6387	1.0000	0.7425	0.7631	0.6067	0.7629	0.5714	0.8072
SP10	0.5790	0.6555	0.6978	0.7308	0.6705	0.7745	0.7039	0.8157	0.7425	1.0000	0.8053	0.7194	0.7178	0.6012	0.7240
SP11	0.6883	0.6009	0.6096	0.6769	0.5876	0.7563	0.8475	0.7412	0.7631	0.8053	1.0000	0.6245	0.6667	0.5514	0.7495
SP12	0.4494	0.5857	0.6905	0.5957	0.6723	0.6353	0.5448	0.7934	0.6067	0.7194	0.6245	1.0000	0.6249	0.5525	0.6499
SP13	0.5163	0.4590	0.5141	0.5835	0.5649	0.5859	0.6313	0.5796	0.7629	0.7178	0.6667	0.6249	1.0000	0.5196	0.7285
SP14	0.4893	0.5972	0.4998	0.5667	0.5764	0.6017	0.5156	0.6477	0.5714	0.6012	0.5514	0.5525	0.5196	1.0000	0.5584
SP15	0.6744	0.4722	0.6467	0.6684	0.6069	0.7712	0.6922	0.7198	0.8072	0.7240	0.7495	0.6499	0.7285	0.5584	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.8777	0.9476	0.8091	0.9466	0.9030	0.9527	0.9328	0.8666	0.8507	0.8019	0.8270	0.8562	0.8925	0.8568
EF2	0.8777	1.0000	0.8394	0.9088	0.8913	0.7943	0.8456	0.9188	0.9452	0.9239	0.8847	0.9216	0.9474	0.9479	0.9436
EF3	0.9476	0.8394	1.0000	0.7899	0.9097	0.9375	0.9701	0.9115	0.8267	0.8119	0.7759	0.7831	0.8323	0.8794	0.8099
EF4	0.8091	0.9088	0.7899	1.0000	0.8269	0.7462	0.7965	0.8666	0.9115	0.9164	0.9410	0.9537	0.9314	0.8927	0.9302
EF5	0.9466	0.8913	0.9097	0.8269	1.0000	0.8572	0.9097	0.9521	0.8914	0.8954	0.8543	0.8419	0.8736	0.9092	0.8697
EF6	0.9030	0.7943	0.9375	0.7462	0.8572	1.0000	0.9411	0.8555	0.7701	0.7555	0.7117	0.7449	0.7717	0.8209	0.7658
EF7	0.9527	0.8456	0.9701	0.7965	0.9097	0.9411	1.0000	0.9105	0.8239	0.8091	0.7726	0.7943	0.8296	0.8739	0.8229
EF8	0.9328	0.9188	0.9115	0.8666	0.9521	0.8555	0.9105	1.0000	0.9068	0.8896	0.8483	0.8660	0.9141	0.9501	0.8918
EF9	0.8666	0.9452	0.8267	0.9115	0.8914	0.7701	0.8239	0.9068	1.0000	0.9618	0.9158	0.9396	0.9606	0.9241	0.9652
EF10	0.8507	0.9239	0.8119	0.9164	0.8954	0.7555	0.8091	0.8896	0.9618	1.0000	0.9387	0.9339	0.9509	0.9068	0.9623
EF11	0.8019	0.8847	0.7759	0.9410	0.8543	0.7117	0.7726	0.8483	0.9158	0.9387	1.0000	0.9199	0.9198	0.8723	0.9131
EF12	0.8270	0.9216	0.7831	0.9537	0.8419	0.7449	0.7943	0.8660	0.9396	0.9339	0.9199	1.0000	0.9334	0.8858	0.9619
EF13	0.8562	0.9474	0.8323	0.9314	0.8736	0.7717	0.8296	0.9141	0.9606	0.9509	0.9198	0.9334	1.0000	0.9399	0.9611
EF14	0.8925	0.9479	0.8794	0.8927	0.9092	0.8209	0.8739	0.9501	0.9241	0.9068	0.8723	0.8858	0.9399	1.0000	0.9173
EF15	0.8568	0.9436	0.8099	0.9302	0.8697	0.7658	0.8229	0.8918	0.9652	0.9623	0.9131	0.9619	0.9611	0.9173	1.0000
ID1	0.8093	0.9219	0.7709	0.8703	0.8214	0.7589	0.7779	0.8491	0.9254	0.8882	0.8477	0.9015	0.9104	0.8740	0.9183
ID2	0.8052	0.9172	0.7673	0.8983	0.8177	0.7241	0.7743	0.8462	0.9225	0.9066	0.8763	0.9330	0.9230	0.8705	0.9393
ID3	0.9134	0.8809	0.8756	0.7977	0.9252	0.8424	0.8824	0.9142	0.8465	0.8162	0.7768	0.8225	0.8373	0.8715	0.8417
ID4	0.7297	0.8364	0.6944	0.8756	0.7433	0.6407	0.7011	0.7694	0.8402	0.8259	0.8682	0.8770	0.8426	0.7935	0.8594
ID5	0.8342	0.9497	0.7978	0.8640	0.8497	0.7755	0.8039	0.8750	0.9139	0.8807	0.8401	0.8932	0.9035	0.9013	0.9111
ID6	0.7569	0.8674	0.7161	0.9084	0.7691	0.6709	0.7261	0.7943	0.8688	0.8575	0.8978	0.9126	0.8672	0.8206	0.8869
ID7	0.6861	0.7818	0.6517	0.8290	0.6993	0.5895	0.6577	0.7220	0.7960	0.7851	0.8237	0.8266	0.7976	0.7474	0.8123
ID8	0.7152	0.8247	0.6801	0.8710	0.7263	0.6284	0.6873	0.7541	0.8252	0.8129	0.8552	0.8674	0.8296	0.7787	0.8424
ID9	0.6694	0.7716	0.6349	0.8158	0.6843	0.5776	0.6408	0.7061	0.7781	0.7681	0.8041	0.8156	0.7790	0.7301	0.7957
ID10	0.8077	0.9225	0.7722	0.9163	0.8219	0.7240	0.7782	0.8482	0.9216	0.9106	0.8888	0.9471	0.9239	0.8749	0.9403
ID11	0.6505	0.7305	0.6160	0.7691	0.6664	0.5469	0.6106	0.6886	0.7627	0.7493	0.7856	0.7725	0.7564	0.7076	0.7627
ID12	0.6677	0.7736	0.6321	0.8150	0.6788	0.5841	0.6385	0.7048	0.7738	0.7612	0.7997	0.8140	0.7769	0.7281	0.7913
ID13	0.7365	0.8434	0.6989	0.8870	0.7478	0.6493	0.7056	0.7751	0.8480	0.8355	0.8753	0.8877	0.8490	0.7980	0.8658
ID14	0.7636	0.8770	0.7269	0.9236	0.7787	0.6852	0.7343	0.8035	0.8790	0.8644	0.9068	0.9211	0.8788	0.8287	0.8964
ID15	0.6777	0.7818	0.6384	0.8257	0.6883	0.6020	0.6454	0.7127	0.7855	0.7721	0.8103	0.8248	0.7858	0.7360	0.8018

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.8382	0.7466	0.8464	0.6707	0.7912	0.8510	0.8655	0.7821	0.7141	0.6915	0.6578	0.6884	0.7105	0.7493	0.7098
SP2	0.8982	0.8790	0.8578	0.7921	0.9139	0.8385	0.8674	0.9108	0.8436	0.8119	0.7769	0.8191	0.8337	0.8717	0.8415
SP3	0.9536	0.8622	0.9147	0.7791	0.9070	0.8815	0.9220	0.8921	0.8260	0.7973	0.7606	0.8000	0.8146	0.8546	0.8211
SP4	0.9244	0.8168	0.9291	0.7324	0.8744	0.9057	0.9419	0.8674	0.8004	0.7721	0.7337	0.7547	0.7946	0.8317	0.7841
SP5	0.9186	0.8822	0.8829	0.7971	0.9210	0.8406	0.8873	0.9135	0.8432	0.8133	0.7742	0.8176	0.8363	0.8723	0.8378
SP6	0.9259	0.8287	0.9298	0.7482	0.8765	0.9027	0.9460	0.8645	0.7984	0.7692	0.7322	0.7734	0.7872	0.8247	0.7932
SP7	0.8707	0.7662	0.8767	0.6923	0.8242	0.8729	0.8937	0.8107	0.7465	0.7229	0.6849	0.7105	0.7386	0.7732	0.7406
SP8	0.9462	0.8633	0.9073	0.7841	0.9117	0.8703	0.9133	0.9007	0.8317	0.8033	0.7626	0.8052	0.8223	0.8612	0.8296
SP9	0.8910	0.7828	0.8977	0.7108	0.8436	0.8934	0.9187	0.8316	0.7650	0.7410	0.6990	0.7317	0.7540	0.7930	0.7616
SP10	0.9239	0.8255	0.9273	0.7490	0.8777	0.9292	0.9510	0.8610	0.7971	0.7694	0.7341	0.7708	0.7873	0.8241	0.7957
SP11	0.8638	0.7646	0.8701	0.6924	0.8167	0.8828	0.8893	0.8034	0.7376	0.7120	0.6756	0.7112	0.7296	0.7649	0.7315
SP12	0.9411	0.8379	0.8977	0.7575	0.8922	0.8839	0.9077	0.8737	0.8092	0.7804	0.7402	0.7820	0.7932	0.8353	0.8034
SP13	0.8894	0.7873	0.8977	0.7145	0.8422	0.8973	0.9161	0.8333	0.7644	0.7390	0.6991	0.7362	0.7602	0.7922	0.7595
SP14	0.8864	0.9355	0.8449	0.8674	0.9005	0.8185	0.8541	0.9271	0.9117	0.8814	0.8358	0.8908	0.8961	0.9324	0.9085
SP15	0.8951	0.7873	0.8999	0.7149	0.8490	0.8966	0.9218	0.8367	0.7690	0.7439	0.7030	0.7358	0.7589	0.8005	0.7647

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.9481	0.8781	0.8544	0.9634	0.8856	0.7893	0.8472	0.7790	0.9445	0.7313	0.7865	0.8697	0.9047	0.8060
ID2	0.9481	1.0000	0.8722	0.8959	0.9340	0.9207	0.8241	0.8850	0.8151	0.9763	0.7685	0.8142	0.9054	0.9455	0.8260
ID3	0.8781	0.8722	1.0000	0.7850	0.9023	0.8041	0.7145	0.7750	0.7058	0.8630	0.6594	0.7085	0.7915	0.8322	0.7240
ID4	0.8544	0.8959	0.7850	1.0000	0.8435	0.9557	0.9133	0.9716	0.9058	0.9006	0.8558	0.9006	0.9774	0.9284	0.9087
ID5	0.9634	0.9340	0.9023	0.8435	1.0000	0.8789	0.7809	0.8356	0.7753	0.9396	0.7265	0.7715	0.8544	0.8930	0.7920
ID6	0.8856	0.9207	0.8041	0.9557	0.8789	1.0000	0.8914	0.9484	0.8862	0.9338	0.8379	0.8803	0.9689	0.9523	0.8932
ID7	0.7893	0.8241	0.7145	0.9133	0.7809	0.8914	1.0000	0.9271	0.9743	0.8419	0.9297	0.9589	0.9059	0.8545	0.9688
ID8	0.8472	0.8850	0.7750	0.9716	0.8356	0.9484	0.9271	1.0000	0.9172	0.8942	0.8611	0.9170	0.9657	0.9176	0.9260
ID9	0.7790	0.8151	0.7058	0.9058	0.7753	0.8862	0.9743	0.9172	1.0000	0.8347	0.9384	0.9742	0.8984	0.8455	0.9556
ID10	0.9445	0.9763	0.8630	0.9006	0.9396	0.9338	0.8419	0.8942	0.8347	1.0000	0.7838	0.8292	0.9115	0.9444	0.8386
ID11	0.7313	0.7685	0.6594	0.8558	0.7265	0.8379	0.9297	0.8611	0.9384	0.7838	1.0000	0.9308	0.8470	0.7936	0.9122
ID12	0.7865	0.8142	0.7085	0.9006	0.7715	0.8803	0.9589	0.9170	0.9742	0.8292	0.9308	1.0000	0.8982	0.8462	0.9697
ID13	0.8697	0.9054	0.7915	0.9774	0.8544	0.9689	0.9059	0.9657	0.8984	0.9115	0.8470	0.8982	1.0000	0.9351	0.9087
ID14	0.9047	0.9455	0.8322	0.9284	0.8930	0.9523	0.8545	0.9176	0.8455	0.9444	0.7936	0.8462	0.9351	1.0000	0.8640
ID15	0.8060	0.8260	0.7240	0.9087	0.7920	0.8932	0.9688	0.9260	0.9556	0.8386	0.9122	0.9697	0.9087	0.8640	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.7244	0.7155	0.8254	0.6406	0.7451	0.6661	0.5842	0.6322	0.5747	0.7158	0.5387	0.5780	0.6506	0.6780	0.5851
SP2	0.8850	0.8688	0.9736	0.7750	0.9147	0.8014	0.7070	0.7652	0.6972	0.8589	0.6535	0.6959	0.7797	0.8268	0.7152
SP3	0.8448	0.8305	0.9497	0.7468	0.8729	0.7798	0.6890	0.7385	0.6816	0.8348	0.6393	0.6811	0.7556	0.7949	0.6985
SP4	0.7906	0.7972	0.9037	0.7169	0.8140	0.7362	0.6556	0.7000	0.6417	0.7862	0.6208	0.6370	0.7186	0.7557	0.6470
SP5	0.8649	0.8666	0.9804	0.7789	0.8856	0.7985	0.7072	0.7676	0.6984	0.8552	0.6525	0.7031	0.7860	0.8318	0.7119
SP6	0.8091	0.8109	0.9243	0.7271	0.8328	0.7497	0.6585	0.7151	0.6497	0.8030	0.6106	0.6516	0.7311	0.7761	0.6619
SP7	0.7345	0.7393	0.8459	0.6654	0.7640	0.6851	0.6128	0.6506	0.6000	0.7357	0.5680	0.5880	0.6682	0.6988	0.5991
SP8	0.8362	0.8406	0.9545	0.7544	0.8641	0.7768	0.6850	0.7406	0.6775	0.8323	0.6354	0.6776	0.7584	0.8069	0.6875
SP9	0.7541	0.7623	0.8703	0.6840	0.7822	0.7009	0.6258	0.6685	0.6138	0.7549	0.5780	0.6054	0.6858	0.7219	0.6117
SP10	0.7994	0.7894	0.9046	0.7128	0.8241	0.7383	0.6574	0.7005	0.6483	0.7924	0.6101	0.6520	0.7208	0.7539	0.6607
SP11	0.7440	0.7368	0.8543	0.6609	0.7707	0.6820	0.5982	0.6497	0.5890	0.7346	0.5514	0.5891	0.6638	0.7037	0.6070
SP12	0.8421	0.8178	0.9412	0.7272	0.8633	0.7550	0.6600	0.7153	0.6515	0.8089	0.6087	0.6496	0.7325	0.7836	0.6687
SP13	0.7576	0.7601	0.8654	0.6837	0.7840	0.7032	0.6259	0.6699	0.6163	0.7558	0.5784	0.6113	0.6898	0.7177	0.6192
SP14	0.9108	0.8932	0.9223	0.8058	0.9393	0.8392	0.7570	0.7977	0.7443	0.8960	0.7046	0.7464	0.8163	0.8572	0.7665
SP15	0.7532	0.7598	0.8672	0.6824	0.7813	0.7031	0.6218	0.6668	0.6110	0.7530	0.5762	0.6031	0.6831	0.7230	0.6123

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.8107	0.8623	0.8941	0.8335	0.8830	0.9577	0.8494	0.9286	0.9028	0.9575	0.8453	0.9365	0.7753	0.9204
SP2	0.8107	1.0000	0.9400	0.8860	0.9605	0.9053	0.8319	0.9385	0.8539	0.8895	0.8393	0.9423	0.8485	0.9248	0.8579
SP3	0.8623	0.9400	1.0000	0.9332	0.9522	0.9499	0.8787	0.9702	0.8964	0.9434	0.8871	0.9750	0.8983	0.8987	0.9033
SP4	0.8941	0.8860	0.9332	1.0000	0.9138	0.9681	0.9220	0.9308	0.9422	0.9654	0.9152	0.9257	0.9369	0.8416	0.9489
SP5	0.8335	0.9605	0.9522	0.9138	1.0000	0.9300	0.8522	0.9657	0.8771	0.9094	0.8542	0.9439	0.8741	0.9117	0.8801
SP6	0.8830	0.9053	0.9499	0.9681	0.9300	1.0000	0.9091	0.9534	0.9322	0.9643	0.9124	0.9478	0.9263	0.8614	0.9377
SP7	0.9577	0.8319	0.8787	0.9220	0.8522	0.9091	1.0000	0.8749	0.9635	0.9212	0.9853	0.8689	0.9669	0.7952	0.9531
SP8	0.8494	0.9385	0.9702	0.9308	0.9657	0.9534	0.8749	1.0000	0.9026	0.9350	0.8784	0.9678	0.8981	0.9012	0.9087
SP9	0.9286	0.8539	0.8964	0.9422	0.8771	0.9322	0.9635	0.9026	1.0000	0.9456	0.9580	0.8953	0.9829	0.8155	0.9813
SP10	0.9028	0.8895	0.9434	0.9654	0.9094	0.9643	0.9212	0.9350	0.9456	1.0000	0.9287	0.9318	0.9467	0.8617	0.9480
SP11	0.9575	0.8393	0.8871	0.9152	0.8542	0.9124	0.9853	0.8784	0.9580	0.9287	1.0000	0.8800	0.9651	0.8053	0.9487
SP12	0.8453	0.9423	0.9750	0.9257	0.9439	0.9478	0.8689	0.9678	0.8953	0.9318	0.8800	1.0000	0.8867	0.8846	0.9018
SP13	0.9365	0.8485	0.8983	0.9369	0.8741	0.9263	0.9669	0.8981	0.9829	0.9467	0.9651	0.8867	1.0000	0.8184	0.9740
SP14	0.7753	0.9248	0.8987	0.8416	0.9117	0.8614	0.7952	0.9012	0.8155	0.8617	0.8053	0.8846	0.8184	1.0000	0.8190
SP15	0.9204	0.8579	0.9033	0.9489	0.8801	0.9377	0.9531	0.9087	0.9813	0.9480	0.9487	0.9018	0.9740	0.8190	1.0000

APPENDIX E

Index Values For All Communities Collected During The August Sampling Date

SORENSON'S INDEX
ALL POSSIBLE COMPARISONS
AUGUST 1995

	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.7111	0.7907	0.6957	0.7556	0.7111	0.7391	0.7619	0.6957	0.6809	0.7600	0.6809	0.7442	0.7556	0.6250
EF2	0.7111	1.0000	0.6957	0.6531	0.6667	0.6250	0.7347	0.7111	0.7347	0.7200	0.7170	0.6800	0.6522	0.6667	0.7451
EF3	0.7907	0.6957	1.0000	0.5957	0.6522	0.6522	0.6809	0.6977	0.6809	0.7083	0.7059	0.6667	0.7273	0.7391	0.6939
EF4	0.6957	0.6531	0.5957	1.0000	0.6939	0.6531	0.7200	0.6957	0.7600	0.7451	0.7407	0.7059	0.8085	0.7755	0.7308
EF5	0.7556	0.6667	0.6522	0.6939	1.0000	0.6667	0.8571	0.7111	0.8571	0.7600	0.7547	0.8000	0.7826	0.8333	0.7451
EF6	0.7111	0.6250	0.6522	0.6531	0.6667	1.0000	0.7347	0.7111	0.6939	0.8400	0.7547	0.7200	0.7391	0.7500	0.7059
EF7	0.7391	0.7347	0.6809	0.7200	0.8571	0.7347	1.0000	0.8261	0.8400	0.8627	0.8889	0.8235	0.7660	0.8163	0.7692
EF8	0.7619	0.7111	0.6977	0.6957	0.7111	0.7111	0.8261	1.0000	0.7391	0.8085	0.7600	0.7234	0.7907	0.8000	0.7083
EF9	0.6957	0.7347	0.6809	0.7600	0.8571	0.6939	0.8400	0.7391	1.0000	0.8235	0.7407	0.7843	0.8511	0.8571	0.8462
EF10	0.6809	0.7200	0.7083	0.7451	0.7600	0.8400	0.8627	0.8085.	0.8235	1.0000	0.8364	0.8846	0.8750	0.8800	0.8302
EF11	0.7600	0.7170	0.7059	0.7407	0.7547	0.7547	0.8889	0.7600	0.7407	0.8364	1.0000	0.7636	0.7451	0.7547	0.7500
EF12	0.6809	0.6800	0.6667	0.7059	0.8000	0.7200	0.8235	0.7234	0.7843	0.8846	0.7636	1.0000	0.7917	0.8400	0.7925
EF13	0.7442	0.6522	0.7273	0.8085	0.7826	0.7391	0.7660	0.7907	0.8511	0.8750	0.7451	0.7917	1.0000	0.8696	0.7755
EF14	0.7556	0.6667	0.7391	0.7755	0.8333	0.7500	0.8163	0.8000	0.8571	0.8800	0.7547	0.8400	0.8696	1.0000	0.7000
EF15	0.6250	0.7451	0.6939	0.7308	0.7451	0.7059	0.7692	0.7083	0.8462	0.8302	0.7500	0.7925	0.7755	0.7000	1.0000
ID1	0.6316	0.5854	0.5128	0.6190	0.5854	0.4878	0.5714	0.5789	0.5238	0.5116	0.6087	0.4651	0.5641	0.5366	0.5000
ID2	0.5500	0.6047	0.5366	0.6364	0.5581	0.5581	0.5909	0.6000	0.5909	0.6222	0.6250	0.5333	0.5854	0.6512	0.6087
ID3	0.5263	0.6341	0.5641	0.6190	0.6341	0.5366	0.5238	0.5789	0.6667	0.6512	0.5217	0.6047	0.6667	0.6829	0.7273
ID4	0.5581	0.6087	0.6364	0.6383	0.6522	0.6522	0.6809	0.6047	0.6809	0.7917	0.7059	0.7083	0.7727	0.6957	0.7755
ID5	0.5854	0.5909	0.6667	0.6222	0.6818	0.6364	0.7111	0.5854	0.7556	0.7391	0.6531	0.7391	0.7143	0.7273	0.6809
ID6	0.5500	0.6047	0.5854	0.6364	0.6512	0.6047	0.6364	0.5500	0.6364	0.6667	0.6250	0.6667	0.6341	0.6047	0.6957
ID7	0.6111	0.6154	0.6486	0.6000	0.6154	0.6667	0.6500	0.5556	0.6500	0.6829	0.6364	0.6341	0.6486	0.6667	0.6190
ID8	0.6316	0.5854	0.6667	0.7143	0.6829	0.5854	0.7143	0.6842	0.7619	0.7442	0.6522	0.6977	0.8205	0.7317	0.7273
ID9	0.7027	0.6000	0.6842	0.6341	0.7000	0.6500	0.6829	0.7027	0.7317	0.7619	0.6667	0.6667	0.8421	0.7500	0.6977
ID10	0.5854	0.6818	0.5714	0.6222	0.6364	0.5909	0.5778	0.5366	0.6222	0.6522	0.6122	0.6522	0.6190	0.6364	0.6809
ID11	0.5854	0.5909	0.6667	0.6222	0.5909	0.7273	0.6667	0.6829	0.7111	0.7826	0.6939	0.6522	0.8095	0.7273	0.7234
ID12	0.5714	0.6222	0.6512	0.6087	0.7111	0.5778	0.6087	0.5714	0.6957	0.6809	0.6400	0.5957	0.6977	0.6222	0.6667
ID13	0.6316	0.5854	0.6667	0.6190	0.5366	0.6341	0.6190	0.6316	0.6190	0.6512	0.6522	0.5581	0.7179	0.6341	0.5909
ID14	0.5789	0.6829	0.6154	0.5714	0.5366	0.6341	0.5714	0.5789	0.6190	0.6512	0.5652	0.5581	0.6154	0.6829	0.6364
ID15	0.5366	0.5455	0.6190	0.5778	0.5455	0.6364	0.5778	0.5854	0.6222	0.6957	0.6122	0.5652	0.6667	0.6818	0.5957

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.6667	0.6222	0.6977	0.6957	0.7111	0.7556	0.7391	0.7619	0.8261	0.8936	0.7200	0.7660	0.8837	0.8889	0.7500
SP2	0.7805	0.7727	0.7619	0.6667	0.7273	0.7273	0.7556	0.8293	0.8000	0.8261	0.7347	0.7391	0.8571	0.8182	0.7660
SP3	0.7143	0.7111	0.7442	0.7391	0.7111	0.7111	0.6957	0.7143	0.7391	0.8511	0.7200	0.7660	0.8837	0.8444	0.7500
SP4	0.7027	0.7000	0.7368	0.5854	0.6500	0.6000	0.6829	0.7027	0.6829	0.7143	0.6667	0.6190	0.7895	0.7000	0.6512
SP5	0.6957	0.6531	0.6809	0.6800	0.6122	0.7755	0.6800	0.7391	0.6800	0.7843	0.7778	0.6667	0.7660	0.7755	0.7692
SP6	0.6512	0.6522	0.6364	0.6809	0.7391	0.6957	0.7234	0.7442	0.7660	0.8333	0.7451	0.7083	0.8636	0.7826	0.7755
SP7	0.7317	0.6364	0.7143	0.6667	0.7273	0.6818	0.6667	0.7317	0.6667	0.7391	0.6939	0.6957	0.7619	0.8182	0.7234
SP8	0.6667	0.7083	0.6522	0.7347	0.7917	0.8333	0.8163	0.7556	0.8571	0.9200	0.7547	0.8400	0.8696	0.8333	0.8235
SP9	0.6087	0.6531	0.6809	0.6400	0.6939	0.6939	0.8000	0.6957	0.7600	0.7843	0.7778	0.6667	0.7234	0.7755	0.7692
SP10	0.7111	0.6667	0.7391	0.6939	0.7917	0.8333	0.7755	0.7556	0.8163	0.8800	0.7547	0.8400	0.8696	0.8750	0.7843
SP11	0.5854	0.7273	0.7143	0.6667	0.6364	0.7727	0.7111	0.6341	0.6667	0.8261	0.6939	0.6957	0.7143	0.7273	0.7234
SP12	0.7143	0.7556	0.7907	0.6522	0.8000	0.6667	0.7391	0.6667	0.7826	0.7660	0.6800	0.7234	0.7907	0.7556	0.7083
SP13	0.6047	0.7391	0.7273	0.5532	0.6957	0.6957	0.6809	0.6047	0.7234	0.7500	0.6667	0.6667	0.6818	0.6957	0.6939
SP14	0.6512	0.8261	0.7273	0.6383	0.6522	0.6957	0.6383	0.6977	0.7660	0.7500	0.7059	0.6667	0.7727	0.7391	0.7755
SP15	0.5500	0.7442	0.5366	0.6364	0.6047	0.6047	0.5909	0.6500	0.6364	0.6222	0.5417	0.5778	0.5854	0.6512	0.6522

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.6667	0.7059	0.5641	0.5405	0.5556	0.6250	0.6471	0.6667	0.7027	0.5946	0.5789	0.6471	0.5882	0.5946
ID2	0.6667	1.0000	0.7222	0.5854	0.5641	0.6316	0.6471	0.6111	0.6286	0.6667	0.6154	0.6500	0.6111	0.6667	0.6667
ID3	0.7059	0.7222	1.0000	0.7179	0.6486	0.6667	0.6250	0.7059	0.7273	0.7568	0.6486	0.7368	0.5882	0.7059	0.6486
ID4	0.5641	0.5854	0.7179	1.0000	0.7143	0.7317	0.7027	0.8205	0.7895	0.7619	0.8095	0.7442	0.7179	0.6667	0.6667
ID5	0.5405	0.5641	0.6486	0.7143	1.0000	0.6154	0.8000	0.8108	0.7222	0.7000	0.7500	0.6829	0.7027	0.7568	0.7000
ID6	0.5556	0.6316	0.6667	0.7317	0.6154	1.0000	0.6471	0.7222	0.6286	0.7692	0.6667	0.7500	0.6667	0.5556	0.5641
ID7	0.6250	0.6471	0.6250	0.7027	0.8000	0.6471	1.0000	0.7500	0.6452	0.6857	0.7429	0.6667	0.7500	0.8750	0.7429
ID8	0.6471	0.6111	0.7059	0.8205	0.8108	0.7222	0.7500	1.0000	0.8485	0.7568	0.8108	0.7368	0.8235	0.6471	0.6486
ID9	0.6667	0.6286	0.7273	0.7895	0.7222	0.6286	0.6452	0.8485	1.0000	0.7222	0.7778	0.7027	0.7879	0.6061	0.6667
ID10	0.7027	0.6667	0.7568	0.7619	0.7000	0.7692	0.6857	0.7568	0.7222	1.0000	0.7000	0.7317	0.7027	0.7027	0.6000
ID11	0.5946	0.6154	0.6486	0.8095	0.7500	0.6667	0.7429	0.8108	0.7778	0.7000	1.0000	0.7317	0.8108	0.7027	0.7500
ID12	0.5789	0.6500	0.7368	0.7442	0.6829	0.7500	0.6667	0.7368	0.7027	0.7317	0.7317	1.0000	0.6316	0.6316	0.6341
ID13	0.6471	0.6111	0.5882	0.7179	0.7027	0.6667	0.7500	0.8235	0.7879	0.7027	0.8108	0.6316	1.0000	0.7059	0.7027
ID14	0.5882	0.6667	0.7059	0.6667	0.7568	0.5556	0.8750	0.6471	0.6061	0.7027	0.7027	0.6316	0.7059	1.0000	0.7568
ID15	0.5946	0.6667	0.6486	0.6667	0.7000	0.5641	0.7429	0.6486	0.6667	0.6000	0.7500	0.6341	0.7027	0.7568	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.5789	0.6500	0.7368	0.7907	0.7805	0.6000	0.7222	0.7895	0.8649	0.6829	0.8293	0.7143	0.7368	0.7368	0.7805
SP2	0.5405	0.5641	0.6486	0.6667	0.6000	0.6154	0.6286	0.7027	0.7778	0.6000	0.7500	0.6829	0.7027	0.6486	0.6500
SP3	0.5263	0.6000	0.6842	0.7907	0.6341	0.6500	0.6667	0.6842	0.7568	0.6829	0.7317	0.7143	0.6316	0.6842	0.6829
SP4	0.6061	0.5714	0.6061	0.7368	0.6111	0.6857	0.7097	0.7273	0.8125	0.6111	0.7222	0.6486	0.7879	0.6667	0.6667
SP5	0.5238	0.6364	0.6190	0.6809	0.6222	0.5909	0.6500	0.6190	0.6829	0.5778	0.7556	0.6087	0.7143	0.7143	0.6667
SP6	0.5641	0.5854	0.6667	0.7727	0.6667	0.5854	0.6486	0.7692	0.7895	0.6190	0.7619	0.6977	0.6667	0.6154	0.6667
SP7	0.5946	0.6667	0.7027	0.6190	0.6000	0.6667	0.6286	0.6486	0.6667	0.6500	0.6500	0.6341	0.5946	0.6486	0.6500
SP8	0.4878	0.5116	0.6341	0.7391	0.7273	0.6512	0.6667	0.7317	0.7500	0.6364	0.7727	0.6667	0.6829	0.6341	0.6818
SP9	0.5714	0.6364	0.6667	0.8085	0.7111	0.6364	0.6500	0.7143	0.7317	0.6667	0.8000	0.7391	0.7143	0.7143	0.7111
SP10	0.4878	0.5581	0.6341	0.5957	0.7273	0.6512	0.7179	0.6829	0.7000	0.5909	0.8182	0.6667	0.6829	0.6829	0.7273
SP11	0.5405	0.5641	0.6486	0.7143	0.7000	0.6667	0.8000	0.6486	0.6111	0.6000	0.7500	0.6829	0.6486	0.7568	0.7500
SP12	0.5263	0.5500	0.6316	0.6512	0.6829	0.6500	0.7222	0.6842	0.6486	0.5854	0.6829	0.7619	0.6316	0.6842	0.6829
SP13	0.4615	0.5366	0.6154	0.6818	0.7619	0.6829	0.7568	0.6667	0.5789	0.6667	0.7619	0.7907	0.6667	0.7692	0.7143
SP14	0.6154	0.6829	0.7179	0.7273	0.6667	0.6829	0.7027	0.6667	0.7368	0.7619	0.7619	0.6977	0.7179	0.7692	0.7143
SP15	0.6111	0.5789	0.7222	0.5854	0.6154	0.5263	0.6471	0.6111	0.5714	0.6667	0.5641	0.5500	0.6111	0.7778	0.6154

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.8293	0.8571	0.7568	0.7826	0.8372	0.7317	0.8444	0.8261	0.8444	0.7317	0.7143	0.6977	0.7907	0.6500
SP2	0.8293	1.0000	0.8293	0.8333	0.8000	0.8095	0.7500	0.8636	0.7111	0.8636	0.7500	0.8293	0.7619	0.8095	0.6667
SP3	0.8571	0.8293	1.0000	0.8108	0.7391	0.7907	0.7805	0.8000	0.7391	0.8000	0.7805	0.7619	0.6977	0.7907	0.5500
SP4	0.7568	0.8333	0.8108	1.0000	0.6829	0.7368	0.6667	0.7000	0.6829	0.7000	0.7222	0.7568	0.6842	0.7895	0.5714
SP5	0.7826	0.8000	0.7391	0.6829	1.0000	0.8085	0.8000	0.7755	0.7200	0.8163	0.7111	0.6522	0.6809	0.7660	0.6364
SP6	0.8372	0.8095	0.7907	0.7368	0.8085	1.0000	0.8095	0.8261	0.6809	0.7826	0.7143	0.7442	0.6818	0.7273	0.6341
SP7	0.7317	0.7500	0.7805	0.6667	0.8000	0.8095	1.0000	0.6818	0.6222	0.7727	0.7000	0.7317	0.6667	0.7143	0.6154
SP8	0.8444	0.8636	0.8000	0.7000	0.7755	0.8261	0.6818	1.0000	0.7347	0.9167	0.8182	0.8000	0.7826	0.7391	0.6512
SP9	0.8261	0.7111	0.7391	0.6829	0.7200	0.6809	0.6222	0.7347	1.0000	0.7347	0.7111	0.6957	0.7234	0.7234	0.6364
SP10	0.8444	0.8636	0.8000	0.7000	0.8163	0.7826	0.7727	0.9167	0.7347	1.0000	0.8182	0.8444	0.8261	0.7826	0.6512
SP11	0.7317	0.7500	0.7805	0.7222	0.7111	0.7143	0.7000	0.8182	0.7111	0.8182	1.0000	0.8293	0.8571	0.7143	0.6667
SP12	0.7143	0.8293	0.7619	0.7568	0.6522	0.7442	0.7317	0.8000	0.6957	0.8444	0.8293	1.0000	0.8837	0.7442	0.7000
SP13	0.6977	0.7619	0.6977	0.6842	0.6809	0.6818	0.6667	0.7826	0.7234	0.8261	0.8571	0.8837	1.0000	0.7727	0.6829
SP14	0.7907	0.8095	0.7907	0.7895	0.7660	0.7273	0.7143	0.7391	0.7234	0.7826	0.7143	0.7442	0.7727	1.0000	0.7317
SP15	0.6500	0.6667	0.5500	0.5714	0.6364	0.6341	0.6154	0.6512	0.6364	0.6512	0.6667	0.7000	0.6829	0.7317	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.5517	0.6538	0.5333	0.6071	0.5517	0.5862	0.6154	0.5333	0.5161	0.6129	0.5161	0.5926	0.6071	0.4545
EF2	0.5517	1.0000	0.5333	0.4848	0.5000	0.4545	0.5806	0.5517	0.5806	0.5625	0.5588	0.5152	0.4839	0.5000	0.5938
EF3	0.6538	0.5333	1.0000	0.4242	0.4839	0.4839	0.5161	0.5357	0.5161	0.5484	0.5455	0.5000	0.5714	0.5862	0.5313
EF4	0.5333	0.4848	0.4242	1.0000	0.5313	0.4848	0.5625	0.5333	0.6129	0.5938	0.5882	0.5455	0.6786	0.6333	0.5758
EF5	0.6071	0.5000	0.4839	0.5313	1.0000	0.5000	0.7500	0.5517	0.7500	0.6129	0.6061	0.6667	0.6429	0.7143	0.5938
EF6	0.5517	0.4545	0.4839	0.4848	0.5000	1.0000	0.5806	0.5517	0.5313	0.7241	0.6061	0.5625	0.5862	0.6000	0.5455
EF7	0.5862	0.5806	0.5161	0.5625	0.7500	0.5806	1.0000	0.7037	0.7241	0.7586	0.8000	0.7000	0.6207	0.6897	0.6250
EF8	0.6154	0.5517	0.5357	0.5333	0.5517	0.5517	0.7037	1.0000	0.5862	0.6786	0.6129	0.5667	0.6538	0.6667	0.5484
EF9	0.5333	0.5806	0.5161	0.6129	0.7500	0.5313	0.7241	0.5862	1.0000	0.7000	0.5882	0.6452	0.7407	0.7500	0.7333
EF10	0.5161	0.5625	0.5484	0.5938	0.6129	0.7241	0.7586	0.6786	0.7000	1.0000	0.7188	0.7931	0.7778	0.7857	0.7097
EF11	0.6129	0.5588	0.5455	0.5882	0.6061	0.6061	0.8000	0.6129	0.5882	0.7188	1.0000	0.6176	0.5938	0.6061	0.6000
EF12	0.5161	0.5152	0.5000	0.5455	0.6667	0.5625	0.7000	0.5667	0.6452	0.7931	0.6176	1.0000	0.6552	0.7241	0.6563
EF13	0.5926	0.4839	0.5714	0.6786	0.6429	0.5862	0.6207	0.6538	0.7407	0.7778	0.5938	0.6552	1.0000	0.7692	0.6333
EF14	0.6071	0.5000	0.5862	0.6333	0.7143	0.6000	0.6897	0.6667	0.7500	0.7857	0.6061	0.7241	0.7692	1.0000	0.7000
EF15	0.4545	0.5938	0.5313	0.5758	0.5938	0.5455	0.6250	0.5484	0.7333	0.7097	0.6000	0.6563	0.6333	0.7000	1.0000
ID1	0.4615	0.4138	0.3448	0.4483	0.4138	0.3226	0.4000	0.4074	0.3548	0.3438	0.4375	0.3030	0.3929	0.3667	0.3333
ID2	0.3793	0.4333	0.3667	0.4667	0.3871	0.3871	0.4194	0.4286	0.4194	0.4516	0.4545	0.3636	0.4138	0.4828	0.4375
ID3	0.3571	0.4643	0.3929	0.4483	0.4643	0.3667	0.3548	0.4074	0.5000	0.4828	0.3529	0.4333	0.5000	0.5185	0.5714
ID4	0.3871	0.4375	0.4667	0.4688	0.4839	0.4839	0.5161	0.4333	0.5161	0.6552	0.5455	0.5484	0.6296	0.5333	0.6333
ID5	0.4138	0.4194	0.5000	0.4516	0.5172	0.4667	0.5517	0.4138	0.6071	0.5862	0.4848	0.5862	0.5556	0.5714	0.5161
ID6	0.3793	0.4333	0.4138	0.4667	0.4828	0.4333	0.4667	0.3793	0.4667	0.5000	0.4545	0.5000	0.4643	0.4333	0.5333
ID7	0.4400	0.4444	0.4800	0.4286	0.4444	0.5000	0.4815	0.3846	0.4815	0.5185	0.4667	0.4643	0.4800	0.5000	0.4483
ID8	0.4615	0.4138	0.5000	0.5556	0.5185	0.4138	0.5556	0.5200	0.6154	0.5926	0.4839	0.5357	0.6957	0.5769	0.5714
ID9	0.5417	0.4286	0.5200	0.4643	0.5385	0.4815	0.5185	0.5417	0.5769	0.6154	0.5000	0.5000	0.7273	0.6000	0.5357
ID10	0.4138	0.5172	0.4000	0.4516	0.4667	0.4194	0.4063	0.3667	0.4516	0.4839	0.4412	0.4839	0.4483	0.4667	0.5161
ID11	0.4138	0.4194	0.5000	0.4516	0.4194	0.5714	0.5000	0.5185	0.5517	0.6429	0.5313	0.4839	0.6800	0.5714	0.5667
ID12	0.4000	0.4516	0.4828	0.4375	0.5517	0.4063	0.4375	0.4000	0.5333	0.5161	0.4706	0.4242	0.5357	0.4516	0.5000
ID13	0.4615	0.4138	0.5000	0.4483	0.3667	0.4643	0.4483	0.4615	0.4483	0.4828	0.4839	0.3871	0.5600	0.4643	0.4194
ID14	0.4074	0.5185	0.4444	0.4000	0.3667	0.4643	0.4000	0.4074	0.4483	0.4828	0.3939	0.3871	0.4444	0.5185	0.4667
ID15	0.3667	0.3750	0.4483	0.4063	0.3750	0.4667	0.4063	0.4138	0.4516	0.5333	0.4412	0.3939	0.5000	0.5172	0.4242

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.5000	0.4516	0.5357	0.5333	0.5517	0.6071	0.5862	0.6154	0.7037	0.8077	0.5625	0.6207	0.7917	0.8000	0.6000
SP2	0.6400	0.6296	0.6154	0.5000	0.5714	0.5714	0.6071	0.7083	0.6667	0.7037	0.5806	0.5862	0.7500	0.6923	0.6207
SP3	0.5556	0.5517	0.5926	0.5862	0.5517	0.5517	0.5333	0.5556	0.5862	0.7407	0.5625	0.6207	0.7917	0.7308	0.6000
SP4	0.5417	0.5385	0.5833	0.4138	0.4815	0.4286	0.5185	0.5417	0.5185	0.5556	0.5000	0.4483	0.6522	0.5385	0.4828
SP5	0.5333	0.4848	0.5161	0.5152	0.4412	0.6333	0.5152	0.5862	0.5152	0.6452	0.6364	0.5000	0.6207	0.6333	0.6250
SP6	0.4828	0.4839	0.4667	0.5161	0.5862	0.5333	0.5667	0.5926	0.6207	0.7143	0.5938	0.5484	0.7600	0.6429	0.6333
SP7	0.5769	0.4667	0.5556	0.5000	0.5714	0.5172	0.5000	0.5769	0.5000	0.5862	0.5313	0.5333	0.6154	0.6923	0.5667
SP8	0.5000	0.5484	0.4839	0.5806	0.6552	0.7143	0.6897	0.6071	0.7500	0.8519	0.6061	0.7241	0.7692	0.7143	0.7000
SP9	0.4375	0.4848	0.5161	0.4706	0.5313	0.5313	0.6667	0.5333	0.6129	0.6452	0.6364	0.5000	0.5667	0.6333	0.6250
SP10	0.5517	0.5000	0.5862	0.5313	0.6552	0.7143	0.6333	0.6071	0.6897	0.7857	0.6061	0.7241	0.7692	0.7778	0.6452
SP11	0.4138	0.5714	0.5556	0.5000	0.4667	0.6296	0.5517	0.4643	0.5000	0.7037	0.5313	0.5333	0.5556	0.5714	0.5667
SP12	0.5556	0.6071	0.6538	0.4839	0.6667	0.5000	0.5862	0.5000	0.6429	0.6207	0.5152	0.5667	0.6538	0.6071	0.5484
SP13	0.4333	0.5862	0.5714	0.3824	0.5333	0.5333	0.5161	0.4333	0.5667	0.6000	0.5000	0.5000	0.5172	0.5333	0.5313
SP14	0.4828	0.7037	0.5714	0.4688	0.4839	0.5333	0.4688	0.5357	0.6207	0.6000	0.5455	0.5000	0.6296	0.5862	0.6333
SP15	0.3793	0.5926	0.3667	0.4667	0.4333	0.4333	0.4194	0.4815	0.4667	0.4516	0.3714	0.4063	0.4138	0.4828	0.4839

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.5000	0.5455	0.3929	0.3704	0.3846	0.4545	0.4783	0.5000	0.5417	0.4231	0.4074	0.4783	0.4167	0.4231
ID2	0.5000	1.0000	0.5652	0.4138	0.3929	0.4615	0.4783	0.4400	0.4583	0.5000	0.4444	0.4815	0.4400	0.5000	0.5000
ID3	0.5455	0.5652	1.0000	0.5600	0.4800	0.5000	0.4545	0.5455	0.5714	0.6087	0.4800	0.5833	0.4167	0.5455	0.4800
ID4	0.3929	0.4138	0.5600	1.0000	0.5556	0.5769	0.5417	0.6957	0.6522	0.6154	0.6800	0.5926	0.5600	0.5000	0.5000
ID5	0.3704	0.3929	0.4800	0.5556	1.0000	0.4444	0.6667	0.6818	0.5652	0.5385	0.6000	0.5185	0.5417	0.6087	0.5385
ID6	0.3846	0.4615	0.5000	0.5769	0.4444	1.0000	0.4783	0.5652	0.4583	0.6250	0.5000	0.6000	0.5000	0.3846	0.3929
ID7	0.4545	0.4783	0.4545	0.5417	0.6667	0.4783	1.0000	0.6000	0.4762	0.5217	0.5909	0.5000	0.6000	0.7778	0.5909
ID8	0.4783	0.4400	0.5455	0.6957	0.6818	0.5652	0.6000	1.0000	0.7368	0.6087	0.6818	0.5833	0.7000	0.4783	0.4800
ID9	0.5000	0.4583	0.5714	0.6522	0.5652	0.4583	0.4762	0.7368	1.0000	0.5652	0.6364	0.5417	0.6500	0.4348	0.5000
ID10	0.5417	0.5000	0.6087	0.6154	0.5385	0.6250	0.5217	0.6087	0.5652	1.0000	0.5385	0.5769	0.5417	0.5417	0.4286
ID11	0.4231	0.4444	0.4800	0.6800	0.6000	0.5000	0.5909	0.6818	0.6364	0.5385	1.0000	0.5769	0.6818	0.5417	0.6000
ID12	0.4074	0.4815	0.5833	0.5926	0.5185	0.6000	0.5000	0.5833	0.5417	0.5769	0.5769	1.0000	0.4615	0.4615	0.4643
ID13	0.4783	0.4400	0.4167	0.5600	0.5417	0.5000	0.6000	0.7000	0.6500	0.5417	0.6818	0.4615	1.0000	0.5455	0.5417
ID14	0.4167	0.5000	0.5455	0.5000	0.6087	0.3846	0.7778	0.4783	0.4348	0.5417	0.5417	0.4615	0.5455	1.0000	0.6087
ID15	0.4231	0.5000	0.4800	0.5000	0.5385	0.3929	0.5909	0.4800	0.5000	0.4286	0.6000	0.4643	0.5417	0.6087	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.4074	0.4815	0.5833	0.6538	0.6400	0.4286	0.5652	0.6522	0.7619	0.5185	0.7083	0.5556	0.5833	0.5833	0.6400
SP2	0.3704	0.3929	0.4800	0.5000	0.4286	0.4444	0.4583	0.5417	0.6364	0.4286	0.6000	0.5185	0.5417	0.4800	0.4815
SP3	0.3571	0.4286	0.5200	0.6538	0.4643	0.4815	0.5000	0.5200	0.6087	0.5185	0.5769	0.5556	0.4615	0.5200	0.5185
SP4	0.4348	0.4000	0.4348	0.5833	0.4400	0.5217	0.5500	0.5714	0.6842	0.4400	0.5652	0.4800	0.6500	0.5000	0.5000
SP5	0.3548	0.4667	0.4483	0.5161	0.4516	0.4194	0.4815	0.4483	0.5185	0.4063	0.6071	0.4375	0.5556	0.5556	0.5000
SP6	0.3929	0.4138	0.5000	0.6296	0.5000	0.4138	0.4800	0.6250	0.6522	0.4483	0.6154	0.5357	0.5000	0.4444	0.5000
SP7	0.4231	0.5000	0.5417	0.4483	0.4286	0.5000	0.4583	0.4800	0.5000	0.4815	0.4815	0.4643	0.4231	0.4800	0.4815
SP8	0.3226	0.3438	0.4643	0.5862	0.5714	0.4828	0.5000	0.5769	0.6000	0.4667	0.6296	0.5000	0.5185	0.4643	0.5172
SP9	0.4000	0.4667	0.5000	0.6786	0.5517	0.4667	0.4815	0.5556	0.5769	0.5000	0.6667	0.5862	0.5556	0.5556	0.5517
SP10	0.3226	0.3871	0.4643	0.5333	0.5714	0.4828	0.5600	0.5185	0.5385	0.4194	0.6923	0.5000	0.5185	0.5185	0.5714
SP11	0.3704	0.3929	0.4800	0.5556	0.5385	0.5000	0.6667	0.4800	0.4400	0.4286	0.6000	0.5185	0.4800	0.6087	0.6000
SP12	0.3571	0.3793	0.4615	0.4828	0.5185	0.4815	0.5652	0.5200	0.4800	0.4138	0.5185	0.6154	0.4615	0.5200	0.5185
SP13	0.3000	0.3667	0.4444	0.5172	0.6154	0.5185	0.6087	0.5000	0.4074	0.5000	0.6154	0.6538	0.5000	0.6250	0.5556
SP14	0.4444	0.5185	0.5600	0.5714	0.5000	0.5185	0.5417	0.5000	0.5833	0.6154	0.6154	0.5357	0.5600	0.6250	0.5556
SP15	0.4400	0.4074	0.5652	0.4138	0.4444	0.3571	0.4783	0.4400	0.4000	0.5000	0.3929	0.3793	0.4400	0.6364	0.4444

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.7083	0.7500	0.6087	0.6429	0.7200	0.5769	0.7308	0.7037	0.7308	0.5769	0.5556	0.5357	0.6538	0.4815
SP2	0.7083	1.0000	0.7083	0.7143	0.6667	0.6800	0.6000	0.7600	0.5517	0.7600	0.6000	0.7083	0.6154	0.6800	0.5000
SP3	0.7500	0.7083	1.0000	0.6818	0.5862	0.6538	0.6400	0.6667	0.5862	0.6667	0.6400	0.6154	0.5357	0.6538	0.3793
SP4	0.6087	0.7143	0.6818	1.0000	0.5185	0.5833	0.5000	0.5385	0.5185	0.5385	0.5652	0.6087	0.5200	0.6522	0.4000
SP5	0.6429	0.6667	0.5862	0.5185	1.0000	0.6786	0.6667	0.6333	0.5625	0.6897	0.5517	0.4839	0.5161	0.6207	0.4667
SP6	0.7200	0.6800	0.6538	0.5833	0.6786	1.0000	0.6800	0.7037	0.5161	0.6429	0.5556	0.5926	0.5172	0.5714	0.4643
SP7	0.5769	0.6000	0.6400	0.5000	0.6667	0.6800	1.0000	0.5172	0.4516	0.6296	0.5385	0.5769	0.5000	0.5556	0.4444
SP8	0.7308	0.7600	0.6667	0.5385	0.6333	0.7037	0.5172	1.0000	0.5806	0.8462	0.6923	0.6667	0.6429	0.5862	0.4828
SP9	0.7037	0.5517	0.5862	0.5185	0.5625	0.5161	0.4516	0.5806	1.0000	0.5806	0.5517	0.5333	0.5667	0.5667	0.4667
SP10	0.7308	0.7037	0.6667	0.5385	0.6897	0.6429	0.6296	0.8462	0.5806	1.0000	0.6923	0.7308	0.7037	0.6429	0.4828
SP11	0.5769	0.6000	0.6400	0.5652	0.5517	0.5556	0.5385	0.6923	0.5517	0.6923	1.0000	0.7083	0.7500	0.5556	0.5000
SP12	0.5556	0.7083	0.6154	0.6087	0.4839	0.5926	0.5769	0.6667	0.5333	0.7308	0.7083	1.0000	0.7917	0.5926	0.5385
SP13	0.5357	0.7500	0.5357	0.5200	0.5161	0.5172	0.5000	0.6429	0.5667	0.7037	0.7500	0.7917	1.0000	0.6296	0.5185
SP14	0.6538	0.6800	0.6538	0.6522	0.6207	0.5714	0.5556	0.5862	0.5667	0.6429	0.5556	0.5926	0.6296	1.0000	0.5769
SP15	0.4815	0.5000	0.3793	0.4000	0.4667	0.4643	0.4444	0.4828	0.4667	0.4828	0.5000	0.5385	0.5185	0.5769	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.9642	0.9745	0.9465	0.9449	0.9218	0.9485	0.9572	0.9283	0.9403	0.9421	0.9343	0.9144	0.9495	0.9010
EF2	0.9642	1.0000	0.9708	0.9655	0.9586	0.9431	0.9564	0.9692	0.9491	0.9580	0.9488	0.9481	0.9367	0.9618	0.9212
EF3	0.9745	0.9708	1.0000	0.9609	0.9610	0.9370	0.9619	0.9721	0.9435	0.9581	0.9548	0.9493	0.9304	0.9621	0.9186
EF4	0.9465	0.9655	0.9609	1.0000	0.9705	0.9499	0.9687	0.9753	0.9620	0.9706	0.9611	0.9532	0.9472	0.9808	0.9291
EF5	0.9449	0.9586	0.9610	0.9705	1.0000	0.9542	0.9818	0.9676	0.9677	0.9791	0.9691	0.9727	0.9544	0.9811	0.9424
EF6	0.9218	0.9431	0.9370	0.9499	0.9542	1.0000	0.9603	0.9487	0.9779	0.9593	0.9601	0.9607	0.9792	0.9551	0.9517
EF7	0.9485	0.9564	0.9619	0.9687	0.9818	0.9603	1.0000	0.9711	0.9724	0.9750	0.9821	0.9765	0.9579	0.9763	0.9439
EF8	0.9572	0.9692	0.9721	0.9753	0.9676	0.9487	0.9711	1.0000	0.9548	0.9714	0.9625	0.9547	0.9437	0.9755	0.9283
EF9	0.9283	0.9491	0.9435	0.9620	0.9677	0.9779	0.9724	0.9548	1.0000	0.9717	0.9714	0.9727	0.9793	0.9690	0.9595
EF10	0.9403	0.9580	0.9581	0.9706	0.9791	0.9593	0.9750	0.9714	0.9717	1.0000	0.9708	0.9695	0.9611	0.9810	0.9461
EF11	0.9421	0.9488	0.9548	0.9611	0.9691	0.9601	0.9821	0.9625	0.9714	0.9708	1.0000	0.9817	0.9611	0.9703	0.9513
EF12	0.9343	0.9481	0.9493	0.9532	0.9727	0.9607	0.9765	0.9547	0.9727	0.9695	0.9817	1.0000	0.9647	0.9650	0.9559
EF13	0.9144	0.9367	0.9304	0.9472	0.9544	0.9792	0.9579	0.9437	0.9793	0.9611	0.9611	0.9647	1.0000	0.9543	0.9644
EF14	0.9495	0.9618	0.9621	0.9808	0.9811	0.9551	0.9763	0.9755	0.9690	0.9810	0.9703	0.9650	0.9543	1.0000	0.9388
EF15	0.9010	0.9212	0.9186	0.9291	0.9424	0.9517	0.9439	0.9283	0.9595	0.9461	0.9513	0.9559	0.9644	0.9388	1.0000
ID1	0.8397	0.8541	0.8543	0.8647	0.8748	0.8807	0.8766	0.8612	0.8820	0.8673	0.8829	0.8838	0.8885	0.8634	0.8985
ID2	0.8317	0.8433	0.8471	0.8636	0.8669	0.8774	0.8713	0.8586	0.8802	0.8671	0.8797	0.8730	0.8856	0.8680	0.8893
ID3	0.8597	0.8793	0.8748	0.8972	0.8886	0.9115	0.8957	0.8876	0.9111	0.8925	0.9058	0.9004	0.9193	0.8928	0.9202
ID4	0.8365	0.8503	0.8542	0.8611	0.8740	0.8806	0.8753	0.8566	0.8815	0.8681	0.8816	0.8852	0.8888	0.8641	0.9092
ID5	0.8416	0.8547	0.8593	0.8642	0.8764	0.6843	0.8859	0.8640	0.8895	0.8766	0.8923	0.8880	0.8938	0.8707	0.9030
ID6	0.8365	0.8496	0.8541	0.8603	0.8765	0.8812	0.8755	0.8585	0.8837	0.8694	0.8801	0.8842	0.8912	0.8644	0.9083
ID7	0.9351	0.9288	0.9345	0.9098	0.9137	0.8877	0.9099	0.9177	0.8914	0.9049	0.8983	0.8999	0.8811	0.9081	0.8746
ID8	0.8247	0.8313	0.8401	0.8523	0.8582	0.8670	0.8646	0.8478	0.8713	0.8554	0.8691	0.8651	0.8760	0.8548	0.8827
ID9	0.7836	0.7956	0.7989	0.8030	0.8169	0.8298	0.8187	0.8025	0.8312	0.8140	0.8261	0.8291	0.8381	0.8086	0.8472
ID10	0.8251	0.8405	0.8419	0.8512	0.8661	0.8718	0.8643	0.8459	0.8744	0.8593	0.8694	0.8746	0.8799	0.8549	0.8928
ID11	0.8033	0.8259	0.8206	0.8322	0.8429	0.8599	0.8463	0.8317	0.8599	0.8443	0.8513	0.8529	0.8682	0.8373	0.8765
ID12	0.8734	0.8899	0.8919	0.9047	0.9031	0.9153	0.9102	0.9006	0.9228	0.9093	0.9157	0.9134	0.9265	0.9033	0.9330
ID13	0.8034	0.8178	0.8211	0.8247	0.8381	0.8486	0.8431	0.8253	0.8492	0.8343	0.8506	0.8517	0.8564	0.8291	0.8705
ID14	0.8100	0.8366	0.8288	0.8351	0.8429	0.8587	0.8478	0.8346	0.8579	0.8450	0.8510	0.8552	0.8658	0.8367	0.8773
ID15	0.7153	0.7400	0.7349	0.7456	0.7524	0.7729	0.7569	0.7434	0.7709	0.7563	0.7630	0.7645	0.7813	0.7468	0.7889

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.9455	0.9607	0.9594	0.9753	0.9679	0.9531	0.9691	0.9706	0.9633	0.9733	0.9635	0.9545	0.9530	0.9793	0.9329
SP2	0.9622	0.9795	0.9767	0.9706	0.9629	0.9496	0.9647	0.9791	0.9550	0.9687	0.9529	0.9488	0.9461	0.9712	0.9240
SP3	0.9751	0.9680	0.9706	0.9577	0.9528	0.9273	0.9536	0.9634	0.9412	0.9548	0.9447	0.9401	0.9290	0.9635	0.9160
SP4	0.9755	0.9704	0.9790	0.9549	0.9606	0.9281	0.9588	0.9621	0.9418	0.9572	0.9487	0.9456	0.9294	0.9617	0.9137
SP5	0.9523	0.9701	0.9694	0.9738	0.9699	0.9542	0.9676	0.9721	0.9601	0.9752	0.9614	0.9548	0.9504	0.9781	0.9369
SP6	0.9540	0.9691	0.9615	0.9685	0.9565	0.9469	0.9565	0.9688	0.9485	0.9614	0.9507	0.9416	0.9423	0.9668	0.9176
SP7	0.9339	0.9503	0.9524	0.9644	0.9684	0.9656	0.9762	0.9639	0.9774	0.9750	0.9798	0.9732	0.9687	0.9711	0.9505
SP8	0.9476	0.9709	0.9661	0.9758	0.9757	0.9603	0.9697	0.9732	0.9653	0.9752	0.9617	0.9612	0.9556	0.9791	0.9386
SP9	0.9425	0.9572	0.9459	0.9554	0.9512	0.9428	0.9547	0.9531	0.9492	0.9602	0.9504	0.9393	0.9416	0.9598	0.9209
SP10	0.9314	0.9562	0.9511	0.9587	0.9587	0.9680	0.9527	0.9550	0.9666	0.9655	0.9530	0.9572	0.9634	0.9624	0.9368
SP11	0.9570	0.9788	0.9659	0.9665	0.9560	0.9441	0.9577	0.9676	0.9452	0.9591	0.9459	0.9406	0.9381	0.9624	0.9154
SP12	0.9347	0.9505	0.9533	0.9551	0.9703	0.9614	0.9762	0.9620	0.9718	0.9725	0.9756	0.9778	0.9641	0.9645	0.9511
SP13	0.9528	0.9703	0.9697	0.9714	0.9660	0.9479	0.9680	0.9795	0.9538	0.9682	0.9611	0.9519	0.9410	0.9756	0.9277
SP14	0.9528	0.9677	0.9514	0.9597	0.9524	0.9394	0.9542	0.9549	0.9467	0.9536	0.9463	0.9378	0.9358	0.9616	0.9175
SP15	0.9408	0.9559	0.9400	0.9486	0.9329	0.9213	0.9335	0.9499	0.9248	0.9330	0.9246	0.9168	0.9136	0.9415	0.8981

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.9697	0.9452	0.9458	0.9688	0.9605	0.8206	0.9619	0.9196	0.9717	0.9490	0.9342	0.9483	0.9513	0.8600
ID2	0.9697	1.0000	0.9409	0.9323	0.9594	0.9525	0.8042	0.9588	0.9159	0.9646	0.9440	0.9380	0.9392	0.9457	0.8556
ID3	0.9452	0.9409	1.0000	0.9372	0.9457	0.9402	0.8308	0.9274	0.8789	0.9258	0.9123	0.9686	0.9048	0.9247	0.8292
ID4	0.9458	0.9323	0.9372	1.0000	0.9396	0.9673	0.8359	0.9316	0.8892	0.9385	0.9173	0.9253	0.9187	0.9257	0.8282
ID5	0.9688	0.9594	0.9457	0.9396	1.0000	0.9528	0.8255	0.9577	0.9046	0.9554	0.9432	0.9357	0.9428	0.9443	0.8577
ID6	0.9605	0.9525	0.9402	0.9673	0.9528	1.0000	0.8393	0.9481	0.9014	0.9554	0.9357	0.9374	0.9386	0.9306	0.8461
ID7	0.8206	0.8042	0.8308	0.8359	0.8255	0.8393	1.0000	0.8081	0.7568	0.8101	0.8003	0.8372	0.8043	0.8011	0.7155
ID8	0.9619	0.9588	0.9274	0.9316	0.9577	0.9481	0.8081	1.0000	0.9199	0.9714	0.9524	0.9236	0.9488	0.9493	0.8661
ID9	0.9196	0.9159	0.8789	0.8892	0.9046	0.9014	0.7568	0.9199	1.0000	0.9370	0.9399	0.8766	0.9422	0.9288	0.9185
ID10	0.9717	0.9646	0.9258	0.9385	0.9554	0.9554	0.8101	0.9714	0.9370	1.0000	0.9652	0.9232	0.9638	0.9671	0.8757
ID11	0.9490	0.9440	0.9123	0.9173	0.9432	0.9357	0.8003	0.9524	0.9399	0.9652	1.0000	0.9066	0.9796	0.9733	0.9013
ID12	0.9342	0.9380	0.9686	0.9253	0.9357	0.9374	0.8372	0.9236	0.8766	0.9232	0.9066	1.0000	0.8959	0.9138	0.8218
ID13	0.9483	0.9392	0.9048	0.9187	0.9428	0.9386	0.8043	0.9488	0.9422	0.9638	0.9796	0.8959	1.0000	0.9615	0.8949
ID14	0.9513	0.9457	0.9247	0.9257	0.9443	0.9306	0.8011	0.9493	0.9288	0.9671	0.9733	0.9138	0.9615	1.0000	0.8852
ID15	0.8600	0.8556	0.8292	0.8282	0.8577	0.8461	0.7155	0.8661	0.9185	0.8757	0.9013	0.8218	0.8949	0.8852	1.0000

PERCENT SIMILARITY
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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.8612	0.8603	0.8949	0.8584	0.8702	0.8585	0.9086	0.8482	0.8037	0.8488	0.8373	0.9053	0.8271	0.8348	0.7558
SP2	0.8532	0.8500	0.8844	0.8509	0.8583	0.8526	0.9237	0.8391	0.7960	0.8408	0.8287	0.8985	0.8190	0.8325	0.7450
SP3	0.8381	0.8382	0.8667	0.8379	0.8460	0.8390	0.9330	0.8282	0.7814	0.8280	0.8146	0.8856	0.8048	0.8185	0.7283
SP4	0.8491	0.8424	0.8660	0.8479	0.8542	0.8531	0.9377	0.8338	0.7923	0.8377	0.8174	0.8842	0.8170	0.8213	0.7285
SP5	0.8595	0.8566	0.8890	0.8619	0.8666	0.8608	0.9172	0.8443	0.8047	0.8480	0.8388	0.8973	0.8290	0.8425	0.7481
SP6	0.8516	0.8506	0.8881	0.8499	0.8556	0.8501	0.9155	0.8396	0.7959	0.8374	0.8261	0.8956	0.8151	0.8271	0.7414
SP7	0.8779	0.8800	0.9097	0.8754	0.8871	0.8795	0.8972	0.8662	0.8198	0.8666	0.8559	0.9226	0.8447	0.8570	0.7691
SP8	0.8647	0.8572	0.8891	0.8633	0.8714	0.8653	0.9185	0.8468	0.8087	0.8529	0.8445	0.8988	0.8350	0.8421	0.7555
SP9	0.8465	0.8465	0.8880	0.8509	0.8566	0.8467	0.9055	0.8362	0.7907	0.8355	0.8262	0.8922	0.8165	0.8307	0.7442
SP10	0.8679	0.8614	0.8973	0.8674	0.8700	0.8712	0.9059	0.8511	0.8139	0.8576	0.8469	0.9021	0.8364	0.8465	0.7615
SP11	0.8517	0.8453	0.8825	0.8461	0.8564	0.8491	0.9303	0.8358	0.7888	0.8374	0.8297	0.8919	0.8177	0.8321	0.7463
SP12	0.8818	0.8740	0.8981	0.8781	0.8882	0.8816	0.9056	0.8638	0.8223	0.8697	0.8530	0.9153	0.8512	0.8553	0.7689
SP13	0.8567	0.8569	0.8858	0.8545	0.8714	0.8568	0.9180	0.8441	0.7990	0.8459	0.8334	0.9009	0.8265	0.8400	0.7478
SP14	0.8428	0.8420	0.8783	0.8421	0.8542	0.8427	0.9135	0.8302	0.7859	0.8337	0.8200	0.8878	0.8105	0.8251	0.7401
SP15	0.8312	0.8227	0.8684	0.8245	0.8348	0.8228	0.9167	0.8115	0.7643	0.8140	0.7997	0.8691	0.7920	0.8078	0.7204

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.9749	0.9621	0.9576	0.9748	0.9754	0.9683	0.9778	0.9695	0.9657	0.9683	0.9628	0.9747	0.9707	0.9523
SP2	0.9749	1.0000	0.9710	0.9726	0.9774	0.9770	0.9597	0.9756	0.9643	0.9642	0.9806	0.9582	0.9752	0.9684	0.9577
SP3	0.9621	0.9710	1.0000	0.9828	0.9627	0.9604	0.9488	0.9596	0.9563	0.9398	0.9683	0.9457	0.9631	0.9657	0.9513
SP4	0.9576	0.9726	0.9828	1.0000	0.9650	0.9603	0.9452	0.9587	0.9516	0.9421	0.9685	0.9484	0.9611	0.9581	0.9428
SP5	0.9748	0.9774	0.9627	0.9650	1.0000	0.9723	0.9668	0.9842	0.9658	0.9682	0.9704	0.9601	0.9738	0.9642	0.9484
SP6	0.9754	0.9770	0.9604	0.9603	0.9723	1.0000	0.9586	0.9728	0.9760	0.9711	0.9755	0.9486	0.9701	0.9771	0.9625
SP7	0.9683	0.9597	0.9488	0.9452	0.9668	0.9586	1.0000	0.9702	0.9565	0.9655	0.9574	0.9806	0.9668	0.9505	0.9320
SP8	0.9778	0.9756	0.9596	0.9587	0.9842	0.9728	0.9702	1.0000	0.9618	0.9743	0.9729	0.9686	0.9800	0.9621	0.9457
SP9	0.9695	0.9643	0.9563	0.9516	0.9658	0.9760	0.9565	0.9618	1.0000	0.9668	0.9665	0.9521	0.9588	0.9787	0.9634
SP10	0.9657	0.9642	0.9398	0.9421	0.9682	0.9711	0.9655	0.9743	0.9668	1.0000	0.9615	0.9611	0.9587	0.9590	0.9405
SP11	0.9683	0.9806	0.9683	0.9685	0.9704	0.9755	0.9574	0.9729	0.9665	0.9615	1.0000	0.9547	0.9751	0.9681	0.9609
SP12	0.9628	0.9582	0.9457	0.9484	0.9601	0.9486	0.9806	0.9686	0.9521	0.9611	0.9547	1.0000	0.9679	0.9460	0.9298
SP13	0.9747	0.9752	0.9631	0.9611	0.9738	0.9701	0.9668	0.9800	0.9588	0.9587	0.9751	0.9679	1.0000	0.9631	0.9518
SP14	0.9707	0.9684	0.9657	0.9581	0.9642	0.9771	0.9505	0.9621	0.9787	0.9590	0.9681	0.9460	0.9631	1.0000	0.9709
SP15	0.9523	0.9577	0.9513	0.9428	0.9484	0.9625	0.9320	0.9457	0.9634	0.9405	0.9609	0.9298	0.9518	0.9709	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.9998	0.9998	0.9995	0.9994	0.9987	0.9990	0.9995	0.9988	0.9994	0.9986	0.9986	0.9983	0.9995	0.9976
EF2	0.9998	1.0000	0.9999	0.9997	0.9996	0.9992	0.9993	0.9997	0.9993	0.9997	0.9990	0.9990	0.9989	0.9997	0.9983
EF3	0.9998	0.9999	1.0000	0.9998	0.9998	0.9994	0.9997	0.9999	0.9995	0.9998	0.9994	0.9994	0.9991	0.9999	0.9987
EF4	0.9995	0.9997	0.9998	1.0000	0.9998	0.9996	0.9997	0.9999	0.9997	0.9999	0.9996	0.9995	0.9995	0.9999	0.9989
EF5	0.9994	0.9996	0.9998	0.9998	1.0000	0.9996	0.9999	0.9998	0.9998	0.9999	0.9997	0.9998	0.9996	0.9999	0.9994
EF6	0.9987	0.9992	0.9994	0.9996	0.9996	1.0000	0.9997	0.9996	0.9999	0.9998	0.9997	0.9997	0.9999	0.9997	0.9996
EF7	0.9990	0.9993	0.9997	0.9997	0.9999	0.9997	1.0000	0.9998	0.9999	0.9999	0.9999	0.9999	0.9997	0.9998	0.9995
EF8	0.9995	0.9997	0.9999	0.9999	0.9998	0.9996	0.9998	1.0000	0.9997	0.9999	0.9997	0.9996	0.9995	0.9999	0.9990
EF9	0.9988	0.9993	0.9995	0.9997	0.9998	0.9999	0.9999	0.9997	1.0000	0.9999	0.9999	0.9999	0.9999	0.9998	0.9997
EF10	0.9994	0.9997	0.9998	0.9999	0.9999	0.9998	0.9999	0.9999	0.9999	1.0000	0.9997	0.9998	0.9997	0.9999	0.9993
EF11	0.9986	0.9990	0.9994	0.9996	0.9997	0.9997	0.9999	0.9997	0.9999	0.9997	1.0000	0.9999	0.9998	0.9997	0.9996
EF12	0.9986	0.9990	0.9994	0.9995	0.9998	0.9997	0.9999	0.9996	0.9999	0.9998	0.9999	1.0000	0.9998	0.9996	0.9998
EF13	0.9983	0.9989	0.9991	0.9995	0.9996	0.9999	0.9997	0.9995	0.9999	0.9997	0.9998	0.9998	1.0000	0.9996	0.9998
EF14	0.9995	0.9997	0.9999	0.9999	0.9999	0.9997	0.9998	0.9999	0.9998	0.9999	0.9997	0.9996	0.9996	1.0000	0.9991
EF15	0.9976	0.9983	0.9987	0.9989	0.9994	0.9996	0.9995	0.9990	0.9997	0.9993	0.9996	0.9998	0.9998	0.9991	1.0000
ID1	0.9852	0.9867	0.9882	0.9891	0.9903	0.9917	0.9916	0.9895	0.9918	0.9901	0.9926	0.9925	0.9927	0.9895	0.9941
ID2	0.9838	0.9854	0.9870	0.9881	0.9891	0.9908	0.9906	0.9885	0.9909	0.9891	0.9917	0.9915	0.9918	0.9884	0.9931
ID3	0.9912	0.9924	0.9934	0.9944	0.9948	0.9961	0.9958	0.9946	0.9962	0.9949	0.9966	0.9964	0.9968	0.9945	0.9974
ID4	0.9909	0.9922	0.9931	0.9935	0.9948	0.9956	0.9954	0.9938	0.9957	0.9945	0.9960	0.9963	0.9963	0.9939	0.9976
ID5	0.9870	0.9884	0.9898	0.9907	0.9917	0.9930	0.9930	0.9911	0.9932	0.9916	0.9940	0.9938	0.9939	0.9910	0.9951
ID6	0.9894	0.9908	0.9919	0.9925	0.9937	0.9947	0.9946	0.9928	0.9948	0.9935	0.9953	0.9954	0.9955	0.9929	0.9968
ID7	0.9985	0.9982	0.9976	0.9969	0.9967	0.9955	0.9958	0.9968	0.9956	0.9967	0.9950	0.9953	0.9949	0.9969	0.9939
ID8	0.9842	0.9857	0.9873	0.9884	0.9894	0.9909	0.9908	0.9887	0.9911	0.9893	0.9919	0.9917	0.9919	0.9887	0.9932
ID9	0.9634	0.9659	0.9682	0.9698	0.9717	0.9744	0.9740	0.9705	0.9746	0.9715	0.9759	0.9757	0.9762	0.9704	0.9788
ID10	0.9825	0.9842	0.9858	0.9868	0.9881	0.9897	0.9895	0.9873	0.9899	0.9879	0.9907	0.9907	0.9908	0.9872	0.9925
ID11	0.9794	0.9814	0.9830	0.9842	0.9855	0.9875	0.9871	0.9847	0.9876	0.9854	0.9884	0.9883	0.9888	0.9846	0.9904
ID12	0.9917	0.9929	0.9939	0.9947	0.9953	0.9964	0.9962	0.9950	0.9965	0.9953	0.9969	0.9968	0.9970	0.9949	0.9976
ID13	0.9789	0.9808	0.9825	0.9836	0.9850	0.9869	0.9867	0.9841	0.9870	0.9849	0.9880	0.9879	0.9881	0.9840	0.9900
ID14	0.9806	0.9825	0.9841	0.9852	0.9865	0.9884	0.9881	0.9857	0.9885	0.9864	0.9893	0.9892	0.9896	0.9856	0.9912
ID15	0.9478	0.9509	0.9535	0.9555	0.9576	0.9613	0.9605	0.9563	0.9613	0.9575	0.9628	0.9625	0.9634	0.9562	0.9664

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.9995	0.9997	0.9999	0.9999	0.9997	0.9995	0.9988	0.9996	0.9994	0.9992	0.9998	0.9988	0.9996	0.9995	0.9992
SP2	0.9998	0.9999	0.9999	0.9999	0.9999	0.9998	0.9992	0.9998	0.9997	0.9997	0.9999	0.9992	0.9998	0.9997	0.9994
SP3	0.9998	0.9999	0.9998	0.9999	0.9999	0.9996	0.9995	0.9999	0.9994	0.9995	0.9998	0.9995	0.9999	0.9994	0.9988
SP4	0.9999	0.9999	0.9997	0.9997	0.9999	0.9997	0.9997	0.9999	0.9996	0.9997	0.9998	0.9996	0.9999	0.9995	0.9989
SP5	0.9997	0.9997	0.9995	0.9997	0.9998	0.9993	0.9998	0.9999	0.9991	0.9995	0.9995	0.9998	0.9998	0.9991	0.9982
SP6	0.9996	0.9995	0.9989	0.9990	0.9996	0.9994	0.9999	0.9997	0.9991	0.9997	0.9992	0.9997	0.9996	0.9989	0.9981
SP7	0.9997	0.9995	0.9992	0.9994	0.9996	0.9991	0.9999	0.9997	0.9989	0.9993	0.9992	0.9999	0.9998	0.9988	0.9978
SP8	0.9999	0.9999	0.9996	0.9997	0.9999	0.9996	0.9998	0.9999	0.9994	0.9996	0.9997	0.9997	0.9999	0.9993	0.9987
SP9	0.9997	0.9995	0.9990	0.9992	0.9996	0.9993	0.9999	0.9997	0.9991	0.9996	0.9992	0.9999	0.9997	0.9989	0.9980
SP10	0.9999	0.9998	0.9995	0.9997	0.9999	0.9996	0.9999	0.9999	0.9994	0.9997	0.9996	0.9998	0.9999	0.9993	0.9985
SP11	0.9995	0.9992	0.9988	0.9990	0.9994	0.9989	0.9999	0.9995	0.9986	0.9991	0.9989	0.9999	0.9996	0.9984	0.9973
SP12	0.9994	0.9992	0.9988	0.9991	0.9994	0.9988	0.9998	0.9995	0.9985	0.9992	0.9989	0.9999	0.9995	0.9984	0.9972
SP13	0.9995	0.9993	0.9986	0.9988	0.9994	0.9991	0.9999	0.9995	0.9988	0.9995	0.9989	0.9998	0.9995	0.9986	0.9976
SP14	0.9999	0.9999	0.9997	0.9997	0.9999	0.9997	0.9998	0.9999	0.9995	0.9997	0.9997	0.9997	0.9999	0.9994	0.9987
SP15	0.9989	0.9986	0.9979	0.9982	0.9988	0.9982	0.9996	0.9990	0.9979	0.9988	0.9981	0.9997	0.9990	0.9976	0.9963

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.9998	0.9988	0.9983	0.9997	0.9993	0.9771	0.9996	0.9950	0.9998	0.9993	0.9987	0.9993	0.9995	0.9880
ID2	0.9998	1.0000	0.9986	0.9974	0.9996	0.9987	0.9751	0.9996	0.9955	0.9998	0.9994	0.9985	0.9992	0.9995	0.9889
ID3	0.9988	0.9986	1.0000	0.9987	0.9992	0.9991	0.9844	0.9985	0.9897	0.9980	0.9971	0.9998	0.9967	0.9976	0.9810
ID4	0.9983	0.9974	0.9987	1.0000	0.9984	0.9996	0.9856	0.9975	0.9891	0.9976	0.9965	0.9986	0.9964	0.9970	0.9799
ID5	0.9997	0.9996	0.9992	0.9984	1.0000	0.9993	0.9793	0.9996	0.9936	0.9995	0.9989	0.9991	0.9988	0.9991	0.9863
ID6	0.9993	0.9987	0.9991	0.9996	0.9993	1.0000	0.9832	0.9988	0.9914	0.9988	0.9979	0.9991	0.9979	0.9981	0.9830
ID7	0.9771	0.9751	0.9844	0.9856	0.9793	0.9832	1.0000	0.9759	0.9514	0.9739	0.9704	0.9849	0.9700	0.9717	0.9342
ID8	0.9996	0.9996	0.9985	0.9975	0.9996	0.9988	0.9759	1.0000	0.9951	0.9996	0.9993	0.9984	0.9992	0.9993	0.9886
ID9	0.9950	0.9955	0.9897	0.9891	0.9936	0.9914	0.9514	0.9951	1.0000	0.9964	0.9974	0.9894	0.9975	0.9969	0.9979
ID10	0.9998	0.9998	0.9980	0.9976	0.9995	0.9988	0.9739	0.9996	0.9964	1.0000	0.9997	0.9979	0.9997	0.9997	0.9901
ID11	0.9993	0.9994	0.9971	0.9965	0.9989	0.9979	0.9704	0.9993	0.9974	0.9997	1.0000	0.9969	0.9999	0.9998	0.9924
ID12	0.9987	0.9985	0.9998	0.9986	0.9991	0.9991	0.9849	0.9984	0.9894	0.9979	0.9969	1.0000	0.9965	0.9974	0.9803
ID13	0.9993	0.9992	0.9967	0.9964	0.9988	0.9979	0.9700	0.9992	0.9975	0.9997	0.9999	0.9965	1.0000	0.9997	0.9925
ID14	0.9995	0.9995	0.9976	0.9970	0.9991	0.9981	0.9717	0.9993	0.9969	0.9997	0.9998	0.9974	0.9997	1.0000	0.9914
ID15	0.9880	0.9889	0.9810	0.9799	0.9863	0.9830	0.9342	0.9886	0.9979	0.9901	0.9924	0.9803	0.9925	0.9914	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.9888	0.9878	0.9941	0.9934	0.9904	0.9923	0.9971	0.9880	0.9693	0.9865	0.9839	0.9945	0.9833	0.9849	0.9551
SP2	0.9878	0.9867	0.9934	0.9928	0.9895	0.9916	0.9976	0.9869	0.9677	0.9854	0.9827	0.9938	0.9821	0.9838	0.9532
SP3	0.9856	0.9844	0.9917	0.9912	0.9875	0.9898	0.9982	0.9847	0.9642	0.9830	0.9801	0.9922	0.9794	0.9812	0.9488
SP4	0.9866	0.9853	0.9922	0.9920	0.9883	0.9907	0.9982	0.9857	0.9657	0.9841	0.9811	0.9927	0.9806	0.9823	0.9505
SP5	0.9883	0.9872	0.9937	0.9934	0.9899	0.9921	0.9975	0.9874	0.9685	0.9860	0.9833	0.9941	0.9827	0.9844	0.9540
SP6	0.9870	0.9859	0.9930	0.9920	0.9887	0.9908	0.9975	0.9861	0.9665	0.9845	0.9819	0.9933	0.9811	0.9830	0.9520
SP7	0.9919	0.9911	0.9963	0.9956	0.9933	0.9948	0.9954	0.9912	0.9747	0.9900	0.9877	0.9966	0.9871	0.9886	0.9615
SP8	0.9889	0.9877	0.9940	0.9938	0.9904	0.9926	0.9973	0.9879	0.9695	0.9866	0.9840	0.9944	0.9834	0.9850	0.9551
SP9	0.9861	0.9851	0.9924	0.9915	0.9880	0.9901	0.9976	0.9853	0.9653	0.9836	0.9811	0.9927	0.9802	0.9822	0.9507
SP10	0.9886	0.9875	0.9940	0.9935	0.9901	0.9923	0.9971	0.9876	0.9691	0.9862	0.9838	0.9943	0.9831	0.9848	0.9551
SP11	0.9864	0.9852	0.9924	0.9918	0.9882	0.9905	0.9981	0.9855	0.9654	0.9839	0.9811	0.9928	0.9804	0.9823	0.9505
SP12	0.9922	0.9912	0.9962	0.9959	0.9935	0.9951	0.9955	0.9913	0.9751	0.9902	0.9879	0.9966	0.9875	0.9888	0.9619
SP13	0.9892	0.9881	0.9943	0.9937	0.9908	0.9926	0.9970	0.9884	0.9699	0.9869	0.9843	0.9947	0.9837	0.9854	0.9558
SP14	0.9852	0.9841	0.9917	0.9908	0.9872	0.9894	0.9979	0.9844	0.9638	0.9826	0.9800	0.9920	0.9791	0.9811	0.9489
SP15	0.9824	0.9811	0.9896	0.9885	0.9844	0.9868	0.9981	0.9814	0.9594	0.9794	0.9766	0.9898	0.9756	0.9779	0.9438

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.9999	0.9997	0.9997	0.9999	0.9998	0.9997	0.9999	0.9997	0.9998	0.9998	0.9996	0.9999	0.9997	0.9991
SP2	0.9999	1.0000	0.9998	0.9998	0.9999	0.9999	0.9995	0.9999	0.9998	0.9998	0.9999	0.9994	0.9999	0.9998	0.9993
SP3	0.9997	0.9998	1.0000	0.9999	0.9998	0.9997	0.9990	0.9997	0.9997	0.9995	0.9999	0.9989	0.9997	0.9997	0.9994
SP4	0.9997	0.9998	0.9999	1.0000	0.9998	0.9996	0.9992	0.9998	0.9995	0.9994	0.9998	0.9992	0.9997	0.9995	0.9991
SP5	0.9999	0.9999	0.9998	0.9998	1.0000	0.9998	0.9996	1.0000	0.9996	0.9998	0.9998	0.9995	0.9999	0.9996	0.9990
SP6	0.9998	0.9999	0.9997	0.9996	0.9998	1.0000	0.9993	0.9997	0.9999	0.9999	0.9999	0.9990	0.9997	0.9999	0.9996
SP7	0.9997	0.9995	0.9990	0.9992	0.9996	0.9993	1.0000	0.9997	0.9991	0.9995	0.9992	0.9999	0.9998	0.9989	0.9979
SP8	0.9999	0.9999	0.9997	0.9998	1.0000	0.9997	0.9997	1.0000	0.9996	0.9998	0.9998	0.9996	0.9999	0.9995	0.9989
SP9	0.9997	0.9998	0.9997	0.9995	0.9996	0.9999	0.9991	0.9996	1.0000	0.9998	0.9998	0.9988	0.9995	0.9999	0.9997
SP10	0.9998	0.9998	0.9995	0.9994	0.9998	0.9999	0.9995	0.9998	0.9998	1.0000	0.9997	0.9993	0.9997	0.9997	0.9992
SP11	0.9998	0.9999	0.9999	0.9998	0.9998	0.9999	0.9992	0.9998	0.9998	0.9997	1.0000	0.9991	0.9998	0.9998	0.9995
SP12	0.9996	0.9994	0.9989	0.9992	0.9995	0.9990	0.9999	0.9996	0.9988	0.9993	0.9991	1.0000	0.9997	0.9986	0.9976
SP13	0.9999	0.9999	0.9997	0.9997	0.9999	0.9997	0.9998	0.9999	0.9995	0.9997	0.9998	0.9997	1.0000	0.9995	0.9988
SP14	0.9997	0.9998	0.9997	0.9995	0.9996	0.9999	0.9989	0.9995	0.9999	0.9997	0.9998	0.9986	0.9995	1.0000	0.9998
SP15	0.9991	0.9993	0.9994	0.9991	0.9990	0.9996	0.9979	0.9989	0.9997	0.9992	0.9995	0.9976	0.9988	0.9998	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.5444	0.6165	0.4947	0.4228	0.4880	0.4815	0.3958	0.4361	0.3907	0.6277	0.4129	0.4332	0.5011	0.4089
EF2	0.5444	1.0000	0.5376	0.4811	0.3836	0.4848	0.4552	0.5204	0.4889	0.4501	0.5514	0.4357	0.4551	0.4001	0.4864
EF3	0.6165	0.5376	1.0000	0.4338	0.3773	0.4731	0.4392	0.4338	0.4605	0.4336	0.5747	0.4839	0.4455	0.4898	0.4818
EF4	0.4947	0.4311	0.4338	1.0000	0.4727	0.4934	0.4908	0.5178	0.5423	0.5006	0.6047	0.4850	0.5216	0.6058	0.5313
EF5	0.4228	0.3836	0.3773	0.4727	1.0000	0.4551	0.6602	0.4393	0.6323	0.5311	0.5123	0.5196	0.5340	0.6149	0.5178
EF6	0.4880	0.4848	0.4731	0.4934	0.4551	1.0000	0.4823	0.4832	0.5124	0.5553	0.5592	0.5148	0.5369	0.5156	0.4628
EF7	0.4815	0.4552	0.4392	0.4908	0.6602	0.4823	1.0000	0.5820	0.6060	0.5611	0.6326	0.5971	0.5541	0.5788	0.5906
EF8	0.3958	0.5204	0.4338	0.5178	0.4393	0.4832	0.5820	1.0000	0.5149	0.6064	0.5770	0.5265	0.5194	0.5135	0.5276
EF9	0.4361	0.4889	0.4605	0.5423	0.6323	0.5124	0.6060	0.5149	1.0000	0.5592	0.6076	0.5553	0.6885	0.6613	0.6366
EF10	0.3907	0.4501	0.4336	0.5006	0.5311	0.5553	0.5611	0.6064	0.5592	1.0000	0.5476	0.5339	0.6585	0.6192	0.5733
EF11	0.6277	0.5514	0.5747	0.6047	0.5123	0.5592	0.6326	0.5770	0.6076	0.5476	1.0000	0.5729	0.5731	0.6165	0.5501
EF12	0.4129	0.4357	0.4839	0.4850	0.5196	0.5148	0.5971	0.5265	0.5553	0.5339	0.5729	1.0000	0.5502	0.6280	0.5918
EF13	0.4332	0.4551	0.4455	0.5216	0.5340	0.5369	0.5541	0.5194	0.6885	0.6585	0.5731	0.5502	1.0000	0.5753	0.5862
EF14	0.5011	0.4001	0.4898	0.6058	0.6149	0.5156	0.5788	0.5135	0.6613	0.6192	0.6165	0.6280	0.5753	1.0000	0.5546
EF15	0.4089	0.4864	0.4818	0.5313	0.5178	0.4628	0.5906	0.5276	0.6366	0.5733	0.5501	0.5918	0.5862	0.5546	1.0000
ID1	0.4502	0.4365	0.3567	0.4924	0.3560	0.3717	0.4179	0.3639	0.3941	0.3455	0.5638	0.3038	0.3894	0.2963	0.3703
ID2	0.2784	0.3115	0.2643	0.4391	0.3653	0.3275	0.3882	0.3623	0.3996	0.3687	0.5105	0.3421	0.3122	0.4524	0.4092
ID3	0.2481	0.4451	0.2662	0.3578	0.3290	0.3205	0.2375	0.2648	0.3866	0.3492	0.3567	0.3351	0.3111	0.3489	0.3923
ID4	0.2832	0.3318	0.3608	0.4329	0.3049	0.3779	0.4058	0.2989	0.3776	0.3742	0.4829	0.4360	0.3469	0.3012	0.4910
ID5	0.2866	0.3159	0.3514	0.3164	0.4003	0.3571	0.4866	0.3110	0.5296	0.5115	0.5532	0.3920	0.3843	0.4334	0.4184
ID6	0.2964	0.4340	0.3637	0.4592	0.4576	0.4271	0.4474	0.3456	0.4832	0.4506	0.5061	0.4776	0.4030	0.3562	0.6197
ID7	0.3890	0.4553	0.4184	0.4601	0.3729	0.5365	0.4387	0.2893	0.4715	0.3788	0.5656	0.4795	0.4139	0.3980	0.4398
ID8	0.3651	0.3681	0.4666	0.5029	0.4051	0.3493	0.4227	0.3622	0.5536	0.4686	0.5296	0.3747	0.4810	0.4429	0.4983
ID9	0.4975	0.5054	0.4992	0.4665	0.3988	0.4299	0.3949	0.4300	0.5401	0.5015	0.5112	0.4803	0.5802	0.4680	0.4847
ID10	0.4291	0.5638	0.3818	0.4751	0.3753	0.5002	0.3935	0.3462	0.4696	0.4520	0.5232	0.4604	0.4294	0.3957	0.4630
ID11	0.3023	0.3509	0.4233	0.3696	0.3766	0.5155	0.4196	0.4033	0.5015	0.5242	0.4918	0.3871	0.4624	0.4462	0.4750
ID12	0.3463	0.3939	0.4539	0.3678	0.4324	0.3346	0.3854	0.3410	0.4720	0.4802	0.5117	0.3834	0.4470	0.3568	0.4209
ID13	0.4205	0.4554	0.5114	0.4270	0.2665	0.4339	0.3756	0.3555	0.3624	0.3945	0.4928	0.3979	0.3869	0.3437	0.3805
ID14	0.3715	0.4715	0.4041	0.3977	0.3625	0.5100	0.4530	0.3299	0.4892	0.4448	0.4281	0.4207	0.3431	0.5115	0.4143
ID15	0.3322	0.3729	0.4153	0.3358	0.2839	0.4410	0.3879	0.3493	0.3958	0.4340	0.4819	0.4157	0.3813	0.4265	0.4172

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.3743	0.3814	0.4221	0.4932	0.4069	0.4431	0.5261	0.4600	0.5675	0.5961	0.5272	0.5396	0.5447	0.5417	0.5642
SP2	0.5081	0.5878	0.5287	0.4646	0.5031	0.5266	0.5338	0.6101	0.5867	0.5807	0.5226	0.4325	0.5176	0.5567	0.5124
SP3	0.4278	0.4912	0.4989	0.5180	0.4075	0.4736	0.5425	0.4596	0.5152	0.5946	0.5815	0.5727	0.5659	0.6067	0.6407
SP4	0.5263	0.5208	0.6023	0.5237	0.5276	0.4686	0.6024	0.5004	0.7176	0.6890	0.6106	0.5306	0.6510	0.5928	0.5985
SP5	0.5006	0.4884	0.5654	0.5035	0.4170	0.5871	0.4352	0.5674	0.4760	0.6053	0.5817	0.4334	0.5792	0.5965	0.5828
SP6	0.4435	0.4265	0.4184	0.4074	0.3788	0.4612	0.4104	0.4927	0.4672	0.5381	0.5424	0.4275	0.4932	0.4349	0.4707
SP7	0.4042	0.4430	0.5020	0.5089	0.4454	0.4229	0.4626	0.5221	0.4588	0.6451	0.5975	0.5229	0.5262	0.6213	0.5846
SP8	0.3800	0.5146	0.4260	0.4702	0.4707	0.5413	0.4634	0.5376	0.5636	0.5684	0.5005	0.5296	0.5328	0.5277	0.5522
SP9	0.4734	0.3782	0.4288	0.3845	0.4556	0.4006	0.5337	0.4771	0.4895	0.5056	0.5199	0.3715	0.4836	0.5523	0.4804
SP10	0.4489	0.4735	0.5601	0.4651	0.4922	0.5918	0.4301	0.5523	0.5387	0.5662	0.5005	0.5716	0.6135	0.6325	0.4766
SP11	0.3302	0.5627	0.4717	0.5116	0.4206	0.6078	0.5377	0.4451	0.4936	0.6579	0.5242	0.5230	0.5258	0.5614	0.5145
SP12	0.3906	0.5079	0.4639	0.4060	0.5627	0.4266	0.5282	0.4662	0.5859	0.5285	0.4855	0.5118	0.5259	0.5471	0.4885
SP13	0.4126	0.5502	0.4329	0.3402	0.4560	0.4400	0.4271	0.4618	0.5142	0.5039	0.5130	0.4041	0.4164	0.4901	0.4620
SP14	0.4617	0.6009	0.4574	0.4271	0.3814	0.4567	0.4855	0.4177	0.5447	0.4459	0.5507	0.4389	0.4574	0.4491	0.5661
SP15	0.3941	0.4968	0.3475	0.4253	0.4342	0.4614	0.4405	0.3967	0.4958	0.4141	0.4307	0.3984	0.3722	0.3817	0.4501

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.4254	0.3986	0.4420	0.3864	0.4447	0.4488	0.4235	0.3958	0.6213	0.4850	0.4338	0.4179	0.4005	0.4406
ID2	0.4254	1.0000	0.4572	0.3499	0.3565	0.3814	0.4085	0.3516	0.3574	0.3917	0.3404	0.3768	0.2964	0.3730	0.3634
ID3	0.3986	0.4572	1.0000	0.5203	0.4507	0.4349	0.2999	0.4022	0.4363	0.4835	0.3864	0.4431	0.3308	0.4139	0.3773
ID4	0.4420	0.3499	0.5203	1.0000	0.4394	0.5440	0.5034	0.6022	0.4944	0.5427	0.5136	0.4863	0.5178	0.5151	0.4091
ID5	0.3864	0.3565	0.4507	0.4394	1.0000	0.3725	0.5067	0.5005	0.3657	0.3814	0.5374	0.3421	0.4007	0.4935	0.4125
ID6	0.4447	0.3814	0.4349	0.5440	0.3725	1.0000	0.5166	0.4923	0.3773	0.5497	0.4945	0.4465	0.4723	0.3536	0.4042
ID7	0.4488	0.4085	0.2999	0.5034	0.5067	0.5166	1.0000	0.4869	0.3574	0.5096	0.5828	0.3458	0.5164	0.5777	0.5582
ID8	0.4235	0.3516	0.4022	0.6022	0.5005	0.4923	0.4869	1.0000	0.4625	0.5540	0.5982	0.5372	0.5039	0.4778	0.4188
ID9	0.3958	0.3574	0.4363	0.4944	0.3657	0.3773	0.3574	0.4625	1.0000	0.5594	0.5162	0.4777	0.5181	0.4047	0.4372
ID10	0.6213	0.3917	0.4835	0.5427	0.3814	0.5497	0.5096	0.5540	0.5594	1.0000	0.5154	0.5059	0.5418	0.5925	0.4302
ID11	0.4850	0.3404	0.3864	0.5136	0.5374	0.4945	0.5828	0.5982	0.5162	0.5154	1.0000	0.4318	0.6033	0.5359	0.5137
ID12	0.4338	0.3768	0.4431	0.4863	0.3421	0.4465	0.3458	0.5372	0.4777	0.5059	0.4318	1.0000	0.3877	0.4167	0.3948
ID13	0.4179	0.2964	0.3308	0.5178	0.4007	0.4723	0.5164	0.5039	0.5181	0.5418	0.6033	0.3877	1.0000	0.4598	0.5678
ID14	0.4005	0.3730	0.4139	0.5151	0.4935	0.3536	0.5777	0.4778	0.4047	0.5925	0.5359	0.4167	0.4598	1.0000	0.5645
ID15	0.4406	0.3634	0.3773	0.4091	0.4125	0.4042	0.5582	0.4188	0.4372	0.4302	0.5137	0.3948	0.5678	0.5645	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.3495	0.3868	0.3611	0.3733	0.4483	0.3549	0.4349	0.4416	0.4770	0.3737	0.3959	0.4148	0.4343	0.3650	0.4021
SP2	0.3036	0.2707	0.3046	0.3320	0.2951	0.4051	0.3143	0.3155	0.4321	0.3644	0.4062	0.4247	0.4092	0.3309	0.3801
SP3	0.2866	0.3117	0.3228	0.3846	0.3548	0.4529	0.3451	0.3647	0.3766	0.3901	0.4245	0.4008	0.3684	0.3675	0.4099
SP4	0.3439	0.3375	0.2266	0.4188	0.4148	0.4630	0.3086	0.4200	0.4663	0.4034	0.4571	0.3913	0.4315	0.4027	0.4122
SP5	0.3920	0.3924	0.3858	0.3464	0.3856	0.4262	0.4207	0.3972	0.5388	0.4286	0.5710	0.3918	0.5229	0.5009	0.4889
SP6	0.3581	0.3064	0.3408	0.3965	0.3632	0.3498	0.3839	0.5089	0.6014	0.3914	0.4473	0.4010	0.4227	0.3751	0.3166
SP7	0.3522	0.3777	0.3666	0.3312	0.3621	0.4394	0.3036	0.4342	0.3731	0.3548	0.3755	0.4375	0.3176	0.3724	0.3936
SP8	0.3156	0.2548	0.3983	0.4823	0.4859	0.4961	0.3661	0.4355	0.5196	0.4284	0.5073	0.3385	0.3983	0.4020	0.3943
SP9	0.3971	0.3504	0.4040	0.3831	0.4364	0.4572	0.3693	0.4399	0.4862	0.4272	0.5139	0.3734	0.4242	0.4557	0.4085
SP10	0.3481	0.3299	0.3842	0.3694	0.4227	0.4813	0.5096	0.4425	0.5720	0.4358	0.5476	0.3514	0.4423	0.4830	0.4535
SP11	0.3179	0.2747	0.3603	0.3838	0.4060	0.4365	0.4559	0.3578	0.3497	0.3823	0.4527	0.3332	0.3552	0.4544	0.3929
SP12	0.3095	0.2889	0.2633	0.2726	0.3947	0.4210	0.4010	0.3562	0.3181	0.3484	0.3619	0.4083	0.3134	0.3834	0.3683
SP13	0.2422	0.3358	0.3285	0.3296	0.5044	0.4375	0.4552	0.4489	0.3339	0.3910	0.4647	0.4969	0.3766	0.4535	0.3769
SP14	0.4338	0.3893	0.3732	0.3443	0.3695	0.5139	0.4990	0.3922	0.4502	0.4864	0.4046	0.3939	0.4567	0.4329	0.4384
SP15	0.4010	0.2671	0.3370	0.3193	0.3526	0.3329	0.4305	0.3221	0.3021	0.4232	0.3368	0.3575	0.3598	0.4531	0.3297

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.4923	0.5471	0.5637	0.5529	0.5760	0.5298	0.4788	0.5875	0.5329	0.4910	0.4233	0.5003	0.5566	0.4910
SP2	0.4923	1.0000	0.5487	0.5788	0.6120	0.5322	0.4882	0.6032	0.4976	0.6634	0.5339	0.5464	0.5317	0.5812	0.4539
SP3	0.5471	0.5487	1.0000	0.6623	0.5921	0.4356	0.6122	0.5627	0.5285	0.5265	0.5659	0.4965	0.4632	0.5798	0.3487
SP4	0.5637	0.5788	0.6623	1.0000	0.6924	0.5706	0.5180	0.5617	0.5718	0.5403	0.5670	0.5010	0.5196	0.6037	0.4080
SP5	0.5529	0.6120	0.5921	0.6924	1.0000	0.5601	0.6683	0.5517	0.4997	0.6120	0.5789	0.4268	0.4630	0.5153	0.4581
SP6	0.5760	0.5322	0.4356	0.5706	0.5601	1.0000	0.6099	0.5535	0.4829	0.6069	0.5310	0.3513	0.4636	0.4785	0.5019
SP7	0.5298	0.4882	0.6122	0.5180	0.6683	0.6099	1.0000	0.5211	0.4849	0.5932	0.5199	0.4803	0.5166	0.5143	0.3765
SP8	0.4788	0.6032	0.5627	0.5617	0.5517	0.5535	0.5211	1.0000	0.4520	0.6677	0.6642	0.5783	0.6220	0.4697	0.4599
SP9	0.5875	0.4976	0.5285	0.5718	0.4997	0.4829	0.4849	0.4520	1.0000	0.5278	0.5308	0.5117	0.5015	0.5483	0.4886
SP10	0.5329	0.6634	0.5265	0.5403	0.6120	0.6069	0.5932	0.6677	0.5278	1.0000	0.7241	0.6194	0.5289	0.5156	0.4533
SP11	0.4910	0.5339	0.5659	0.5670	0.5789	0.5310	0.5199	0.6642	0.5308	0.7241	1.0000	0.5208	0.5918	0.5165	0.3831
SP12	0.4233	0.5464	0.4965	0.5010	0.4268	0.3513	0.4803	0.5783	0.5117	0.6194	0.5208	1.0000	0.6361	0.5057	0.4430
SP13	0.5003	0.5317	0.4632	0.5196	0.4630	0.4636	0.5166	0.6220	0.5015	0.5289	0.5918	0.6361	1.0000	0.5413	0.5165
SP14	0.5566	0.5812	0.5798	0.6037	0.5153	0.4785	0.5143	0.4697	0.5483	0.5156	0.5165	0.5057	0.5413	1.0000	0.6157
SP15	0.4910	0.4539	0.3487	0.4080	0.4581	0.5019	0.3765	0.4599	0.4886	0.4533	0.3831	0.4430	0.5165	0.6157	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.9241	0.8805	0.8856	0.7742	0.8295	0.7779	0.8095	0.7780	0.8430	0.8106	0.7388	0.8043	0.7509	0.8259
EF2	0.9241	1.0000	0.8566	0.8838	0.7696	0.8767	0.7642	0.8021	0.7788	0.8397	0.7945	0.7325	0.8031	0.7433	0.8667
EF3	0.8805	0.8566	1.0000	0.9172	0.8655	0.7982	0.8628	0.9034	0.8655	0.9328	0.8959	0.8224	0.8934	0.8366	0.7880
EF4	0.8856	0.8838	0.9172	1.0000	0.8467	0.8407	0.8400	0.8753	0.8528	0.9237	0.8717	0.7986	0.8735	0.8271	0.8318
EF5	0.7742	0.7696	0.8655	0.8467	1.0000	0.7539	0.9642	0.9326	0.9281	0.8872	0.9060	0.9225	0.8735	0.9348	0.7676
EF6	0.8295	0.8767	0.7982	0.8407	0.7539	1.0000	0.7508	0.7712	0.7852	0.8258	0.7811	0.7248	0.8220	0.7260	0.8902
EF7	0.7779	0.7642	0.8628	0.8400	0.9642	0.7508	1.0000	0.9283	0.9431	0.8756	0.9284	0.9333	0.8839	0.9224	0.7764
EF8	0.8095	0.8021	0.9034	0.8753	0.9326	0.7712	0.9283	1.0000	0.9317	0.9060	0.9172	0.8829	0.8761	0.9040	0.7692
EF9	0.7780	0.7788	0.8655	0.8528	0.9281	0.7852	0.9431	0.9317	1.0000	0.8903	0.9385	0.9094	0.9246	0.8939	0.8037
EF10	0.8430	0.8397	0.9328	0.9237	0.8872	0.8258	0.8756	0.9060	0.8903	1.0000	0.9082	0.8399	0.9191	0.8574	0.8245
EF11	0.8106	0.7945	0.8959	0.8717	0.9060	0.7811	0.9284	0.9172	0.9385	0.9082	1.0000	0.9004	0.9262	0.8750	0.8146
EF12	0.7388	0.7325	0.8224	0.7986	0.9225	0.7248	0.9333	0.8829	0.9094	0.8399	0.9004	1.0000	0.8624	0.9310	0.7583
EF13	0.8043	0.8031	0.8934	0.8735	0.8735	0.8220	0.8839	0.8761	0.9246	0.9191	0.9262	0.8624	1.0000	0.8363	0.8397
EF14	0.7509	0.7433	0.8366	0.8271	0.9348	0.7260	0.9224	0.9040	0.8939	0.8574	0.8750	0.9310	0.8363	1.0000	0.7334
EF15	0.8259	0.8667	0.7880	0.8318	0.7676	0.8902	0.7764	0.7692	0.8037	0.8245	0.8146	0.7583	0.8397	0.7334	1.0000
ID1	0.4927	0.5194	0.4755	0.5015	0.4661	0.5722	0.4788	0.4644	0.4929	0.4940	0.5080	0.4809	0.5199	0.4405	0.5821
ID2	0.5360	0.5586	0.5119	0.5454	0.5002	0.6163	0.5101	0.5025	0.5270	0.5344	0.5418	0.5061	0.5537	0.4857	0.6204
ID3	0.6371	0.6713	0.6064	0.6472	0.5845	0.7340	0.5961	0.5910	0.6223	0.6276	0.6351	0.5934	0.6551	0.5637	0.7336
ID4	0.4976	0.5228	0.4870	0.5165	0.4844	0.5859	0.4843	0.4785	0.4966	0.5079	0.5083	0.4732	0.5206	0.4596	0.6070
ID5	0.6070	0.6336	0.5805	0.6056	0.5603	0.6895	0.5768	0.5608	0.5890	0.6026	0.6090	0.5670	0.6162	0.5364	0.6980
ID6	0.4867	0.5120	0.4754	0.5009	0.4770	0.5725	0.4807	0.4676	0.4961	0.4979	0.5029	0.4706	0.5214	0.4484	0.6074
ID7	0.4888	0.5022	0.4492	0.4558	0.4080	0.5000	0.4025	0.4156	0.4049	0.4341	0.4166	0.3920	0.4222	0.3843	0.4774
ID8	0.3844	0.4028	0.3840	0.4079	0.3849	0.4637	0.3830	0.3823	0.3949	0.4047	0.4028	0.3665	0.4128	0.3698	0.4699
ID9	0.4116	0.4356	0.3966	0.4152	0.3875	0.4792	0.3934	0.3832	0.4147	0.4111	0.4183	0.3985	0.4370	0.3689	0.4848
ID10	0.4233	0.4503	0.4148	0.4369	0.4139	0.5045	0.4260	0.4071	0.4419	0.4352	0.4524	0.4199	0.4655	0.3920	0.5180
ID11	0.4646	0.4977	0.4509	0.4759	0.4475	0.5506	0.4551	0.4446	0.4722	0.4772	0.4774	0.4559	0.4972	0.4240	0.5589
ID12	0.5712	0.6008	0.5540	0.5847	0.5347	0.6585	0.5519	0.5424	0.5711	0.5795	0.5841	0.5383	0.6005	0.5173	0.6757
ID13	0.3472	0.3708	0.3497	0.3629	0.3525	0.4263	0.3506	0.3471	0.3617	0.3695	0.3681	0.3417	0.3799	0.3329	0.4300
ID14	0.3905	0.4204	0.3876	0.4061	0.3856	0.4707	0.4032	0.3820	0.4133	0.4089	0.4180	0.3889	0.4321	0.3686	0.4864
ID15	0.2972	0.3260	0.2974	0.3133	0.2962	0.3663	0.3081	0.2954	0.3229	0.3209	0.3257	0.3147	0.3410	0.2856	0.3789

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.8678	0.9088	0.8240	0.8645	0.7549	0.9186	0.7544	0.7799	0.7668	0.8280	0.7825	0.7169	0.7887	0.7344	0.8775
SP2	0.8876	0.9322	0.8354	0.8586	0.7468	0.9138	0.7476	0.7843	0.7579	0.8204	0.7693	0.7071	0.7805	0.7269	0.8624
SP3	0.8875	0.8614	0.9513	0.9003	0.8514	0.7734	0.8523	0.8857	0.8570	0.9206	0.8843	0.8131	0.8837	0.8300	0.7855
SP4	0.9080	0.8839	0.9390	0.9263	0.8386	0.8004	0.8355	0.8652	0.8406	0.9166	0.8646	0.7960	0.8664	0.8094	0.7996
SP5	0.9041	0.9013	0.9143	0.9477	0.8316	0.8480	0.8235	0.8572	0.8338	0.9155	0.8544	0.7840	0.8625	0.8080	0.8438
SP6	0.8840	0.9226	0.8188	0.8478	0.7385	0.9064	0.7367	0.7713	0.7434	0.8107	0.7674	0.7011	0.7758	0.7176	0.8536
SP7	0.7580	0.7972	0.7366	0.7746	0.6826	0.8479	0.6833	0.7013	0.6969	0.7578	0.7164	0.6569	0.7221	0.6652	0.8010
SP8	0.9094	0.9158	0.8985	0.9399	0.8276	0.8654	0.8137	0.8485	0.8306	0.9012	0.8453	0.7818	0.8575	0.8004	0.8554
SP9	0.8400	0.8262	0.9142	0.8805	0.8691	0.7732	0.8706	0.8925	0.8778	0.9078	0.9063	0.8271	0.8904	0.8410	0.7707
SP10	0.8423	0.8933	0.8064	0.8355	0.7381	0.9306	0.7246	0.7546	0.7547	0.8074	0.7594	0.7077	0.7907	0.7132	0.8592
SP11	0.8998	0.9447	0.8314	0.8628	0.7508	0.8934	0.7511	0.7819	0.7588	0.8232	0.7746	0.7123	0.7870	0.7305	0.8650
SP12	0.8866	0.8790	0.8707	0.9077	0.8376	0.8688	0.8374	0.8469	0.8529	0.9022	0.8720	0.8094	0.8811	0.8021	0.8835
SP13	0.9121	0.9402	0.8740	0.9052	0.7927	0.8814	0.7880	0.8299	0.7932	0.8672	0.8194	0.7498	0.8182	0.7736	0.8757
SP14	0.8538	0.8794	0.7734	0.8053	0.7047	0.8734	0.7102	0.7257	0.7162	0.7688	0.7361	0.6724	0.7401	0.6845	0.8247
SP15	0.7809	0.8051	0.7118	0.7397	0.6471	0.8042	0.6474	0.6750	0.6540	0.7038	0.6726	0.6166	0.6784	0.6241	0.7562

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.8488	0.7547	0.8925	0.7671	0.9141	0.7077	0.7382	0.7966	0.8406	0.9168	0.8297	0.6855	0.7782	0.6281
ID2	0.8488	1.0000	0.8158	0.8000	0.8555	0.8072	0.6195	0.6503	0.7477	0.7321	0.8471	0.8925	0.5956	0.6805	0.5942
ID3	0.7547	0.8158	1.0000	0.7310	0.9047	0.7270	0.5609	0.5772	0.6279	0.6418	0.7253	0.8303	0.5251	0.6066	0.5060
ID4	0.8925	0.8000	0.7310	1.0000	0.7240	0.9239	0.7078	0.7345	0.7370	0.7868	0.8482	0.8272	0.6689	0.7408	0.5623
ID5	0.7671	0.8555	0.9047	0.7240	1.0000	0.7258	0.5646	0.5904	0.6723	0.6536	0.7664	0.8003	0.5410	0.6129	0.5536
ID6	0.9141	0.8072	0.7270	0.9239	0.7258	1.0000	0.7364	0.7545	0.7686	0.8249	0.8743	0.8265	0.6982	0.7681	0.5967
ID7	0.7077	0.6195	0.5609	0.7078	0.5646	0.7364	1.0000	0.6752	0.7162	0.7455	0.6912	0.6437	0.6151	0.6934	0.5402
ID8	0.7382	0.6503	0.5772	0.7345	0.5904	0.7545	0.6752	1.0000	0.7258	0.8551	0.7125	0.6582	0.8596	0.8848	0.7310
ID9	0.7966	0.7477	0.6279	0.7370	0.6723	0.7686	0.7162	0.7258	1.0000	0.8304	0.8305	0.6842	0.6927	0.7778	0.7337
ID10	0.8406	0.7321	0.6418	0.7868	0.6536	0.8249	0.7455	0.8551	0.8304	1.0000	0.8058	0.7363	0.7963	0.9083	0.7023
ID11	0.9168	0.8471	0.7253	0.8482	0.7664	0.8743	0.6912	0.7125	0.8305	0.8058	1.0000	0.7853	0.6901	0.7701	0.6829
ID12	0.8297	0.8925	0.8303	0.8272	0.8003	0.8265	0.6437	0.6582	0.6842	0.7363	0.7853	1.0000	0.5943	0.6910	0.5346
ID13	0.6855	0.5956	0.5251	0.6689	0.5410	0.6982	0.6151	0.8596	0.6927	0.7963	0.6901	0.5943	1.0000	0.8345	0.8138
ID14	0.7782	0.6805	0.6066	0.7408	0.6129	0.7681	0.6934	0.8848	0.7778	0.9083	0.7701	0.6910	0.8345	1.0000	0.7361
ID15	0.6281	0.5942	0.5060	0.5623	0.5536	0.5967	0.5402	0.7310	0.7337	0.7023	0.6829	0.5346	0.8138	0.7361	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.5423	0.5939	0.7104	0.5540	0.6728	0.5411	0.5038	0.4319	0.4495	0.4680	0.5185	0.6373	0.3894	0.4324	0.3410
SP2	0.5346	0.5842	0.7015	0.5438	0.6615	0.5342	0.5133	0.4216	0.4442	0.4621	0.5128	0.6289	0.3831	0.4304	0.3366
SP3	0.4562	0.5029	0.5951	0.4664	0.5703	0.4597	0.4468	0.3641	0.3785	0.3931	0.4416	0.5420	0.3244	0.3681	0.2895
SP4	0.4772	0.5205	0.6108	0.4853	0.5902	0.4798	0.4611	0.3782	0.3996	0.4138	0.4554	0.5538	0.3446	0.3848	0.2967
SP5	0.5013	0.5431	0.6469	0.5120	0.6145	0.5033	0.4640	0.4011	0.4194	0.4367	0.4876	0.5842	0.3677	0.4128	0.3225
SP6	0.5323	0.5830	0.6974	0.5416	0.6572	0.5289	0.5096	0.4219	0.4465	0.4581	0.5081	0.6221	0.3782	0.4240	0.3264
SP7	0.6207	0.6789	0.8055	0.6375	0.7664	0.6249	0.5587	0.5051	0.5137	0.5383	0.5984	0.7351	0.4524	0.5064	0.3961
SP8	0.5124	0.5506	0.6585	0.5233	0.6275	0.5142	0.4725	0.4093	0.4290	0.4467	0.4977	0.5907	0.3763	0.4158	0.3290
SP9	0.4588	0.4984	0.6003	0.4712	0.5683	0.4595	0.4248	0.3666	0.3808	0.3961	0.4407	0.5331	0.3310	0.3719	0.2881
SP10	0.5554	0.6020	0.7175	0.5647	0.6774	0.5569	0.5139	0.4407	0.4699	0.4839	0.5345	0.6390	0.4018	0.4471	0.3490
SP11	0.5230	0.5712	0.6892	0.5297	0.6491	0.5191	0.5089	0.4108	0.4324	0.4493	0.5063	0.6114	0.3700	0.4212	0.3297
SP12	0.5394	0.5758	0.6745	0.5537	0.6502	0.5433	0.4633	0.4388	0.4433	0.4751	0.5120	0.6192	0.4092	0.4451	0.3465
SP13	0.5189	0.5704	0.6735	0.5320	0.6460	0.5213	0.4860	0.4184	0.4309	0.4505	0.5011	0.6118	0.3792	0.4258	0.3293
SP14	0.5440	0.5975	0.7142	0.5511	0.6824	0.5418	0.5289	0.4239	0.4531	0.4672	0.5187	0.6361	0.3814	0.4327	0.3384
SP15	0.5689	0.6214	0.7504	0.5697	0.7135	0.5578	0.5688	0.4317	0.4676	0.4792	0.5405	0.6628	0.3884	0.4444	0.3436

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.9608	0.8234	0.8430	0.8802	0.9535	0.8492	0.8916	0.8176	0.9339	0.9363	0.8649	0.9201	0.9087	0.8319
SP2	0.9608	1.0000	0.8340	0.8606	0.8783	0.9593	0.8358	0.8846	0.8071	0.9325	0.9535	0.8545	0.9133	0.9088	0.8367
SP3	0.8234	0.8340	1.0000	0.9491	0.8983	0.8228	0.7238	0.8807	0.9215	0.7889	0.8417	0.8572	0.8586	0.7945	0.7230
SP4	0.8430	0.8606	0.9491	1.0000	0.9292	0.8459	0.7395	0.9058	0.8991	0.8184	0.8644	0.8817	0.8791	0.8048	0.7352
SP5	0.8802	0.8783	0.8983	0.9292	1.0000	0.8677	0.7850	0.9604	0.8839	0.8593	0.8796	0.9194	0.9214	0.8215	0.7531
SP6	0.9535	0.9593	0.8228	0.8459	0.8677	1.0000	0.8313	0.8775	0.8200	0.9423	0.9451	0.8430	0.9062	0.9247	0.8478
SP7	0.8492	0.8358	0.7238	0.7395	0.7850	0.8313	1.0000	0.7980	0.7167	0.8526	0.8201	0.7905	0.8204	0.8475	0.8790
SP8	0.8916	0.8846	0.8807	0.9058	0.9604	0.8775	0.7980	1.0000	0.8672	0.8754	0.8910	0.9424	0.9418	0.8286	0.7613
SP9	0.8176	0.8071	0.9215	0.8991	0.8839	0.8200	0.7167	0.8672	1.0000	0.8053	0.8171	0.8517	0.8416	0.7874	0.7209
SP10	0.9339	0.9325	0.7889	0.8184	0.8593	0.9423	0.8526	0.8754	0.8053	1.0000	0.9121	0.8493	0.8866	0.9122	0.8348
SP11	0.9363	0.9535	0.8417	0.8644	0.8796	0.9451	0.8201	0.8910	0.8171	0.9121	1.0000	0.8625	0.9210	0.8998	0.8273
SP12	0.8649	0.8545	0.8572	0.8817	0.9194	0.8430	0.7905	0.9424	0.8517	0.8493	0.8625	1.0000	0.9115	0.8101	0.7446
SP13	0.9201	0.9133	0.8586	0.8791	0.9214	0.9062	0.8204	0.9418	0.8416	0.8866	0.9210	0.9115	1.0000	0.8605	0.7948
SP14	0.9087	0.9088	0.7945	0.8048	0.8215	0.9247	0.8475	0.8286	0.7874	0.9122	0.8998	0.8101	0.8605	1.0000	0.8932
SP15	0.8319	0.8367	0.7230	0.7352	0.7531	0.8478	0.8790	0.7613	0.7209	0.8348	0.8273	0.7446	0.7948	0.8932	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.6571	0.7167	0.6160	0.5850	0.6083	0.5749	0.6167	0.5412	0.5919	0.6323	0.5187	0.5986	0.5840	0.5334
EF2	0.6571	1.0000	0.6145	0.5772	0.5131	0.5662	0.5615	0.5704	0.5722	0.6214	0.5846	0.5127	0.5237	0.5110	0.6628
EF3	0.7167	0.6145	1.0000	0.5659	0.5833	0.5553	0.6058	0.6513	0.6077	0.6996	0.6676	0.5825	0.6700	0.6548	0.5789
EF4	0.6160	0.5772	0.5659	1.0000	0.5875	0.5662	0.6048	0.6089	0.6481	0.7064	0.6618	0.5794	0.7063	0.6583	0.6239
EF5	0.5850	0.5131	0.5833	0.5875	1.0000	0.5183	0.8264	0.6632	0.7955	0.6920	0.7008	0.7564	0.6836	0.7985	0.5870
EF6	0.6083	0.5662	0.5553	0.5662	0.5183	1.0000	0.5669	0.5656	0.5608	0.7267	0.6190	0.5508	0.6255	0.5747	0.6633
EF7	0.5749	0.5615	0.6058	0.6048	0.8264	0.5669	1.0000	0.7669	0.7922	0.7726	0.8424	0.7869	0.6770	0.7718	0.6122
EF8	0.6167	0.5704	0.6513	0.6089	0.6632	0.5656	0.7669	1.0000	0.6887	0.7518	0.7154	0.6575	0.6927	0.7433	0.5608
EF9	0.5412	0.5722	0.6077	0.6481	0.7955	0.5608	0.7922	0.6887	1.0000	0.7506	0.7125	0.7311	0.7869	0.7844	0.6955
EF10	0.5919	0.6214	0.6996	0.7064	0.6920	0.7267	0.7726	0.7518	0.7506	1.0000	0.7926	0.7753	0.8234	0.7888	0.7156
EF11	0.6323	0.5846	0.6676	0.6618	0.7008	0.6190	0.8424	0.7154	0.7125	0.7926	1.0000	0.7203	0.7083	0.6934	0.6401
EF12	0.5187	0.5127	0.5825	0.5794	0.7564	0.5508	0.7869	0.6575	0.7311	0.7753	0.7203	1.0000	0.7007	0.8193	0.6296
EF13	0.5986	0.5237	0.6700	0.7063	0.6836	0.6255	0.6770	0.6927	0.7869	0.8234	0.7083	0.7007	1.0000	0.7454	0.6684
EF14	0.5840	0.5110	0.6548	0.6583	0.7985	0.5747	0.7718	0.7433	0.7844	0.7888	0.6934	0.8193	0.7454	1.0000	0.6327
EF15	0.5334	0.6628	0.5789	0.6239	0.5870	0.6633	0.6122	0.5608	0.6955	0.7156	0.6401	0.6296	0.6684	0.6327	1.0000
ID1	0.3112	0.3041	0.2560	0.3104	0.2729	0.2931	0.2736	0.2688	0.2582	0.2643	0.3202	0.2348	0.2933	0.2471	0.3043
ID2	0.3082	0.3507	0.2997	0.3594	0.2908	0.3727	0.3130	0.3141	0.3234	0.3563	0.3612	0.2924	0.3376	0.3389	0.4046
ID3	0.3521	0.4421	0.3731	0.4161	0.3849	0.4296	0.3265	0.3577	0.4296	0.4379	0.3590	0.3864	0.4535	0.4125	0.5669
ID4	0.2893	0.3296	0.3321	0.3406	0.3264	0.4076	0.3401	0.3005	0.3487	0.4233	0.3787	0.3549	0.4141	0.3397	0.4955
ID5	0.3701	0.3888	0.4146	0.3903	0.3947	0.4701	0.4230	0.3420	0.4581	0.4716	0.4226	0.4437	0.4548	0.4145	0.5050
ID6	0.2799	0.3215	0.3015	0.3301	0.3217	0.3728	0.3168	0.2688	0.3270	0.3541	0.3353	0.3347	0.3434	0.2920	0.4490
ID7	0.3123	0.3219	0.3156	0.2848	0.2615	0.3590	0.2717	0.2424	0.2733	0.3176	0.2841	0.2677	0.2853	0.2759	0.3183
ID8	0.2428	0.2358	0.2658	0.2913	0.2628	0.2827	0.2736	0.2616	0.3009	0.3105	0.2714	0.2642	0.3387	0.2796	0.3524
ID9	0.2892	0.2614	0.2818	0.2633	0.2712	0.3235	0.2686	0.2693	0.3035	0.3230	0.2882	0.2751	0.3680	0.2859	0.3495
ID10	0.2581	0.3173	0.2568	0.2816	0.2728	0.3210	0.2556	0.2284	0.2848	0.3028	0.2954	0.2921	0.2993	0.2672	0.3747
ID11	0.2833	0.3054	0.3221	0.3067	0.2746	0.4255	0.3135	0.3145	0.3463	0.3942	0.3508	0.3172	0.4144	0.3276	0.4281
ID12	0.3400	0.3872	0.3865	0.3686	0.3921	0.4097	0.3479	0.3229	0.4097	0.4192	0.3972	0.3436	0.4329	0.3449	0.4786
ID13	0.2193	0.2170	0.2421	0.2247	0.1891	0.2808	0.2171	0.2192	0.2239	0.2492	0.2481	0.1987	0.2728	0.2193	0.2639
ID14	0.2364	0.2974	0.2584	0.2417	0.2163	0.3214	0.2400	0.2312	0.2657	0.2853	0.2544	0.2352	0.2770	0.2697	0.3317
ID15	0.1667	0.1852	0.1983	0.1880	0.1683	0.2498	0.1849	0.1801	0.2081	0.2372	0.2127	0.1915	0.2355	0.2077	0.2418

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.5992	0.5857	0.6132	0.6202	0.5536	0.7349	0.5740	0.6128	0.6501	0.7399	0.5947	0.5797	0.7154	0.6855	0.6947
SP2	0.6927	0.7204	0.6563	0.5724	0.5431	0.6853	0.5649	0.6504	0.6064	0.6955	0.5809	0.5380	0.6690	0.6113	0.6789
SP3	0.6551	0.6317	0.7522	0.6850	0.6244	0.5843	0.6114	0.6538	0.6521	0.8227	0.6720	0.6574	0.8015	0.7378	0.6219
SP4	0.6380	0.6187	0.7166	0.5422	0.5451	0.5002	0.5706	0.6080	0.5740	0.6766	0.5956	0.5117	0.6840	0.5868	0.5392
SP5	0.6486	0.6070	0.6614	0.6634	0.5261	0.6922	0.5764	0.6522	0.5837	0.7540	0.6961	0.5534	0.6790	0.6596	0.6815
SP6	0.5756	0.6017	0.5396	0.5773	0.5458	0.6503	0.5329	0.5740	0.5694	0.6924	0.5868	0.5112	0.6700	0.5772	0.6794
SP7	0.5732	0.5254	0.5612	0.5336	0.5119	0.6166	0.4707	0.5303	0.4801	0.5930	0.5264	0.4855	0.5674	0.5745	0.6136
SP8	0.6063	0.6487	0.6055	0.6905	0.6552	0.7392	0.6642	0.6411	0.7120	0.8472	0.6539	0.6723	0.7457	0.6836	0.7212
SP9	0.5296	0.5564	0.6613	0.5811	0.6208	0.5681	0.7139	0.6403	0.6847	0.7476	0.7385	0.5839	0.6630	0.6865	0.6225
SP10	0.6177	0.6141	0.6311	0.5968	0.5997	0.8143	0.5767	0.5869	0.6315	0.7428	0.6018	0.6228	0.7047	0.6537	0.7076
SP11	0.5487	0.7085	0.6334	0.5943	0.4948	0.7310	0.5508	0.5149	0.5227	0.7158	0.5691	0.5265	0.5809	0.5645	0.6625
SP12	0.6333	0.6641	0.7087	0.5920	0.6701	0.5985	0.6189	0.5646	0.6675	0.7102	0.6104	0.6027	0.6967	0.6238	0.6442
SP13	0.5727	0.7154	0.6754	0.5200	0.5686	0.6515	0.5533	0.5211	0.5907	0.6865	0.5784	0.5311	0.5764	0.5718	0.6434
SP14	0.5758	0.7456	0.5977	0.5312	0.4749	0.6456	0.4684	0.5232	0.5638	0.6086	0.5485	0.4763	0.5887	0.5357	0.6732
SP15	0.4295	0.5992	0.3993	0.4707	0.3912	0.5050	0.3826	0.4387	0.4162	0.4536	0.3784	0.3699	0.3971	0.4209	0.5096

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.5894	0.5549	0.5263	0.4354	0.5332	0.4644	0.4777	0.5310	0.6134	0.5699	0.5022	0.4436	0.4807	0.3905
ID2	0.5894	1.0000	0.6345	0.5073	0.5265	0.5523	0.4373	0.4155	0.4914	0.5256	0.5647	0.6248	0.3805	0.4915	0.4266
ID3	0.5549	0.6345	1.0000	0.5623	0.6357	0.5251	0.3856	0.4244	0.4757	0.5204	0.5097	0.6555	0.3243	0.4638	0.3555
ID4	0.5263	0.5073	0.5623	1.0000	0.5516	0.7211	0.5356	0.6215	0.6012	0.6370	0.7270	0.6541	0.4974	0.5318	0.4017
ID5	0.4354	0.5265	0.6357	0.5516	1.0000	0.4839	0.4840	0.4947	0.5042	0.4902	0.6131	0.5856	0.3948	0.4969	0.4152
ID6	0.5332	0.5523	0.5251	0.7211	0.4839	1.0000	0.5198	0.5659	0.5051	0.6768	0.6277	0.6612	0.4848	0.4694	0.3672
ID7	0.4644	0.4373	0.3856	0.5356	0.4840	0.5198	1.0000	0.5275	0.4852	0.5538	0.5530	0.4649	0.4805	0.6501	0.4322
ID8	0.4777	0.4155	0.4244	0.6215	0.4947	0.5659	0.5275	1.0000	0.6158	0.6702	0.5970	0.5023	0.7079	0.5985	0.4939
ID9	0.5310	0.4914	0.4757	0.6012	0.5042	0.5051	0.4852	0.6158	1.0000	0.6228	0.6690	0.4993	0.5458	0.4949	0.5095
ID10	0.6134	0.5256	0.5204	0.6370	0.4902	0.6768	0.5538	0.6702	0.6228	1.0000	0.6044	0.5747	0.5811	0.6873	0.4565
ID11	0.5699	0.5647	0.5097	0.7270	0.6131	0.6277	0.5530	0.5970	0.6690	0.6044	1.0000	0.6129	0.5782	0.5827	0.5463
ID12	0.5022	0.6248	0.6555	0.6541	0.5856	0.6612	0.4649	0.5023	0.4993	0.5747	0.6129	1.0000	0.3910	0.4728	0.3651
ID13	0.4436	0.3805	0.3243	0.4974	0.3948	0.4848	0.4805	0.7079	0.5458	0.5811	0.5782	0.3910	1.0000	0.6136	0.5939
ID14	0.4807	0.4915	0.4638	0.5318	0.4969	0.4694	0.6501	0.5985	0.4949	0.6873	0.5827	0.4728	0.6136	1.0000	0.5968
ID15	0.3905	0.4266	0.3555	0.4017	0.4152	0.3672	0.4322	0.4939	0.5095	0.4565	0.5463	0.3651	0.5939	0.5968	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.3282	0.4157	0.5608	0.4638	0.5579	0.3517	0.3919	0.3523	0.4009	0.3425	0.4553	0.4856	0.2972	0.3414	0.2828
SP2	0.2890	0.3445	0.4740	0.3755	0.4134	0.3424	0.3373	0.2963	0.3455	0.2888	0.3974	0.4448	0.2692	0.2908	0.2272
SP3	0.2521	0.3269	0.4385	0.3904	0.3895	0.3218	0.3227	0.2587	0.2967	0.2876	0.3447	0.4129	0.2134	0.2712	0.2118
SP4	0.2892	0.3123	0.3887	0.3703	0.3771	0.3427	0.3421	0.2750	0.3247	0.2644	0.3416	0.3742	0.2715	0.2682	0.2061
SP5	0.2745	0.3703	0.4312	0.3704	0.4096	0.3203	0.3248	0.2579	0.2967	0.2717	0.3900	0.3810	0.2714	0.3145	0.2293
SP6	0.3003	0.3555	0.4828	0.4308	0.4538	0.3225	0.3443	0.3246	0.3525	0.2945	0.3992	0.4485	0.2522	0.2718	0.2254
SP7	0.3858	0.4874	0.6096	0.4250	0.4982	0.4486	0.3831	0.3413	0.3567	0.3768	0.4189	0.5020	0.2812	0.3559	0.2773
SP8	0.2500	0.2945	0.4336	0.3982	0.4706	0.3468	0.3271	0.2995	0.3218	0.2944	0.3959	0.4070	0.2570	0.2738	0.2318
SP9	0.2731	0.3398	0.4288	0.4010	0.4294	0.3133	0.2973	0.2706	0.2879	0.2816	0.3721	0.4172	0.2443	0.2833	0.2176
SP10	0.2845	0.3640	0.4900	0.4174	0.5235	0.3885	0.3953	0.3117	0.3406	0.3079	0.4616	0.4544	0.2842	0.3272	0.2697
SP11	0.2969	0.3515	0.4843	0.4036	0.4868	0.3727	0.4362	0.2776	0.2763	0.2920	0.4051	0.4473	0.2500	0.3415	0.2638
SP12	0.2839	0.3311	0.4438	0.3734	0.4599	0.3667	0.3475	0.3003	0.2875	0.2897	0.3622	0.4865	0.2585	0.3163	0.2451
SP13	0.2528	0.3339	0.4490	0.3869	0.5229	0.3814	0.3940	0.2897	0.2608	0.3218	0.4057	0.5122	0.2626	0.3494	0.2509
SP14	0.3487	0.4372	0.5494	0.4258	0.4874	0.3964	0.4003	0.2935	0.3458	0.3782	0.4199	0.4734	0.2836	0.3551	0.2578
SP15	0.3477	0.3761	0.5628	0.3474	0.4574	0.3083	0.3848	0.2638	0.2672	0.3317	0.3187	0.3811	0.2374	0.3580	0.2202

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.8202	0.7450	0.6608	0.7271	0.8205	0.6628	0.7727	0.7110	0.8301	0.7308	0.6384	0.6848	0.7608	0.5615
SP2	0.8202	1.0000	0.7120	0.7172	0.7222	0.7766	0.6477	0.7640	0.5918	0.8266	0.7390	0.7086	0.7176	0.7574	0.5578
SP3	0.7450	0.7120	1.0000	0.7952	0.7030	0.6697	0.6003	0.7241	0.7212	0.6662	0.6980	0.6735	0.6389	0.6651	0.4157
SP4	0.6608	0.7172	0.7952	1.0000	0.6573	0.6233	0.5135	0.6341	0.6359	0.5933	0.6483	0.6672	0.6246	0.6565	0.4201
SP5	0.7271	0.7222	0.7030	0.6573	1.0000	0.7200	0.6629	0.7644	0.6718	0.7366	0.6646	0.6196	0.6665	0.6642	0.4964
SP6	0.8205	0.7766	0.6697	0.6233	0.7200	1.0000	0.6928	0.7249	0.5757	0.7580	0.6976	0.6273	0.6385	0.6936	0.5376
SP7	0.6628	0.6477	0.6003	0.5135	0.6629	0.6928	1.0000	0.5623	0.4778	0.6976	0.6150	0.5977	0.5860	0.6457	0.5635
SP8	0.7727	0.7640	0.7241	0.6341	0.7644	0.7249	0.5623	1.0000	0.6548	0.8207	0.7493	0.7539	0.7575	0.6305	0.4957
SP9	0.7110	0.5918	0.7212	0.6359	0.6718	0.5757	0.4778	0.6548	1.0000	0.6245	0.6174	0.6110	0.6446	0.6031	0.4751
SP10	0.8301	0.8266	0.6662	0.5933	0.7366	0.7580	0.6976	0.8207	0.6245	1.0000	0.7877	0.7361	0.7709	0.7536	0.5630
SP11	0.7308	0.7390	0.6980	0.6483	0.6646	0.6976	0.6150	0.7493	0.6174	0.7877	1.0000	0.7363	0.8333	0.6855	0.5727
SP12	0.6384	0.7086	0.6735	0.6672	0.6196	0.6273	0.5977	0.7539	0.6110	0.7361	0.7363	1.0000	0.8267	0.6217	0.5212
SP13	0.6848	0.7176	0.6389	0.6246	0.6665	0.6385	0.5860	0.7575	0.6446	0.7709	0.8333	0.8267	1.0000	0.7041	0.5622
SP14	0.7608	0.7574	0.6651	0.6565	0.6642	0.6936	0.6457	0.6305	0.6031	0.7536	0.6855	0.6217	0.7041	1.0000	0.6754
SP15	0.5615	0.5578	0.4157	0.4201	0.4964	0.5376	0.5635	0.4957	0.4751	0.5630	0.5727	0.5212	0.5622	0.6754	1.0000

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
EF1	1.0000	0.9736	0.9445	0.9553	0.8890	0.9374	0.8916	0.9077	0.9001	0.9355	0.9131	0.8668	0.9204	0.8765	0.9400
EF2	0.9736	1.0000	0.9337	0.9437	0.8842	0.9589	0.8805	0.8980	0.8935	0.9303	0.9001	0.8604	0.9147	0.8643	0.9561
EF3	0.9445	0.9337	1.0000	0.9686	0.9407	0.9165	0.9388	0.9580	0.9484	0.9811	0.9590	0.9165	0.9701	0.9233	0.9156
EF4	0.9553	0.9437	0.9686	1.0000	0.9229	0.9306	0.9231	0.9431	0.9321	0.9689	0.9416	0.8982	0.9520	0.9079	0.9377
EF5	0.8890	0.8842	0.9407	0.9229	1.0000	0.8771	0.9864	0.9720	0.9763	0.9492	0.9591	0.9703	0.9534	0.9710	0.8891
EF6	0.9374	0.9589	0.9165	0.9306	0.8771	1.0000	0.8741	0.8931	0.8852	0.9250	0.8937	0.8548	0.9079	0.8586	0.9628
EF7	0.8916	0.8805	0.9388	0.9231	0.9864	0.8741	1.0000	0.9710	0.9835	0.9448	0.9709	0.9716	0.9573	0.9691	0.8983
EF8	0.9077	0.8980	0.9580	0.9431	0.9720	0.8931	0.9710	1.0000	0.9796	0.9597	0.9677	0.9474	0.9570	0.9562	0.9025
EF9	0.9001	0.8935	0.9484	0.9321	0.9763	0.8852	0.9835	0.9796	1.0000	0.9548	0.9798	0.9632	0.9718	0.9570	0.9080
EF10	0.9355	0.9303	0.9811	0.9689	0.9492	0.9250	0.9448	0.9597	0.9548	1.0000	0.9626	0.9252	0.9766	0.9300	0.9270
EF11	0.9131	0.9001	0.9590	0.9416	0.9591	0.8937	0.9709	0.9677	0.9798	0.9626	1.0000	0.9520	0.9764	0.9469	0.9188
EF12	0.8668	0.8604	0.9165	0.8982	0.9703	0.8548	0.9716	0.9474	0.9632	0.9252	0.9520	1.0000	0.9409	0.9768	0.8767
EF13	0.9204	0.9147	0.9701	0.9520	0.9534	0.9079	0.9573	0.9570	0.9718	0.9766	0.9764	0.9409	1.0000	0.9309	0.9280
EF14	0.8765	0.8643	0.9233	0.9079	0.9710	0.8586	0.9691	0.9562	0.9570	0.9300	0.9469	0.9768	0.9309	1.0000	0.8756
EF15	0.9400	0.9561	0.9156	0.9377	0.8891	0.9628	0.8983	0.9025	0.9080	0.9270	0.9188	0.8767	0.9280	0.8756	1.0000
ID1	0.7256	0.7469	0.7116	0.7278	0.6917	0.7820	0.7008	0.6964	0.7120	0.7221	0.7191	0.6910	0.7342	0.6709	0.7761
ID2	0.7621	0.7787	0.7463	0.7676	0.7277	0.8135	0.7354	0.7343	0.7429	0.7589	0.7551	0.7256	0.7636	0.7109	0.8149
ID3	0.8270	0.8440	0.8079	0.8303	0.7832	0.8777	0.7937	0.7946	0.8007	0.8173	0.8150	0.7816	0.8221	0.7671	0.8780
ID4	0.7416	0.7585	0.7266	0.7424	0.7043	0.7941	0.7069	0.7088	0.7148	0.7367	0.7207	0.6821	0.7318	0.6863	0.7839
ID5	0.8096	0.8273	0.7944	0.8115	0.7728	0.8627	0.7848	0.7761	0.7935	0.8033	0.8043	0.7715	0.8125	0.7552	0.8620
ID6	0.7226	0.7446	0.7085	0.7244	0.6944	0.7790	0.6958	0.6915	0.7075	0.7211	0.7101	0.6822	0.7269	0.6703	0.7726
ID7	0.6655	0.6812	0.6262	0.6356	0.5884	0.6849	0.5813	0.5915	0.5932	0.6210	0.5950	0.5685	0.6124	0.5647	0.6495
ID8	0.6327	0.6494	0.6219	0.6418	0.6011	0.6878	0.6029	0.6127	0.6097	0.6313	0.6176	0.5782	0.6273	0.5878	0.6792
ID9	0.6694	0.6916	0.6583	0.6709	0.6429	0.7244	0.6518	0.6428	0.6647	0.6691	0.6693	0.6453	0.6834	0.6230	0.7205
ID10	0.6694	0.6922	0.6592	0.6724	0.6413	0.7293	0.6510	0.6434	0.6623	0.6719	0.6697	0.6342	0.6831	0.6210	0.7235
ID11	0.7178	0.7387	0.7039	0.7173	0.6864	0.7761	0.6959	0.6878	0.7074	0.7147	0.7142	0.6875	0.7272	0.6664	0.7676
ID12	0.7773	0.7932	0.7609	0.7817	0.7372	0.8293	0.7477	0.7472	0.7558	0.7706	0.7689	0.7270	0.7768	0.7199	0.8308
ID13	0.6015	0.6229	0.5942	0.6058	0.5783	0.6635	0.5774	0.5782	0.5883	0.6049	0.5906	0.5567	0.6046	0.5593	0.6456
ID14	0.6443	0.6655	0.6348	0.6502	0.6182	0.7044	0.6296	0.6201	0.6389	0.6464	0.6442	0.6076	0.6570	0.5993	0.6996
ID15	0.5766	0.5975	0.5716	0.5852	0.5609	0.6387	0.5720	0.5589	0.5812	0.5855	0.5880	0.5656	0.5997	0.5432	0.6358

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	EF1	EF2	EF3	EF4	EF5	EF6	EF7	EF8	EF9	EF10	EF11	EF12	EF13	EF14	EF15
SP1	0.9480	0.9637	0.9161	0.9355	0.8693	0.9755	0.8719	0.8880	0.8804	0.9158	0.8896	0.8468	0.9004	0.8550	0.9617
SP2	0.9547	0.9732	0.9195	0.9338	0.8696	0.9760	0.8688	0.8868	0.8769	0.9164	0.8857	0.8447	0.8977	0.8530	0.9567
SP3	0.9447	0.9343	0.9786	0.9624	0.9340	0.9029	0.9346	0.9494	0.9443	0.9744	0.9542	0.9140	0.9645	0.9219	0.9140
SP4	0.9575	0.9500	0.9718	0.9759	0.9258	0.9200	0.9238	0.9382	0.9364	0.9728	0.9422	0.9026	0.9563	0.9098	0.9225
SP5	0.9674	0.9599	0.9663	0.9793	0.9160	0.9424	0.9151	0.9312	0.9262	0.9636	0.9333	0.8928	0.9478	0.8985	0.9384
SP6	0.9573	0.9729	0.9154	0.9301	0.8621	0.9718	0.8640	0.8839	0.8714	0.9103	0.8844	0.8392	0.8913	0.8482	0.9521
SP7	0.8882	0.9049	0.8678	0.8876	0.8211	0.9327	0.8212	0.8370	0.8275	0.8685	0.8405	0.7991	0.8488	0.8070	0.9087
SP8	0.9675	0.9648	0.9591	0.9704	0.9117	0.9485	0.9068	0.9250	0.9197	0.9567	0.9261	0.8889	0.9418	0.8917	0.9460
SP9	0.9359	0.9231	0.9761	0.9577	0.9457	0.8988	0.9479	0.9618	0.9561	0.9659	0.9660	0.9215	0.9630	0.9303	0.9067
SP10	0.9425	0.9651	0.9142	0.9239	0.8653	0.9805	0.8596	0.8778	0.8722	0.9091	0.8779	0.8420	0.8949	0.8442	0.9458
SP11	0.9624	0.9776	0.9213	0.9357	0.8692	0.9658	0.8698	0.8879	0.8773	0.9154	0.8880	0.8451	0.8976	0.8537	0.9569
SP12	0.9557	0.9505	0.9494	0.9651	0.9236	0.9453	0.9196	0.9297	0.9306	0.9589	0.9364	0.8990	0.9504	0.9012	0.9580
SP13	0.9678	0.9763	0.9438	0.9587	0.8927	0.9597	0.8929	0.9115	0.9007	0.9379	0.9134	0.8689	0.9200	0.8778	0.9631
SP14	0.9376	0.9474	0.8884	0.9086	0.8431	0.9532	0.8451	0.8573	0.8531	0.8873	0.8630	0.8200	0.8709	0.8285	0.9336
SP15	0.8958	0.9052	0.8494	0.8683	0.8014	0.9123	0.8021	0.8209	0.8100	0.8464	0.8213	0.7782	0.8290	0.7856	0.8924

	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
ID1	1.0000	0.9294	0.8807	0.9681	0.8757	0.9670	0.8405	0.8618	0.9230	0.9241	0.9746	0.9326	0.8334	0.8963	0.8373
ID2	0.9294	1.0000	0.9277	0.9171	0.9306	0.9014	0.7725	0.8052	0.8898	0.8596	0.9325	0.9717	0.7657	0.8324	0.8036
ID3	0.8807	0.9277	1.0000	0.8706	0.9682	0.8563	0.7318	0.7631	0.8271	0.8091	0.8780	0.9211	0.7243	0.7863	0.7450
ID4	0.9681	0.9171	0.8706	1.0000	0.8657	0.9708	0.8510	0.8779	0.8971	0.9127	0.9524	0.9388	0.8433	0.8901	0.8095
ID5	0.8757	0.9306	0.9682	0.8657	1.0000	0.8495	0.7320	0.7586	0.8478	0.8056	0.8917	0.9089	0.7251	0.7848	0.7731
ID6	0.9670	0.9014	0.8563	0.9708	0.8495	1.0000	0.8617	0.8695	0.9064	0.9207	0.9532	0.9232	0.8430	0.8951	0.8173
ID7	0.8405	0.7725	0.7318	0.8510	0.7320	0.8617	1.0000	0.8315	0.8478	0.8715	0.8313	0.7932	0.7960	0.8452	0.7566
ID8	0.8618	0.8052	0.7631	0.8779	0.7586	0.8695	0.8315	1.0000	0.8665	0.9281	0.8477	0.8253	0.9428	0.9567	0.9025
ID9	0.9230	0.8898	0.8271	0.8971	0.8478	0.9064	0.8478	0.8665	1.0000	0.9305	0.9368	0.8659	0.8420	0.9039	0.8795
ID10	0.9241	0.8596	0.8091	0.9127	0.8056	0.9207	0.8715	0.9281	0.9305	1.0000	0.9047	0.8802	0.9021	0.9651	0.8829
ID11	0.9746	0.9325	0.8780	0.9524	0.8917	0.9532	0.8313	0.8477	0.9368	0.9047	1.0000	0.9142	0.8243	0.8789	0.8582
ID12	0.9326	0.9717	0.9211	0.9388	0.9089	0.9232	0.7932	0.8253	0.8659	0.8802	0.9142	1.0000	0.8243	0.8789	0.8582
ID13	0.8334	0.7657	0.7243	0.8433	0.7251	0.8430	0.7960	0.9428	0.8420	0.9021	0.8243	0.8243	1.0000	0.8522	0.7729
ID14	0.8963	0.8324	0.7863	0.8901	0.7848	0.8951	0.8452	0.9567	0.9039	0.9651	0.8789	0.8789	0.8522	1.0000	0.9030
ID15	0.8373	0.8036	0.7450	0.8095	0.7731	0.8173	0.7566	0.9025	0.8795	0.8829	0.8582	0.8582	0.7729	0.9030	1.0000

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	ID1	ID2	ID3	ID4	ID5	ID6	ID7	ID8	ID9	ID10	ID11	ID12	ID13	ID14	ID15
SP1	0.7611	0.8024	0.8651	0.7790	0.8497	0.7588	0.6814	0.6728	0.7025	0.7074	0.7074	0.7535	0.8179	0.6802	0.6139
SP2	0.7633	0.8013	0.8645	0.7808	0.8473	0.7610	0.6900	0.6696	0.7033	0.7083	0.7083	0.7537	0.8160	0.6825	0.6140
SP3	0.6945	0.7355	0.7968	0.7100	0.7834	0.6933	0.6234	0.6054	0.6402	0.6403	0.6403	0.6875	0.7474	0.6158	0.5547
SP4	0.7154	0.7511	0.8114	0.7298	0.7989	0.7114	0.6400	0.6221	0.6607	0.6612	0.6612	0.7062	0.7614	0.6369	0.5733
SP5	0.7311	0.7629	0.8258	0.7430	0.8152	0.7268	0.6503	0.6368	0.6788	0.6763	0.6763	0.7267	0.7773	0.6545	0.5910
SP6	0.7576	0.7970	0.8642	0.7757	0.8415	0.7573	0.6912	0.6679	0.7009	0.7025	0.7025	0.7510	0.8145	0.6770	0.6061
SP7	0.8161	0.8573	0.9242	0.8364	0.9037	0.8174	0.7280	0.7284	0.7563	0.7628	0.7628	0.8077	0.8777	0.7384	0.6673
SP8	0.7364	0.7683	0.8328	0.7479	0.8219	0.7349	0.6538	0.6422	0.6841	0.6823	0.6823	0.7337	0.7828	0.6595	0.5969
SP9	0.6973	0.7332	0.7965	0.7111	0.7850	0.6946	0.6206	0.6094	0.6429	0.6417	0.6417	0.6925	0.7465	0.6186	0.5592
SP10	0.7714	0.8039	0.8699	0.7855	0.8543	0.7723	0.7011	0.6749	0.7169	0.7172	0.7172	0.7676	0.8206	0.6927	0.6241
SP11	0.7487	0.7862	0.8531	0.7650	0.8379	0.7478	0.6886	0.6556	0.6909	0.6930	0.6930	0.7437	0.8020	0.6697	0.6042
SP12	0.7543	0.7857	0.8452	0.7668	0.8353	0.7526	0.6434	0.6594	0.6973	0.7022	0.7022	0.7459	0.8005	0.6761	0.6151
SP13	0.7460	0.7860	0.8516	0.7619	0.8359	0.7456	0.6629	0.6585	0.6906	0.6917	0.6917	0.7427	0.8023	0.6696	0.6055
SP14	0.7649	0.8055	0.8704	0.7830	0.8550	0.7631	0.7110	0.6709	0.7033	0.7084	0.7084	0.7550	0.8200	0.6813	0.6131
SP15	0.7751	0.8179	0.8879	0.7937	0.8676	0.7745	0.7427	0.6795	0.7116	0.7180	0.7180	0.7672	0.8395	0.6885	0.6154

	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15
SP1	1.0000	0.9876	0.9213	0.9314	0.9438	0.9856	0.9296	0.9470	0.9166	0.9778	0.9755	0.9397	0.9663	0.9659	0.9242
SP2	0.9876	1.0000	0.9211	0.9358	0.9441	0.9910	0.9294	0.9482	0.9116	0.9835	0.9830	0.9375	0.9646	0.9663	0.9249
SP3	0.9213	0.9211	1.0000	0.9783	0.9570	0.9182	0.8601	0.9496	0.9794	0.9065	0.9234	0.9412	0.9357	0.9018	0.8571
SP4	0.9314	0.9358	0.9783	1.0000	0.9752	0.9292	0.8698	0.9632	0.9662	0.9231	0.9360	0.9537	0.9465	0.9100	0.8646
SP5	0.9438	0.9441	0.9570	0.9752	1.0000	0.9404	0.8899	0.9857	0.9537	0.9409	0.9479	0.9710	0.9681	0.9158	0.8745
SP6	0.9856	0.9910	0.9182	0.9292	0.9404	1.0000	0.9271	0.9432	0.9103	0.9793	0.9832	0.9305	0.9639	0.9656	0.9282
SP7	0.9296	0.9294	0.8601	0.8698	0.8899	0.9271	1.0000	0.8968	0.8544	0.9349	0.9191	0.8881	0.9157	0.9364	0.9572
SP8	0.9470	0.9482	0.9496	0.9632	0.9857	0.9432	0.8968	1.0000	0.9441	0.9474	0.9516	0.9813	0.9764	0.9177	0.8796
SP9	0.9166	0.9116	0.9794	0.9662	0.9537	0.9103	0.8544	0.9441	1.0000	0.9031	0.9158	0.9372	0.9337	0.8917	0.8483
SP10	0.9778	0.9835	0.9065	0.9231	0.9409	0.9793	0.9349	0.9474	0.9031	1.0000	0.9718	0.9322	0.9575	0.9647	0.9249
SP11	0.9755	0.9830	0.9234	0.9360	0.9479	0.9832	0.9191	0.9516	0.9158	0.9718	1.0000	0.9410	0.9711	0.9615	0.9220
SP12	0.9397	0.9375	0.9412	0.9537	0.9710	0.9305	0.8881	0.9813	0.9372	0.9322	0.9410	1.0000	0.9634	0.9116	0.8715
SP13	0.9663	0.9646	0.9357	0.9465	0.9681	0.9639	0.9157	0.9764	0.9337	0.9575	0.9711	0.9634	1.0000	0.9382	0.9020
SP14	0.9659	0.9663	0.9018	0.9100	0.9158	0.9656	0.9364	0.9177	0.8917	0.9647	0.9615	0.9116	0.9382	1.0000	0.9511
SP15	0.9242	0.9249	0.8571	0.8646	0.8745	0.9282	0.9572	0.8796	0.8483	0.9249	0.9220	0.8715	0.9020	0.9511	1.0000

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