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LA THÈSE A ÉTÉ
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THE WEIGHT DISTRIBUTION OF A (54,27) CODE

George Robert Young

A

Major Technical Report

in

The Faculty

of

Engineering

Presented in Partial Fulfillment of the Requirements
for the degree of Master of Engineering at
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Montreal, Quebec, Canada

August 1978

ABSTRACT

THE WEIGHT DISTRIBUTION OF A (54,27) CODE

George Robert Young

A (54,27) error-correcting code has been examined, and the weight distribution calculated. By exploiting some cyclic properties of the generator matrix, the computation time has been reduced significantly. The results were verified for accuracy by two independent checks.

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LIST OF SYMBOLS

Symbol	Definitions
n	Code block length
k	Information vector length
V_n	N-dimensional vector space
G_i	Generator matrices
I_k	Identity matrix, kxk
A	Incidence matrix
P,Q,R,p_i,q_i,r_i	Circulant matrices
i	Column vector of 27 ones
j	Row vector of 27 ones
T	Transpose
$\emptyset$	Column vector of 27 zeros
a_i	Vector components
LS( ),RS( ),LC( ),RC( )	Vector set operators
F,G	Vectors
X,S_1,S_2	Sets of vectors
B	One of the bottom 18 rows of the generator matrix
C	Any combination of the top nine rows of the generator matrix
D	Set of all possible combinations of the bottom 18 rows of the generator matrix
D'	Subset of D
X_1,B_1	Registers
d	Minimum distance
$[\ \ ]$	Retain the integer part

Chapter I

GENERAL

1.1 Introduction

Coding of digital information before transmission offers the possibility of removing errors introduced by a noisy transmission medium. Block coding breaks up a digital transmission stream into equal segments called blocks of length n bits [8]. Each block is formed from k information bits according to some rule and the resulting set of 2^k codewords is called an (n,k) block code.

It is convenient to think of codewords as vectors from the vector space V_n of all n-tuples. A linear block code is one in which the codewords form a k-dimensional subspace of V_n. A kxn matrix which has, as its rows, basis vectors of the subspace is called the generator matrix of the code. The codeword corresponding to a particular k information bits is found by pre-multiplying the generator matrix by the lxk information vector.

This paper describes a (54,27) error-correcting linear block code, and the procedure used to obtain the weight distribution of the code. As a method of verifying the accuracy of the results, the code was extended to a (56,28) code, and the weight distribution of the extended code was compared with previously tabulated results [9].

1.2 Generator Matrix

The generator matrix [3] is given by

$$G_0 = I_{27} : A$$

where

$$A = \begin{matrix} P:Q:R \\ \cdots\cdots \\ R:P:Q \\ \cdots\cdots \\ Q:R:P \end{matrix}$$

and each of P,Q, and R is comprised of nine 3x3 circulants which are given by

$$P = \begin{matrix} p_1:p_2:p_3 \\ \cdots\cdots \\ p_3:p_1:p_2 \\ \cdots\cdots \\ p_2:p_3:p_1 \end{matrix} \text{ with } p_1 = \begin{matrix} 1:0:1 \\ \cdots\cdots \\ 1:1:0 \\ \cdots\cdots \\ 0:1:1 \end{matrix}, \; p_2 = \begin{matrix} 1:1:1 \\ \cdots\cdots \\ 1:1:1 \\ \cdots\cdots \\ 1:1:1 \end{matrix}, \text{ and } p_3 = \begin{matrix} 0:0:0 \\ \cdots\cdots \\ 0:0:0 \\ \cdots\cdots \\ 0:0:0 \end{matrix},$$

$$Q = \begin{matrix} q_1:q_2:q_3 \\ \cdots\cdots \\ q_3:q_1:q_2 \\ \cdots\cdots \\ q_2:q_3:q_1 \end{matrix} \text{ with } q_1 = \begin{matrix} 0:1:0 \\ \cdots\cdots \\ 0:0:1 \\ \cdots\cdots \\ 1:0:0 \end{matrix}, \; q_2 = \begin{matrix} 0:0:1 \\ \cdots\cdots \\ 1:0:0 \\ \cdots\cdots \\ 0:1:0 \end{matrix}, \text{ and } q_3 = \begin{matrix} 0:0:1 \\ \cdots\cdots \\ 1:0:0 \\ \cdots\cdots \\ 0:1:0 \end{matrix}, \text{ and}$$

$$R = \begin{matrix} r_1:r_2:r_3 \\ \cdots\cdots \\ r_3:r_1:r_2 \\ \cdots\cdots \\ r_2:r_3:r_1 \end{matrix} \text{ with } r_1 = \begin{matrix} 1:1:0 \\ \cdots\cdots \\ 0:1:1 \\ \cdots\cdots \\ 1:0:1 \end{matrix}, \; r_2 = \begin{matrix} 1:0:1 \\ \cdots\cdots \\ 1:1:0 \\ \cdots\cdots \\ 0:1:1 \end{matrix}, \text{ and } q_3 = \begin{matrix} 1:0:1 \\ \cdots\cdots \\ 1:1:0 \\ \cdots\cdots \\ 0:1:1 \end{matrix}.$$

The weight distribution of this code had not been evaluated previously, as the incidence matrix A was not a simple circulant [3]. The above definition of the generator matrix emphasizes its cyclic and repetitive properties. However, it will be useful to present the matrix in its complete form as shown in Table 1.

1.3 Extension to (56,28) Code

As a method of independently checking the results of this paper, it is useful to examine the code obtained by modifying the initial generator matrix. Starting with the (54,27) code generator matrix, a (55,27) code is constructed by adding an overall parity to

Table 1

(54,27) Code Generator Matrix

1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	1	0	1	1	0	1
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	1	1	0	0	1	0	0	0	1	1	1	1	0	1	1	0
0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	1	0	1	0	0	0	1	1	0	1	1	1	0	1	0	1
0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	0	0	0	0	1	1	0	0	1	1	0	0	1	1	1	1	0
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	1	0	0	0	1	0	0	1	1	1	0	1	0	1	1
0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	1	0
0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	1	0	1	0	0	1	0	0	0	0	1	1	1	0	1	1	0	0	1	1
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	1	0	1	0	0	1	0	1	0	0	0	1	1	0	1	1	1	0	1
0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	0	0	0	0	1	0	0	0	1	0	0	1
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	0	1	1	0	1	1	1	0	0	0	0	0	1	1	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	0	0	0	1	0	0	0	1	0	0	1	0
0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	1	0	0	0	1	0	1	1	1	1	0	0	1	0	1	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1	0	0	0	0	1	1	0	1	1	1	1	0	0	0	0	1	1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	1	1	0	0	0	0	1	1	1	1	1	0	1	0	1	0	0	0	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	1	0	1	1	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	1	1	1	1	1	0	0	0	1	1	0	1	0	0	1	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	1	1	1	1	0	0	0	0	1	1	0	1	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	1	1	1	0	1	1	0	1	1	0	1	1	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	1	1	1	0	1	0	1	0	0	0	1	0	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	1	1	0	0	1	1	1	1	0	0	0	0	1	1	0	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	1	1	1	0	1	0	1	1	0	0	0	0	1	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	1	0	1	1	1	0	0	0	1	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	1	1	0	1	1	0	0	1	1	1	1	1	0	0	0	1	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	1	1	0	1	1	1	0	1	1	1	1	0	0	0	0	1	1

the (54,27) code. Thus the (55,27) code is specified by a generator matrix

$$G_1 = I_{27}:A:i$$

where i is a column vector of 27 ones. This gives every row of G_1 even parity and thus every vector of the code generated by G_1 also has even parity.

To G_1, a row vector j of 55 ones is added to give a (55,28) code generated by

$$G_2 = \begin{matrix} j \\ \cdots \\ I_{27}:A:i. \end{matrix}$$

The result of this change is that the set of code vectors is enlarged to include the complement of every vector which was in the set.

Finally, an overall parity is added to the (55,28) code generated by G_2. This yields a (56,28) code generated by the matrix

$$G_3 = \begin{matrix} 1: & j \\ \cdots & \cdots \\ \emptyset:I_{27}:A:i \end{matrix}$$

where $\emptyset$ is a column vector of 27 zeros. The code generated by the G_3 generator matrix is self-dual, and all weights present in the weight distribution are integer multiples of four [3]. Since elementary row operations and column permutations on the generator matrix result in an equivalent code, the (56,28) code can also be specified by

$$G_3' = \begin{matrix} & :0:i^T \\ I_{28}: & \cdots \\ & :i:A. \end{matrix}$$

1.4 Block Length

The block length of the (56,28) code is an integer multiple of eight. It is not demonstrated in this report, but if this code is

used commercially for transmission purposes, the coding and decoding circuitry required may be simplified, as microprocessors and families of digital integrated circuits, which might be used for hardware implementation, are strongly oriented toward 8-bit arithmetic [7]. In addition the block length is beneficial in itself, as the probability of error in transmission goes down exponentially as block length increases [8].

Chapter II

WEIGHT DISTRIBUTION

2.1 Weight Distribution Determination

The weight distribution of a code is very important from many points of view. For communications engineers, its importance lies in the exact determination of the post-decoding bit error rate [1]. In addition it can be used to ascertain the error-correcting capability of the code.

The determination of the weight distribution of a code is a straightforward if lengthy procedure. All output codewords are generated, which is to say all possible modulo-2 combinations of the rows of the generator matrix are formed, the number of ones in each codeword is counted, and the quantity of output codewords of each weight is totalled.

The above procedure would seem to lend itself immediately to a solution by computer program, and the Control Data computer at Concordia University was used. Assembler language programming was chosen for its ease of handling binary numbers and logic operations, and its relatively high execution speed compared to higher level languages such as Fortran.

2.2 Exploitation of Cyclic Nature of Generator Matrix

A direct method, which simply generated all code vectors, and counted the ones in each codeword, would require an estimated three and one-half hours of central processor time to complete the deter-

mination of the entire weight distribution. The cyclic nature of the generator matrix was examined, and methods were found which reduced the required computer time to under half an hour.

2.3 Definitions

A vector is an ordered n-tuple of numbers. A vector set operator is a transformation which changes a set of vectors into another set of vectors according to a certain rule. For the theorems that follow, certain vector set operators will be defined which are applicable for vectors with length an integer multiple of nine.

1) Left Shift; LS( )

This operator transforms each member of a set of vectors according to the rule; the vector $(a_n,a_{n-1},a_{n-2},\cdots a_3,a_2,a_1)$ changes to $(a_{n-1},a_{n-2},a_n,\cdots a_2,a_1,a_3)$.

2) Right Shift; RS( )

This operator transforms each member of a vector set from $(a_n,a_{n-1},a_{n-2},\cdots a_3,a_2,a_1)$ to $(a_{n-2},a_n,a_{n-1},\cdots a_1,a_3,a_2)$.

3) Left Cycle; LC( )

This operator transforms each member of a vector set from

$$(a_n,a_{n-1},a_{n-2},a_{n-3},a_{n-4},a_{n-5},a_{n-6},a_{n-7},a_{n-8},\cdots \cdots a_9,a_8,a_7,a_6,a_5,a_4,a_3,a_2,a_1)$$

to

$$(a_{n-3},a_{n-4},a_{n-5},a_{n-6},a_{n-7},a_{n-8},a_n,a_{n-1},a_{n-2},\cdots \cdots a_6,a_5,a_4,a_3,a_2,a_1,a_9,a_8,a_7).$$

4) Right Cycle; RC( )

This operator transforms each member of a vector set from

$(a_n, a_{n-1}, a_{n-2}, a_{n-3}, a_{n-4}, a_{n-5}, a_{n-6}, a_{n-7}, a_{n-8}, \cdots$

$\cdots a_9, a_8, a_7, a_6, a_5, a_4, a_3, a_2, a_1)$

to

$(a_{n-6}, a_{n-7}, a_{n-8}, a_n, a_{n-1}, a_{n-2}, a_{n-3}, a_{n-4}, a_{n-5}, \cdots$

$\cdots a_3, a_2, a_1, a_9, a_8, a_7, a_6, a_5, a_4)$.

2.4 Properties of Vector Operators

In the following statements of the properties of these vector operators, F and G are vectors, X is a set of vectors, and G_0 is the generator matrix. Addition is modulo-2.

1) a) LS(RS(X)) = RS(LS(X)) = X

   b) LC(RC(X)) = RC(LC(X)) = X

2) a) LS(RC(X)) = RC(LS(X))

   b) LS(LC(X)) = LC(LS(X))

   c) RS(LC(X)) = LC(RS(X))

   d) RS(RC(X)) = RC(RS(X))

3) a) LS(F+G) = LS(F) + LS(G)

   b) RS(F+G) = RS(F) + RS(G)

   c) LC(F+G) = LC(F) + LC(G)

   d) RC(F+G) = RC(F) + RC(G)

4) a) LS(LS(X)) = RS(X)

   b) RS(RS(X)) = LS(X)

   c) LC(LC(X)) = RC(X)

   d) RC(RC(X)) = LC(X)

5) a) $LS(FxG_0) = LS(F)xG_0$

   b) $RS(FxG_0) = RS(F)xG_0$

c) $LC(FxG_0) = LC(F)xG_0$

d) $RC(FxG_0) = RC(F)xG_0$

2.5 Theorems

Two theorems and one lemma were discovered which justify the reduced amount of computation time used to determine the code weight distribution. For the purpose of these theorems, combination implies modulo-2 summation and all arithmetic is modulo-2. Rows refer to rows of the (54,27) generator matrix G_0.

2.5.1 Lemma

The vector operators LS( ), RS( ), LC( ), and RC( ), when applied singly or in pairs to a set of vectors, do not change the weight distribution of the set.

2.5.2 Theorem I

The set S_1 of vectors given by

[(arbitrary combination of top nine rows) + (all possible combinations of bottom 18 rows)]

has the same weight distribution as the set S_2 given by

[LS(same combination of top nine rows) + (all possible combinations of bottom 18 rows)],

and similarly for the RS( ) operator.

Proof: Theorem I

In the bottom 18 rows, if B is a row then so are LS(B) and RS(B) by inspection of the generator matrix. It follows then that the set D of all possible combinations of the bottom 18 rows is closed under the operators LS( ) and RS( ).

Breaking up D into subsets of vectors gives

$$D = [D', LS(D'), RS(D')].$$

C is any combination of the top nine rows. Then

$$S_1 = C + [D', LS(D'), RS(D')]$$

and

$$S_2 = LS(C) + [D', LS(D'), RS(D')].$$

Applying the LS( ) operator to S_1 gives

$$\begin{aligned} LS(S_1) &= LS(C) + [LS(D'), LS(LS(D')), LS(RS(D'))] \\ &= LS(C) + [LS(D'), RS(D'), D'] \\ &= LS(C) + [D', LS(D'), RS(D')] \\ &= S_2. \end{aligned}$$

Using the lemma, the weight distribution of S_1 is equal to the weight distribution of S_2, and similarly for the RS( ) operator. Q.E.D.

2.5.3 Theorem II

The set S_1 of vectors given by

[(arbitrary combination of top nine rows) + (all possible combinations of bottom 18 rows)]

has the same weight distribution as the set S_2 given by

[LC(same combination of top nine rows) + (all possible combinations of bottom 18 rows)],

and similarly for the RC( ) operator.

Proof: Theorem II

In the bottom 18 rows, if B is a row, then so are LC(B) and RC(B) by inspection of the generator matrix. It follows then that the set D of all possible combinations of the bottom 18 rows is closed under the operators LC( ) and RC( ).

Breaking up D into subsets of vectors gives

$$D = [D', LC(D'), RC(D')].$$

C is any combination of the top nine rows. Then

$$S_1 = C + [D', LC(D'), RC(D')]$$

and

$$S_2 = LC(C) + [D', LC(D'), RC(D')].$$

Applying the LC( ) operator to S_1 gives

$$\begin{aligned} LC(S_1) &= LC(C) + [LC(D'), LC(LC(D')), LC(RC(D'))] \\ &= LC(C) + [LC(D'), RC(D'), D'] \\ &= LC(C) + [D', LC(D'), RC(D')] \\ &= S_2. \end{aligned}$$

Using the lemma, the weight distribution of S_1 equals the weight distribution of S_2, and similarly for the RC( ) operator. Q.E.D.

2.6 Implications of Theorems

Inspection of the generator matrix (Table 1) shows that the set of the top nine rows is closed under the vector operators LS( ), RS( ), LC( ), and RC( ), either singly or in pairs. Hence the set of all possible combinations of the top nine rows is also closed under the same operators, again either singly or in pairs.

One method of calculating the weight distribution of the code is to add the weight sub-distributions obtained by taking an arbitrary combination of the top nine rows, and combining it with all possible combinations of the bottom 18 rows, and repeating this procedure for all possible combinations of the top nine rows. This represents a summation of 2^9 or 512 weight sub-distributions.

Theorems I and II state that there are sets of weight sub-distributions which are identical, and hence only one weight sub-distribution in each of these sets need be calculated. The other members of these sets can be identified by subjecting the combination of the first nine rows of any sub-distribution to the vector operators either singly or in pairs. According to property five of the vector operators, this is equivalent to subjecting the nine most significant information bits to these same operators. This leads to a possible eight additional members generated by LS( ), RS( ), LC( ), RC( ). LS(LC( )), LS(RC( )), RS(LC( )), and RS(RC( )), which because of the closure property, are all part of the 512 sub-distributions. Some of these sets do not contain the full nine members, as these operators do not necessarily generate unique vectors.

2.7 Program to Determine Equivalent Sub-Distributions

A program (Appendix 1) was written in assembler language to determine the minimum number of fundamental sub-distributions required to calculate the overall weight distribution, and to find the number of identical sub-distributions in the set corresponding to each.

A counter generates binary numbers from 0 to 511 decimal, which represent the nine most significant information bits. Each number is subjected to all eight vector operators, and the transformed binary numbers so obtained are compared in magnitude to the original number. If none of the transformed numbers is smaller than the original, it is arbitrarily retained as a fundamental number corresponding to a fundamental sub-distribution, and printed out. If one or

more of the transformed numbers is smaller than the original number, the smallest of these is printed out, indicating the set to which the original number belongs. The results appear in Appendix 2. There were found to be 64 fundamental sub-distributions (see Table 2) out of the original 512.

2.8 Central Processor Time Reduction

The individual program runs to calculate the weight sub-distributions took approximately 22 seconds each of C.P.U. time. The entire 64 runs required approximately 24 minutes, which is approaching a nine-fold reduction in total computer time.

2.9 Program to Calculate Weight Sub-Distributions

An assembler language program was written, a description of which follows, to calculate the weight sub-distributions (Appendix 3). The rows of the incidence matrix are stored in 27 memory locations. The nine most significant information bits are specified by an external parameter (X1) and remain fixed for an entire run. The 18 least significant information bits are generated by a counter.

The program first calculates the modulo-2 sum of the specified combination of the top nine rows. This is done by examining the nine most significant information bits, one at a time, and retrieving from memory those rows corresponding to non-zero bits, and adding them into an accumulator.

Using a similar procedure, the vector formed from the top nine rows is added to all possible combinations of the bottom 18 rows, one

Table 2

Fundamental Sub-Distributions and Frequency of Occurrence

Nine Most Significant Information Bits (Octal)	Frequency of Occurrence	Nine Most Significant Information Bits (Octal)	Frequency of Occurrence
000	1	127	9
001	9	132	9
003	9	133	9
007	3	135	9
011	9	136	9
012	9	137	9
013	9	142	3
014	9	143	9
015	9	146	9
016	9	147	9
017	9	153	9
031	9	155	9
032	9	156	9
033	9	157	9
034	9	163	9
035	9	165	9
036	9	166	9
037	9	167	9
071	9	173	9
073	9	175	9
077	3	176	9
111	3	177	9
112	9	333	3
113	9	335	9
114	9	336	9
115	9	337	9
116	9	356	3
117	9	357	9
123	9	365	3
124	3	367	9
125	9	377	9
126	9	777	1

combination at a time, to form the parity bits of the codeword. The complete codeword is then formed from the information and parity bits.

It was found to be worthwhile in this part of the program, which is executed 2^{18} or 262144 times, to write out explicitly a sequence of five assembler language instructions 18 times, rather than to use the same five instructions in a loop, with two additional instructions performing the counter and end-of-loop-check functions. This reduces execution time by a factor of five-sevenths.

The number of ones in each codeword is counted, and depending on the number found, the corresponding memory location is incremented. Finally, the contents of these 55 locations are printed, giving the weight sub-distribution.

There are two octal parameters which must be specified for each program run (see Table 3). One of these (X1) is a nine bit number which determines the appropriate combination of the top nine rows. The second (B1) is a number which specifies the end point of the computer run.

2.10 Program Outputs - Sub-Distributions

The 64 weight sub-distributions are presented in Appendix 4. The overall weight distribution is found by multiplying each of these sub-distributions by the frequency of occurrence from Table 2, and summing.

Table 3

Main Program Parameters (Octal)

Combination of Top Rows X1 Register	Stop Point B1 Register	Combination of Top Rows X1 Register	Stop Point B1 Register
000	51	127	46
001	50	132	51
003	47	133	47
007	46	135	50
011	50	136	51
012	51	137	44
013	47	142	51
014	51	143	47
015	50	146	51
016	51	147	46
017	45	153	47
031	50	155	50
032	51	156	51
033	47	157	45
034	51	163	47
035	50	165	50
036	51	166	51
037	44	167	46
071	50	173	47
073	47	175	50
077	43	176	51
111	50	177	42
112	51	333	47
113	47	335	50
114	51	336	51
115	50	337	44
116	51	356	51
117	45	357	45
123	47	365	50
124	51	367	46
125	50	377	41
126	51	777	40

Chapter III

RESULTS AND VERIFICATION

3.1 Results

The weight distribution of the overall code, which is a linear combination of the weight sub-distributions, is presented in Table 4.

Table 4

(54,27) Code Weight Distribution

Weight	Population
0	1
11	1404
12	5031
15	129312
16	315198
19	2734992
20	4786236
23	16185312
24	20906028
27	29006824
28	27970866
31	16185312
32	11633193
35	2734992
36	1443468
39	129312
40	48492
43	1404
44	351

3.2 Independent Verification

The weights were totalled to verify that the sum equalled $2^{27} = 134217728$.

As a second check, the code was extended as described in the introduction, in steps to a (56,28) code. The weight distributions of

the extended codes, corresponding to G_1, G_2, and G_3 can be derived from the (54,27) weight distribution.

Adding an overall parity shifts the odd weight vectors into the next higher weight as shown in Table 5.

Table 5

(55,27) Code Weight Distribution

Weight	Population
0	1
12	6435
16	444510
20	7521228
24	37091340
28	56977690
32	27818505
36	4178460
40	177804
44	1755

Adding a row of 55 ones to the generator matrix inserts the complement of each vector into the code, as shown in Table 6.

Adding a second overall parity to the generator matrix again collapses the odd weights into the next higher even weight, as shown in Table 7.

The weight distribution given in Table 7 is identical to that for a (56,28) self-dual code with minimum weight d = 12 [9]. This is the upper bound that the minimum weight can assume, as given by the formula

$$d \leq 4[n/24] + 4$$

where n is the block length, and [ ] means retain the integer part [9].

Table 6

(55,28) Code Weight Distribution

Weight	Population
0	1
11	1755
12	6435
15	177804
16	444510
19	4178460
20	7521228
23	27818505
24	37091340
27	56977690
28	56977690
31	37091340
32	27818505
35	7521228
36	4178460
39	444510
40	177804
43	6435
44	1755
55	1

Table 7

(56,28) Code Weight Distribution

Weight	Population
0	1
12	8190
16	622314
20	11699688
24	64909845
28	113955380
32	64909845
36	11699688
40	622314
44	8190
56	1

The generator matrix of this code was not previously known; only the unique weight distribution had been tabulated. Thus an important secondary result is that it is now possible to completely characterize the (56,28) self-dual code with weights divisible by four.

Chapter IV

CONCLUSIONS AND OBSERVATIONS

4.1 Conclusions

The available literature on error-correcting codes of the block type was consulted, and a (54,27) code, which had not been completely characterized, was chosen for further study. This code seemed to have the potential for high error-correcting capability. In addition, the (56,28) code, which is an extension of the chosen code, might lend itself well to hardware implementation because the block length is an integer multiple of eight, and microprocessor technology is strongly committed to eight bit arithmetic. However, the study of this code presented some difficulty, due to its large number (2^{27} = 134217728) of codewords.

The generator matrix possesses some pseudo-circulant properties, and these were studied with the idea in mind of reducing the amount of computer time required to find the weight distribution, compared to a direct evaluation approach. Two theorems were derived which permitted a significant reduction in the amount of C.P.U. time necessary. The computational sections of all programs were written in assembler language, again with the purpose of reducing execution time.

The results of this work were presented in detail in this report, but in essence the weight distribution of the (54,27) code was determined, and the minimum distance was found to be d = 11. The weight distribution was checked for accuracy by verifying that the sum of the weights equalled 2^{27}. As a further check, the code was

extended to a (56,28) code, and the corresponding weight distribution was compared to that already tabulated in the literature. This report then, relates two previously published papers by finding the weight distribution of a (54,27) code with a known generator matrix, and finding the generator matrix for the (56,28) code with a known weight distribution.

The two theorems in this report were derived in a form specific to a block length an integer multiple of nine. However, in a more generalized form, they can be used to justify reduced computation time in the study of other codes which possess similar pseudo-circulant properties.

4.2 Observations

The (54,27) code does not contain the all-ones vector. However, it does display the odd weight symmetry which has been observed previously for other codes [2,5].

The weight sub-distributions calculated and presented herein were not all unique. In fact, approximately half of the 64 sub-distributions were identical to other sub-distributions. If some way had been found to predict these repeats, based on some heretofore unnoticed property of the generator matrix, the computation time could have been reduced even further.

LIST OF REFERENCES

[1] Avni, M. Coding/Modulation Tradeoffs in Digital Communication. M. Eng. Thesis, Concordia University, Montreal, Canada, March 1978.

[2] Bhargava, V. K. "Odd Weight Symmetry in Some Binary Codes." I.E.E.E. Transactions on Information Theory, July 1977.

[3] Bhargava, V. K., S. E. Tavares, and S. G. S. Shiva. "Difference Sets of the Hadamard Type and Quasi-Cyclic Codes." Information and Control, 26, No. 4, Dec. 1974.

[4] Compass Version 3 Reference Manual. Control Data Corporation, 1976.

[5] Karlin, M., V. K. Bhargava, and S. E. Tavares. "A Note on Extended Quaternary Quadratic Residue Codes and Their Binary Images," to appear in Information and Control, October 1978.

[6] Kronos 2.1 Time-Sharing User's Reference Manual. Control Data Corporation, 1975.

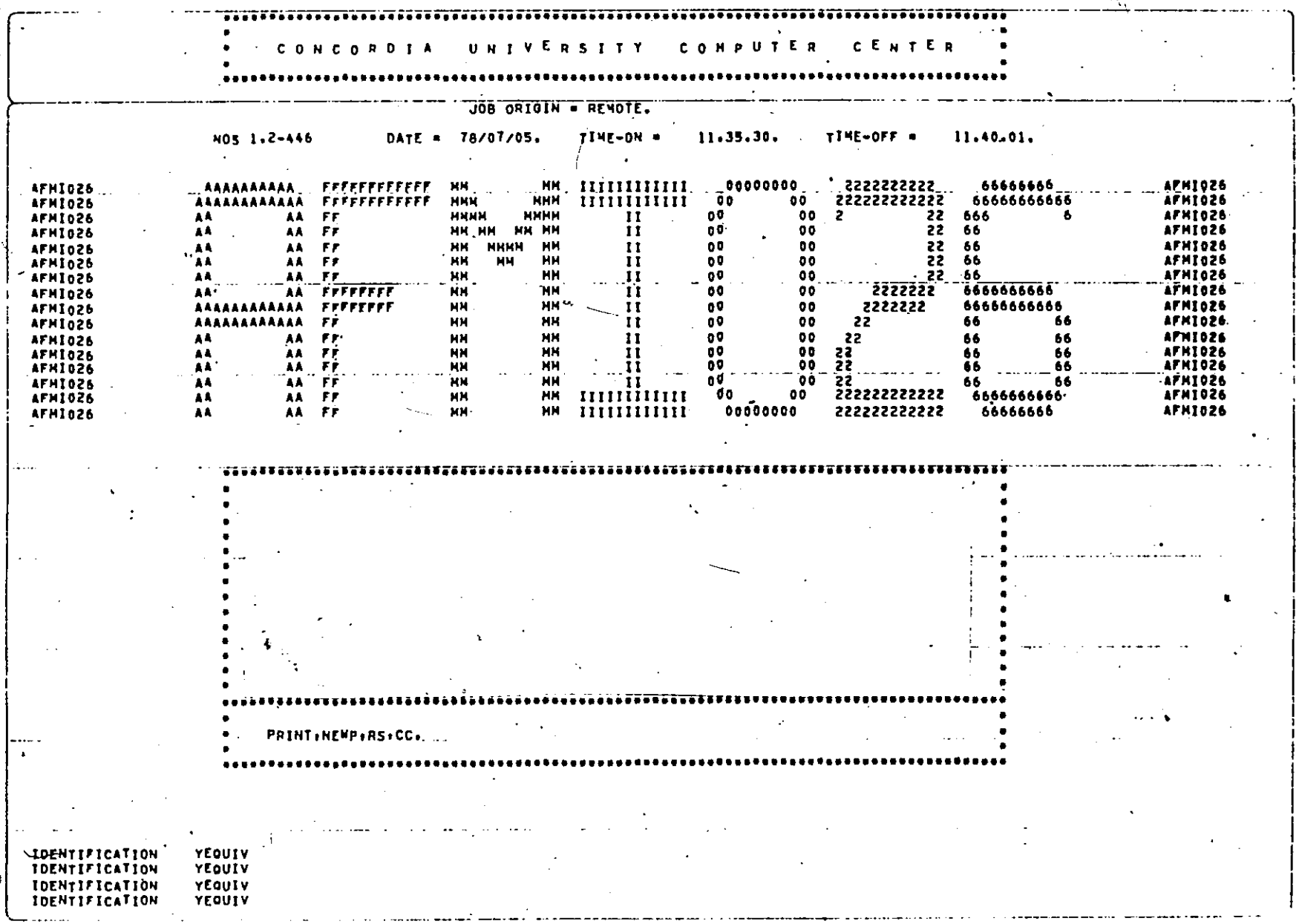
[7] Le-Ngoc, T., and V. K. Bhargava. "A Microprocessor Based Decoder for the BCH Codes," paper to be presented at the 1978 I.E.E.E. Canadian Communication and Power Conference, Montreal, Canada, October 1978.

[8] Lin, Shu. An Introduction to Error-Correcting Codes. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1970.

[9] Mallows, C. L., and N. J. A. Sloane. "An Upper Bound for Self-Dual Codes." Information and Control, 22, No. 2, March 1973.

APPENDIX 1

Program to Determine Equivalent Sub-Distributions and Frequency of Occurrence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AFMI026
PRINT,NEWP,RS,CC.
IDENTIFICATION YEQUIV
IDENTIFICATION YEQUIV
IDENTIFICATION YEQUIV
IDENTIFICATION YEQUIV

```
      PROGRAM EQUIV (INPUT,OUTPUT)
      PRINT 46
      M=0
      DO 47 I=1,512
      IT=I-1
      CALL SHCAL(IT,K,L)
      IF (L.EQ.0) M=M+1
      IF (L.EQ.0) PRINT 48,IT
      IF (L.EQ.1) PRINT 49,IT,K
      IF (L.EQ.2) PRINT 50,IT,K
      IF (L.EQ.3) PRINT 51,IT,K
      IF (L.EQ.4) PRINT 52,IT,K
      IF (L.EQ.5) PRINT 53,IT,K
      IF (L.EQ.6) PRINT 54,IT,K
      IF (L.EQ.7) PRINT 55,IT,K
      IF (L.EQ.8) PRINT 56,IT,K
      J=(59*(I/59))-I
      IF (J.EQ.0) PRINT 46
   47 CONTINUE
      PRINT 57,M
   46 FORMAT (*1NUMBER  EQUIVALENT  SHIFT OPERATION*)
   48 FORMAT (I5,8X,*NONE*)
   49 FORMAT (I5,8X,I4,4X,*L SH*)
   50 FORMAT (I5,8X,I4,4X,*R SH*)
   51 FORMAT (I5,8X,I4,4X,*L CY*)
   52 FORMAT (I5,8X,I4,4X,*R CY*)
   53 FORMAT (I5,8X,I4,4X,*L SH,L CY*)
   54 FORMAT (I5,8X,I4,4X,*L SH,R CY*)
   55 FORMAT (I5,8X,I4,4X,*R SH,L CY*)
   56 FORMAT (I5,8X,I4,4X,*R SH,R CY*)
   57 FORMAT (*0CALCULATIONS =*I3)
      STOP
      END
          IDENT  SHCAL
          ENTRY  SHCAL
SHCAL     BSS    1
          BASE   0
          SB1    B0          L=0
          SA2    A1          X2=ADD IT
          SA3    X2          X3=IT
          BX4    X3          K=IT
LSH       SX0    444         X0=100100100
          BX1    X3*X0       MASK MULT
          AX1    2           R SH 2
          SX0    333         X0=011011011
          BX5    X3*X0       MASK MULT
          LX5    1           L SH 1
          BX5    X5*X1       X5=L SH X3
          SB2    X5          B2=X5
          IX6    X5-X4       X6=X5-X4
          PL     X6,RSH      JP IF NOT SHALLER
          SB1    1           L=1
          BX4    X5          K=L SH IT
RSH       SX0    111         X0=001001001
          BX1    X3*X0       MASK MULT
          LX1    2           L SH 2
          SX0    666         X0=110110110
          BX5    X3*X0       MASK MULT
          AX5    1           R SH 1
          BX5    X5+X1       X5=R SH IT
```

```
        SB3     X5              B3=X5
        IX6     X5-X4           X6=X5-X4
        PL      X6,LCY          JP IF NOT SMALLER
        SB1     2               L=2
        BX4     X5              K=R SH IT
LCY     SX0     77              X0=000111111
        BX1     X3*X0           MASK MULT
        LX1     3               L SH 3
        SX0     700             X0=111000000
        BX5     X3*X0           MASK MULT
        AX5     6               R SH 6
        BX5     X5*X1           X5=L CY IT
        IX6     X5-X4           X6=X5-X4
        PL      X6,RCY          JP IF NOT SMALLER
        SB1     3               L=3
        BX4     X5              K=L CY X3
RCY     SX0     770             X0=111111000
        BX1     X3*X0           MASK MULT
        AX1     3               R SH 3
        SX0     7               X0=000000111
        BX5     X3*X0           MASK MULT
        LX5     6               L SH 6
        BX5     X5*X1           X5=R CY IT
        IX6     X5-X4           X6=X5-X4
        PL      X6,LSHLCY       JP IF NOT SMALLER
        SB1     4               L=4
        BX4     X5              K=R CY X3
LSHLCY  SX3     B2              X3=L SH IT
        SX0     77
        BX1     X3*X0
        LX1     3
        SX0     700
        BX5     X3*X0
        AX5     6
        BX5     X5*X1
        IX6     X5-X4
        PL      X6,LSHRCY
        SB1     5
        BX4     X5
LSHRCY  SX0     770
        BX1     X3*X0
        AX1     3
        SX0     7
        BX5     X3*X0
        LX5     6
        BX5     X5*X1
        IX6     X5-X4
        PL      X6,RSHLCY
        SB1     6
        BX4     X5
RSHLCY  SX3     B3              X3=R SH IT
        SX0     77
        BX1     X3*X0
        LX1     3
        SX0     700
        BX5     X3*X0
        AX5     6
        BX5     X5*X1
        IX6     X5-X4
        PL      X6,RSHRCY
```

```
         SB1    7
         BX4    X5
RSHRCY   SX0    770
         BX1    X3*X0
         AX1    3
         SX0    7
         BX5    X3*X0
         LX5    6
         BX5    X5+X1
         IX6    X5-X4
         PL     X6,LEAVE
         SB1    10
         BX4    X5
LEAVE    SX2    X2+1          X2=ADD K
         SX6    X4            X6=X4
         SA6    X2            K=X4
         SX2    X2+1          X2=ADD L
         SX6    B1            X6=B1
         SA6    X2            L=B1
         EQ     SHCAL
         END
```

APPENDIX 2

Equivalent Sub-Distributions and Frequency of Occurrence - Computer Output

CONCORDIA UNIVERSITY COMPUTER CENTER

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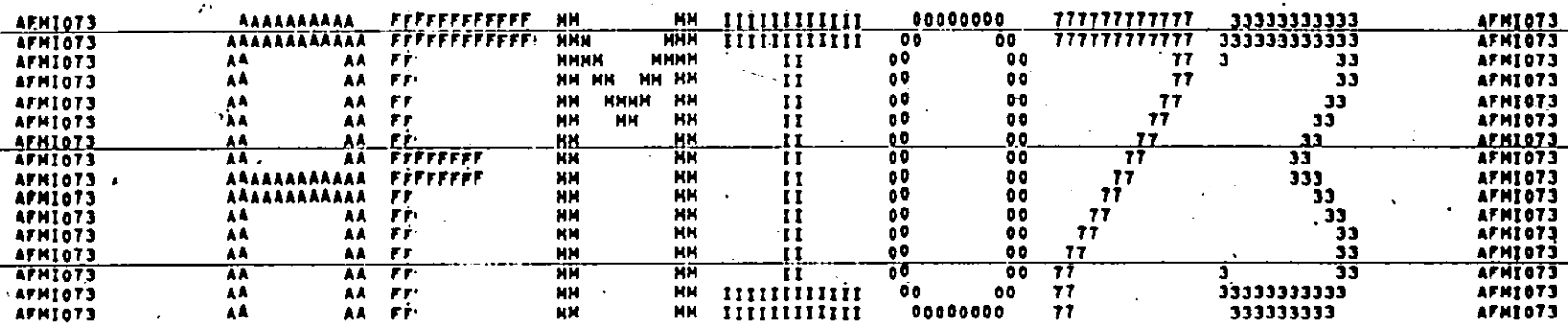


PRINT,OTPT,RS,CC.

IDENTIFICATION YOUNG
IDENTIFICATION YOUNG
IDENTIFICATION YOUNG
IDENTIFICATION YOUNG

NUMBER	EQUIVALENT	SHIFT OPERATION
0	NONE	
1	NONE	
2	1	R SH
3	NONE	
4	1	L SH
5	3	L SH
6	3	R SH
7	NONE	
8	1	R CY
9	NONE	
10	NONE	
11	NONE	
12	NONE	
13	NONE	
14	NONE	
15	NONE	
16	1	R SH•R CY
17	12	R SH
18	9	R SH
19	13	R SH
20	10	R SH
21	14	R SH
22	11	R SH
23	15	R SH
24	3	R CY
25	NONE	
26	NONE	
27	NONE	
28	NONE	
29	NONE	
30	NONE	
31	NONE	
32	1	L SH•R CY
33	10	L SH
34	12	L SH
35	14	L SH
36	9	L SH
37	11	L SH
38	13	L SH
39	15	L SH
40	3	L SH•R CY
41	26	L SH
42	28	L SH
43	30	L SH
44	25	L SH
45	27	L SH
46	29	L SH
47	31	L SH
48	3	R SH•R CY
49	28	R SH
50	25	R SH
51	29	R SH
52	26	R SH
53	30	R SH
54	27	R SH
55	31	R SH
56	7	R CY
57	NONE	
58	57	R SH

NUMBER	EQUIVALENT	SHIFT OPERATION
59	NONE	
60	57	L SH
61	59	L SH
62	59	R SH
63	NONE	
64	1	L CY
65	9	L CY
66	12	R SH•L CY
67	25	L CY
68	10	L SH•L CY
69	26	L SH•L CY
70	28	R SH•L CY
71	57	L CY
72	9	R CY
73	NONE	
74	NONE	
75	NONE	
76	NONE	
77	NONE	
78	NONE	
79	NONE	
80	10	R CY
81	74	R CY
82	76	R SH•L CY
83	NONE	
84	NONE	
85	NONE	
86	NONE	
87	NONE	
88	11	R CY
89	75	R CY
90	NONE	
91	NONE	
92	86	L SH•R CY
93	NONE	
94	NONE	
95	NONE	
96	12	R CY
97	76	R CY
98	NONE	
99	NONE	
100	74	L SH•L CY
101	99	L SH•L CY
102	NONE	
103	NONE	
104	13	R CY
105	77	R CY
106	102	R SH•R CY
107	NONE	
108	83	L SH•R CY
109	NONE	
110	NONE	
111	NONE	
112	14	R CY
113	78	R CY
114	99	R SH•R CY
115	NONE	
116	85	L SH•R CY
117	NONE	

NUMBER	EQUIVALENT	SHIFT OPERATION
118	NONE	
119	NONE	
120	15	R CY
121	79	R CY
122	103	R SH•R CY
123	NONE	
124	87	L SH•R CY
125	NONE	
126	NONE	
127	NONE	
128	1	R SH•L CY
129	10	L CY
130	9	R SH•L CY
131	26	L CY
132	12	L SH•L CY
133	28	L SH•L CY
134	25	R SH•L CY
135	97	R SH•L CY
136	12	R SH•R CY
137	74	L CY
138	76	R SH•R CY
139	90	L CY
140	98	R SH
141	102	R SH
142	99	R SH
143	103	R SH
144	9	R SH•R CY
145	76	R SH
146	73	R SH
147	77	R SH
148	74	R SH
149	78	R SH
150	75	R SH
151	79	R SH
152	13	R SH•R CY
153	83	R CY
154	77	R SH•R CY
155	109	R SH
156	102	L SH•R CY
157	110	R SH
158	107	R SH
159	111	R SH
160	10	R SH•R CY
161	84	R SH
162	74	R SH•R CY
163	85	R SH
164	76	L SH•L CY
165	86	R SH
166	83	R SH
167	87	R SH
168	14	R SH•R CY
169	85	R CY
170	78	R SH•R CY
171	117	R SH
172	99	L SH•R CY
173	118	R SH
174	115	R SH
175	119	R SH
176	11	R SH•R CY

NUMBER	EQUIVALENT	SHIFT OPERATION
177	86	R CY
178	75	R SH•R CY
179	93	R SH
180	90	R SH
181	94	R SH
182	91	R SH
183	95	R SH
184	15	R SH•R CY
185	87	R CY
186	79	R SH•R CY
187	125	R SH
188	103	L SH•R CY
189	126	R SH
190	123	R SH
191	127	R SH
192	3	L CY
193	11	L CY
194	13	R SH•L CY
195	27	L CY
196	14	L SH•L CY
197	30	L SH•L CY
198	29	R SH•L CY
199	59	L CY
200	25	R CY
201	75	L CY
202	83	L CY
203	91	L CY
204	99	L CY
205	107	L CY
206	115	L CY
207	123	L CY
208	26	R CY
209	90	R CY
210	77	R SH•L CY
211	109	R SH•L CY
212	85	R SH•L CY
213	117	R SH•L CY
214	93	R SH•L CY
215	125	R SH•L CY
216	27	R CY
217	91	R CY
218	109	R SH•R CY
219	NONE	
220	118	L SH•R CY
221	NONE	
222	NONE	
223	NONE	
224	28	R CY
225	86	L SH•L CY
226	102	L SH•L CY
227	118	L SH•L CY
228	78	L SH•L CY
229	94	L SH•L CY
230	110	L SH•L CY
231	126	L SH•L CY
232	29	R CY
233	93	R CY
234	110	R SH•R CY
235	221	R CY

NUMBER	EQUIVALENT	SHIFT OPERATION
236	115	L SH,R CY
237	222	L SH,L CY
238	NONE	
239	NONE	
240	30	R CY
241	94	R CY
242	107	R SH,R CY
243	222	R CY
244	117	L SH,R CY
245	NONE	
246	221	R SH,L CY
247	NONE	
248	31	R CY
249	95	R CY
250	111	R SH,R CY
251	223	R CY
252	119	L SH,R CY
253	247	L SH,R CY
254	239	R SH,R CY
255	NONE	
256	1	L SH,L CY
257	12	L CY
258	10	R SH,L CY
259	28	L CY
260	9	L SH,L CY
261	25	L SH,L CY
262	26	R SH,L CY
263	57	L SH,L CY
264	10	L SH,R CY
265	76	L CY
266	84	L SH
267	86	L SH
268	74	L SH,R CY
269	83	L SH
270	85	L SH
271	87	L SH
272	12	L SH,R CY
273	98	L SH
274	74	R SH,L CY
275	102	L SH
276	76	L SH,R CY
277	99	L SH
278	90	R SH,L CY
279	103	L SH
280	14	L SH,R CY
281	99	R CY
282	85	R SH,R CY
283	116	L SH
284	78	L SH,R CY
285	115	L SH
286	117	L SH
287	119	L SH
288	9	L SH,R CY
289	74	L SH
290	76	L SH
291	78	L SH
292	73	L SH
293	75	L SH
294	77	L SH

NUMBER	EQUIVALENT	SHIFT OPERATION
295	79	L SH
296	11	L SH,R CY
297	90	L SH
298	86	R SH,R CY
299	94	L SH
300	75	L SH,R CY
301	91	L SH
302	93	L SH
303	95	L SH
304	13	L SH,R CY
305	102	R CY
306	83	R SH,R CY
307	110	L SH
308	77	L SH,R CY
309	107	L SH
310	109	L SH
311	111	L SH
312	15	L SH,R CY
313	103	R CY
314	87	R SH,R CY
315	126	L SH
316	79	L SH,R CY
317	123	L SH
318	125	L SH
319	127	L SH
320	3	L SH,L CY
321	13	L CY
322	14	R SH,L CY
323	29	L CY
324	11	L SH,L CY
325	27	L SH,L CY
326	30	R SH,L CY
327	59	L SH,L CY
328	26	L SH,R CY
329	77	L CY
330	85	L CY
331	93	L CY
332	90	L SH,R CY
333	109	L CY
334	117	L CY
335	125	L CY
336	28	L SH,R CY
337	102	R SH,L CY
338	78	R SH,L CY
339	110	R SH,L CY
340	86	R SH,L CY
341	118	R SH,L CY
342	94	R SH,L CY
343	126	R SH,L CY
344	30	L SH,R CY
345	107	R CY
346	117	R SH,R CY
347	221	L CY
348	94	L SH,R CY
349	222	L SH,R CY
350	245	L SH
351	247	L SH
352	95	L SH,R CY
353	83	L SH,L CY

NUMBER	EQUIVALENT	SHIFT OPERATION
354	99	L SH*L CY
355	115	L SH*L CY
356	75	L SH*L CY
357	91	L SH*L CY
358	107	L SH*L CY
359	123	L SH*L CY
360	27	L SH*R CY
361	109	R CY
362	118	R SH*R CY
363	222	L SH
364	91	L SH*R CY
365	219	L SH
366	221	L SH
367	223	L SH
368	29	L SH*R CY
369	110	R CY
370	115	R SH*R CY
371	238	L SH
372	93	L SH*R CY
373	221	L SH*R CY
374	222	R SH*L CY
375	239	L SH
376	31	L SH*R CY
377	111	R CY
378	119	R SH*R CY
379	239	R CY
380	95	L SH*R CY
381	223	L SH*R CY
382	247	R SH*R CY
383	255	L SH
384	3	R SH*L CY
385	14	L CY
386	11	R SH*L CY
387	30	L CY
388	13	L SH*L CY
389	29	L SH*L CY
390	27	R SH*L CY
391	59	R SH*L CY
392	28	R SH*R CY
393	78	L CY
394	86	L CY
395	94	L CY
396	102	L CY
397	110	L CY
398	118	L CY
399	126	L CY
400	25	R SH*R CY
401	99	R SH*L CY
402	75	R SH*L CY
403	107	R SH*L CY
404	83	R SH*L CY
405	115	R SH*L CY
406	91	R SH*L CY
407	123	R SH*L CY
408	29	R SH*R CY
409	115	R CY
410	93	R SH*R CY
411	222	L CY
412	110	L SH*R CY

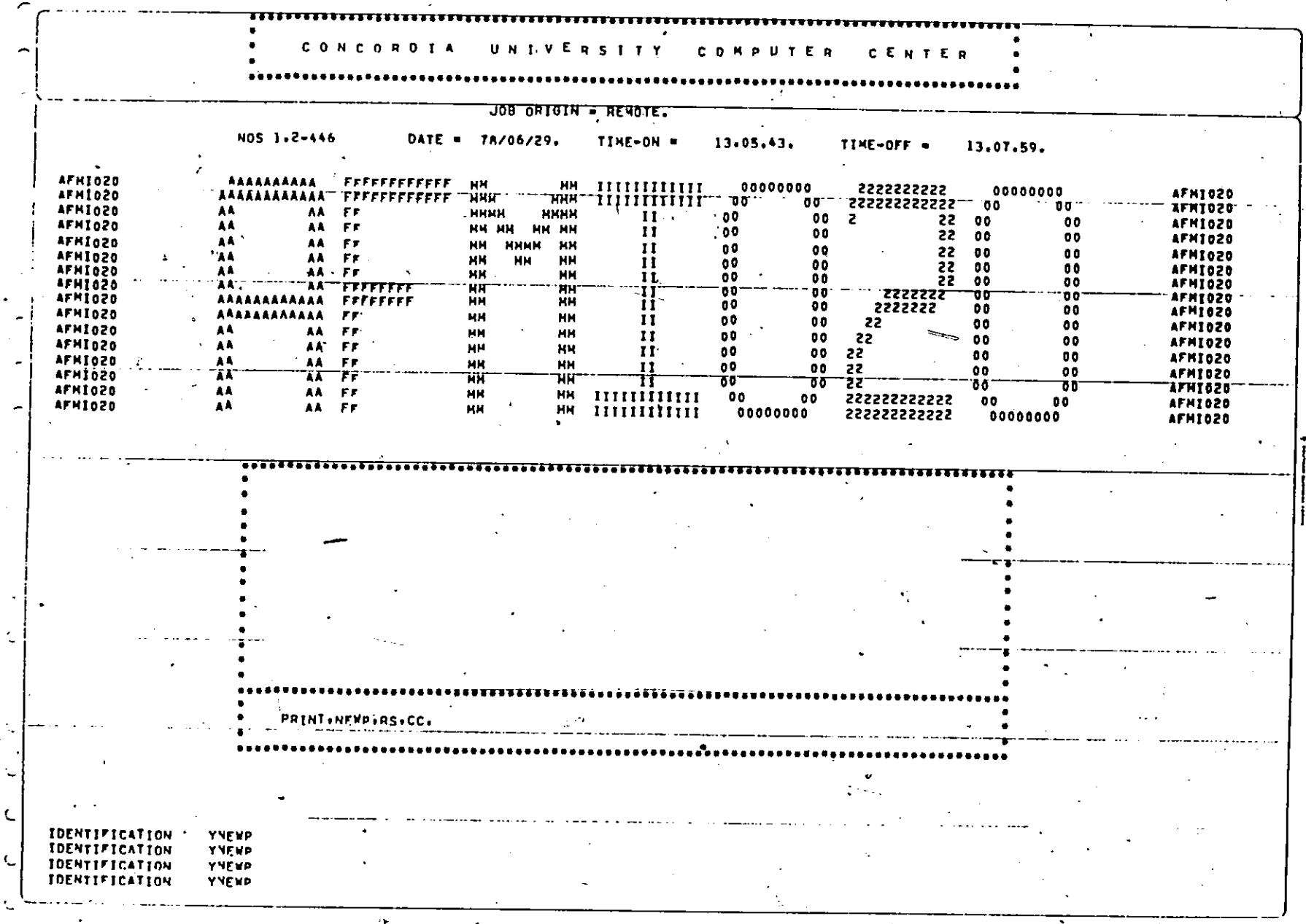
NUMBER	EQUIVALENT	SHIFT OPERATION
413	238	R SH
414	221	R SH,R CY
415	239	R SH
416	26	R SH,R CY
417	85	L SH,L CY
418	90	R SH,R CY
419	117	L SH,L CY
420	77	L SH,L CY
421	93	L SH,L CY
422	109	L SH,L CY
423	125	L SH,L CY
424	30	R SH,R CY
425	117	R CY
426	94	R SH,R CY
427	245	R SH
428	107	L SH,R CY
429	221	L SH,L CY
430	222	R SH,R CY
431	247	R SH
432	27	R SH,R CY
433	118	R CY
434	91	R SH,R CY
435	221	R SH
436	109	L SH,R CY
437	222	R SH
438	219	R SH
439	223	R SH
440	31	R SH,R CY
441	119	R CY
442	95	R SH,R CY
443	247	R CY
444	111	L SH,R CY
445	239	L SH,R CY
446	223	R SH,R CY
447	245	R SH
448	7	L CY
449	15	L CY
450	15	R SH,L CY
451	31	L CY
452	15	L SH,L CY
453	31	L SH,L CY
454	31	R SH,L CY
455	63	L CY
456	57	R CY
457	79	L CY
458	87	L CY
459	95	L CY
460	103	L CY
461	111	L CY
462	119	L CY
463	127	L CY
464	57	R SH,R CY
465	103	R SH,L CY
466	79	R SH,L CY
467	111	R SH,L CY
468	87	R SH,L CY
469	119	R SH,L CY
470	95	R SH,L CY
471	127	R SH,L CY

NUMBER	EQUIVALENT	SHIFT OPERATION
472	99	R CY
473	123	R CY
474	125	R SH,R CY
475	223	L CY
476	126	L SH,R CY
477	239	L CY
478	247	L CY
479	255	L CY
480	57	L SH,R CY
481	87	L SH,L CY
482	103	L SH,L CY
483	119	L SH,L CY
484	79	L SH,L CY
485	95	L SH,L CY
486	111	L SH,L CY
487	127	L SH,L CY
488	59	L SH,R CY
489	125	R CY
490	126	R SH,R CY
491	247	L SH,L CY
492	123	L SH,R CY
493	223	L SH,L CY
494	239	L SH,L CY
495	255	L SH,L CY
496	59	R SH,R CY
497	126	R CY
498	123	R SH,R CY
499	239	R SH,L CY
500	125	L SH,R CY
501	247	R SH,L CY
502	223	R SH,L CY
503	255	R SH,L CY
504	63	R CY
505	127	R CY
506	127	R SH,R CY
507	255	R CY
508	127	L SH,R CY
509	255	L SH,R CY
510	255	R SH,R CY
511	NONE	

CALCULATIONS = 64

APPENDIX 3

Program to Evaluate Fundamental Sub-Distributions


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/06/29. TIME-ON = 13.05.43. TIME-OFF = 13.07.59.
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AFMI020 AAAAAAAAAAAA FFFFFFFFFFFF MMM MMM IIIIIIIIIIII 00 00 2222222222 00 00 AFMI020
AFMI020 AA AA FF MMMM MMMM II 00 00 2 22 00 00 AFMI020
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AFMI020 AA AA FF MM MM II 00 00 22 00 00 AFMI020
AFMI020 AA AA FFFFFFFF MM MM II 00 00 2222222 00 00 AFMI020
AFMI020 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 2222222 00 00 AFMI020
AFMI020 AAAAAAAAAAAA FF MM MM II 00 00 22 00 00 AFMI020
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AFMI020 AA AA FF MM MM II 00 00 22 00 00 AFMI020
AFMI020 AA AA FF MM MM IIIIIIIIIIII 00 00 2222222222 00 00 AFMI020
AFMI020 AA AA FF MM MM IIIIIIIIIIII 00000000 2222222222 00000000 AFMI020
PRINT,NEWP,RS,CC.
IDENTIFICATION YYNEWP
IDENTIFICATION YYNEWP
IDENTIFICATION YYNEWP
IDENTIFICATION YYNEWP

```
      PROGRAM LONG (INPUT,OUTPUT)
      INTEGER ACC(55),TOT
      CALL ONCT(ACC)
      PRINT 22
   22 FORMAT (*1OUTPUT VECTOR ONES DISTRIBUTION*/
     1*0ONES  POPULATION*)
      TOT=0
      DO 23 I=1,55
      J=I-1
      TOT=TOT+ACC(I)
      IF (J.EQ.28) PRINT 25,J,ACC(I)
      IF (J.NE.28) PRINT 24,J,ACC(I)
   23 CONTINUE
   24 FORMAT (*0*,I3,I12)
   25 FORMAT (*1*,I3,I12)
      PRINT 26, TOT
   26 FORMAT (*0TOTAL =*,I12)
      STOP
      END
          IDENT  ONCT
          ENTRY  ONCT
ONCT      BSS    1
          BASE   0
          SX0    1          X0=1
          SX1    VALUE      SET X1
          LX1    22         L SH 18 DEC
          SB1    VALUE      SET B1
          SB5    66         B5=54 DEC
          SB2    73         B2=59 DEC
          SB3    33         B3=27 DEC
          BX2    X1         X2=X1
          SX7    B0         X7=0
          SB4    B0         B4=0
LP2       SB4    B4+X0      INCR B4
          BT     B4,B3,LP1  EXIT
          LX2    B2,X2      L SH 59 PL
          PL     X2,LP2     LP IF 0
          SA4    B4+MAT     X4=ROW B4
          BX7    X7-X4      MOD 2 ADD
          EQ     LP2        LOOP
LP1       BX2    X1         X2=X1
          BX3    X7         X3=X7
          SB4    X0         B4=1
          LX2    B2,X2      L SH 59 PL
          PL     X2,R2      JP IF 0
          SA4    B4+MAT     X4=ROW B4
          BX3    X3-X4      MOD 2 ADD
R2        SB4    B4+X0      INCR B4
          LX2    B2,X2      L SH 59 PL
          PL     X2,R3      JP IF 0
          SA4    B4+MAT     X4=ROW B4
          BX3    X3-X4      MOD 2 ADD
R3        SB4    B4+X0      INCR B4
          LX2    B2,X2      L SH 59 PL
          PL     X2,R4      JP IF 0
          SA4    B4+MAT     X4=ROW B4
          BX3    X3-X4      MOD 2 ADD
R4        SB4    B4+X0      INCR B4
          LX2    B2,X2      L SH 59 PL
          PL     X2,R5      JP IF 0
```

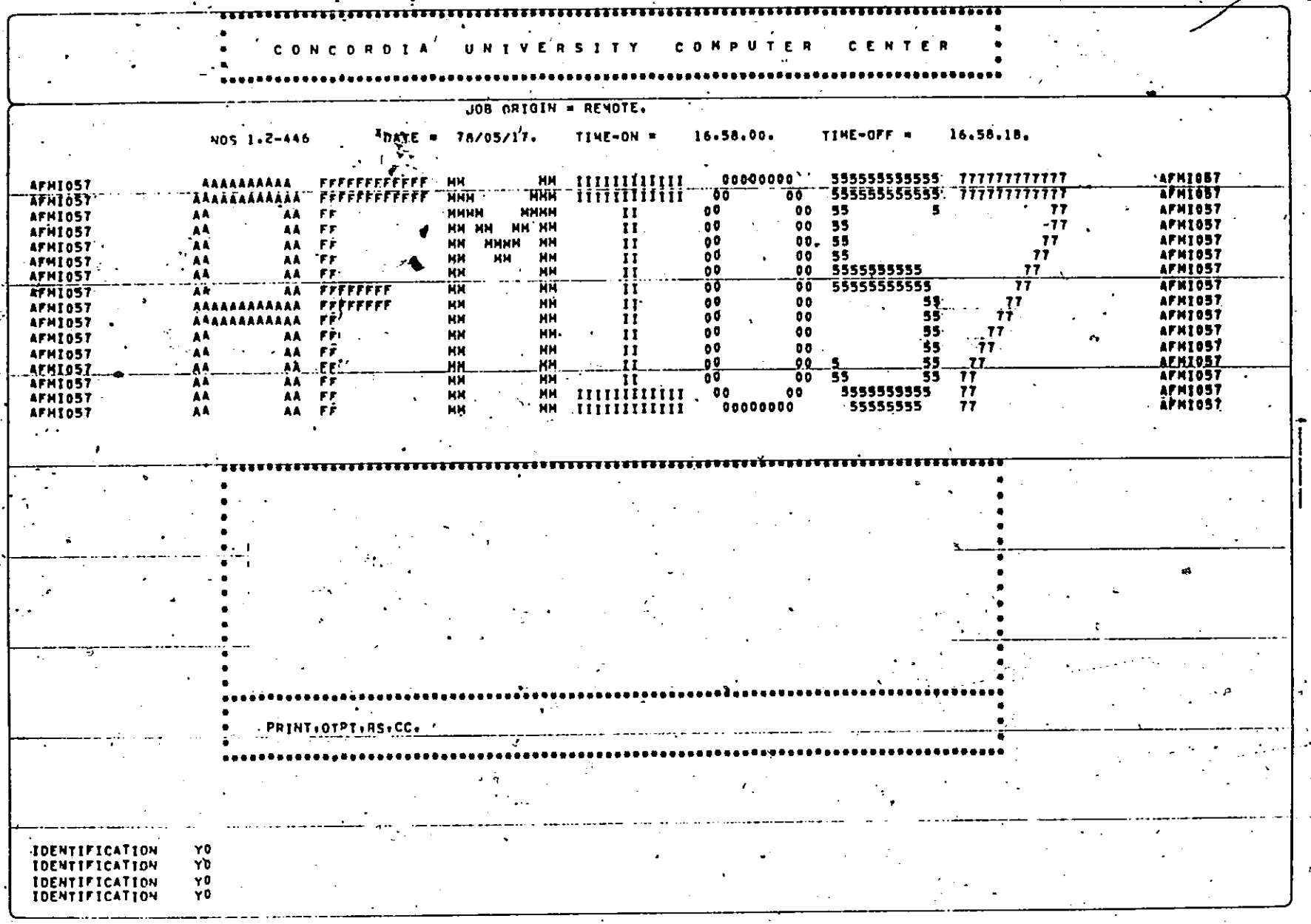
```
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R5       SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R6       JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R6       SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R7       JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R7       SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R8       JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R8       SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R9       JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R9       SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R10      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R10      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R11      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R11      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R12      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R12      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R13      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R13      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R14      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R14      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R15      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R15      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R16      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R16      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R17      JP IF 0
```

```
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R17      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,R18      JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
R18      SB4     B4+X0       INCR B4
         LX2     B2,X2       L SH 59 PL
         PL      X2,DENS     JP IF 0
         SA4     B4+MAT      X4=ROW B4
         BX3     X3-X4       MOD 2 ADD
DENS     LX4     B3,X1       L SH 27 PL
         BX4     X4+X3       X4= OTPT VECT
         CX4     X4          POP CNT
         SA5     X4+ACCT     X5=CONT X4
         IX6     X5+X0       INCR CONT
         SA6     A5          REPL CONT
         IX1     X1+X0       INCR INP VECTOR
         LX2     B1,X1       L SH 81
         MI      X2,DUMP     EXIT
         EQ      LP1         LOOP
DUMP     SB4     B0          B4=0
         SA3     A1          X3=CONT A1
LP3      RT      B4,B5,ONCT  RETURN
         SA2     B4+ACCT     X2=CONT
         BX6     X2          X6=X2
         SA6     B4+X3       LOAD
         SB4     B4+X0       INCR
         EQ      LP3         LOOP
ACCT     BSSZ    67          ZERO 55 LOC
MAT      DATA    0
         DATA    224335703   ROW 1
         DATA    441663706   ROW 2
         DATA    112556705   ROW 3
         DATA    242353037   ROW 4
         DATA    414636067   ROW 5
         DATA    121565057   ROW 6
         DATA    422537370   ROW 7
         DATA    144366670   ROW 8
         DATA    211655570   ROW 9
         DATA    335703224   ROW 10
         DATA    663706441   ROW 11
         DATA    556705112   ROW 12
         DATA    353037242   ROW 13
         DATA    636067414   ROW 14
         DATA    565057121   ROW 15
         DATA    533370422   ROW 16
         DATA    366670144   ROW 17
         DATA    655570211   ROW 18
         DATA    703224335   ROW 19
         DATA    706441663   ROW 20
         DATA    705112556   ROW 21
         DATA    037242353   ROW 22
         DATA    067414636   ROW 23
         DATA    057121565   ROW 24
         DATA    370422533   ROW 25
         DATA    670144366   ROW 26
         DATA    570211655   ROW 27
         END
```

APPENDIX 4

Fundamental Sub-Distributions -

Computer Outputs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NOS 1.2-446 DATE = 78/05/17. TIME-ON = 16.58.00. TIME-OFF = 16.58.18.
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AFMI057 AAAAAAAAAAAA FFFFFFFFFFFF MMM MMM IIIIIIIIIIII 00 00 555555555555 7777777777 AFMI057
AFMI057 AA AA FF MMMM MMMM II 00 00 55 5 77 AFMI057
AFMI057 AA AA FF MM MM MM MM II 00 00 55 -77 AFMI057
AFMI057 AA AA FF MM MMMM MM II 00 00 55 77 AFMI057
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AFMI057 AA AA FF MM MM IIIIIIIIIIII 00000000 55555555 77 AFMI057
PRINT,OTPT,AS,CC.
IDENTIFICATION Y0
IDENTIFICATION Y0
IDENTIFICATION Y0
IDENTIFICATION Y0

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	1
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	171
12	384
13	0
14	0
15	5037
16	9846
17	0
18	0
19	36567
20	46836
21	0
22	0
23	61065
24	56640
25	0
26	0
27	25745

28	16200
29	0
30	0
31	2439
32	1161
33	0
34	0
35	45
36	4
37	0
38	0
39	3
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

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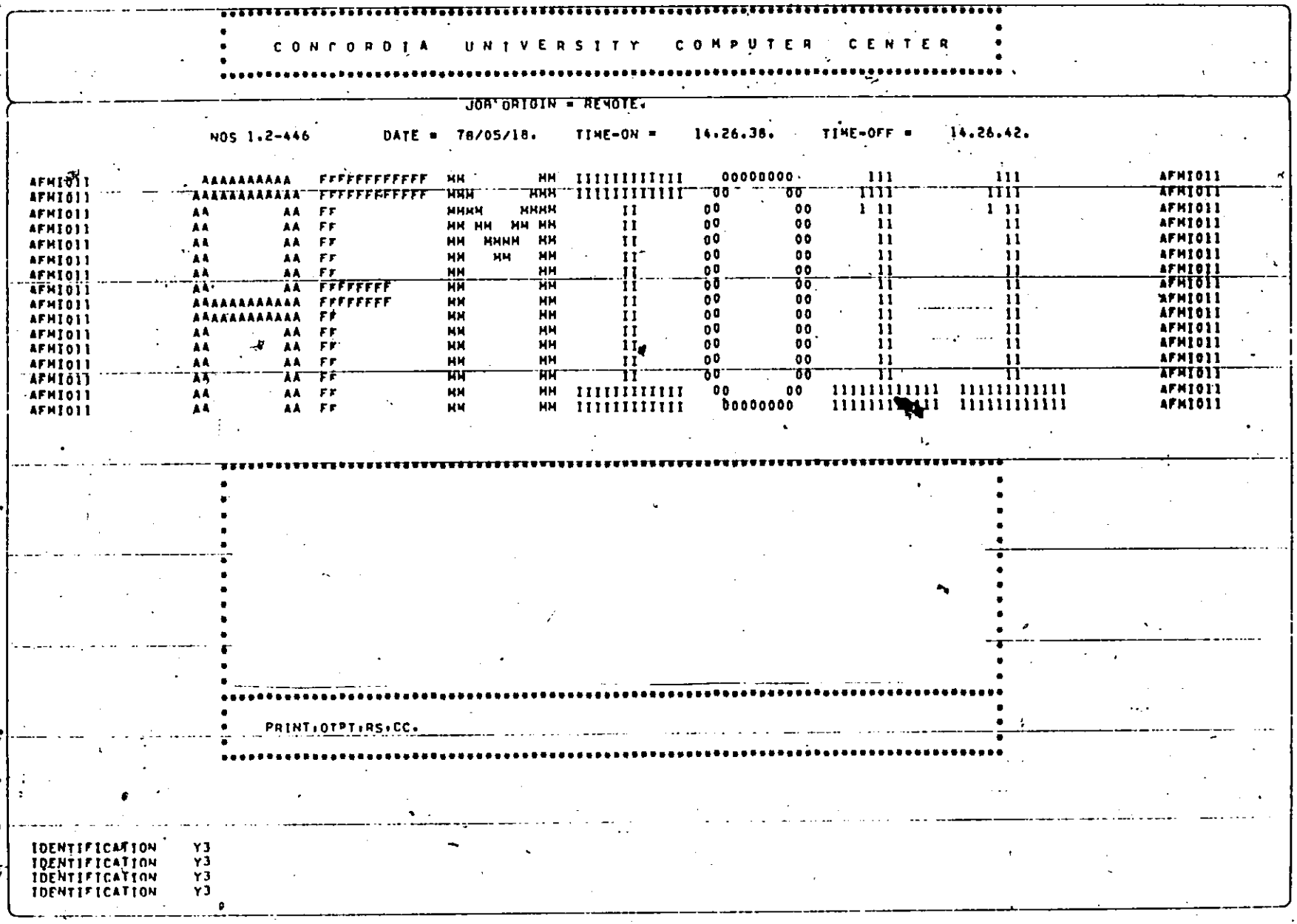
    PRINT,OTPT,RS,CC.


IDENTIFICATION    Y1
IDENTIFICATION    Y1
IDENTIFICATION    Y1
IDENTIFICATION    Y1
```

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	46
12	154
13	0
14	0
15	2496
16	5136
17	0
18	0
19	25550
20	36330
21	0
22	0
23	61360
24	61360
25	0
26	0
27	36330

28	25550
29	0
30	0
31	5136
32	2496
33	0
34	0
35	154
36	46
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
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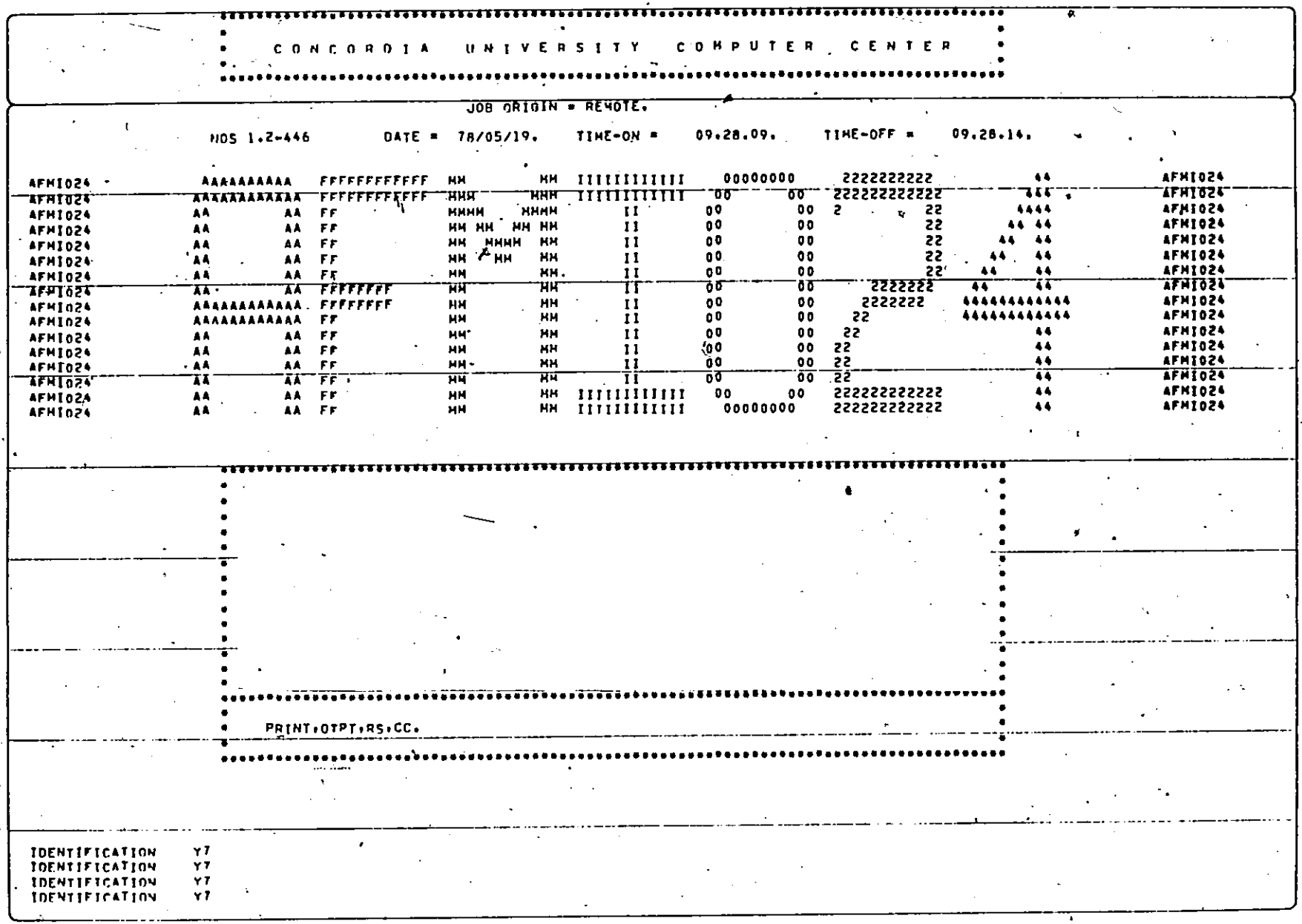
AFMI011 AA AA FFFFFFFF MM MM II 00 00 11 11 AFMI011
AFMI011 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 11 11 AFMI011
AFMI011 AAAAAAAAAAAA FF MM MM II 00 00 11 11 AFMI011
AFMI011 AA AA FF MM MM II 00 00 11 11 AFMI011
AFMI011 AA AA FF MM MM II 00 00 11 11 AFMI011
AFMI011 AA AA FF MM MM II 00 00 11 11 AFMI011
AFMI011 AA AA FF MM MM IIIIIIIIIII 00 00 111111111111 111111111111 AFMI011
AFMI011 AA AA FF MM MM IIIIIIIIIII 00000000 111111111111 111111111111 AFMI011
PRINT,OTPT,RS,CC.
IDENTIFICATION Y3
IDENTIFICATION Y3
IDENTIFICATION Y3
IDENTIFICATION Y3

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	19
12	54
13	0
14	0
15	1051
16	2644
17	0
18	0
19	16539
20	25670
21	0
22	0
23	56075
24	61200
25	0
26	0
27	47377

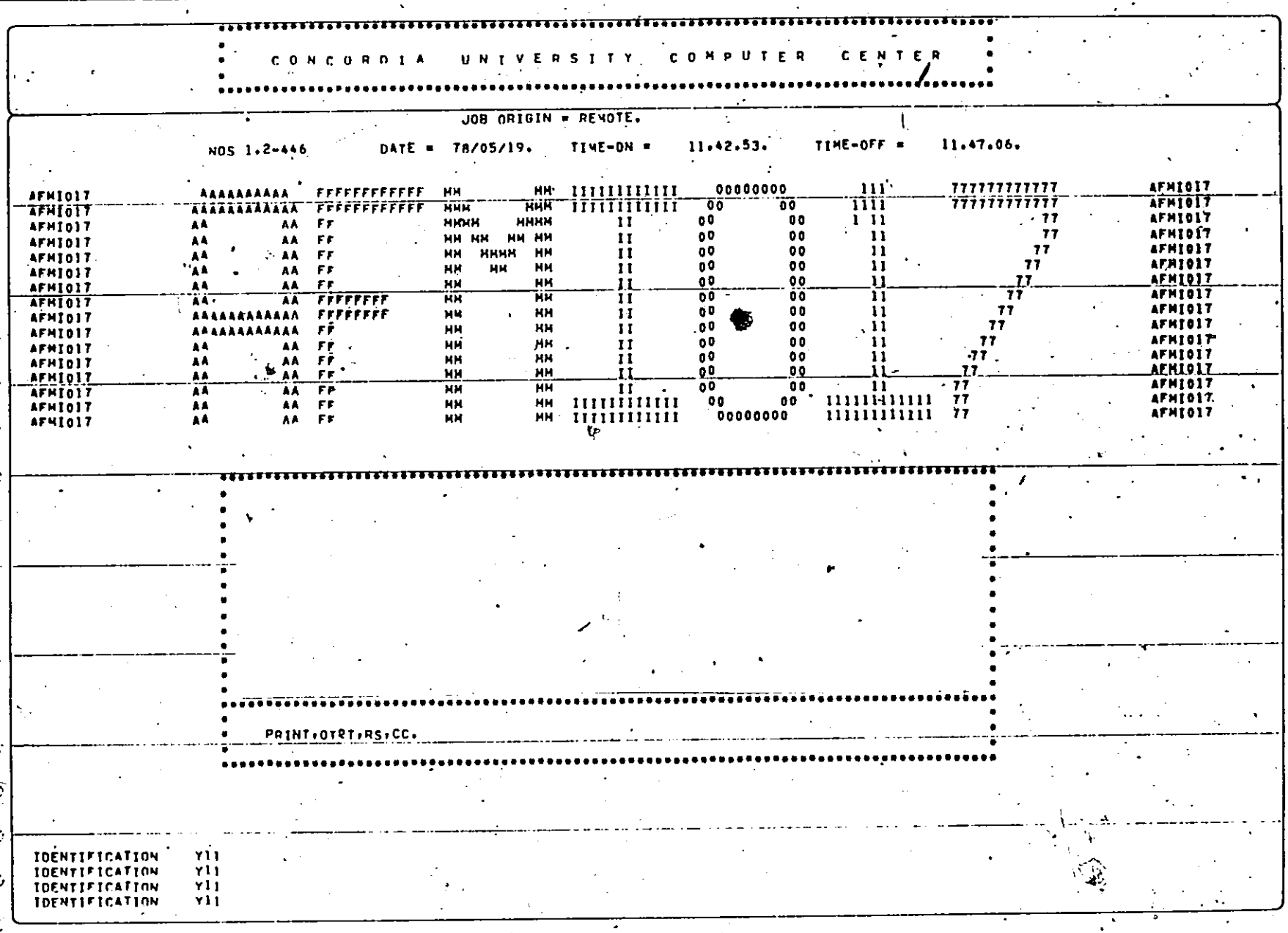
28	30450
29	0
30	0
31	9561
32	5088
33	0
34	0
35	449
36	162
37	0
38	0
39	1
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/19. TIME-ON = 09.28.09. TIME-OFF = 09.28.14.
AFMI024 AAAAAAAAAA FFFFFFFFFFFF MM MM IIIIIIIIIIII 00000000 2222222222 44 AFMI024
AFMI024 AAAAAAAAAAAA FFFFFFFFFFFF MMM MMM IIIIIIIIIIII 00 00 222222222222 444 AFMI024
AFMI024 AA AA FF MMMM MMMM II 00 00 2 22 4444 AFMI024
AFMI024 AA AA FF MM MM MM MM II 00 00 22 44 44 AFMI024
AFMI024 AA AA FF MM MMMM MM II 00 00 22 44 44 AFMI024
AFMI024 AA AA FF MM MM MM II 00 00 22 44 44 AFMI024
AFMI024 AA AA FF MM MM II 00 00 22 44 44 AFMI024
AFMI024 AA AA FFFFFFFF MM MM II 00 00 2222222 44 44 AFMI024
AFMI024 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 2222222 444444444444 AFMI024
AFMI024 AAAAAAAAAAAA FF MM MM II 00 00 22 444444444444 AFMI024
AFMI024 AA AA FF MM MM II 00 00 22 44 AFMI024
AFMI024 AA AA FF MM MM II 00 00 22 44 AFMI024
AFMI024 AA AA FF MM MM II 00 00 22 44 AFMI024
AFMI024 AA AA FF MM MM II 00 00 22 44 AFMI024
AFMI024 AA AA FF MM MM IIIIIIIIIIII 00 00 222222222222 44 AFMI024
AFMI024 AA AA FF MM MM IIIIIIIIIIII 00000000 222222222222 44 AFMI024
PRINT,OTPT,RS,CC.
IDENTIFICATION Y7
IDENTIFICATION Y7
IDENTIFICATION Y7
IDENTIFICATION Y7

OUTPUT VECTOR ONES DISTRIBUTION

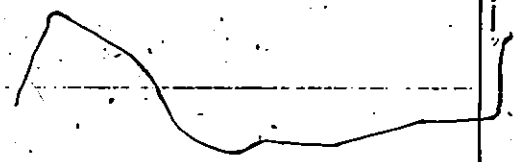
ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	436
16	1164
17	0
18	0
19	9660
20	16260
21	0
22	0
23	47112
24	56440
25	0
26	0
27	56440

28	47112
29	0
30	0
31	10268
32	9660
33	0
34	0
35	1164
36	436
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/19. TIME-ON = 11.42.53. TIME-OFF = 11.47.06.
AFMI017
PRINT,OTRT,RS,CC.
IDENTIFICATION Y11
IDENTIFICATION Y11
IDENTIFICATION Y11
IDENTIFICATION Y11

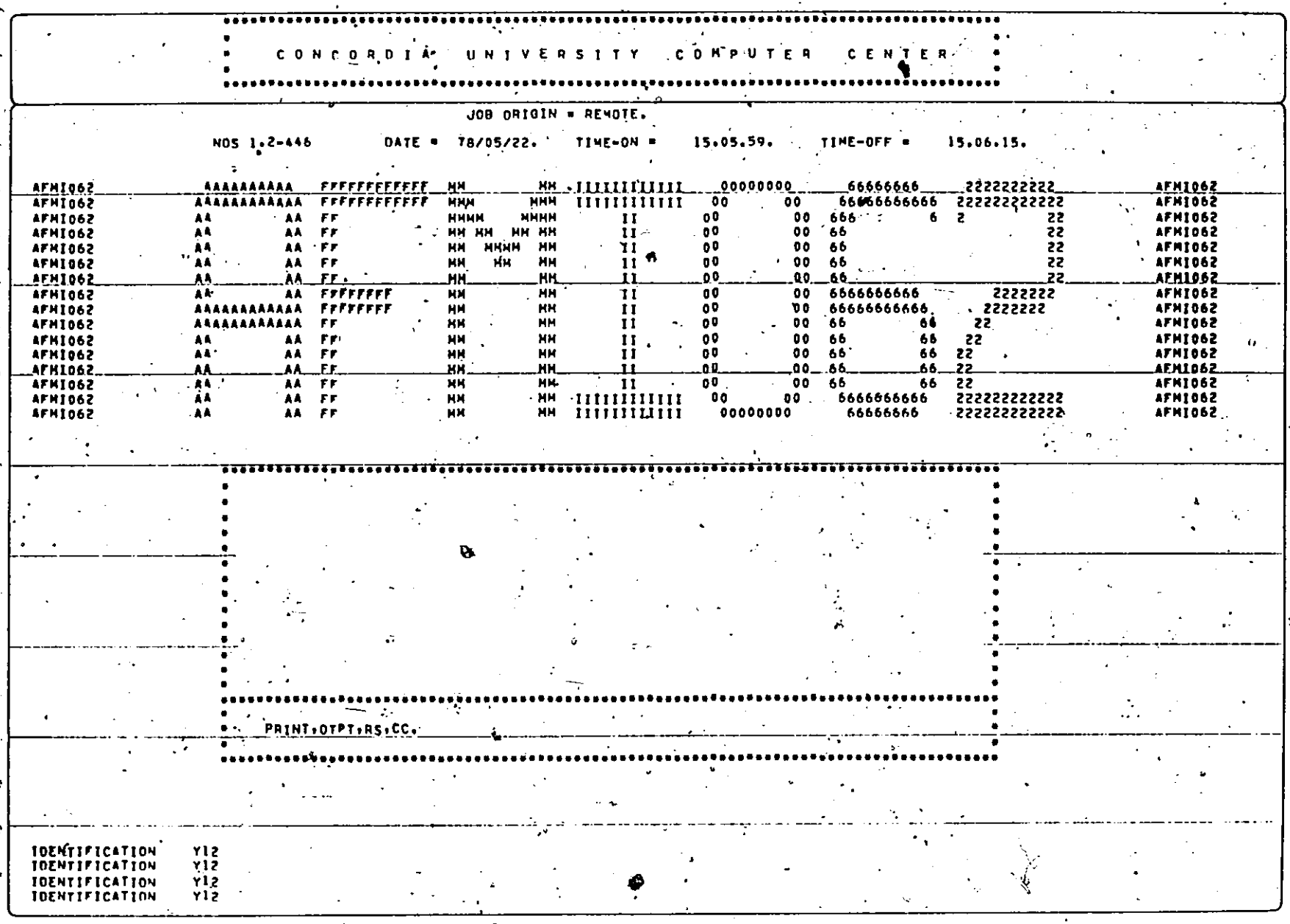
OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	9
12	47
13	0
14	0
15	1115
16	2491
17	0
18	0
19	16365
20	25559
21	0
22	0
23	56335
24	61355
25	0
26	0
27	47147



CONCORDIA UNIVERSITY COMPUTER CENTER

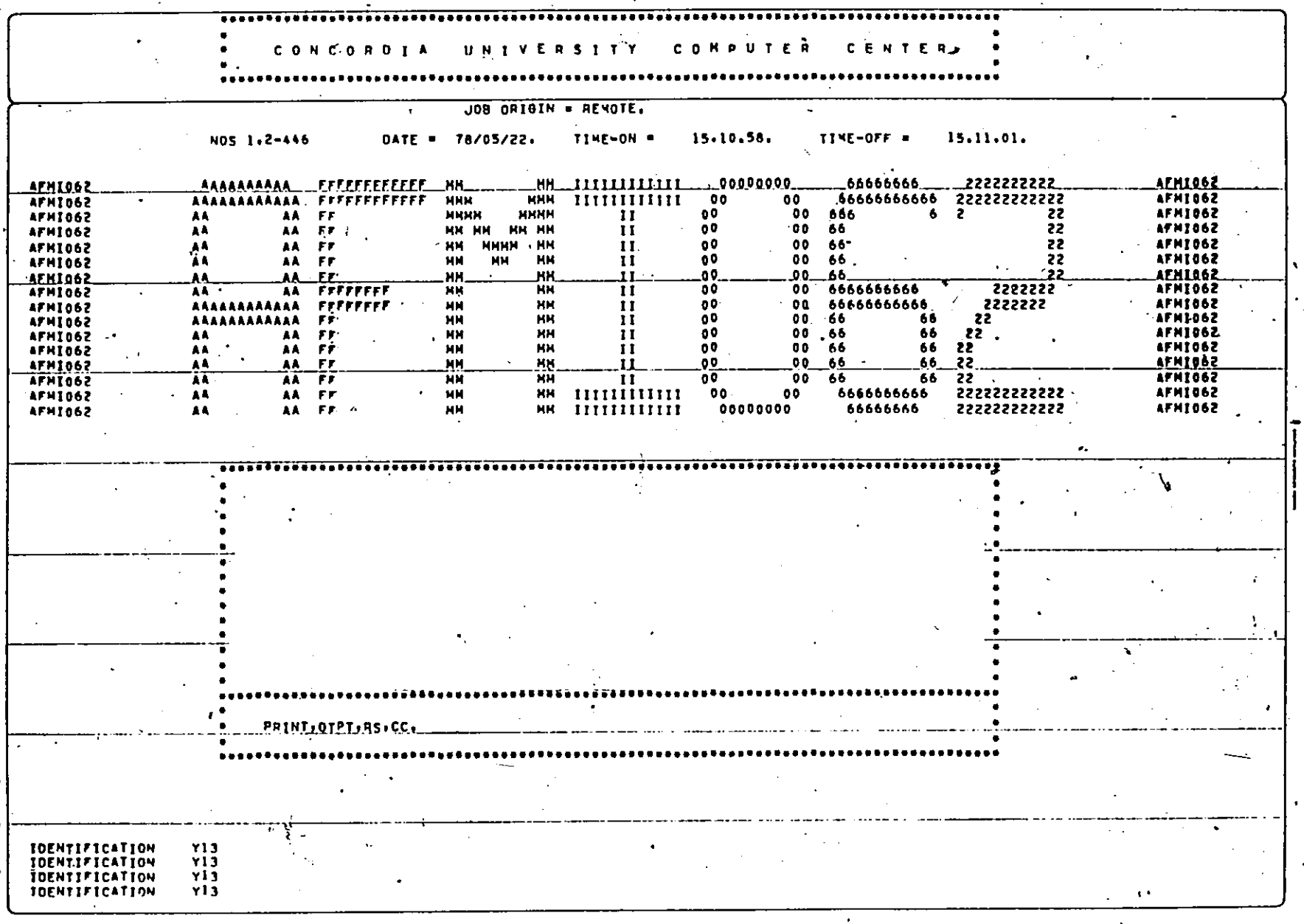
28	16325	
29	0	
30	0	
31	1896	
32	5145	
33	0	
34	0	
35	415	
36	140	
37	0	
38	0	
39	5	
40	1	
41	0	
42	0	
43	0	
44	0	
45	0	
46	0	
47	0	
48	0	
49	0	
50	0	
51	0	
52	0	
53	0	
54	0	
TOTAL =	267144	


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/22. TIME-ON = 15.05.59. TIME-OFF = 15.06.15.
AFMI062 AAAAAAAAAA FFFFFFFFFFF MM MM IIIIIIIIIII 00000000 66666666 2222222222 AFMI062
AFMI062 AAAAAAAAAAAA FFFFFFFFFFF MMM MMM IIIIIIIIIII 00 00 6666666666 2222222222 AFMI062
AFMI062 AA AA FF MMMM MMMM II 00 00 666 6 2 22 AFMI062
AFMI062 AA AA FF MM MM MM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FF MM MMMM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FF MM MM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FFFFFFFF MM MM II 00 00 6666666666 2222222 AFMI062
AFMI062 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 66666666666 2222222 AFMI062
AFMI062 AAAAAAAAAAAA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM IIIIIIIIIII 00 00 6666666666 2222222222 AFMI062
AFMI062 AA AA FF MM MM IIIIIIIIIII 00000000 66666666 2222222222 AFMI062
PRINT,OTPT,RS,CC.
IDENTIFICATION Y12
IDENTIFICATION Y12
IDENTIFICATION Y12
IDENTIFICATION Y12

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	9
12	47
13	0
14	0
15	1115
16	2491
17	0
18	0
19	16365
20	25559
21	0
22	0
23	56335
24	61355
25	0
26	0
27	47147

28	36325
29	0
30	0
31	9681
32	5145
33	0
34	0
35	415
36	149
37	0
38	0
39	5
40	1
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/22. TIME-ON = 15.10.58. TIME-OFF = 15.11.01.
AFMI062 AAAAAAAAAA FFFFFFFFFFF MM MM IIIIIIIIIII 00000000 66666666 2222222222 AFMI062
AFMI062 AAAAAAAAAAAA FFFFFFFFFFF MMM MMM IIIIIIIIIII 00 00 666666666666 222222222222 AFMI062
AFMI062 AA AA FF MMMM MMMM II 00 00 666 6 2 22 AFMI062
AFMI062 AA AA FF MM MM MM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FF MM MMMM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FF MM MM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 22 AFMI062
AFMI062 AA AA FFFFFFFF MM MM II 00 00 6666666666 2222222 AFMI062
AFMI062 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 666666666666 2222222 AFMI062
AFMI062 AAAAAAAAAAAA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM II 00 00 66 66 22 AFMI062
AFMI062 AA AA FF MM MM IIIIIIIIIII 00 00 6666666666 222222222222 AFMI062
AFMI062 AA AA FF MM MM IIIIIIIIIII 00000000 66666666 222222222222 AFMI062
PRINT,OTPT,AS,CC.
IDENTIFICATION Y13
IDENTIFICATION Y13
IDENTIFICATION Y13
IDENTIFICATION Y13

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	3
12	11
13	0
14	0
15	431
16	1103
17	0
18	0
19	9627
20	16395
21	0
22	0
23	47247
24	56295
25	0
26	0
27	56225

28	47177
29	0
30	0
31	16437
32	9669
33	0
34	0
35	1089
36	417
37	0
38	0
39	13
40	5
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                                JOB ORIGIN = REMOTE.

                NOS 1.2-446        DATE =  78/05/22.    TIME-ON =    15.15.27.    TIME-OFF =    15.15.31.


AFMI041          AAAAAAAAAA    FFFFFFFFFFFF  MM        MM  IIIIIIIIIIII    00000000        44        111          AFMI041
AFMI041        AAAAAAAAAAAA    FFFFFFFFFFFF  MMM       MMM IIIIIIIIIIII  00      00       444       1111          AFMI041
AFMI041        AA        AA    FF            MMMM     MMMM       II      00      00      4 444      1 11          AFMI041
AFMI041        AA        AA    FF            MM MM   MM MM       II      00      00        44 44      11          AFMI041
AFMI041        AA        AA    FF            MM  MMMM  MM       II      00      00       44  44      11          AFMI041
AFMI041        AA        AA    FF            MM   MM   MM       II      00      00      44   44      11          AFMI041
AFMI041        AA        AA    FF            MM        MM       II      00      00     44    44      11          AFMI041
AFMI041        AA        AA    FFFFFFFF      MM        MM       II      00      00   44      44      11          AFMI041
AFMI041        AAAAAAAAAAAA    FFFFFFFF      MM        MM       II      00      00  444444444444     11          AFMI041
AFMI041        AAAAAAAAAAAA    FF            MM        MM       II      00      00  444444444444     11          AFMI041
AFMI041        AA        AA    FF            MM        MM       II      00      00          44       11          AFMI041
AFMI041        AA        AA    FF            MM        MM       II      00      00          44       11          AFMI041
AFMI041        AA        AA    FF            MM        MM       II      00      00          44       11          AFMI041
AFMI041        AA        AA    FF            MM        MM       II      00      00          44       11          AFMI041
AFMI041        AA        AA    FF            MM        MM IIIIIIIIIIII  00      00          44 11111111111       AFMI041
AFMI041        AA        AA    FF            MM        MM IIIIIIIIIIII    00000000          44 11111111111       AFMI041


                PRINT,OTPT,RS=CC.


 IDENTIFICATION    Y14
 IDENTIFICATION    Y14
 IDENTIFICATION    Y14
 IDENTIFICATION    Y14
```
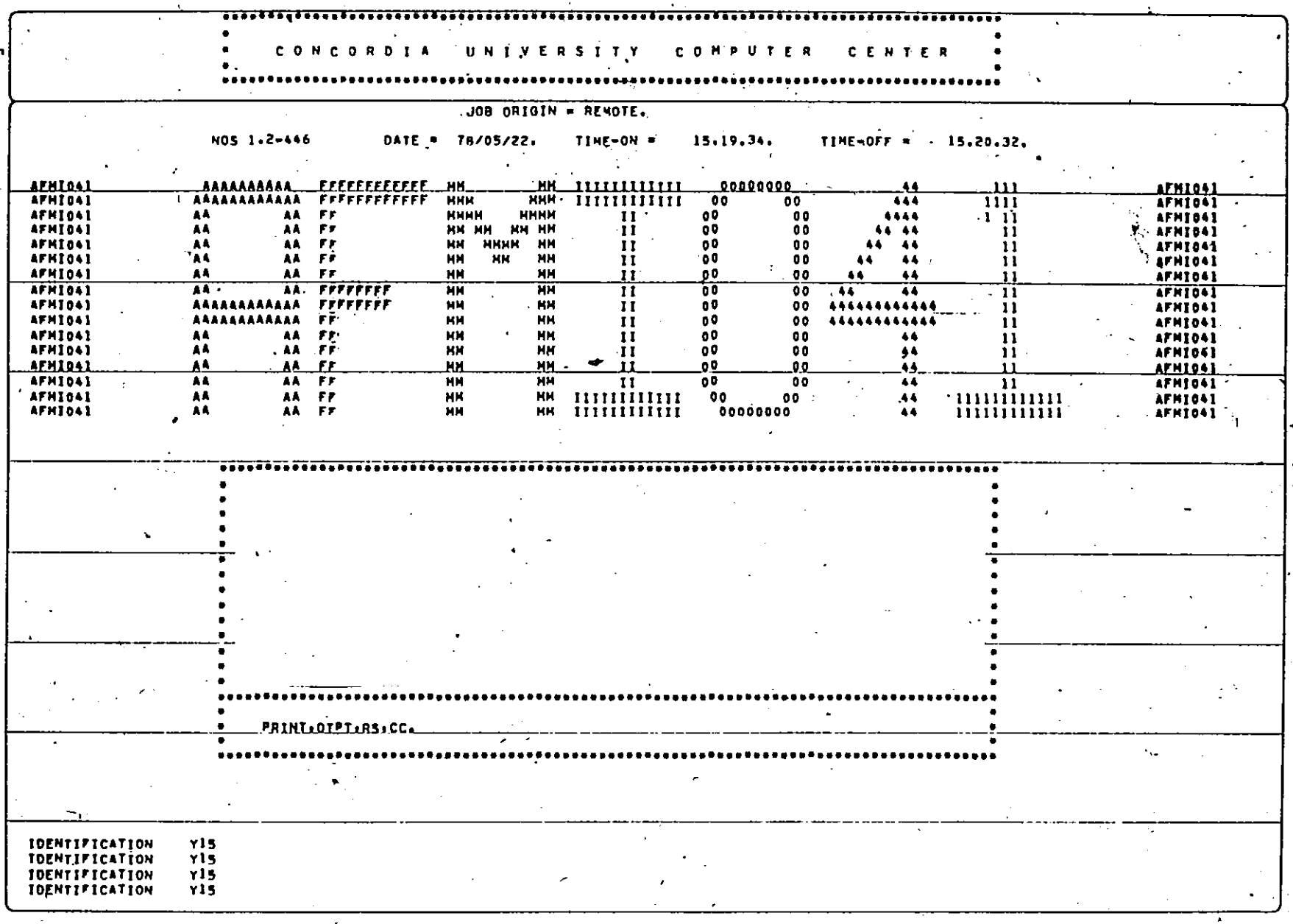

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	9
12	47
13	0
14	0
15	1115
16	2491
17	0
18	0
19	16365
20	25559
21	0
22	0
23	56335
24	61355
25	0
26	0
27	47147

28	36325
29	0
30	0
31	9681
32	5145
33	0
34	0
35	415
36	149
37	0
38	0
39	5
40	1
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144



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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

                NOS 1.2-446        DATE = 78/05/22.     TIME-ON =    15.19.34.     TIME-OFF =    15.20.32.

AFMI041          AAAAAAAAAA   FFFFFFFFFFF  MM       MM  IIIIIIIIIII    00000000        44        111          AFMI041
AFMI041        AAAAAAAAAAAA   FFFFFFFFFFF  MMM      MMM  IIIIIIIIIII   00      00       444       1111          AFMI041
AFMI041        AA        AA   FF           MMMM    MMMM        II      00      00      4444      1  11          AFMI041
AFMI041        AA        AA   FF           MM MM  MM MM        II      00      00        44      44  11          AFMI041
AFMI041        AA        AA   FF           MM  MMMM  MM        II      00      00        44      44  11          AFMI041
AFMI041        AA        AA   FF           MM   MM   MM        II      00      00        44      44  11          AFMI041
AFMI041        AA        AA   FF           MM        MM        II      00      00        44      44  11          AFMI041
AFMI041        AA        AA   FFFFFFFF     MM        MM        II      00      00        44      44  11          AFMI041
AFMI041        AAAAAAAAAAAA   FFFFFFFF     MM        MM        II      00      00  444444444444      11          AFMI041
AFMI041        AAAAAAAAAAAA   FF           MM        MM        II      00      00  444444444444      11          AFMI041
AFMI041        AA        AA   FF           MM        MM        II      00      00        44      44  11          AFMI041
AFMI041        AA        AA   FF           MM        MM        II      00      00        44      44  11          AFMI041
AFMI041        AA        AA   FF           MM        MM        II      00      00        44      44  11          AFMI041
AFMI041        AA        AA   FF           MM        MM  IIIIIIIIIII   00      00        44      44  11          AFMI041
AFMI041        AA        AA   FF           MM        MM  IIIIIIIIIII    00000000       44      44  11          AFMI041

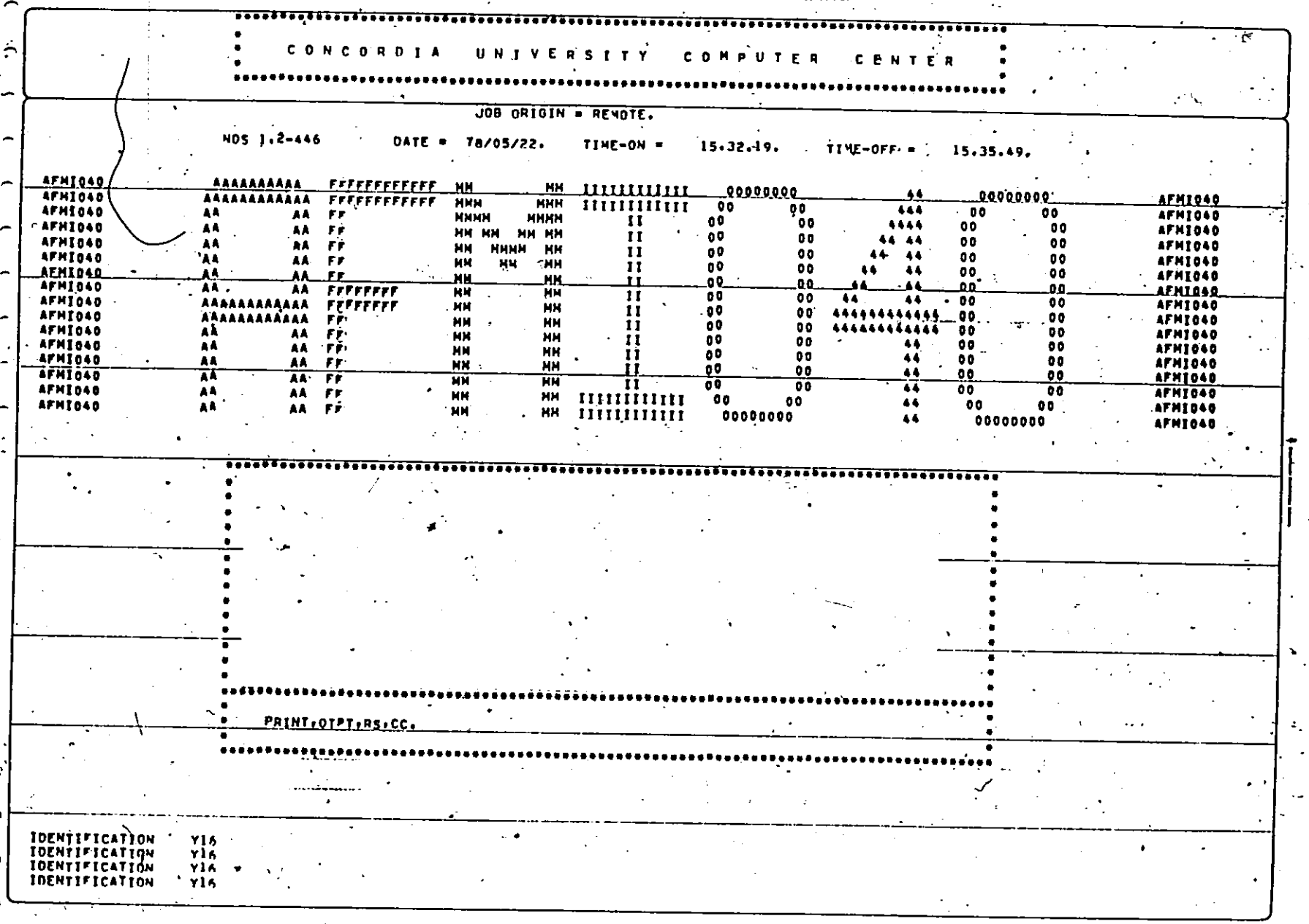
                    PRINT,OPT,RS,CC.

IDENTIFICATION    Y15
IDENTIFICATION    Y15
IDENTIFICATION    Y15
IDENTIFICATION    Y15
```

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	3
12	11
13	0
14	0
15	431
16	1103
17	0
18	0
19	9627
20	16395
21	0
22	0
23	47247
24	56295
25	0
26	0
27	56225

28	47177
29	0
30	0
31	16437
32	9669
33	0
34	0
35	1089
36	417
37	0
38	0
39	13
40	5
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/22. TIME-ON = 15.32.19. TIME-OFF = 15.35.49.
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AFMI040 AAAAAAAAAAAA FFFFFFFFFFFF MMMM MMMM IIIIIIIIIIII 00 00 444 00 00 AFMI040
AFMI040 AA AA FF MMMMM MMMMM II 00 00 4444 00 00 AFMI040
AFMI040 AA AA FF MM MM MM MM II 00 00 44 44 00 00 AFMI040
AFMI040 AA AA FF MM MMMM MM II 00 00 44 44 00 00 AFMI040
AFMI040 AA AA FF MM MM MM II 00 00 44 44 00 00 AFMI040
AFMI040 AA AA FFFFFFFF MM MM II 00 00 44 44 00 00 AFMI040
AFMI040 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 44 44 00 00 AFMI040
AFMI040 AAAAAAAAAAAA FF MM MM II 00 00 4444444444 00 00 AFMI040
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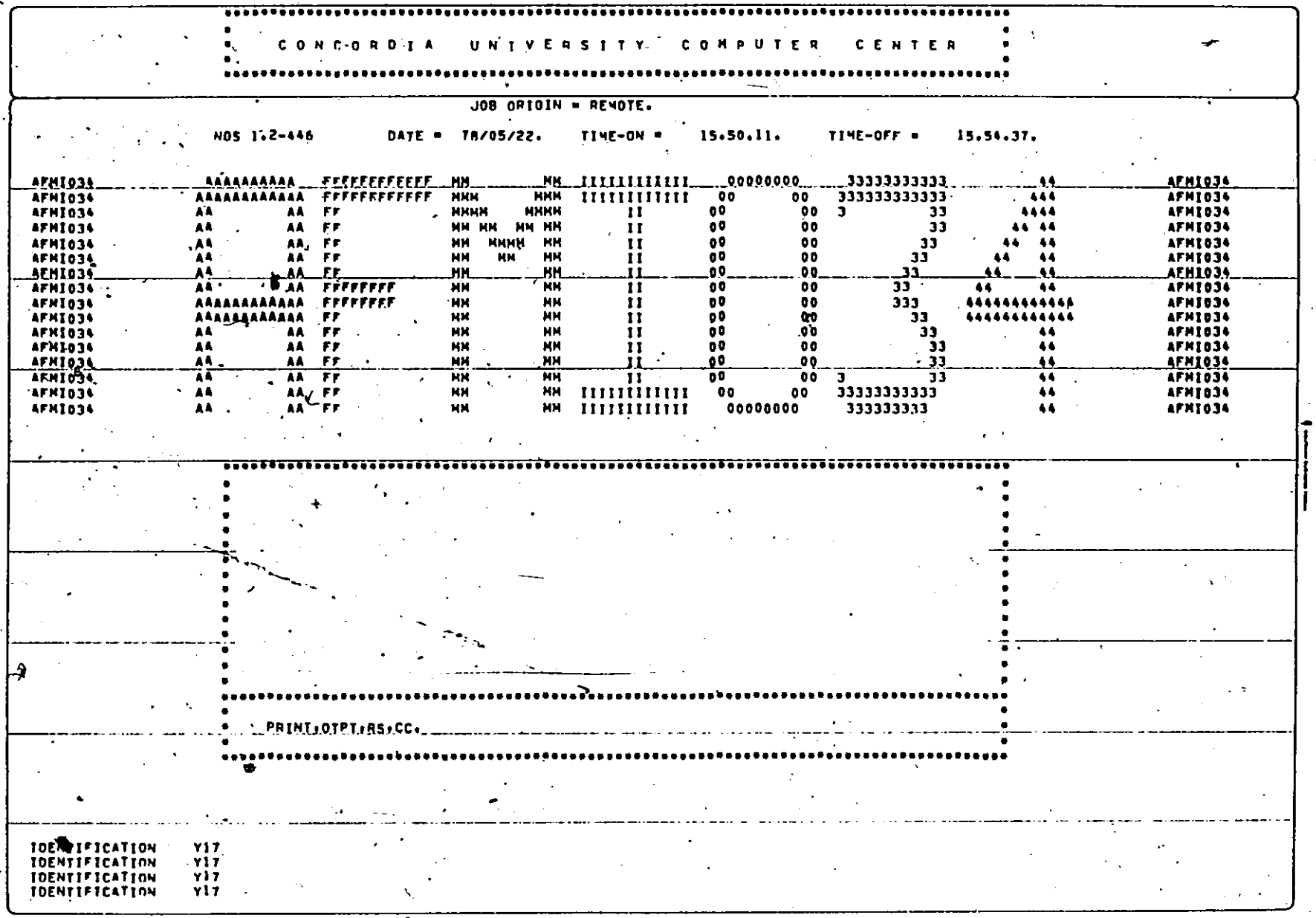
AFMI040 AA AA FF MM MM II 00 00 44 00 00 AFMI040
AFMI040 AA AA FF MM MM II 00 00 44 00 00 AFMI040
AFMI040 AA AA FF MM MM II 00 00 44 00 00 AFMI040
AFMI040 AA AA FF MM MM IIIIIIIIIIII 00 00 44 00 00 AFMI040
AFMI040 AA AA FF MM MM IIIIIIIIIIII 00000000 44 00000000 AFMI040
PRINT,OTPT,RS,CC.
IDENTIFICATION Y16
IDENTIFICATION Y16
IDENTIFICATION Y16
IDENTIFICATION Y16

OUTPUT VECTOR [illegible]S DISTRIBUTION

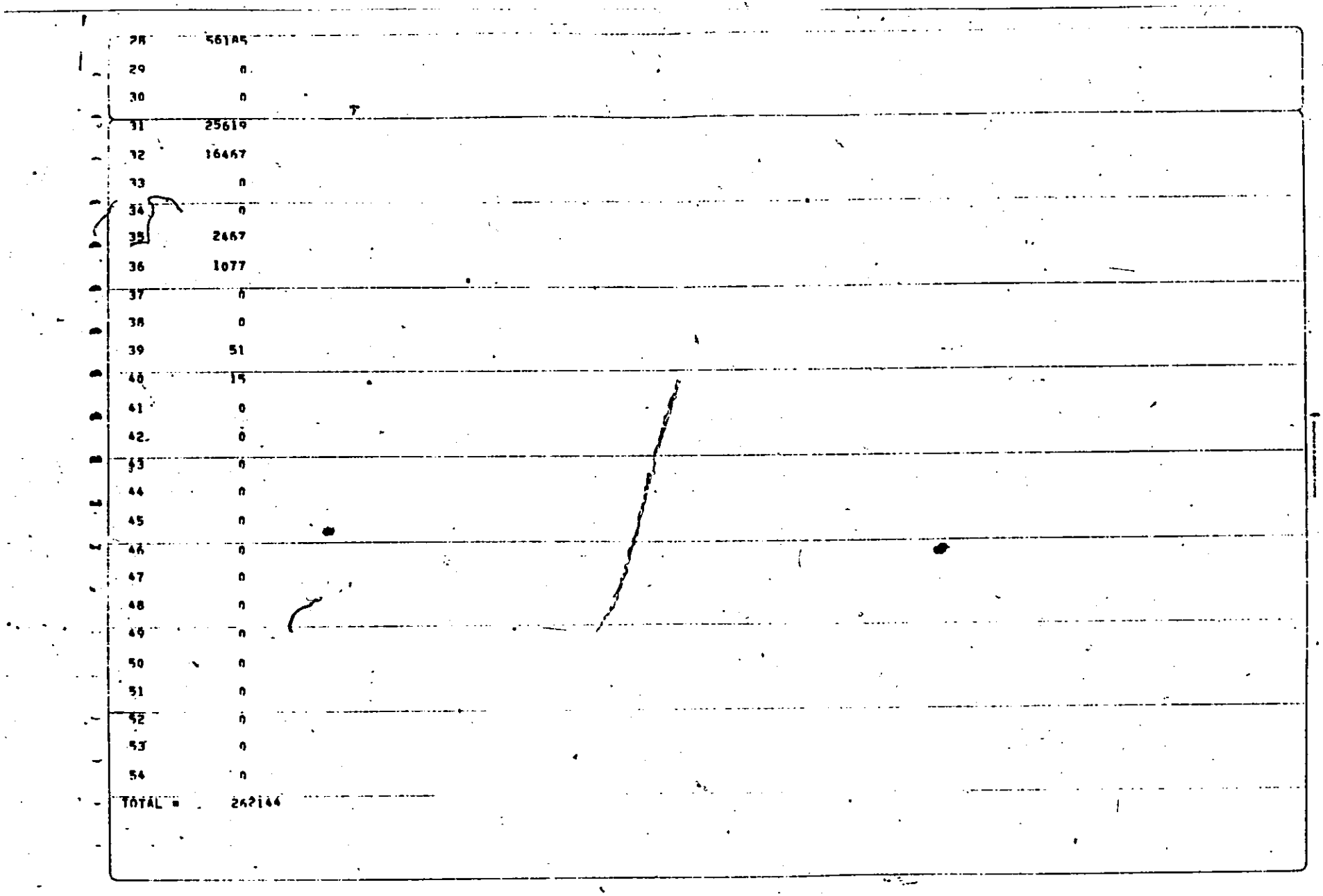
ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	3
12	11
13	0
14	0
15	431
16	1103
17	0
18	0
19	9627
20	16395
21	0
22	0
23	47247
24	56294
25	0
26	0
27	56225

28	47177
29	0
30	0
31	16437
32	9669
33	0
34	0
35	1089
36	417
37	0
38	0
39	13
40	5
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

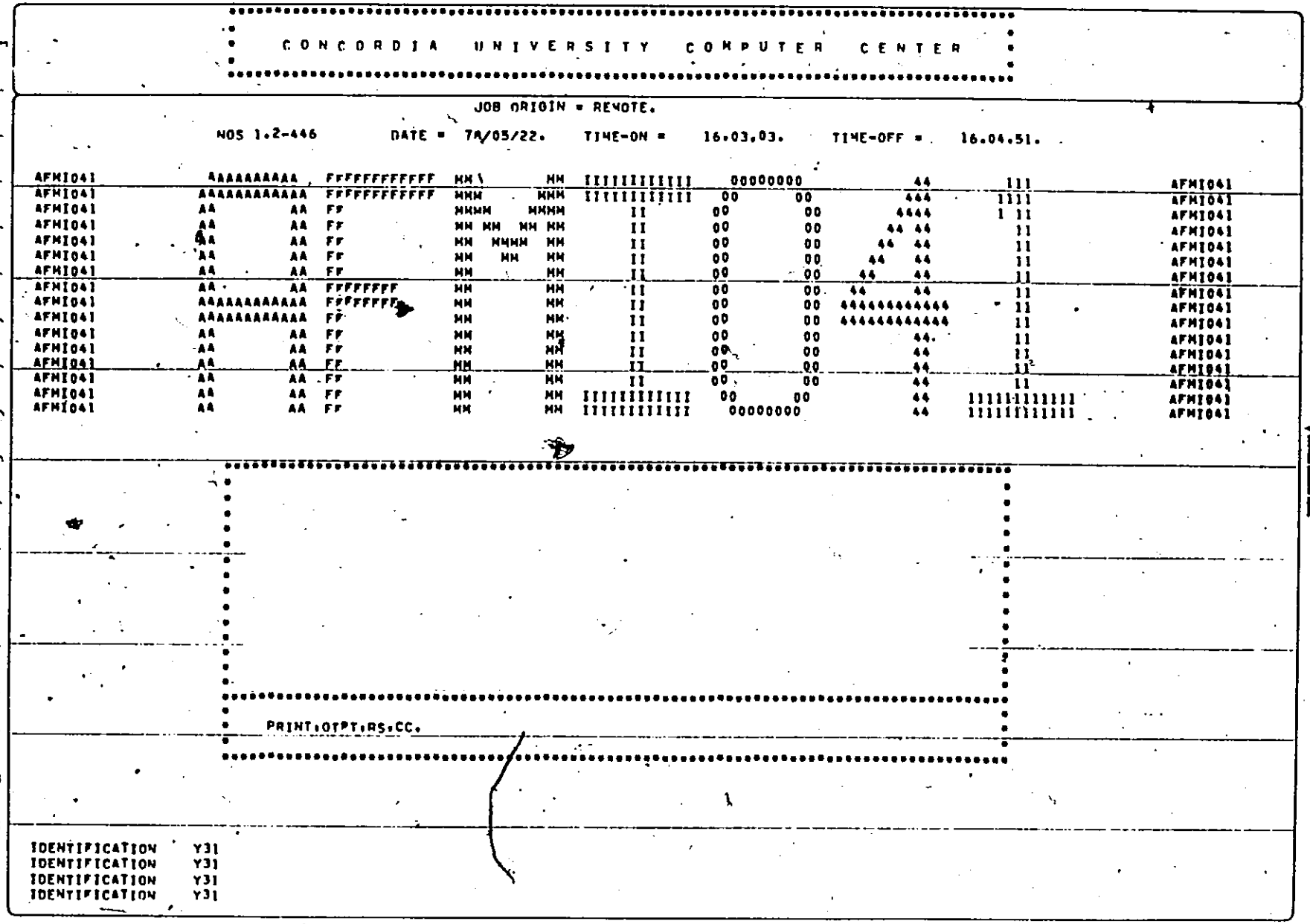

CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/22. TIME-ON = 15.50.11. TIME-OFF = 15.54.37.
AFMI034 AAAAAAAAAA FFFFFFFFFFFF MM MM IIIIIIIIIIII 00000000 33333333333 44 AFMI034
AFMI034 AAAAAAAAAAAA FFFFFFFFFFFF MMM MMM IIIIIIIIIIII 00 00 333333333333 444 AFMI034
AFMI034 AA AA FF MMMM MMMM II 00 00 3 33 4444 AFMI034
AFMI034 AA AA FF MM MM MM MM II 00 00 33 44 44 AFMI034
AFMI034 AA AA FF MM MMMM MM II 00 00 33 44 44 AFMI034
AFMI034 AA AA FF MM MM MM II 00 00 33 44 44 AFMI034
AFMI034 AA AA FF MM MM II 00 00 33 44 44 AFMI034
AFMI034 AA AA FFFFFFFF MM MM II 00 00 33 44 44 AFMI034
AFMI034 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 333 444444444444 AFMI034
AFMI034 AAAAAAAAAAAA FF MM MM II 00 00 33 4444444444 AFMI034
AFMI034 AA AA FF MM MM II 00 00 33 44 AFMI034
AFMI034 AA AA FF MM MM II 00 00 33 44 AFMI034
AFMI034 AA AA FF MM MM II 00 00 33 44 AFMI034
AFMI034 AA AA FF MM MM II 00 00 3 33 44 AFMI034
AFMI034 AA AA FF MM MM IIIIIIIIIIII 00 00 333333333333 44 AFMI034
AFMI034 AA AA FF MM MM IIIIIIIIIIII 00000000 333333333 44 AFMI034
PRINT,OTPT,RS,CC.
IDENTIFICATION Y17
IDENTIFICATION Y17
IDENTIFICATION Y17
IDENTIFICATION Y17

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	1
12	3
13	0
14	0
15	153
16	433
17	0
18	0
19	5121
20	9615
21	0
22	0
23	36385
24	47277
25	0
26	0
27	61275



28	56185
29	0
30	0
31	25619
32	16467
33	0
34	0
35	2467
36	1077
37	0
38	0
39	51
40	15
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/22. TIME-ON = 16.03.03. TIME-OFF = 16.04.51.
AFMI041
PRINT,OTPT,RS,CC.
IDENTIFICATION Y31
IDENTIFICATION Y31
IDENTIFICATION Y31
IDENTIFICATION Y31

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	4
12	13
13	0
14	0
15	424
16	1089
17	0
18	0
19	9648
20	16437
21	0
22	0
23	47212
24	56225
25	0
26	0
27	56260

28	47247
29	0
30	0
31	16416
32	9627
33	0
34	0
35	1096
36	431
37	0
38	0
39	12
40	1
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                                JOB ORIGIN = REMOTE.

                NOS 1.2-446      DATE = 78/05/22.     TIME-ON =    16.06.29.     TIME-OFF =    16.06.30.

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AFMI041         AAAAAAAAAAAA  FFFFFFFFFFFF  MMM      MMM  IIIIIIIIIIII  00      00       444      1111          AFMI041
AFMI041I        AA        AA  FF            MMMM    MMMM        II      00      00      4444     1  11          AFMI041
AFMI041         AA        AA  FF            MM MM  MM MM        II      00      00     44 44       11          AFMI041
AFMI041         AA        AA  FF            MM  MMMM  MM        II      00      00    44  44       11          AFMI041
AFMI041I        AA        AA  FF            MM   MM   MM        II      00      00   44   44       11          AFMI041
AFMI041         AA        AA  FF            MM        MM        II      00      00  44    44       11          AFMI041
AFMI041         AA        AA  FFFFFFFF      MM        MM        II      00      00  44    44       11          AFMI041
AFMI041         AAAAAAAAAAAA  FFFFFFFF      MM        MM        II      00      00  4444444444444  11          AFMI041
AFMI041         AAAAAAAAAAAA  FF            MM        MM        II      00      00  4444444444444  11          AFMI041
AFMI041         AA        AA  FF            MM        MM        II      00      00        44       11          AFMI041
AFMI041         AA        AA  FF            MM        MM        II      00      00        44       11          AFMI041
AFMI041         AA        AA  FF            MM        MM        II      00      00        44       11          AFMI041
AFMI041         AA        AA  FF            MM        MM  IIIIIIIIIIII  00      00        44       11          AFMI041
AFMI041         AA        AA  FF            MM        MM  IIIIIIIIIIII   00000000        44       11111111111 AFMI041

PRINT,OTPT,RS,CC.

IDENTIFICATION    Y32
IDENTIFICATION    Y32
IDENTIFICATION    Y32
IDENTIFICATION    Y32.
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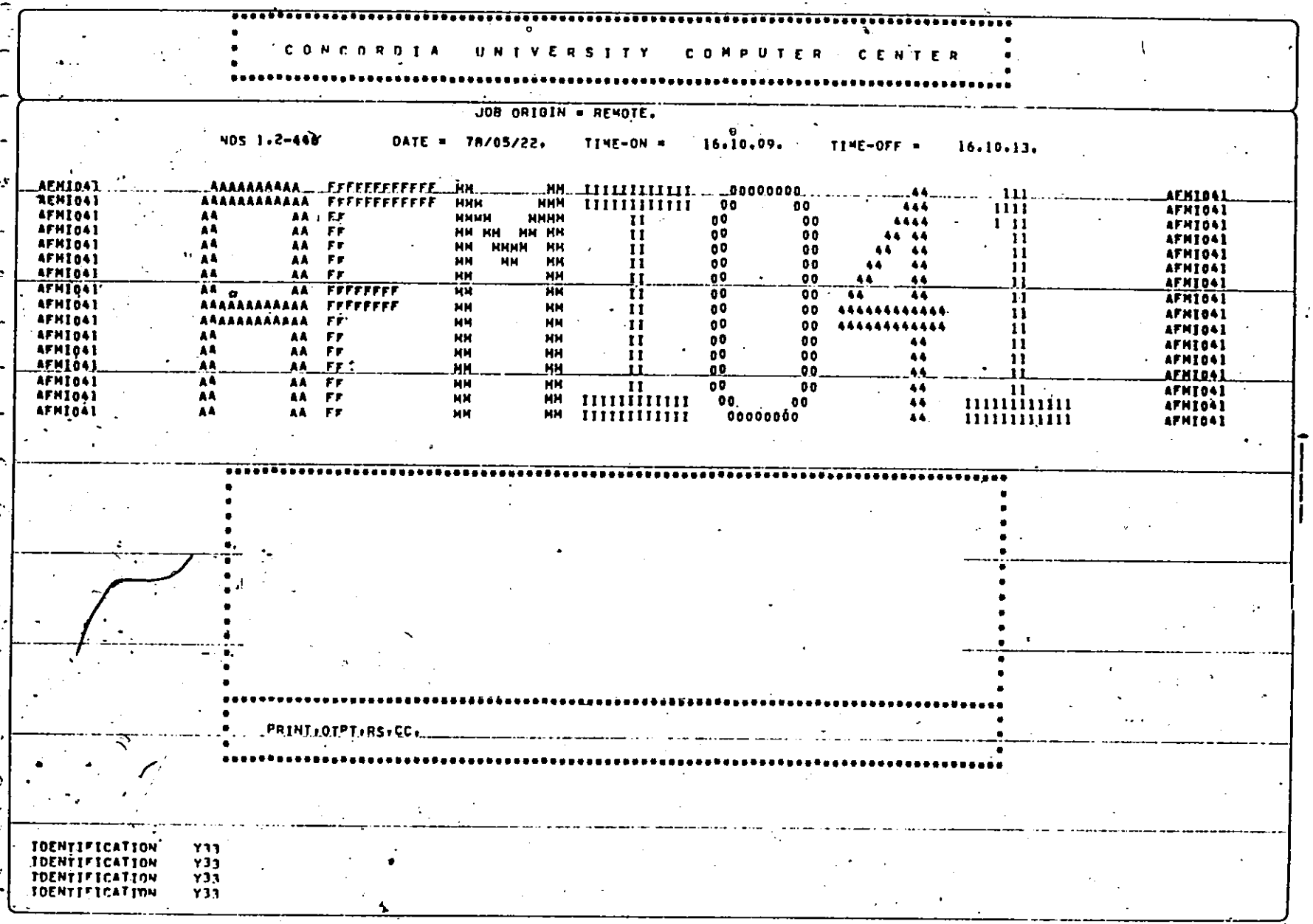
OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	4
12	13
13	0
14	0
15	424
16	1089
17	0
18	0
19	9648
20	16437
21	0
22	0
23	47217
24	56225
25	0
26	0
27	56260

28	47247
29	0
30	0
31	16416
32	9627
33	0
34	0
35	1096
36	431
37	0
38	0
39	12
40	3
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-468 DATE = 78/05/22. TIME-ON = 16.10.09. TIME-OFF = 16.10.13.
AFMI041
PRINT,OTPT,RS,CC.
IDENTIFICATION Y33
IDENTIFICATION Y33
IDENTIFICATION Y33
IDENTIFICATION Y33

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	2
13	0
14	0
15	457
16	434
17	0
18	0
19	5119
20	9604
21	0
22	0
23	36369
24	47282
25	0
26	0
27	61315

28	56190
29	0
30	0
31	25575
32	16458
33	0
34	0
35	2493
36	1082
37	0
38	0
39	47
40	16
41	0
42	0
43	1
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                JOB ORIGIN = REMOTE.

     NOS 1.2-446        DATE = 78/05/22.     TIME-ON =    16.14.18.     TIME-OFF =    16.14.21.

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AFMI041         AAAAAAAAAAAA  FFFFFFFFFFFF  MMM      MMM  IIIIIIIIIIII   00      00        444        1111          AFMI041
AFMI041         AA        AA  FF            MMMM    MMMM      II        00      00       4444       1  11          AFMI041
AFMI041         AA        AA  FF            MM MM  MM MM      II        00      00      44 44         11          AFMI041
AFMI041         AA        AA  FF            MM  MMMM  MM      II        00      00     44  44         11          AFMI041
AFMI041         AA        AA  FF            MM   MM   MM      II        00      00    44   44         11          AFMI041
AFMI041         AA        AA  FF            MM        MM      II        00      00   44    44         11          AFMI041
AFMI041         AA        AA  FFFFFFFF      MM        MM      II        00      00  44     44         11          AFMI041
AFMI041         AAAAAAAAAAAA  FFFFFFFF      MM        MM      II        00      00 44      44         11          AFMI041
AFMI041         AAAAAAAAAAAA  FF            MM        MM      II        00      00 44444444444        11          AFMI041
AFMI041         AA        AA  FF            MM        MM      II        00      00 44444444444        11          AFMI041
AFMI041         AA        AA  FF            MM        MM      II        00      00       44           11          AFMI041
AFMI041         AA        AA  FF            MM        MM      II        00      00       44           11          AFMI041
AFMI041         AA        AA  FF            MM        MM      II        00      00       44           11          AFMI041
AFMI041         AA        AA  FF            MM        MM      II        00      00       44           11          AFMI041
AFMI041         AA        AA  FF            MM        MM  IIIIIIIIIIII    00      00       44  111111111111        AFMI041
AFMI041         AA        AA  FF            MM        MM  IIIIIIIIIIII     00000000        44  111111111111        AFMI041

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y34
IDENTIFICATION    Y34
IDENTIFICATION    Y34
IDENTIFICATION    Y34
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	4
12	19
13	0
14	0
15	424
16	1089
17	0
18	0
19	9648
20	16437
21	0
22	0
23	47212
24	56225
25	0
26	0
27	56260

28	47247
29	0
30	0
31	16416
32	9627
33	0
34	0
35	1096
36	431
37	0
38	0
39	12
40	3
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

```
                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                                JOB ORIGIN = REMOTE.

                NOS 1.2-446        DATE = 78/05/22.    TIME-ON =    16.17.40.     TIME-OFF =    16.17.41.


AFMI041          AAAAAAAAAA   FFFFFFFFFFF  MM        MM  IIIIIIIIIII   00000000         44        111          AFMI041
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AFMI041        AA        AA   FF           MMMM    MMMM       II      00      00      4444       1 11          AFMI041
AFMI041        AA        AA   FF           MM MM  MM MM       II      00      00     44 44         11          AFMI041
AFMI041        AA        AA   FF           MM  MMMM  MM       II      00      00    44  44         11          AFMI041
AFMI041        AA        AA   FF           MM   MM   MM       II      00      00   44   44         11          AFMI041
AFMI041        AA        AA   FF           MM        MM       II      00      00  44    44         11          AFMI041
AFMI041        AA        AA   FFFFFFFF     MM        MM       II      00      00  44    44         11          AFMI041
AFMI041        AAAAAAAAAAAA   FFFFFFFF     MM        MM       II      00      00  4444444444     11          AFMI041
AFMI041        AAAAAAAAAAAA   FF           MM        MM       II      00      00  4444444444     11          AFMI041
AFMI041        AA        AA   FF           MM        MM       II      00      00        44       11          AFMI041
AFMI041        AA        AA   FF           MM        MM       II      00      00        44       11          AFMI041
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AFMI041        AA        AA   FF           MM        MM       II      00      00        44       11          AFMI041
AFMI041        AA        AA   FF           MM        MM  IIIIIIIIIII   00      00        44  111111111111     AFMI041
AFMI041        AA        AA   FF           MM        MM  IIIIIIIIIII    00000000         44  111111111111     AFMI041


                PRINT,OTPT,RS,CC.


IDENTIFICATION    Y35
IDENTIFICATION    Y35
IDENTIFICATION    Y35
IDENTIFICATION    Y35
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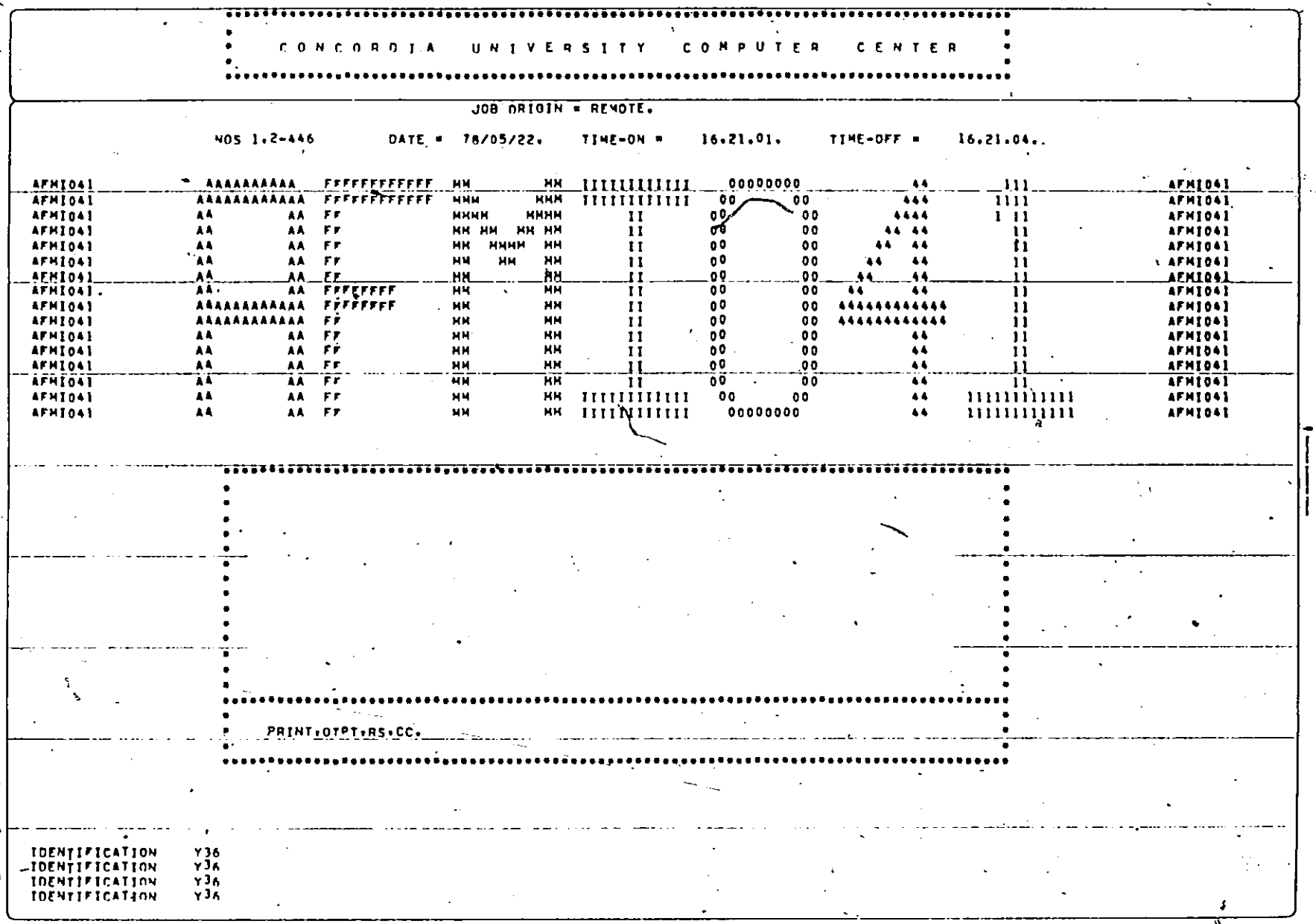
OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	2
13	0
14	0
15	157
16	434
17	0
18	0
19	5119
20	9606
21	0
22	0
23	36369
24	47282
25	0
26	0
27	61315

28	56190
29	0
30	0
31	25575
32	16458
33	0
34	0
35	2493
36	1682
37	0
38	0
39	43
40	14
41	0
42	0
43	1
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/22. TIME-ON = 16.21.01. TIME-OFF = 16.21.04..
AFMI041 AAAAAAAAAA FFFFFFFFFFFF MM MM IIIIIIIIIIII 00000000 44 111 AFMI041
AFMI041 AAAAAAAAAAAA FFFFFFFFFFFF MMM MMM IIIIIIIIIIII 00 00 444 1111 AFMI041
AFMI041 AA AA FF MMMM MMMM II 00 00 4444 1 11 AFMI041
AFMI041 AA AA FF MM MM MM MM II 00 00 44 44 11 AFMI041
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AFMI041 AA AA FF MM MM MM II 00 00 44 44 11 AFMI041
AFMI041 AA AA FF MM MM II 00 00 44 44 11 AFMI041
AFMI041 AA AA FFFFFFFF MM MM II 00 00 44 44 11 AFMI041
AFMI041 AAAAAAAAAAAA FFFFFFFF MM MM II 00 00 444444444444 11 AFMI041
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AFMI041 AA AA FF MM MM II 00 00 44 11 AFMI041
AFMI041 AA AA FF MM MM II 00 00 44 11 AFMI041
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AFMI041 AA AA FF MM MM IIIIIIIIIIII 00 00 44 111111111111 AFMI041
AFMI041 AA AA FF MM MM IIIIIIIIIIII 00000000 44 111111111111 AFMI041
PRINT,OTPT,RS,CC.
IDENTIFICATION Y36
IDENTIFICATION Y36
IDENTIFICATION Y36
IDENTIFICATION Y36

OUTPUT VECTOR ONES DISTRIBUTION

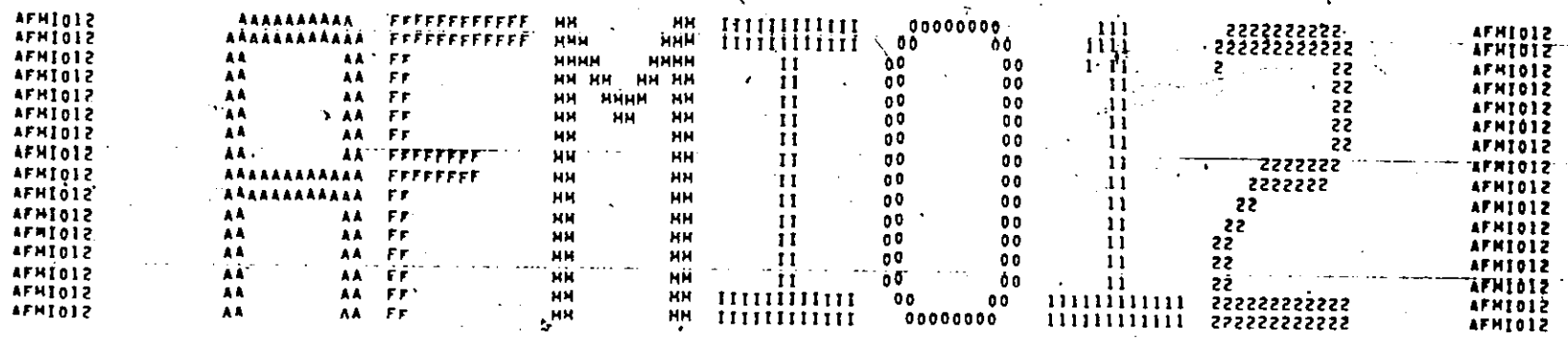
ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	2
13	0
14	0
15	157
16	434
17	0
18	0
19	5119
20	9606
21	0
22	0
23	36369
24	47282
25	0
26	0
27	61315

28	56190
29	0
30	0
31	25576
32	16458
33	0
34	0
35	2493
36	1082
37	0
38	0
39	47
40	14
41	0
42	0
43	1
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

CONCORDIA UNIVERSITY COMPUTER CENTER

JOB ORIGIN = REMOTE.

NOS 1.2-446 DATE = 78/05/23. TIME-ON = 13.51.42. TIME-OFF = 13.51.42.



PRINT,OTPT,RS,CC.

IDENTIFICATION Y37
IDENTIFICATION Y37
IDENTIFICATION Y37
IDENTIFICATION Y37

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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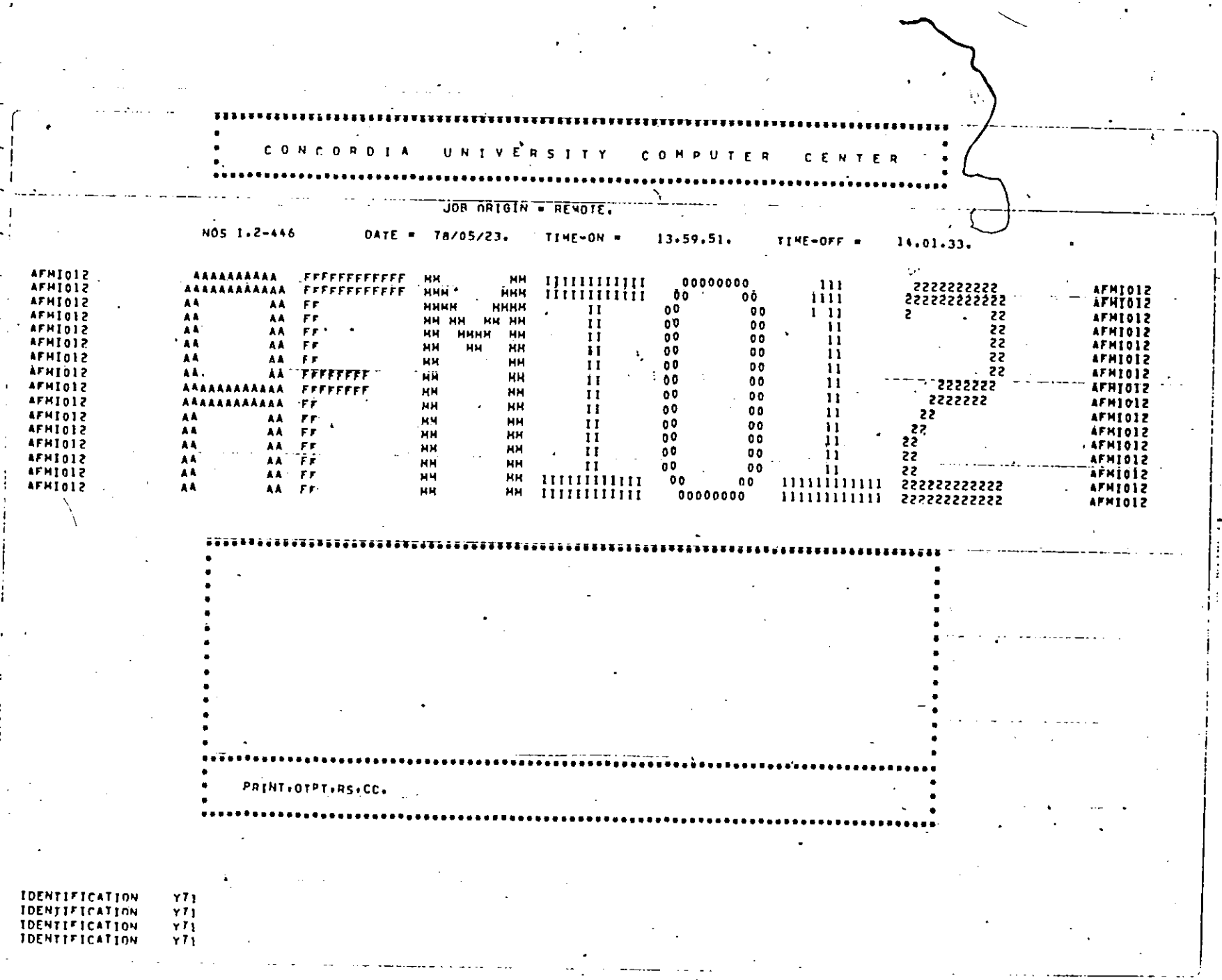
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	1
13	0
14	0
15	46
16	131
17	0
18	0
19	2496
20	5199
21	0
22	0
23	25550
24	36225
25	0
26	0
27	61360

28	61465
29	0
30	0
31	36330
32	25487
33	0
34	0
35	5136
36	2517
37	0
38	0
39	154
40	41
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/23. TIME-ON = 13.59.51. TIME-OFF = 14.01.33.
AFMI012
PRINT,OTPT,RS,CC.
IDENTIFICATION Y7
IDENTIFICATION Y7
IDENTIFICATION Y7
IDENTIFICATION Y7

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
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5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	3
13	0
14	0
15	160
16	433
17	0
18	0
19	5100
20	9615
21	0
22	0
23	36420
24	47277
25	0
26	0
27	61240

POOR PRINT

LIGHT LINES ON PAGE

28	5615	
29	0	
30	0	
31	25646	
32	16467	
33	0	
34	0	
35	2460	
36	1077	
37	0	
38	0	
39	52	
40	15	
41	0	
42	0	
43	0	
44	0	
45	0	
46	0	
47	0	
48	0	
49	0	
50	0	
51	0	
52	0	
53	0	
54	0	
TOTAL =	262144	

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

                NOS 1.2-446       DATE = 78/05/23.    TIME-ON =    14.04.58.    TIME-OFF =    14.05.00.

AFMI012          AAAAAAAAAA   FFFFFFFFFFFF  MM        MM  IIIIIIIIIIII    00000000       111       2222222222          AFMI012
AFMI012         AAAAAAAAAAAA  FFFFFFFFFFFF  MMM       MMM  IIIIIIIIIIII   00      00     1111      2222222222222        AFMI012
AFMI012         AA        AA  FF            MMMM     MMMM      II        00        00    1 11      2          22        AFMI012
AFMI012         AA        AA  FF            MM MM   MM MM      II        00        00      11                  22        AFMI012
AFMI012         AA        AA  FF            MM  MMMMM  MM      II        00        00      11                  22        AFMI012
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AFMI012         AA        AA  FF            MM         MM      II        00        00      11                  22        AFMI012
AFMI012         AA        AA  FFFFFFFF      MM         MM      II        00        00      11           2222222          AFMI012
AFMI012         AAAAAAAAAAAA  FFFFFFFF      MM         MM      II        00        00      11         2222222            AFMI012
AFMI012         AAAAAAAAAAAA  FF            MM         MM      II        00        00      11       22                   AFMI012
AFMI012         AA        AA  FF            MM         MM      II        00        00      11     22                     AFMI012
AFMI012         AA        AA  FF            MM         MM      II        00        00      11   22                       AFMI012
AFMI012         AA        AA  FF            MM         MM      II        00        00      11   22                       AFMI012
AFMI012         AA        AA  FF            MM         MM      II        00        00      11   22                       AFMI012
AFMI012         AA        AA  FF            MM         MM  IIIIIIIIIIII   00      00    111111111111  222222222222        AFMI012
AFMI012         AA        AA  FF            MM         MM  IIIIIIIIIIII    00000000     111111111111  222222222222        AFMI012

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y73
IDENTIFICATION    Y73
IDENTIFICATION    Y73
IDENTIFICATION    Y73
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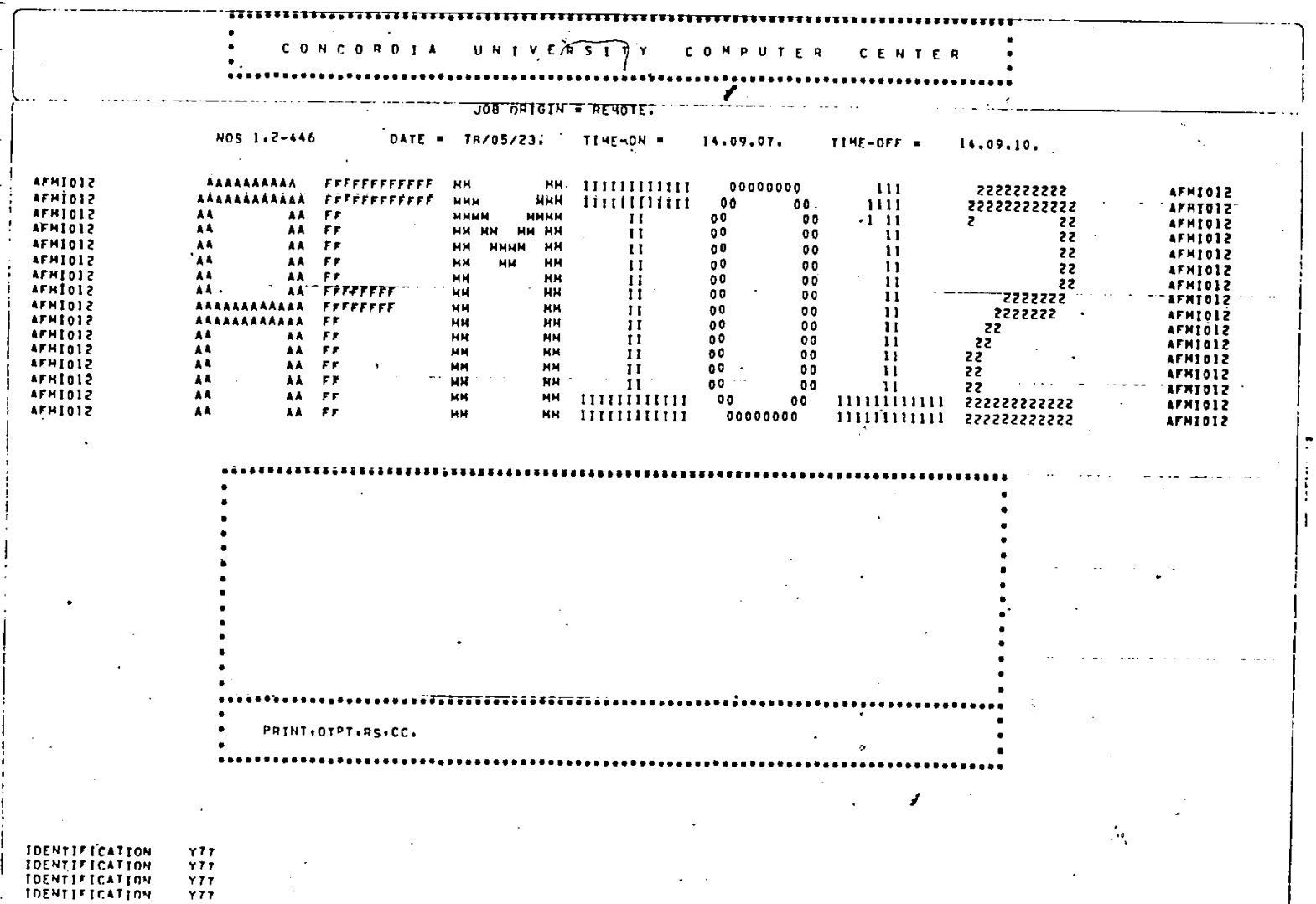
POOR PRINT

LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	1
13	0
14	0
15	45
16	147
17	0
18	0
19	2503
20	5157
21	0
22	0
23	25529
24	36295
25	0
26	0
27	61395

28	61305
29	0
30	0
31	36295
32	25529
33	0
34	0
35	5157
36	2503
37	0
38	0
39	147
40	45
41	0
42	0
43	1
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144



POOR PRINT

LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
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2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	1
13	6
14	0
15	30
16	57
17	0
18	0
19	984
20	2409
21	0
22	0
23	16710
24	25785
25	0
26	0
27	55840

POOR PRINT | LIGHT LINES ON PAGE

28	61035
29	0
30	0
31	47562
32	36579
33	0
34	0
35	9480
36	5035
37	0
38	0
39	466
40	171
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

                    NOS 1.2-446   .   DATE = 78/05/23.    TIME-ON =    14.13.26.     TIME-OFF =    14.13.31.

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AFMI012         AAAAAAAAAAAA  FFFFFFFFFFF  MMM       MMM  IIIIIIIIIII   00      00      1111      2222222222          AFMI012
AFMI012         AA        AA  FF           MMMM     MMMM      II       00        00      1 11      2          22         AFMI012
AFMI012         AA        AA  FF           MM MM   MM MM      II       00        00        11                 22         AFMI012
AFMI012         AA        AA  FF           MM  MMMM  MM      II       00        00        11                 22         AFMI012
AFMI012         AA        AA  FF           MM   MM   MM      II       00        00        11                 22         AFMI012
AFMI012         AA        AA  FF           MM        MM      II       00        00        11                 22         AFMI012
AFMI012         AA        AA  FFFFFFFF     MM        MM      II       00        00        11          2222222           AFMI012
AFMI012         AAAAAAAAAAAA  FFFFFFFF     MM        MM      II       00        00        11        2222222             AFMI012
AFMI012         AAAAAAAAAAAA  FF           MM        MM      II       00        00        11      22                    AFMI012
AFMI012         AA        AA  FF           MM        MM      II       00        00        11    22                      AFMI012
AFMI012         AA        AA  FF           MM        MM      II       00        00        11  22                        AFMI012
AFMI012         AA        AA  FF           MM        MM      II       00        00        11  22                        AFMI012
AFMI012         AA        AA  FF           MM        MM      II       00        00        11  22                        AFMI012
AFMI012         AA        AA  FF           MM        MM  IIIIIIIIIII   00      00    1111111111  2222222222          AFMI012
AFMI012         AA        AA  FF           MM        MM  IIIIIIIIIII    00000000     1111111111  2222222222          AFMI012

                    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y111
IDENTIFICATION    Y111
IDENTIFICATION    Y111
IDENTIFICATION    Y111
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	14
13	0
14	0
15	450
16	1080
17	0
18	0
19	9576
20	16470
21	0
22	0
23	47322
24	56160
25	0
26	0
27	56160

POOR PRINT

LIGHT LINES ON PAGE

28	47322
29	0
30	0
31	16476
32	9574
33	0
34	0
35	1080
36	450
37	0
38	0
39	14
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

          NOS 1.2-446        DATE = 78/05/26.     TIME-ON =    16.00.51.     TIME-OFF =    16.00.56.

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AFMI020        AA          AA  FF            MM MM    MM MM       II       00        00              22  00        00        AFMI020
AFMI020        AA          AA  FF            MM  MMMMMM  MM       II       00        00              22  00        00        AFMI020
AFMI020        AA          AA  FF            MM    MM    MM       II       00        00              22  00        00        AFMI020
AFMI020        AA          AA  FF            MM          MM       II       00        00              22  00        00        AFMI020
AFMI020        AA          AA  FFFFFFFF      MM          MM       II       00        00       2222222    00        00        AFMI020
AFMI020        AAAAAAAAAAAAAA  FFFFFFFF      MM          MM       II       00        00     2222222      00        00        AFMI020
AFMI020        AAAAAAAAAAAAAA  FF            MM          MM       II       00        00   22             00        00        AFMI020
AFMI020        AA          AA  FF            MM          MM       II       00        00  22              00        00        AFMI020
AFMI020        AA          AA  FF            MM          MM       II       00        00  22              00        00        AFMI020
AFMI020        AA          AA  FF            MM          MM       II       00        00  22              00        00        AFMI020
AFMI020        AA          AA  FF            MM          MM       II       00        00  22              00        00        AFMI020
AFMI020        AA          AA  FF            MM          MM  IIIIIIIIIIII   00      00   2222222222222   00      00        AFMI020
AFMI020        AA          AA  FF            MM          MM  IIIIIIIIIIII    00000000    2222222222222    00000000          AFMI020

PRINT,OTPT,RS,CC.

IDENTIFICATION    Y112
IDENTIFICATION    Y112
IDENTIFICATION    Y112
IDENTIFICATION    Y112
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	6
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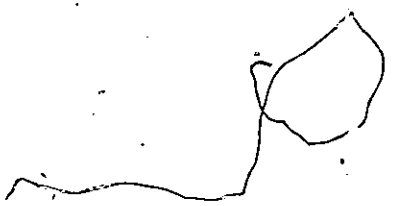
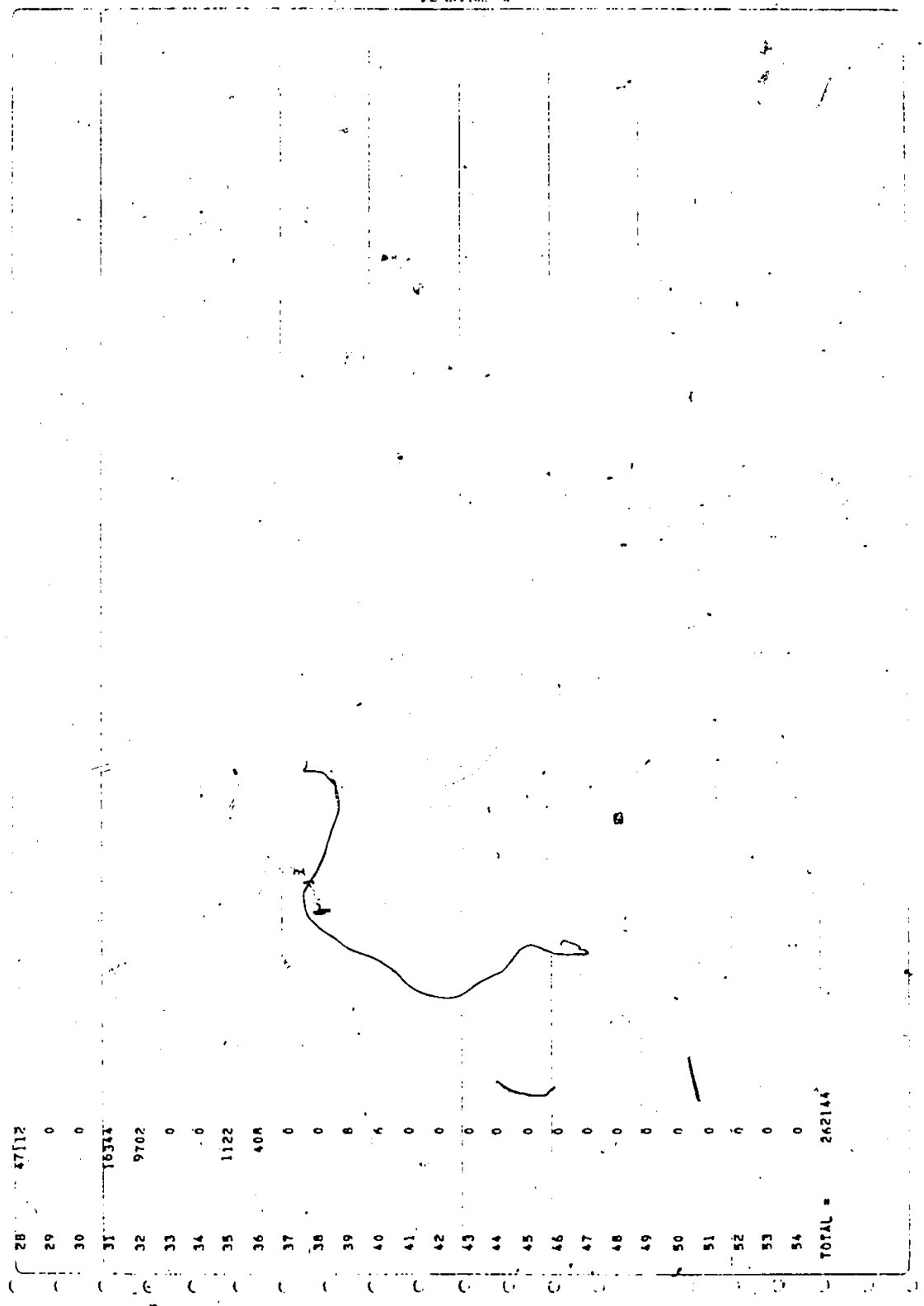
13	0
14	0
15	408
16	1122
17	0
18	0
19	9702
20	16344
21	0
22	0
23	47112
24	56370
25	0
26	0
27	56370



POOR PRINT

LIGHT LINES ON PAGE

POOR PRINT | LIGHT LINES ON PAGE



```
    CONCORDIA  UNIVERSITY  COMPUTER  CENTER

                    JOB ORIGIN = REMOTE.

    NOS 1.2-446      DATE = 78/05/24.    TIME-ON =  10.59.16.    TIME-OFF =  10.59.17.

AFHI024          AAAAAAAAAA   FFFFFFFFFFFF  MM        MM  IIIIIIIIIIII    00000000     2222222222          44          AFHI024
AFHI024         AAAAAAAAAAAA  FFFFFFFFFFFF  MMM      MMM  IIIIIIIIIIII  00    00  .222222222222        444          AFHI024
AFHI024         AA        AA  FF            MMMM    MMMM      II        00      00  2          22       4444          AFHI024
AFHI024         AA        AA  FF            MM MM  MM MM      II        00      00             22      44 44          AFHI024
AFHI024         AA        AA  FF            MM  MMMM  MM      II        00      00             22     44  44          AFHI024
AFHI024         AA        AA  FF            MM   MM   MM      II        00      00             22    44   44          AFHI024
AFHI024         AA        AA  FF            MM        MM      II        00      00             22   44    44          AFHI024
AFHI024         AA        AA  FFFFFFFF      MM        MM      II        00      00      2222222   44    44          AFHI024
AFHI024         AAAAAAAAAAAA  FFFFFFFF      MM        MM      II        00      00    2222222    4444444444          AFHI024
AFHI024         AAAAAAAAAAAA  FF            MM        MM      II        00      00  22           4444444444          AFHI024
AFHI024         AA        AA  FF            MM        MM      II        00      00  22                   44          AFHI024
AFHI024         AA        AA  FF            MM        MM      II        00      00  22                   44          AFHI024
AFHI024         AA        AA  FF            MM        MM      II        00      00  22                   44          AFHI024
AFHI024         AA        AA  FF            MM        MM      II        00      00  22                   44          AFHI024
AFHI024         AA        AA  FF            MM        MM  IIIIIIIIIIII    00  00    222222222222       44          AFHI024
AFHI024         AA        AA  FF            MM        MM  IIIIIIIIIIII     00000000  222222222222       44          AFHI024

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y113
IDENTIFICATION    Y113
IDENTIFICATION    Y113
IDENTIFICATION    Y113
```

POOR PRINT | LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	6
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	1
12	4
13	0
14	0
15	153
16	426
17	0
18	0
19	5121
20	9636
21	0
22	0
23	36365
24	47242
25	0
26	0
27	61275

POOR PRINT | LIGHT LINES ON PAGE

28	56220
29	0
30	0
31	25819
32	16446
33	0
34	0
35	2467
36	1084
37	0
38	0
39	51
40	14
41	0
42	0
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45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

          NOS 1.2-446        DATE = 78/05/29.    TIME-ON =    11.18.37.     TIME-OFF =    11.18.41.

AFMI021     AAAAAAAAAA   FFFFFFFFFFF  MM        MM  IIIIIIIIIII    00000000    2222222222      111             AFMI021
AFMI021    AAAAAAAAAAAA  FFFFFFFFFFF  MMM      MMM  IIIIIIIIIII   00      00  2222222222222    1111            AFMI021
AFMI021    AA        AA  FF           MMMM    MMMM      II       00        00 2           22    1 11            AFMI021
AFMI021    AA        AA  FF           MM MM  MM MM      II       00        00             22      11            AFMI021
AFMI021    AA        AA  FF           MM  MMMM  MM      II       00        00             22      11            AFMI021
AFMI021    AA        AA  FF           MM   MM   MM      II       00        00             22      11            AFMI021
AFMI021    AA        AA  FF           MM        MM      II       00        00             22      11            AFMI021
AFMI021    AA        AA  FFFFFFFF     MM        MM      II       00        00      2222222        11            AFMI021
AFMI021    AAAAAAAAAAAA  FFFFFFFF     MM        MM      II       00        00     2222222         11            AFMI021
AFMI021    AAAAAAAAAAAA  FF           MM        MM      II       00        00   22                11            AFMI021
AFMI021    AA        AA  FF           MM        MM      II       00        00  22                 11            AFMI021
AFMI021    AA        AA  FF           MM        MM      II       00        00 22                  11            AFMI021
AFMI021    AA        AA  FF           MM        MM      II       00        00 22                  11            AFMI021
AFMI021    AA        AA  FF           MM        MM      II       00        00 22                  11            AFMI021
AFMI021    AA        AA  FF           MM        MM  IIIIIIIIIII   00      00  2222222222222 1111111111          AFMI021
AFMI021    AA        AA  FF           MM        MM  IIIIIIIIIII    00000000   2222222222222 1111111111          AFMI021

          PRINT,OTPT,RS,CC.

IDENTIFICATION    Y114
IDENTIFICATION    Y114
IDENTIFICATION    Y114
IDENTIFICATION    Y114
```

POOR PRINT | LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	5
12	12
13	0
14	0
15	415
16	1094
17	0
18	0
19	9681
20	16428
21	0
22	0
23	47147
24	56230
25	0
26	0
27	56335

POOR PRINT | LIGHT LINES ON PAGE

28	47252
29	0
30	0
31	16365
32	9618
33	0
34	0
35	1115
36	436
37	0
38	0
39	0
40	2
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                              JOB ORIGIN = REMOTE.

 NOS 1.2-446        DATE = 78/05/29.     TIME-ON =    11.25.18.     TIME-OFF =    11.25.22.

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AFMI021         AAAAAAAAAAAA  FFFFFFFFFFFF  MMM        MMM  IIIIIIIIIIII  00      00  2222222222222    1111              AFMI021
AFMI021         AA        AA  FF            MMMM      MMMM      II        00      00  2          22    1 11              AFMI021
AFMI021         AA        AA  FF            MM MM    MM MM      II        00      00             22      11              AFMI021
AFMI021         AA        AA  FF            MM  MMMMM  MM      II        00      00             22      11              AFMI021
AFMI021         AA        AA  FF            MM   MM    MM      II        00      00             22      11              AFMI021
AFMI021         AA        AA  FF            MM         MM      II        00      00             22      11              AFMI021
AFMI021         AA        AA  FFFFFFFF      MM         MM      II        00      00          2222222    11              AFMI021
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AFMI021         AA        AA  FF            MM         MM      II        00      00  22                 11              AFMI021
AFMI021         AA        AA  FF            MM         MM      II        00      00  22                 11              AFMI021
AFMI021         AA        AA  FF            MM         MM      II        00      00  22                 11              AFMI021
AFMI021         AA        AA  FF            MM         MM  IIIIIIIIIIII   00      00  2222222222222  1111111111111     AFMI021
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    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y115
IDENTIFICATION    Y115
IDENTIFICATION    Y115
IDENTIFICATION    Y115
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POOR PRINT | LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	6
13	0
14	0
15	160
16	412
17	0
18	0
19	5100
20	9678
21	0
22	0
23	36420
24	47172
25	0
26	0
27	61240

POOR PRINT | LIGHT LINES ON PAGE

28	56290
29	0
30	0
31	25640
32	16404
33	0
34	0
35	2460
36	1098
37	0
38	0
39	52
40	12
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

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AFHI021        AA        AA   FF           HH   HH    HH       II       00        00             22      11              AFHI021
AFHI021        AA        AA   FF           HH         HH       II       00        00             22      11              AFHI021
AFHI021        AA        AA   FFFFFFFF     HH         HH       II       00        00      2222222        11              AFHI021
AFHI021        AAAAAAAAAAAA   FFFFFFFF     HH         HH       II       00        00    2222222          11              AFHI021
AFHI021        AAAAAAAAAAAA   FF           HH         HH       II       00        00   22                11              AFHI021
AFHI021        AA        AA   FF           HH         HH       II       00        00  22                 11              AFHI021
AFHI021        AA        AA   FF           HH         HH       II       00        00 22                  11              AFHI021
AFHI021        AA        AA   FF           HH         HH       II       00        00 22                  11              AFHI021
AFHI021        AA        AA   FF           HH         HH       II       00        00 22                  11              AFHI021
AFHI021        AA        AA   FF           HH         HH  IIIIIIIIIII    00      00   222222222222 111111111111          AFHI021
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    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y116
IDENTIFICATION    Y116
IDENTIFICATION    Y116
IDENTIFICATION    Y116
```

OUTPUT VECTOR ONES DISTRIBUTION

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4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	3
12	3
13	0
14	0
15	139
16	433
17	0
18	0
19	5163
20	9615
21	0
22	0
23	36315
24	47277
25	0
26	0
27	61345

POOR PRINT

LIGHT LINES ON PAGE

28	56185	
29	0	
30	0	
31	25577	
32	16467	
33	0	
34	0	
35	2481	
36	1077	
37	0	
38	0	
39	49	
40	15	
41	0	
42	0	
43	0	
44	0	
45	0	
46	0	
47	0	
48	0	
49	0	
50	0	
51	0	
52	0	
53	0	
54	0	
TOTAL =	262144	

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C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

JOB ORIGIN = REMOTE.

NOS 1.2-446      DATE = 78/05/24.    TIME-ON =    11.03.41.    TIME-OFF =    11.03.47.

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AFMI024   AA        AA  FF            MMMM     MMMM       II       00      00  2          22      4444     AFMI024
AFMI024   AA        AA  FF            MM MM   MM MM       II       00      00             22     44 44     AFMI024
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AFMI024   AA        AA  FF            MM   MM    MM       II       00      00             22   44   44     AFMI024
AFMI024   AA        AA  FF            MM         MM       II       00      00             22  44    44     AFMI024
AFMI024   AA        AA  FFFFFFFF      MM         MM       II       00      00        2222222 44     44     AFMI024
AFMI024   AAAAAAAAAAAA  FFFFFFFF      MM         MM       II       00      00      2222222              AFMI024
AFMI024   AAAAAAAAAAAA  FF            MM         MM       II       00      00    22       444444444444   AFMI024
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AFMI024   AA        AA  FF            MM         MM       II       00      00  22                 44     AFMI024
AFMI024   AA        AA  FF            MM         MM       II       00      00  22                 44     AFMI024
AFMI024   AA        AA  FF            MM         MM       II       00      00  22                 44     AFMI024
AFMI024   AA        AA  FF            MM         MM  IIIIIIIIIIII  00      00  222222222222       44     AFMI024
AFMI024   AA        AA  FF            MM         MM  IIIIIIIIIIII   00000000   222222222222       44     AFMI024

PRINT,OTPT,RS,CC.

IDENTIFICATION    Y117
IDENTIFICATION    Y117
IDENTIFICATION    Y117
IDENTIFICATION    Y117
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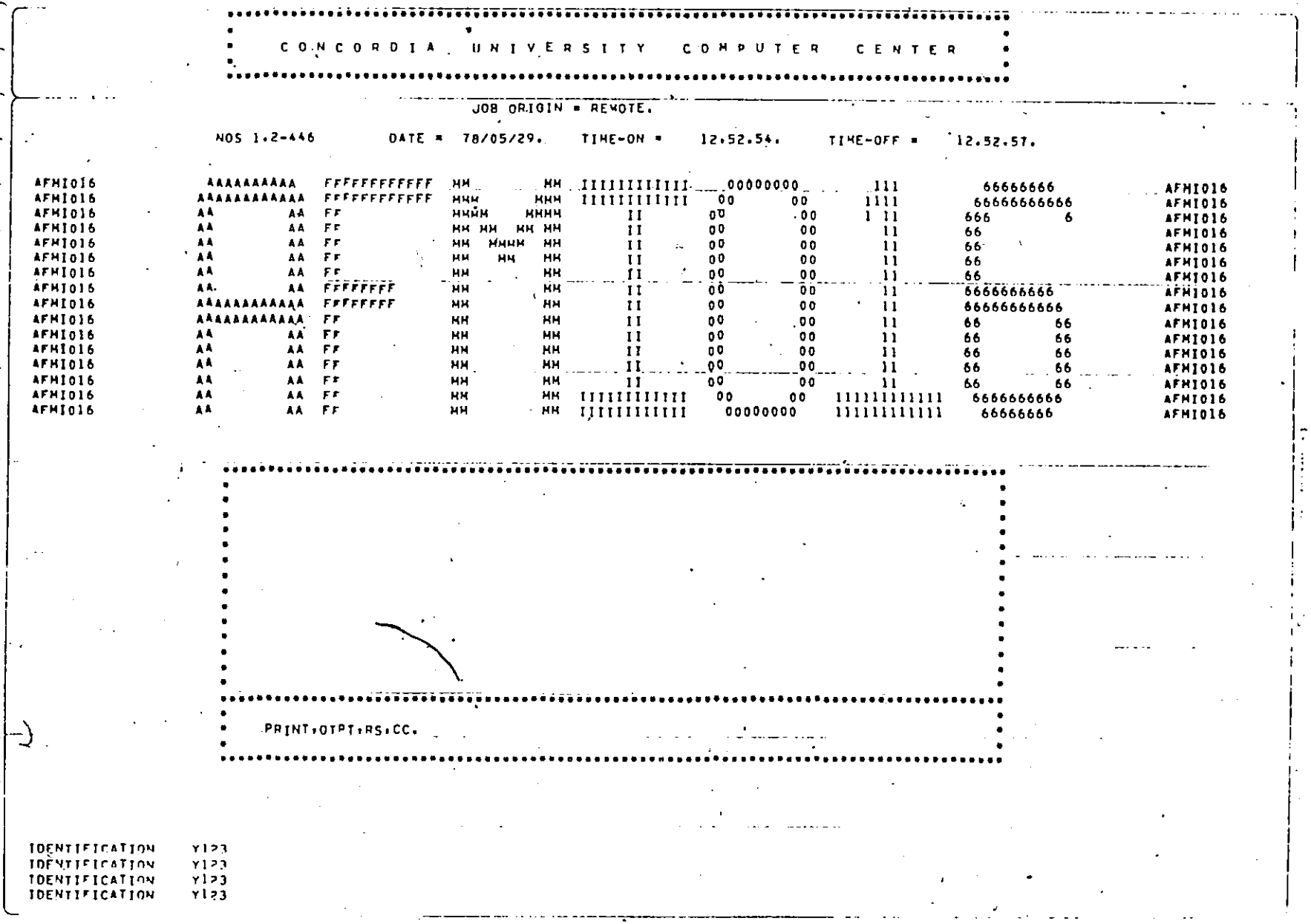
OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	2
13	0
14	0
15	50
16	146
17	0
18	0
19	2474
20	5142
21	0
22	0
23	25598
24	36350
25	0
26	0
27	61310

POOR PRINT

LIGHT LINES ON PAGE

28	61310
29	0
30	0
31	36350
32	25598
33	0
34	0
35	5142
36	2474
37	0
38	0
39	146
40	50
41	0
42	0
43	2
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/29. TIME-ON = 12.52.54. TIME-OFF = 12.52.57.
AFMI016 AA FF MM MM II 00 00 11 66 AFMI016
PRINT,OTPT,RS,CC.
IDENTIFICATION Y123
IDENTIFICATION Y123
IDENTIFICATION Y123
IDENTIFICATION Y123

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	3
12	3
13	0
14	0
15	139
16	433
17	0
18	0
19	5163
20	9615
21	0
22	0
23	36315
24	47277
25	0
26	0
27	61345

28	56185
29	0
30	0
31	25577
32	16467
33	0
34	0
35	2481
36	1077
37	0
38	0
39	49
40	15
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                              JOB ORIGIN = REMOTE.

      NOS 1.2-446       DATE = 78/05/29.    TIME-ON =    12.57.14.    TIME-OFF =    12.57.16.

AFMI016          AAAAAAAAAA   FFFFFFFFFFFF  MM          MM  IIIIIIIIIIII    00000000      111        66666666          AFMI016
AFMI016        AAAAAAAAAAAA   FFFFFFFFFFFF  MMM        MMM  IIIIIIIIIIII   00      00    1111      66666666666       AFMI016
AFMI016        AA        AA   FF            MMMM      MMMM      II        00      00    1  11     666        6       AFMI016
AFMI016        AA        AA   FF            MM MM    MM MM      II        00      00       11     66                 AFMI016
AFMI016        AA        AA   FF            MM  MMMMM  MM      II        00      00       11     66                 AFMI016
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AFMI016        AA        AA   FF            MM         MM      II        00      00       11     66                 AFMI016
AFMI016        AA        AA   FFFFFFFF      MM         MM      II        00      00       11     6666666666         AFMI016
AFMI016        AAAAAAAAAAAA   FFFFFFFF      MM         MM      II        00      00       11     66666666666        AFMI016
AFMI016        AAAAAAAAAAAA   FF            MM         MM      II        00      00       11     66        66       AFMI016
AFMI016        AA        AA   FF            MM         MM      II        00      00       11     66        66       AFMI016
AFMI016        AA        AA   FF            MM         MM      II        00      00       11     66        66       AFMI016
AFMI016        AA        AA   FF            MM         MM      II        00      00       11     66        66       AFMI016
AFMI016        AA        AA   FF            MM         MM      II        00      00       11     66        66       AFMI016
AFMI016        AA        AA   FF            MM         MM  IIIIIIIIIIII   00      00  111111111111   6666666666        AFMI016
AFMI016        AA        AA   FF            MM         MM  IIIIIIIIIIII    00000000   111111111111    66666666          AFMI016

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y124
IDENTIFICATION    Y124
IDENTIFICATION    Y124
IDENTIFICATION    Y124
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	14
13	0
14	0
15	450
16	1080
17	0
18	0
19	9576
20	16470
21	0
22	0
23	47322
24	56160
25	0
26	0
27	56160

28	47322
29	0
30	0
31	16470
32	9576
33	0
34	0
35	1080
36	450
37	0
38	0
39	14
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

POOR PRINT

LIGHT LINES ON PAGE

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                        JOB ORIGIN = REMOTE.

     NOS 1.2-446        DATE = 78/05/29.    TIME-ON =    13.00.52.    TIME-OFF =    13.00.55.

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AFMI016     AAAAAAAAAAAA  FFFFFFFFFFF  HHH      HHH  IIIIIIIIIII  00      00    1111      66666666666     AFMI016
AFMI016     AA        AA  FF           HHHH    HHHH      II      00      00  1 11     666        6      AFMI016
AFMI016     AA        AA  FF           HH HH  HH HH      II      00      00    11     66               AFMI016
AFMI016     AA        AA  FF           HH  HHHH  HH      II      00      00    11     66               AFMI016
AFMI016     AA        AA  FF           HH   HH   HH      II      00      00    11     66               AFMI016
AFMI016     AA        AA  FF           HH        HH      II      00      00    11     66               AFMI016
AFMI016     AA        AA  FFFFFFFF     HH        HH      II      00      00    11     6666666666       AFMI016
AFMI016     AAAAAAAAAAAA  FFFFFFFF     HH        HH      II      00      00    11     66666666666      AFMI016
AFMI016     AAAAAAAAAAAA  FF           HH        HH      II      00      00    11     66        66     AFMI016
AFMI016     AA        AA  FF           HH        HH      II      00      00    11     66        66     AFMI016
AFMI016     AA        AA  FF           HH        HH      II      00      00    11     66        66     AFMI016
AFMI016     AA        AA  FF           HH        HH      II      00      00    11     66        66     AFMI016
AFMI016     AA        AA  FF           HH        HH      II      00      00    11     66        66     AFMI016
AFMI016     AA        AA  FF           HH        HH  IIIIIIIIIII   00      00  111111111111  6666666666     AFMI016
AFMI016     AA        AA  FF           HH        HH  IIIIIIIIIII    00000000   111111111111   66666666      AFMI016

    PRINT,OUTPUT,RS,CC.

IDENTIFICATION    Y125
IDENTIFICATION    Y125
IDENTIFICATION    Y125
IDENTIFICATION    Y125
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	1
12	4
13	0
14	0
15	153
16	426
17	0
18	0
19	5121
20	9636
21	0
22	0
23	36385
24	47242
25	0
26	0
27	61275

POOR PRINT | LIGHT LINES ON PAGE

28	56220
29	0
30	0
31	25619
32	16446
33	0
34	0
35	2467
36	1084
37	0
38	0
39	51
40	14
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                              JOB ORIGIN = REMOTE.

      NOS 1.2-446       DATE = 78/05/29.    TIME-ON =    13.04.19.    TIME-OFF =    13.06.24.

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AFMI016         AA        AA  FF            MMMM      MMMM       II       00      00     1 11       666        6          AFMI016
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AFMI016         AA        AA  FF            MM   MM   MM        II       00      00       11       66                   AFMI016
AFMI016         AA        AA  FF            MM        MM        II       00      00       11       66                   AFMI016
AFMI016         AA        AA  FFFFFFFF      MM        MM        II       00      00       11       6666666666           AFMI016
AFMI016         AAAAAAAAAAAA  FFFFFFFF      MM        MM        II       00      00       11       6666666666           AFMI016
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AFMI016         AA        AA  FF            MM        MM        II       00      00       11       66        66         AFMI016
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AFMI016         AA        AA  FF            MM        MM  IIIIIIIIIIII   00      00  111111111111   6666666666          AFMI016
AFMI016         AA        AA  FF            MM        MM  IIIIIIIIIIII    00000000   111111111111    66666666           AFMI016

PRINT,OTPT,RS,CC.

IDENTIFICATION    Y126
IDENTIFICATION    Y126
IDENTIFICATION    Y126
IDENTIFICATION    Y126
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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3	0
4	0
5	0
6	0
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8	0
9	0
10	0
11	0
12	6
13	0
14	0
15	160
16	412
17	0
18	0
19	5100
20	9678
21	0
22	0
23	36420
24	47172
25	0
26	0
27	61240

POOR PRINT

LIGHT LINES ON PAGE

R		
28	56256	
29	0	
30	0	
31	25640	
32	16404	
33	0	
34	6	
35	2460	
36	1094	
37	0	
38	0	
39	52	
40	12	
41	0	
42	0	
43	0	
44	0	
45	0	
46	0	
47	0	
48	0	
49	0	
50	0	
51	0	
52	0	
53	0	
54	0	
TOTAL =	262144	

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

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AFMI016   AA        AA  FFFFFFFF     HH         HH      II      00      00     11      6666666666             AFMI016
AFMI016   AAAAAAAAAAAA  FFFFFFFF     HH         HH      II      00      00     11      66666666666            AFMI016
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AFMI016   AA        AA  FF           HH         HH      II      00      00     11      66        66           AFMI016
AFMI016   AA        AA  FF           HH         HH      II      00      00     11      66        66           AFMI016
AFMI016   AA        AA  FF           HH         HH IIIIIIIIIII   00      00 11111111111  6666666666           AFMI016
AFMI016   AA        AA  FF           HH         HH IIIIIIIIIII    00000000  11111111111   66666666            AFMI016

          PRINT,OTPT,RS,CC.

IDENTIFICATION    Y127
IDENTIFICATION    Y127
IDENTIFICATION    Y127
IDENTIFICATION    Y127
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POOR PRINT

LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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2	0
3	0
4	0
5	0
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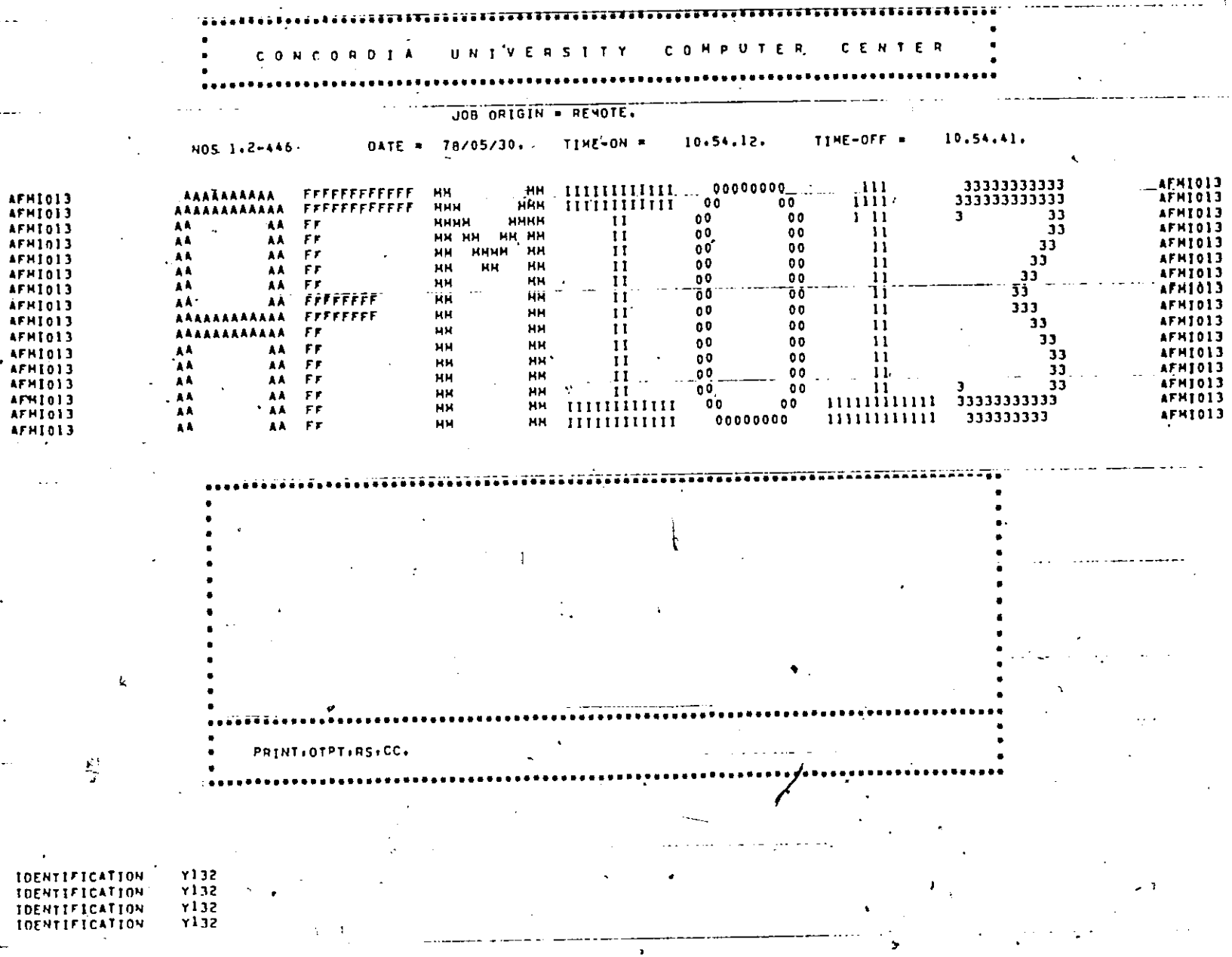
11	0
12	2
13	6
14	0
15	50
16	146
17	0
18	0
19	2474
20	5142
21	0
22	0
23	25598
24	36350
25	0
26	0
27	61310

28	61310
29	0
30	0
31	36350
32	25598
33	0
34	0
35	5142
36	2474
37	0
38	0
39	146
40	50
41	0
42	0
43	2
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144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NOS 1.2-446 DATE = 78/05/30. TIME-ON = 10.54.12. TIME-OFF = 10.54.41.
PRINT,OTPT,RS,CC.
IDENTIFICATION Y132
IDENTIFICATION Y132
IDENTIFICATION Y132
IDENTIFICATION Y132

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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2	0
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4	0
5	0
6	0
7	0
8	0
9	0
10	6
11	3
12	3
13	0
14	0
15	139
16	433
17	0
18	0
19	5163
20	9615
21	0
22	0
23	36315
24	47277
25	0
26	0
27	61345

28	56185
29	0
30	0
31	25577
32	16467
33	0
34	0
35	2481
36	1077
37	0
38	0
39	49
40	15
41	0
42	0
43	0
44	0
45	0
46	0
47	0
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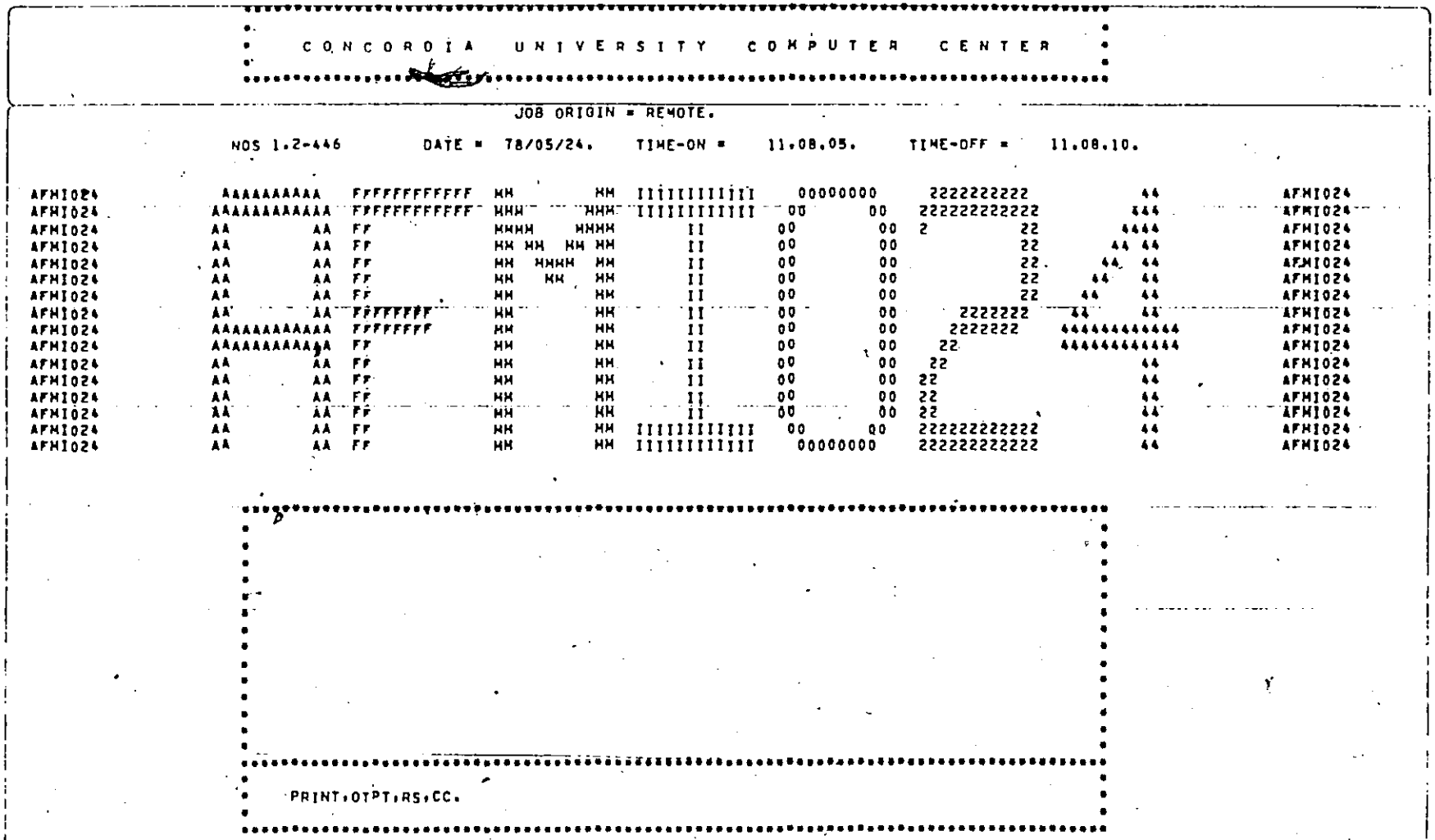
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

POOR PRINT LIGHT LINES ON PAGE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NOS 1.2-446 DATE = 78/05/24. TIME-ON = 11.08.05. TIME-OFF = 11.08.10.
AFHI024
PRINT,OTPT,RS,CC.
IDENTIFICATION Y133
IDENTIFICATION Y133
IDENTIFICATION Y133
IDENTIFICATION Y133

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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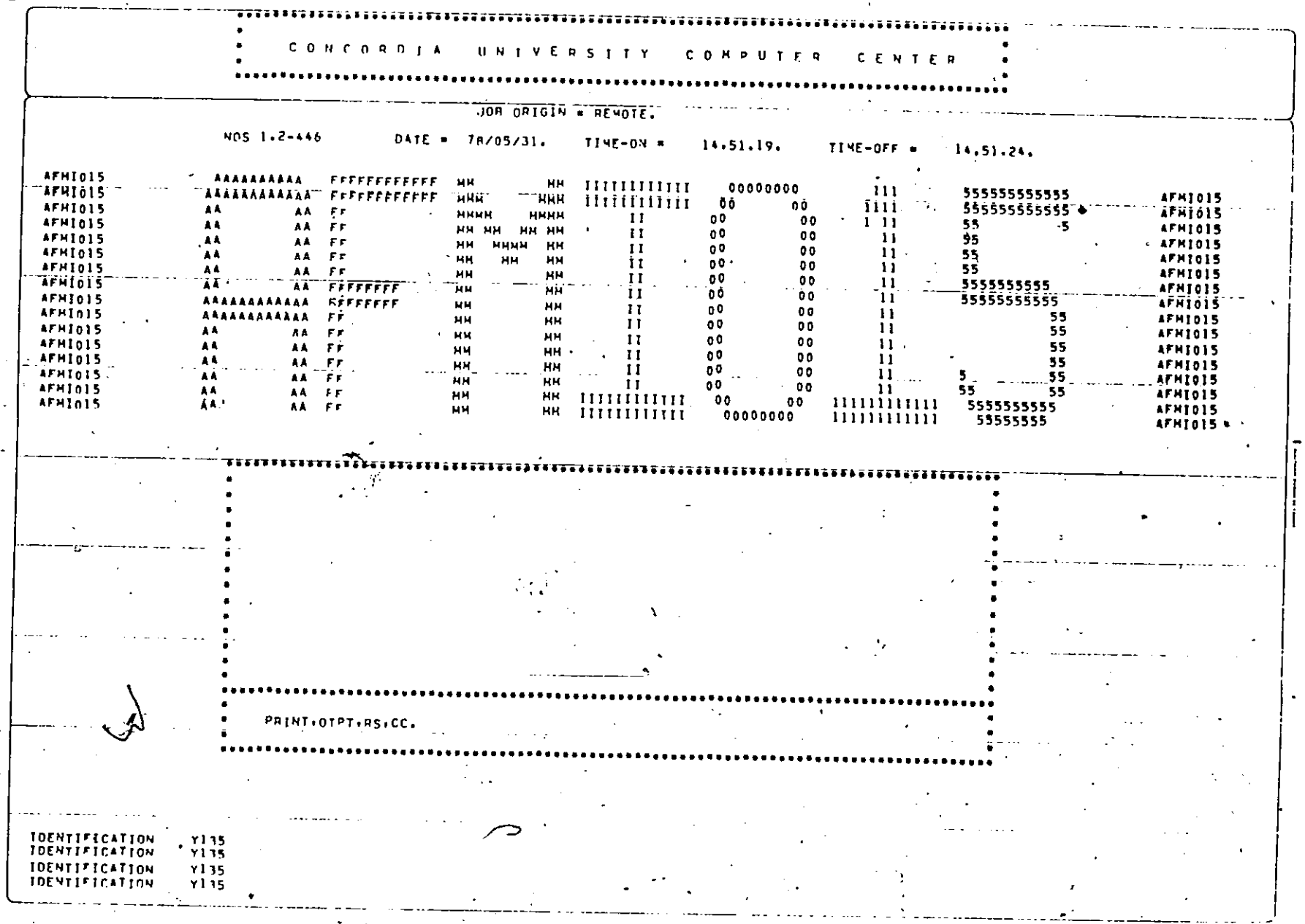
13	0
14	0
15	46
16	154
17	0
18	0
19	2496
20	5136
21	0
22	0
23	25550
24	36330
25	0
26	0
27	61360

28	61360
29	0
30	0
31	36330
32	25550
33	0
34	0
35	5136
36	2496
37	0
38	0
39	154
40	46
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

POOR PRINT LIGHT LINES ON PAGE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NOS 1.2-446 DATE = 78/05/31. TIME-ON = 14.51.19. TIME-OFF = 14.51.24.
AFHI015
PRINT,OTPT,RS,CC.
IDENTIFICATION Y135
IDENTIFICATION Y135
IDENTIFICATION Y135
IDENTIFICATION Y135

POOR PRINT

LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
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2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	46
16	154
17	0
18	0
19	2496
20	5136
21	0
22	0
23	25550
24	36130
25	0
26	0
27	61360

28	61360
29	0
30	0
31	36330
32	25550
33	0
34	0
35	5136
36	2496
37	0
38	0
39	154
40	45
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                    JOB ORIGIN = REMOTE.

          NOS 1.2-446      DATE = 78/05/31.    TIME-ON =   14.56.14.    TIME-OFF =   15.01.27.

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AFMI015   AA        AA  FF           MMMM    MMMM      II       00      00   1  11      55          5   AFMI015
AFMI015   AA        AA  FF           MM MM  MM MM      II       00      00     11      55              AFMI015
AFMI015   AA        AA  FF           MM  MMMM  MM      II       00      00     11      55              AFMI015
AFMI015   AA        AA  FF           MM   MM   MM      II       00      00     11      55              AFMI015
AFMI015   AA        AA  FF           MM        MM      II       00      00     11      5555555555      AFMI015
AFMI015   AA        AA  FFFFFFFF     MM        MM      II       00      00     11      5555555555      AFMI015
AFMI015   AAAAAAAAAAAA  FFFFFFFF     MM        MM      II       00      00     11              55      AFMI015
AFMI015   AAAAAAAAAAAA  FF           MM        MM      II       00      00     11              55      AFMI015
AFMI015   AA        AA  FF           MM        MM      II       00      00     11              55      AFMI015
AFMI015   AA        AA  FF           MM        MM      II       00      00     11              55      AFMI015
AFMI015   AA        AA  FF           MM        MM      II       00      00     11       5      55      AFMI015
AFMI015   AA        AA  FF           MM        MM      II       00      00     11      55      55      AFMI015
AFMI015   AA        AA  FF           MM        MM  IIIIIIIIIII   00      00  1111111111111  5555555555   AFMI015
AFMI015   AA        AA  FF           MM        MM  IIIIIIIIIII    00000000   1111111111111   55555555    AFMI015

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y136
IDENTIFICATION    Y136
IDENTIFICATION    Y136
IDENTIFICATION    Y136
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POOR PRINT

LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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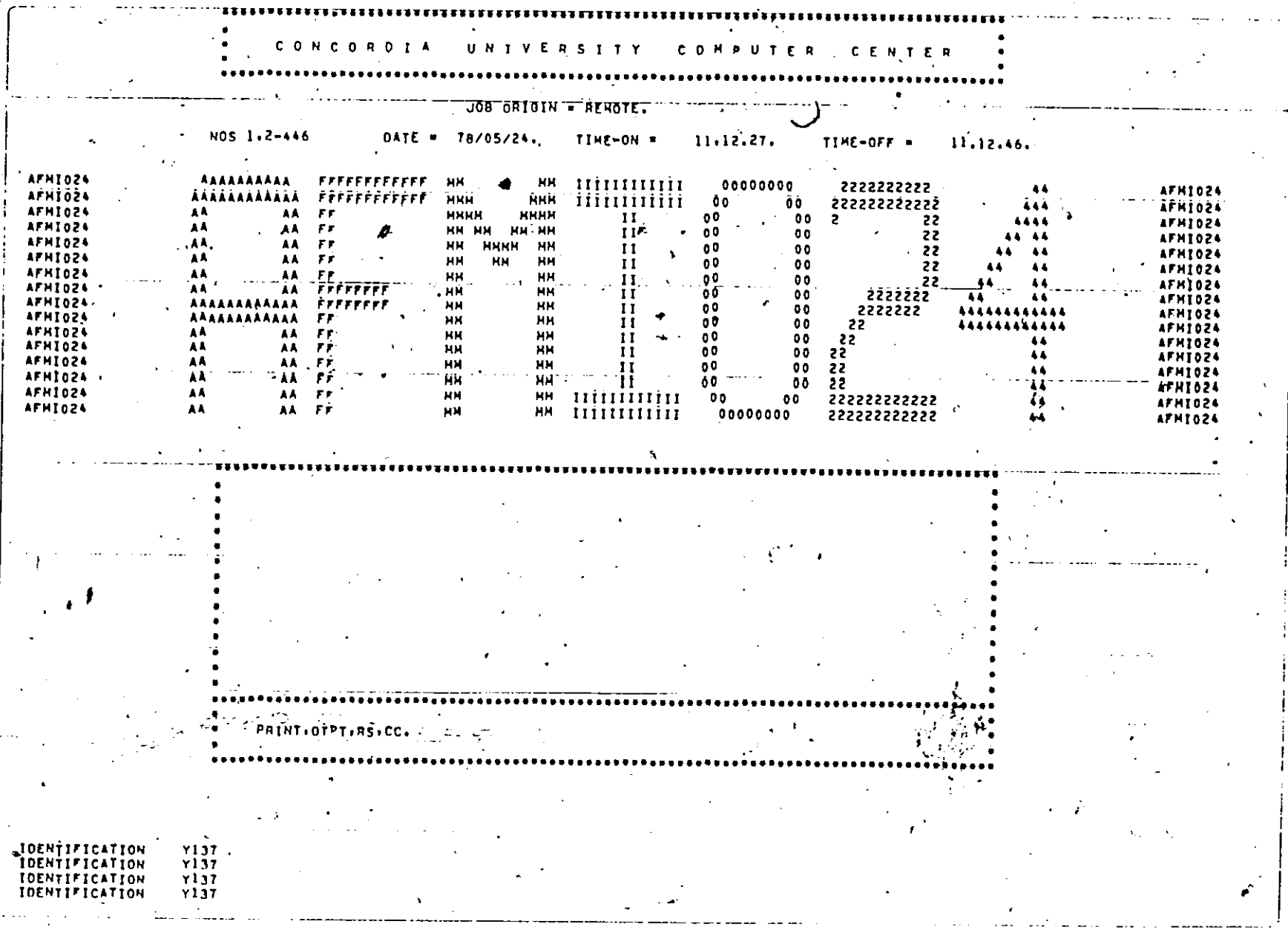
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	45
16	154
17	0
18	0
19	2501
20	5136
21	0
22	0
23	25529
24	36330
25	0
26	0
27	61395

28	61360
29	0
30	0
31	36295
32	25550
33	0
34	0
35	5157
36	2496
37	0
38	0
39	147
40	44
41	0
42	0
43	3
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144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NOS 1.2-446 DATE = 78/05/24. TIME-ON = 11.12.27. TIME-OFF = 11.12.46.
PRINT,OTPT,RS,CC.
IDENTIFICATION Y137
IDENTIFICATION Y137
IDENTIFICATION Y137
IDENTIFICATION Y137

POOR PRINT

LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	11
16	47
17	0
18	0
19	1101
20	2491
21	0
22	0
23	16407
24	25559
25	0
26	0
27	50265

POOR PRINT

LIGHT LINES ON PAGE

28	61355
29	0
30	0
31	47217
32	36325
33	0
34	0
35	9639
36	5145
37	0
38	0
39	429
40	149
41	0
42	0
43	3
44	1
45	0
46	0
47	0
48	0
49	0
50	0
51	0
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53	0
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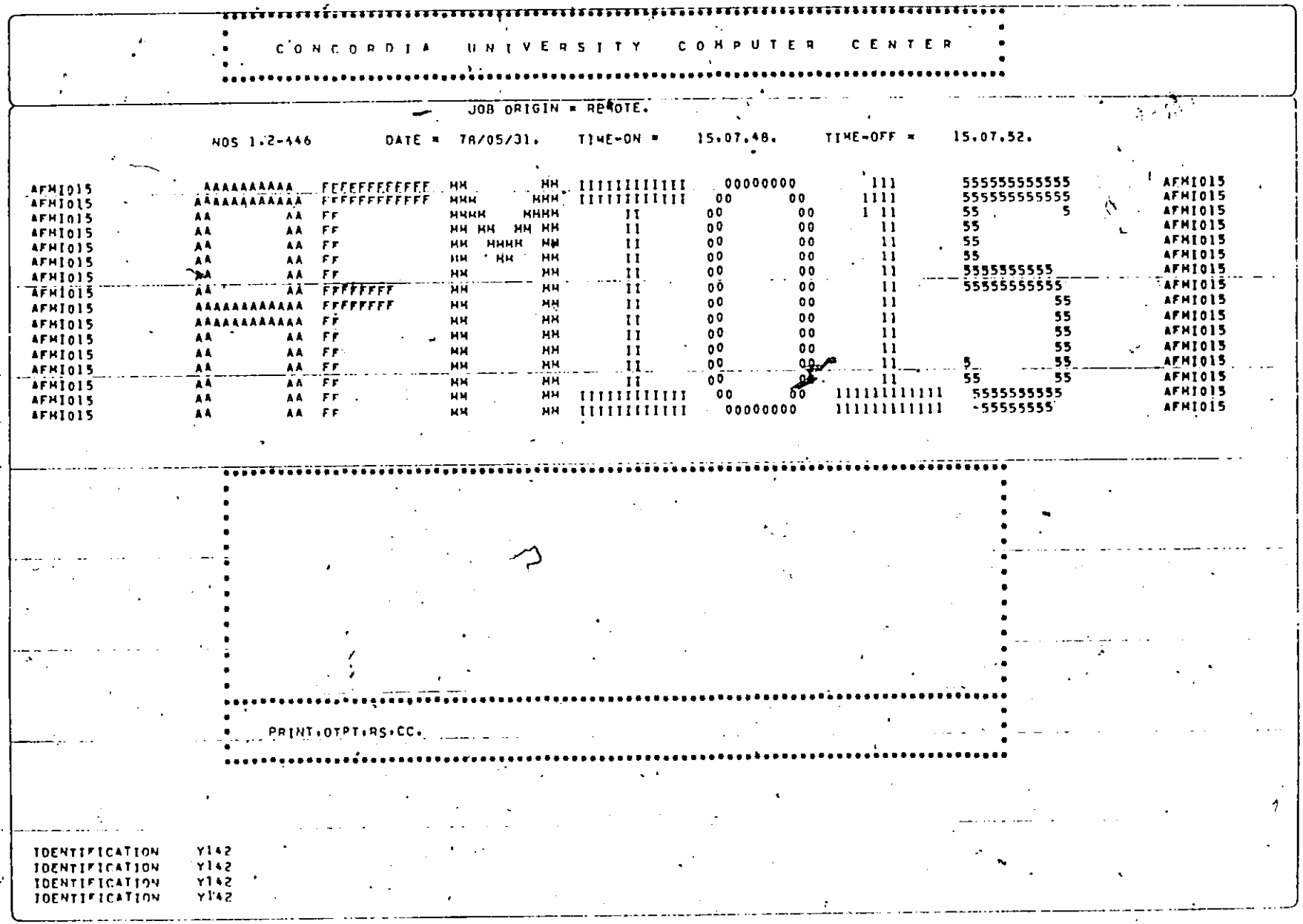
TOTAL =	282144.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AFMI015 AAAAAAAAAAAA FFFFFFFFFF MMM MMM IIIIIIIIIII 00 00 1111 5555555555 AFMI015
AFMI015 AA AA FF MMMM MMMM II 00 00 1 11 55 5 AFMI015
AFMI015 AA AA FF MM MM MM MM II 00 00 11 55 AFMI015
AFMI015 AA AA FF MM MMMM MM II 00 00 11 55 AFMI015
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AFMI015 AA AA FF MM MM II 00 00 11 5 55 AFMI015
AFMI015 AA AA FF MM MM II 00 00 11 55 55 AFMI015
AFMI015 AA AA FF MM MM IIIIIIIIIII 00 00 11111111111 5555555555 AFMI015
AFMI015 AA AA FF MM MM IIIIIIIIIII 00000000 11111111111 5555555555 AFMI015
PRINT,OTPT,RS,CC.
IDENTIFICATION Y142
IDENTIFICATION Y142
IDENTIFICATION Y142
IDENTIFICATION Y142

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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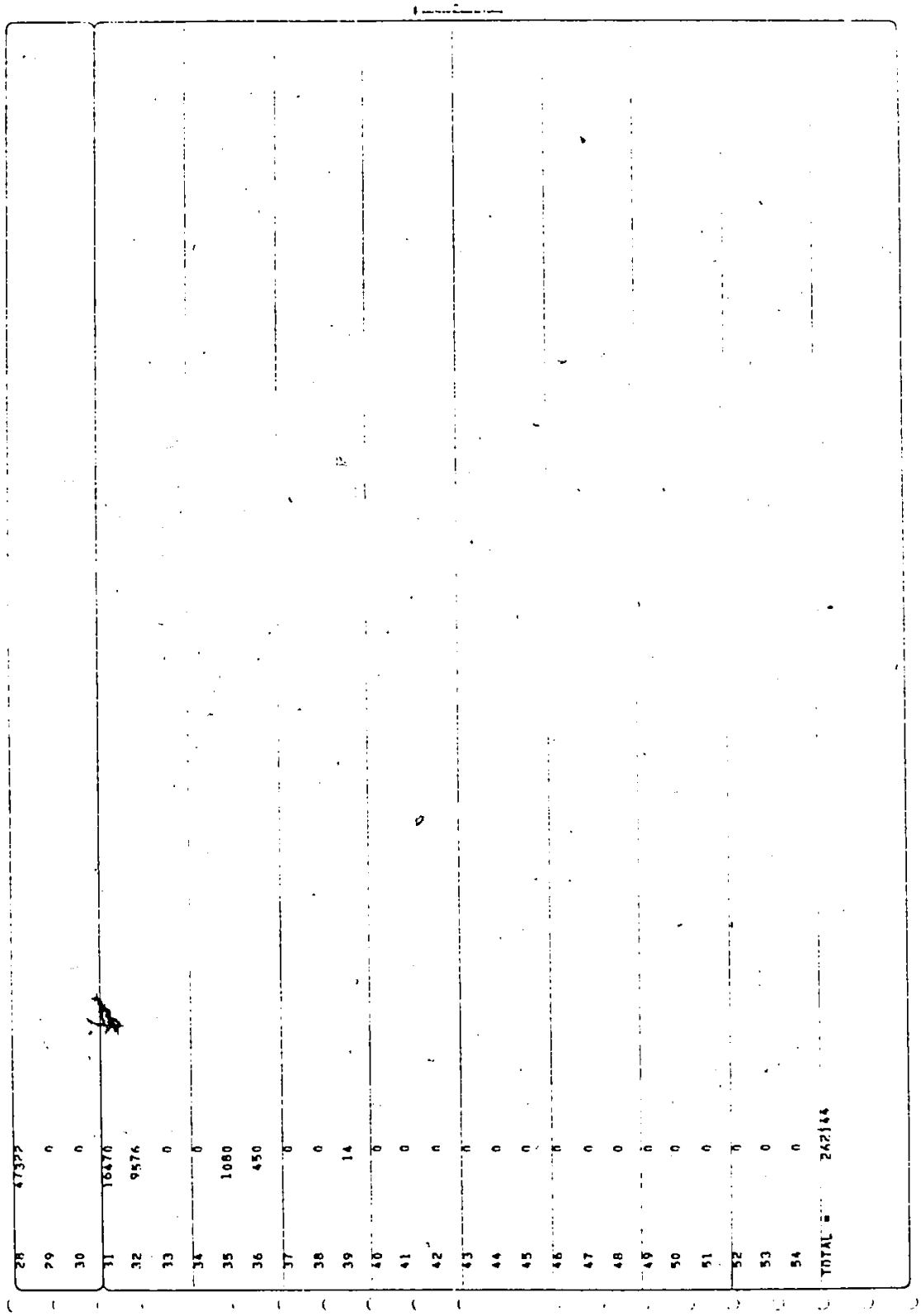
8	0
9	0
10	0
11	0
12	14
13	0
14	0
15	450
16	1080
17	0
18	0
19	9576
20	16470
21	0
22	0
23	47322
24	56160
25	0
26	0
27	56160

POOR PRINT | LIGHT LINES ON PAGE



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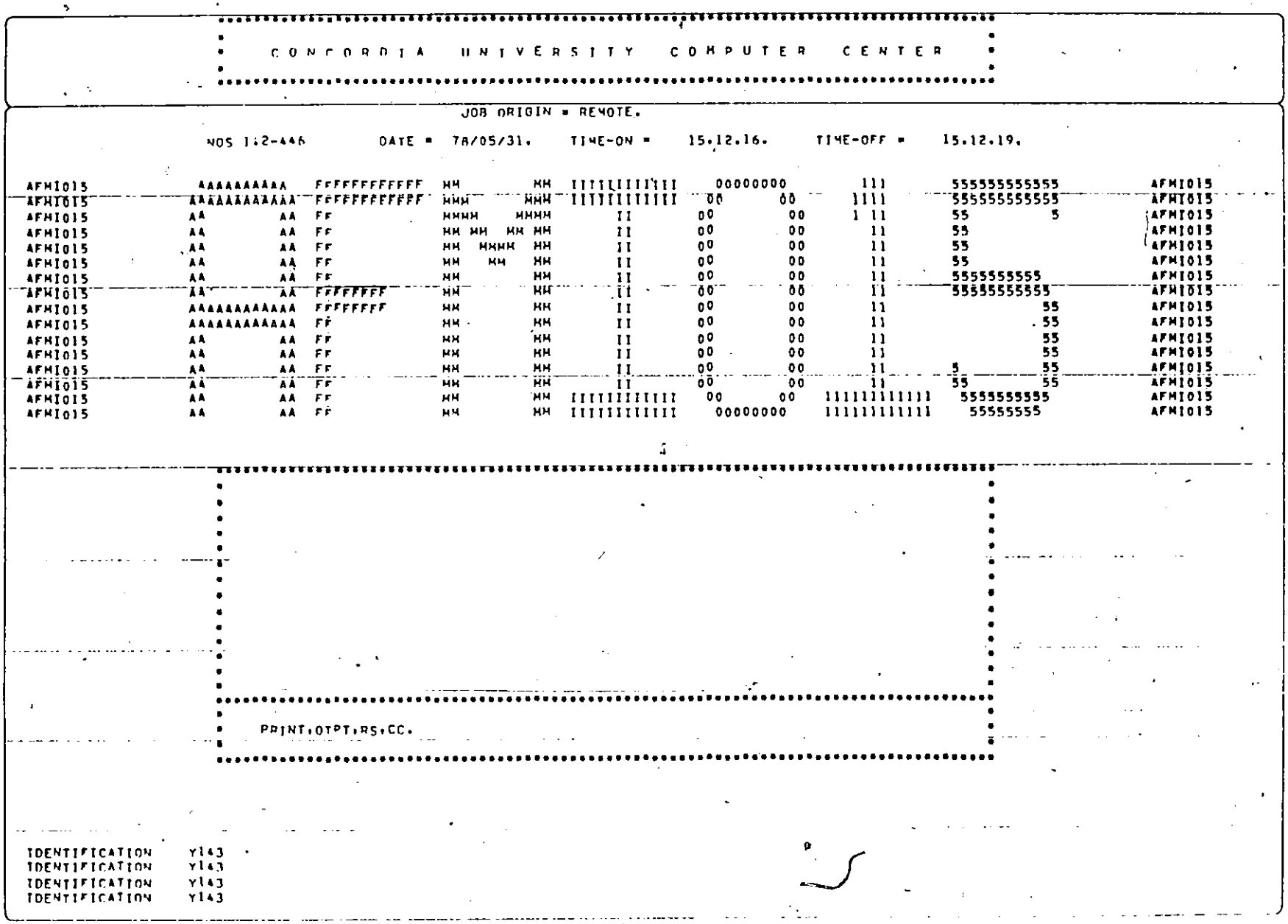
30	0
31	16470
32	9576
33	0
34	0
35	1080
36	450
37	0
38	0
39	14
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

COMPUTER CENTER

CONCORDIA UNIVERSITY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NOS 1.2-446 DATE = 78/05/31. TIME-ON = 15.12.16. TIME-OFF = 15.12.19.
AFMI015
PRINT,OTPT,RS,CC.
IDENTIFICATION Y143
IDENTIFICATION Y143
IDENTIFICATION Y143
IDENTIFICATION Y143

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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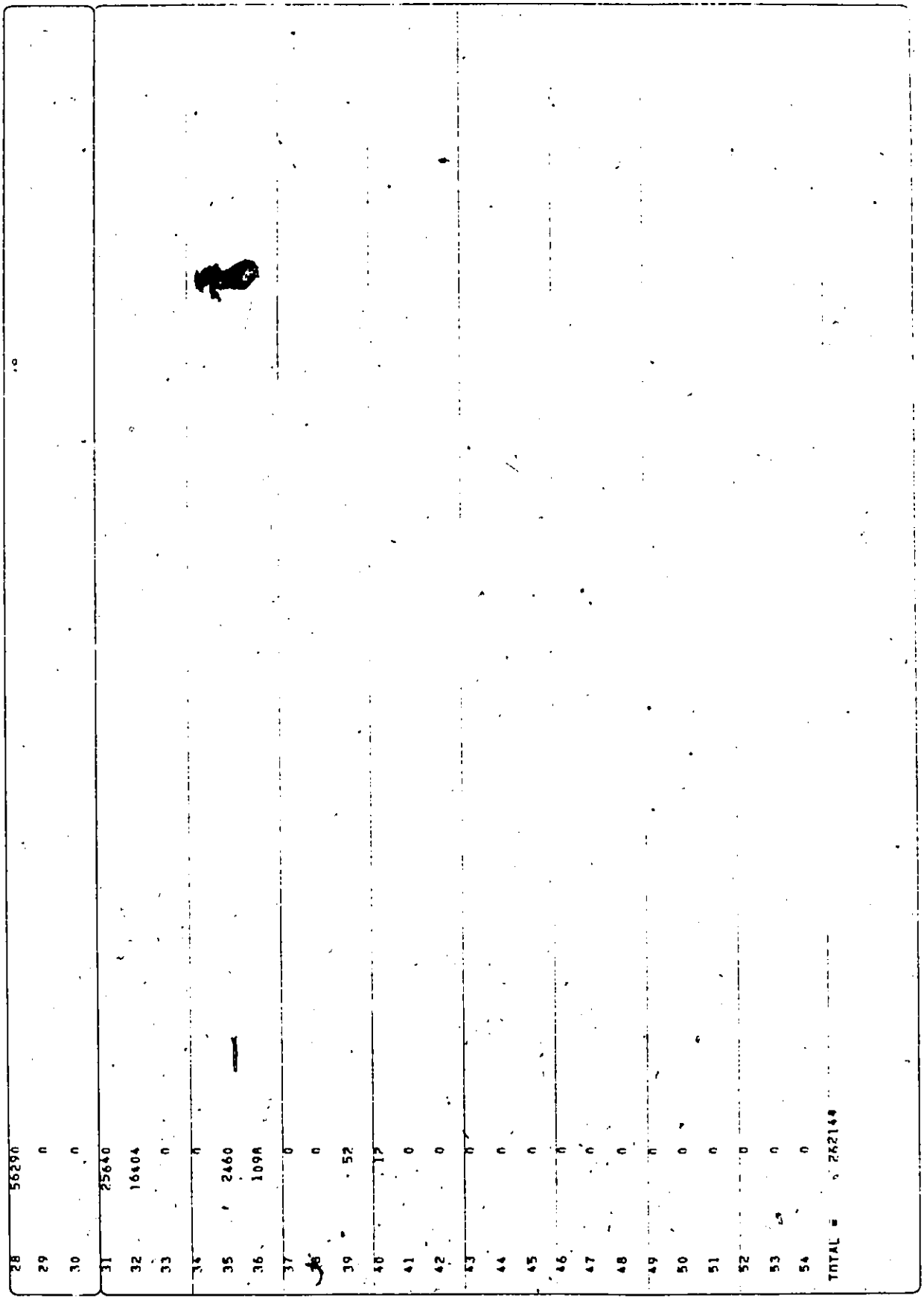
8	0
9	0
10	0
11	0
12	6
13	0
14	0
15	160
16	412
17	0
18	0
19	5100
20	9678
21	0
22	0
23	36420
24	47172
25	0
26	0
27	61240

POOR PRINT

LIGHT LINES ON PAGE



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33	0
34	0
35	2460
36	1094
37	0
38	0
39	52
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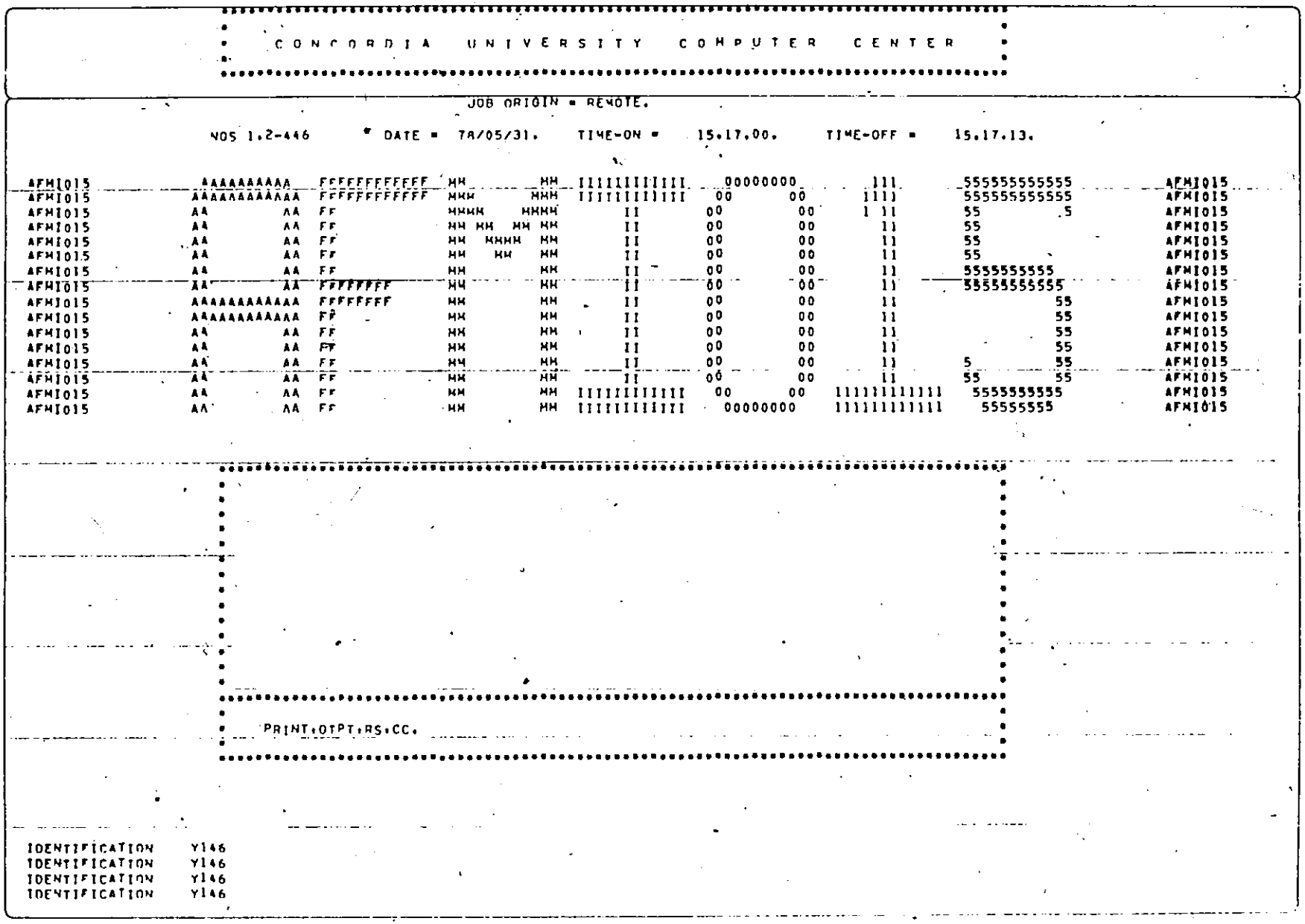
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262148

CONCORDIA UNIVERSITY COMPUTER CENTER


CONCORDIA UNIVERSITY COMPUTER CENTER
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AFMI015 AAAAAAAAAAAA FFFFFFFFFFF MMM MMM IIIIIIIIIII 00 00 1111 555555555555 AFMI015
AFMI015 AA AA FF MMMM MMMM II 00 00 1 11 55 5 AFMI015
AFMI015 AA AA FF MM MM MM MM II 00 00 11 55 AFMI015
AFMI015 AA AA FF MM MMMM MM II 00 00 11 55 AFMI015
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AFMI015 AA AA FFFFFFFF MM MM II 00 00 11 55555555555 AFMI015
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AFMI015 AA AA FF MM MM II 00 00 11 5 55 AFMI015
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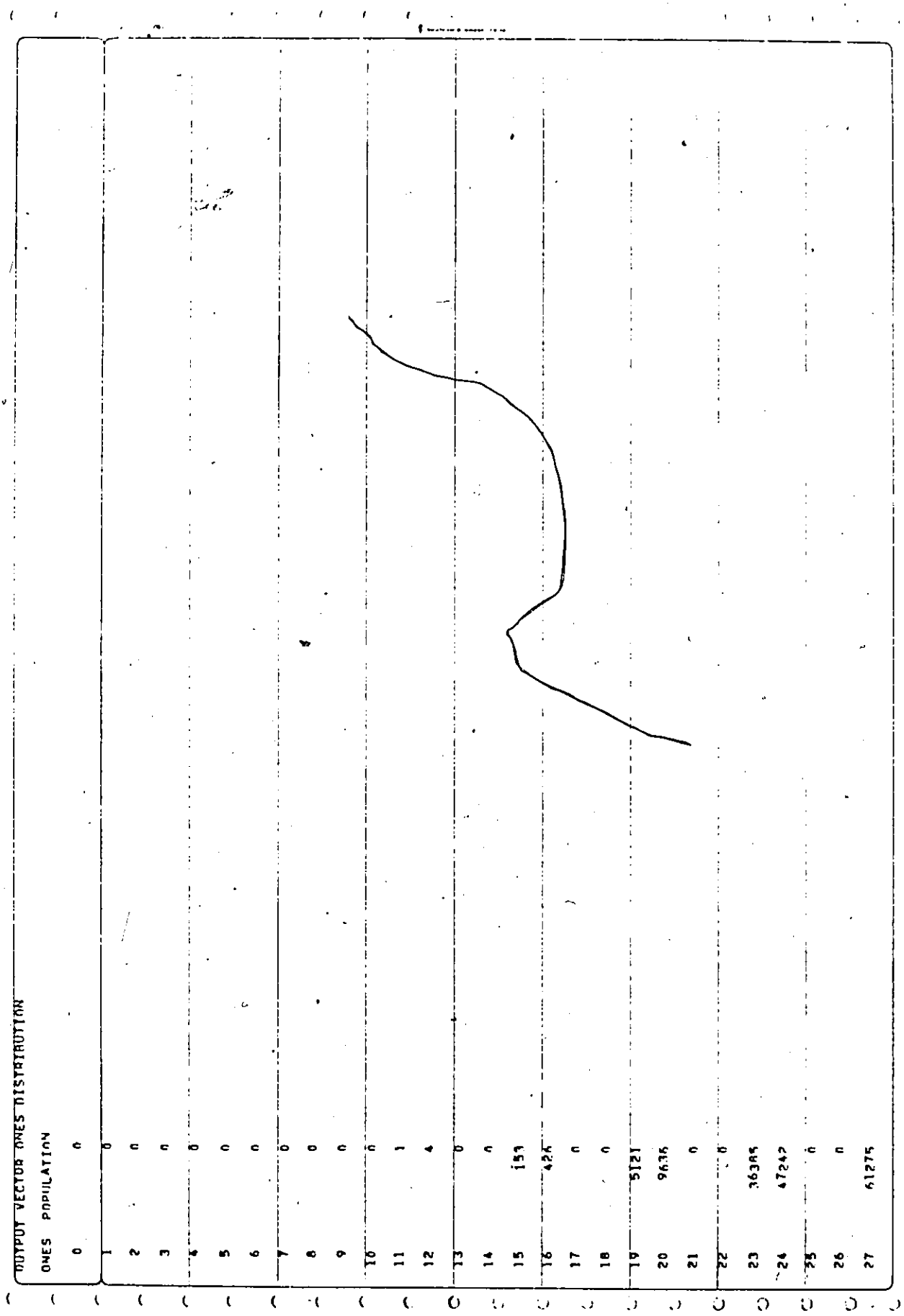
AFMI015 AA AA FF MM MM IIIIIIIIIII 00 00 11111111111 5555555555 AFMI015
AFMI015 AA AA FF MM MM IIIIIIIIIII 00000000 11111111111 55555555 AFMI015
PRINT,OTPT,RS,CC.
IDENTIFICATION Y146
IDENTIFICATION Y146
IDENTIFICATION Y146
IDENTIFICATION Y146

POOR PRINT

LIGHT LINES ON PAGE



POOR PRINT | LIGHT LINES ON PAGE

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30	0	
31	25619	
32	16446	
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36	1084	
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38	0	
39	51	
40	14	
41	0	
42	0	
43	0	
44	0	
45	0	
46	0	
47	0	
48	0	
49	0	
50	0	
51	0	
52	0	
53	0	
54	0	
TOTAL #	242144	

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                JOB ORIGIN = REMOTE.

          NOS 1.2-446      DATE = 78/05/31.    TIME-ON =    15.20.46.    TIME-OFF =    15.20.47.

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    PRINT,OUTPT,RS,CC.

IDENTIFICATION   Y147
IDENTIFICATION   Y147
IDENTIFICATION   Y147
IDENTIFICATION   Y147
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OUTPUT VECTOR ONES DISTRIBUTION

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4	0
5	0
6	0
7	0
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11	0
12	2
13	0
14	0
15	50
16	146
17	0
18	0
19	2474
20	5142
21	0
22	0
23	25598
24	36350
25	0
26	0
27	61310

28	61310
29	0
30	0
31	36350
32	25598
33	0
34	0
35	5142
36	2474
37	0
38	0
39	146
40	50
41	0
42	0
43	2
44	0
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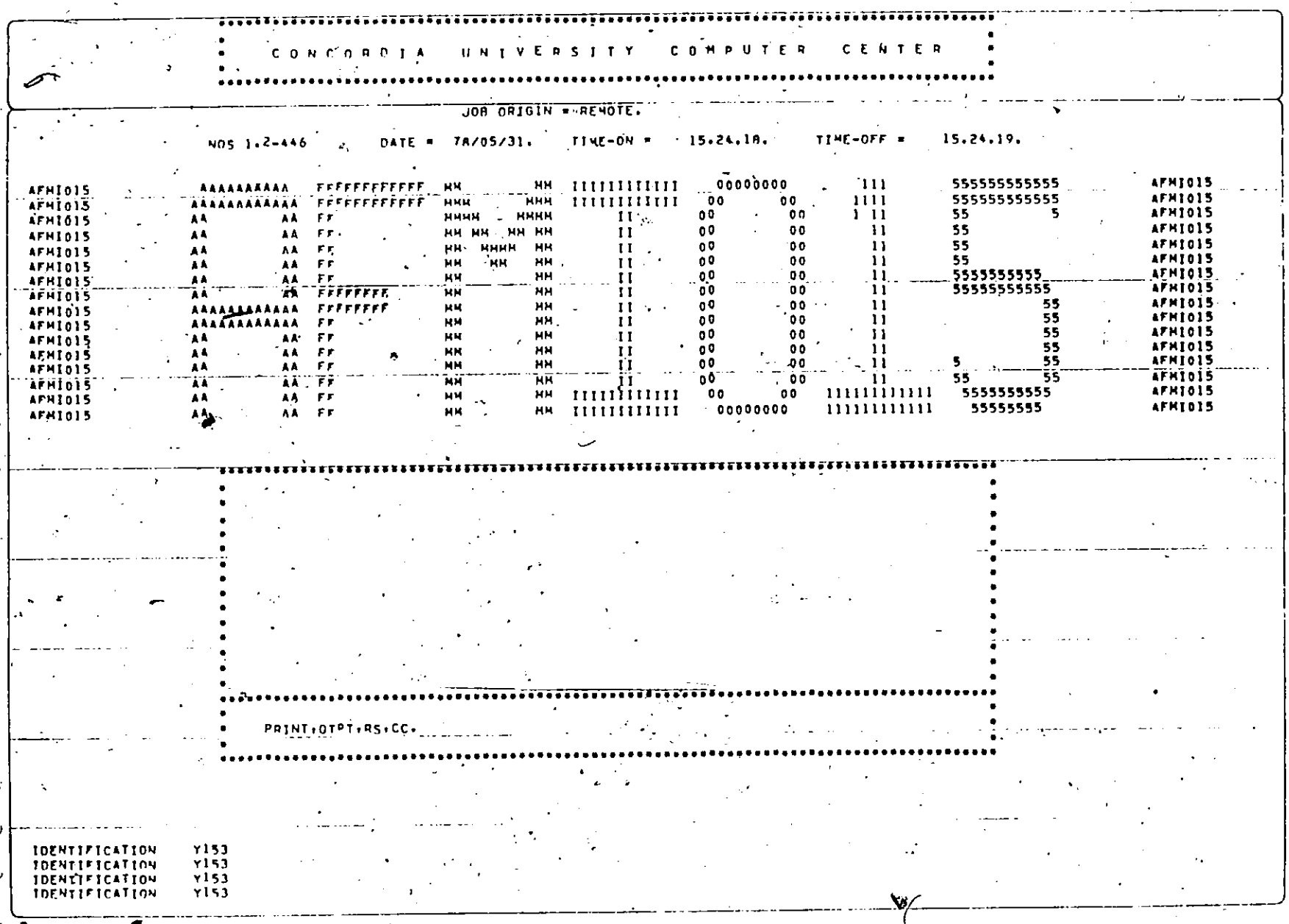
TOTAL =	262144



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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

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PRINT,OTPT,RS,CC.


IDENTIFICATION    Y153
IDENTIFICATION    Y153
IDENTIFICATION    Y153
IDENTIFICATION    Y153
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OUTPUT VECTOR ONES DISTRIBUTION

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4	0
5	0
6	0
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11	0
12	0
13	0
14	0
15	48
16	154
17	0
18	0
19	2498
20	5136
21	0
22	0
23	25550
24	36330
25	0
26	0
27	61360

28	61360
29	0
30	0
31	36330
32	25550
33	0
34	0
35	5136
36	2494
37	0
38	0
39	154
40	44
41	0
42	0
43	0
44	0
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47	0
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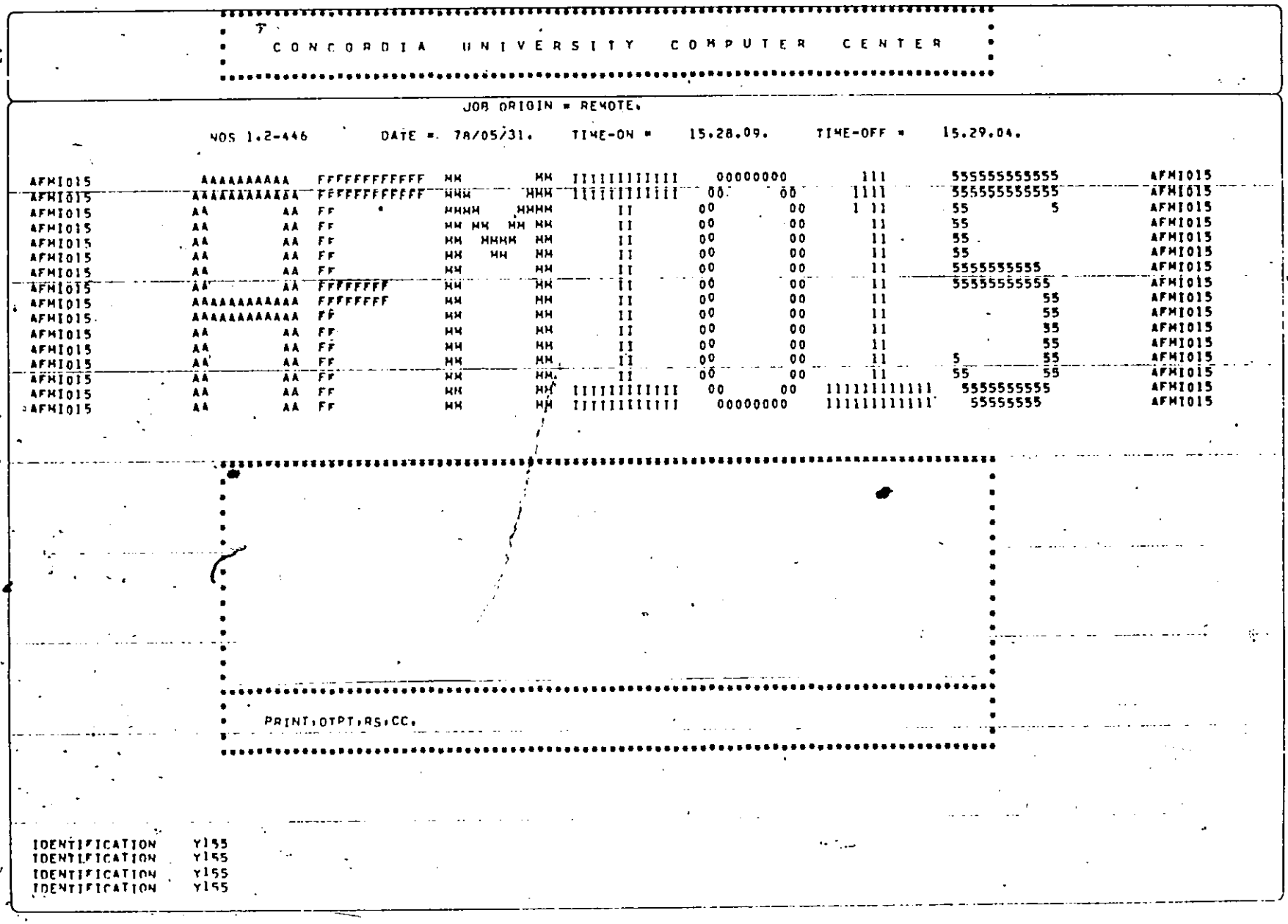
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/31. TIME-ON = 15.28.09. TIME-OFF = 15.29.04.
AFMI015
PRINT,OTPT,RS,CC.
IDENTIFICATION Y155
IDENTIFICATION Y155
IDENTIFICATION Y155
IDENTIFICATION Y155

POOR PRINT

LIGHT LINES ON PAGE

OUTPUT VECTOR ONES DISTRIBUTION

ONES, POPULATION	
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2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	45
16	154
17	0
18	0
19	2303
20	5134
21	0
22	0
23	25529
24	36330
25	0
26	0
27	61395

28	41360
29	0
30	0
31	36295
32	25550
33	0
34	0
35	5157
36	2496
37	0
38	0
39	147
40	43
41	0
42	0
43	1
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	242144

POOR PRINT LIGHT LINES ON PAGE

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          PRINT,OTPT,RS,CC.

IDENTIFICATION   Y156
IDENTIFICATION   Y156
IDENTIFICATION   Y156
IDENTIFICATION   Y156
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OUTPUT VECTOR ONES DISTRIBUTION

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4	0
5	0
6	0
7	0
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15	46
16	154
17	0
18	0
19	2498
20	5136
21	0
22	0
23	25550
24	36330
25	0
26	0
27	61360

28	61360
29	0
30	0
31	36330
32	25550
33	0
34	0
35	5136
36	2496
37	0
38	0
39	154
40	46
41	0
42	0
43	0
44	0
45	0
46	0
47	0
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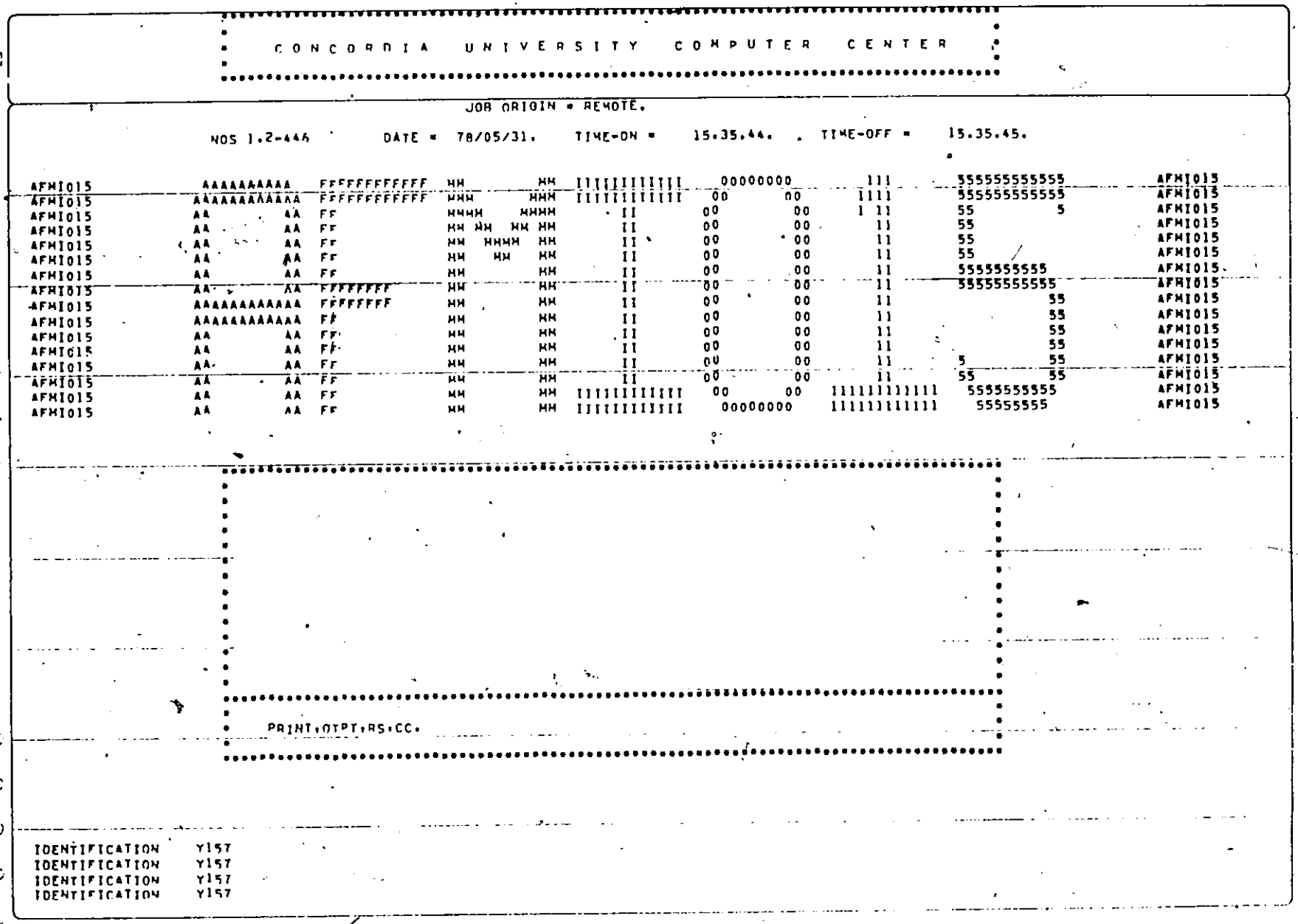
51	0
52	0
53	0
54	0
TOTAL =	242144

POOR PRINT

LIGHT LINES ON PAGE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PRINT,OTPT,RS,CC.
IDENTIFICATION Y157
IDENTIFICATION Y157
IDENTIFICATION Y157
IDENTIFICATION Y157

OUTPUT VECTOR ONES DISTRIBUTION

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12	0
13	0
14	0
15	11
16	47
17	0
18	0
19	1101
20	2491
21	0
22	0
23	16407
24	25559
25	0
26	0
27	56265

28	61355
29	0
30	0
31	47217
32	36325
33	0
34	0
35	9639
36	5145
37	0
38	0
39	429
40	149
41	0
42	0
43	3
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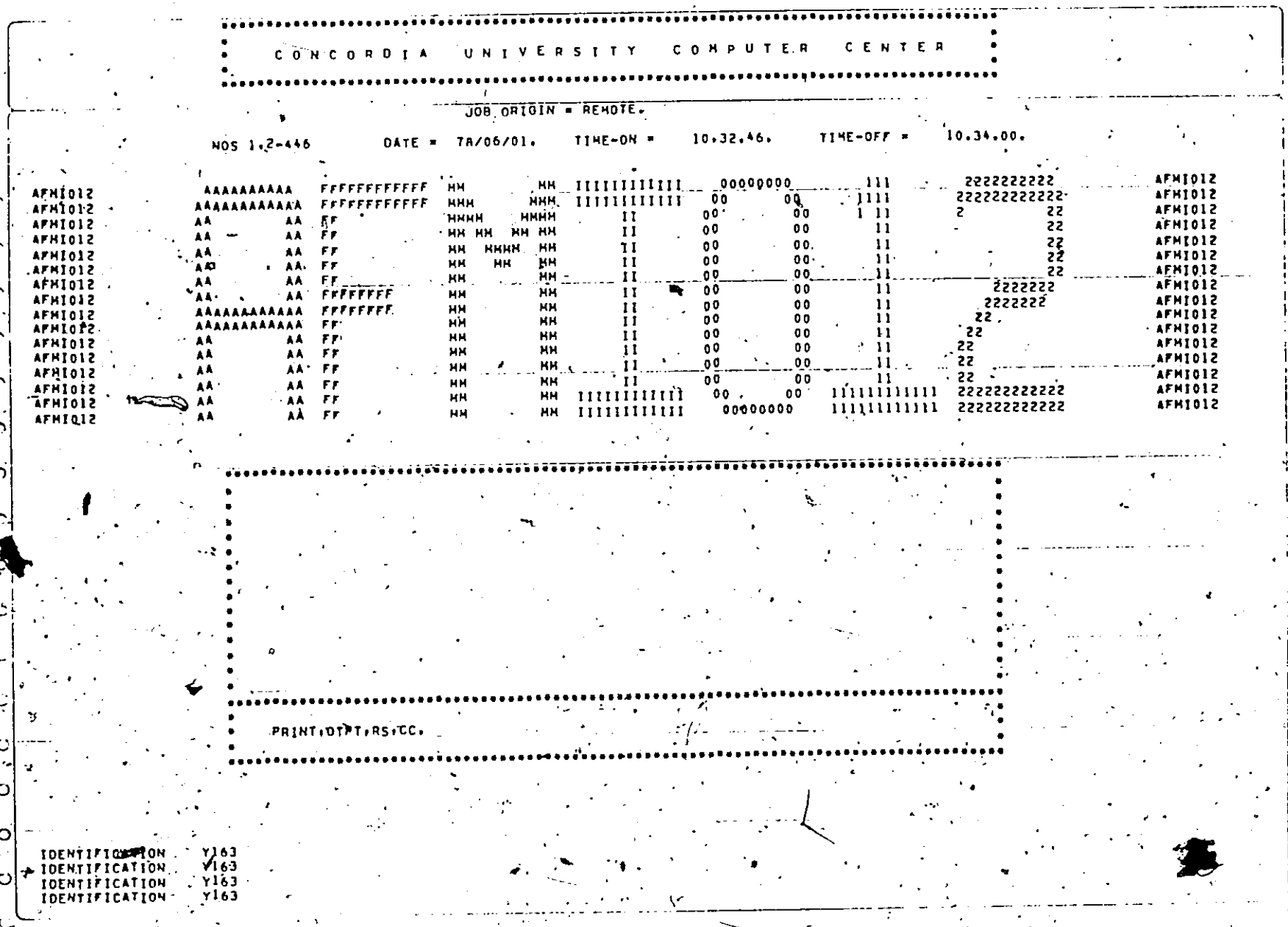
TOTAL =	262146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PRINT,OTPT,RS,CC.
IDENTIFICATION Y163
IDENTIFICATION Y163
IDENTIFICATION Y163
IDENTIFICATION Y163

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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4	0
5	0
6	0
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8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	45
16	154
17	0
18	0
19	2503
20	5136
21	0
22	0
23	25529
24	36330
25	0
26	0
27	61395

LIGHT LINES ON PAGE (POOR PRINT

28	61380
29	0
30	0
31	36295
32	25550
33	0
34	0
35	5157
36	2496
37	0
38	0
39	147
40	46
41	0
42	0
43	1
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

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                    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y165
IDENTIFICATION    Y165
IDENTIFICATION    Y165
IDENTIFICATION    Y165
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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4	0
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6	0
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10	0
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14	0
15	46
16	154
17	0
18	0
19	2496
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22	0
23	25550
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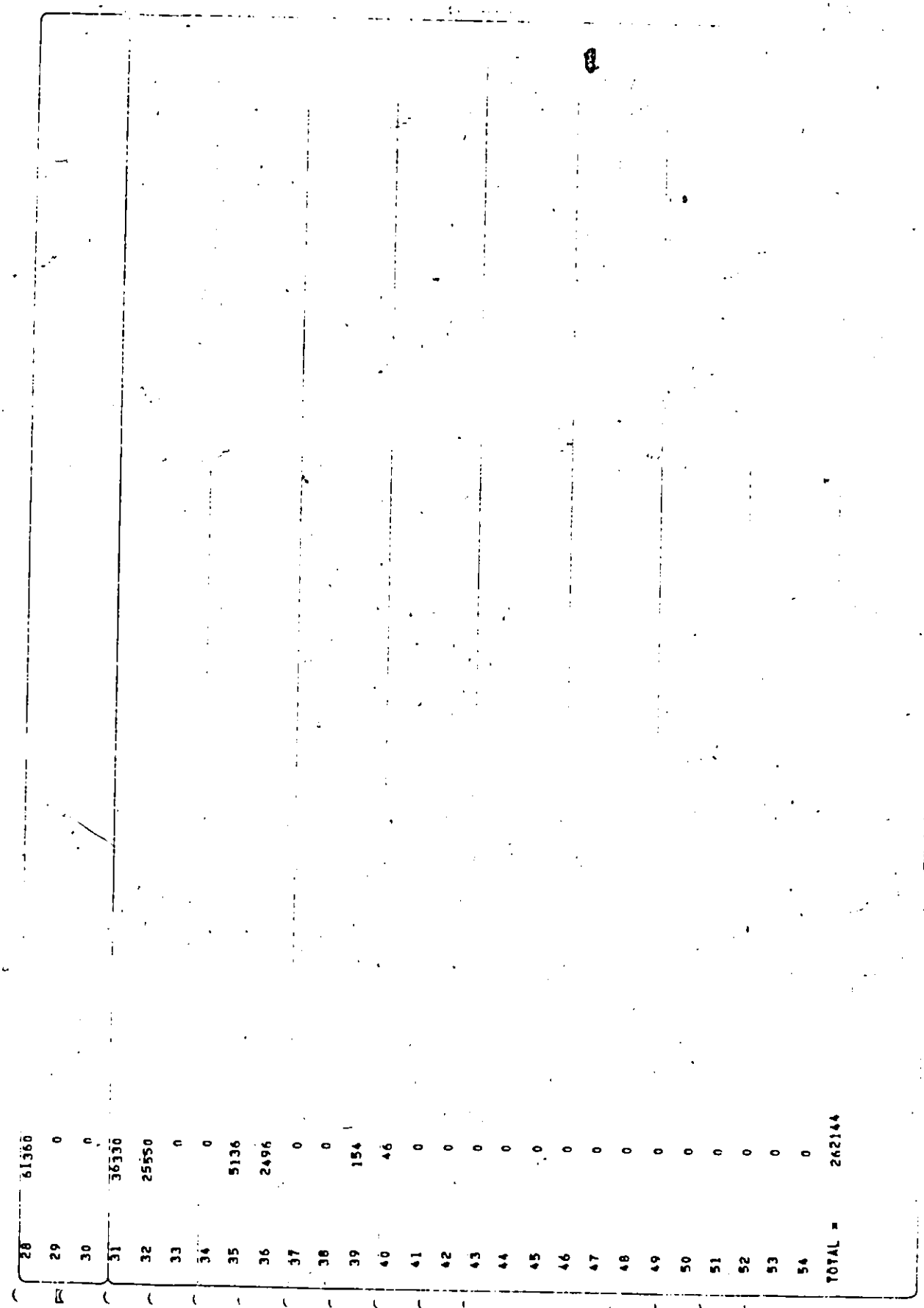
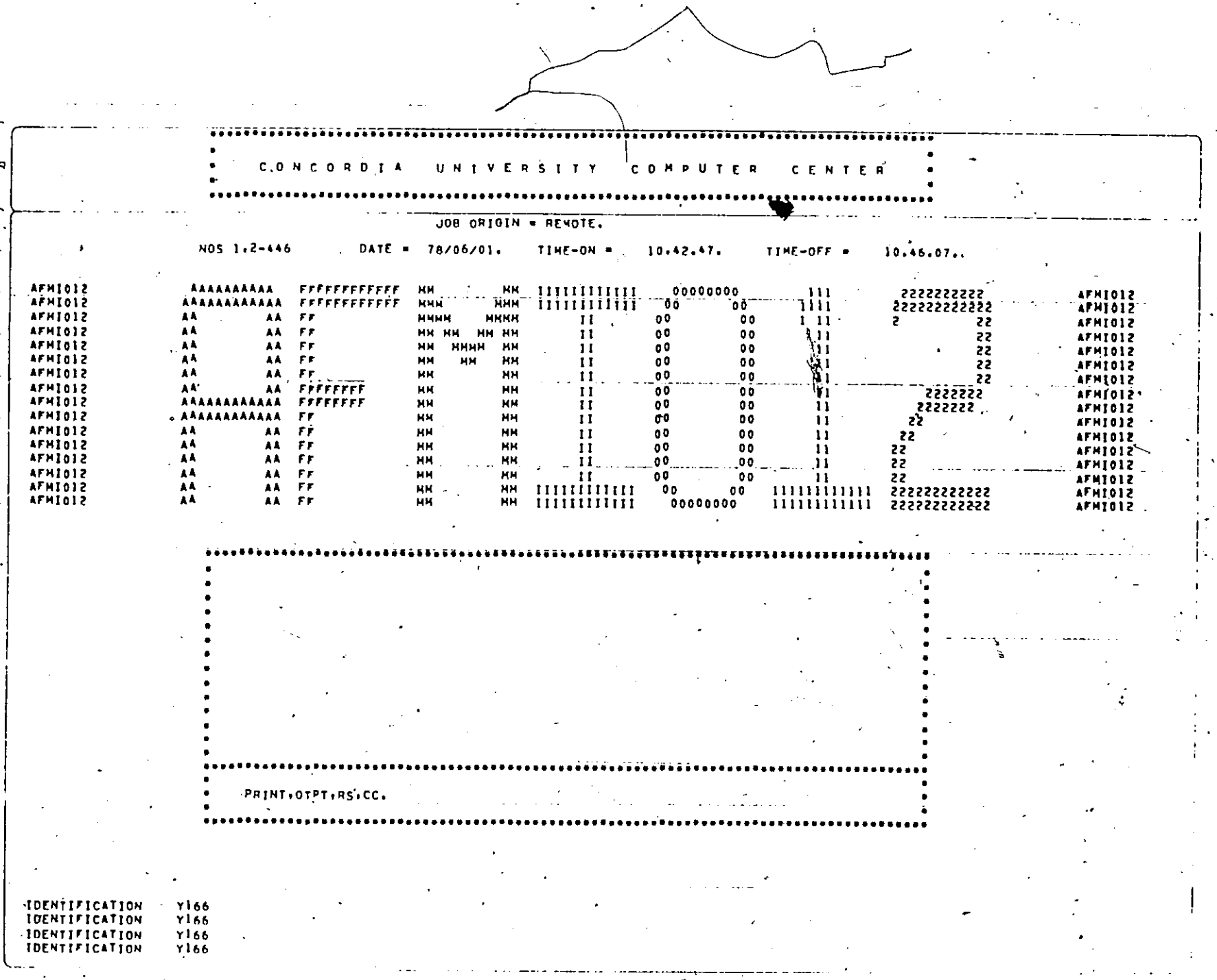
26	0
27	61360

LIGHT LINES ON PAGE POOR PRINT

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NOS 1.2-446 DATE = 78/06/01. TIME-ON = 10.42.47. TIME-OFF = 10.46.07.
AFMI012
PRINT,OTPT,RS,CC.
IDENTIFICATION Y166
IDENTIFICATION Y166
IDENTIFICATION Y166
IDENTIFICATION Y166

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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14	0
15	46
16	154
17	0
18	0
19	2496
20	5136
21	0
22	0
23	25550
24	36330
25	0
26	0
27	61360

LIGHT LINES ON PAGE POOR PRINT

28	61360
29	0
30	0
31	38330
32	25550
33	0
34	0
35	5136
36	2496
37	0
38	0
39	154
40	46
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
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51	0
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54	0
TOTAL =	262144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

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  PRINT,OTPT,RS,CC.

IDENTIFICATION   Y167
IDENTIFICATION   Y167
IDENTIFICATION   Y167
IDENTIFICATION   Y167
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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3	0
4	0
5	0
6	0
7	0
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13	0
14	0
15	11
16	47
17	0
18	0
19	1101
20	2491
21	0
22	0
23	16407
24	25559
25	0
26	0
27	56265

LIGHT LINES ON PAGE POOR PRINT

28	61355
29	0
30	0
31	47217
32	36325
33	0
34	0
35	9639
36	5145
37	0
38	0
39	429
40	149
41	0
42	0
43	3
44	1
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

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AFMI021        AA        AA   FF            MM        MM         II      00      00             22        11         AFMI021
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AFMI021        AAAAAAAAAAAA   FF            MM        MM         II      00      00    22                 11         AFMI021
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   PRINT,OTPT,RS,CC.

IDENTIFICATION    Y173
IDENTIFICATION    Y173
IDENTIFICATION    Y173
IDENTIFICATION    Y173
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
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11	0
12	0
13	0
14	0
15	12
16	47
17	0
18	0
19	1094
20	2491
21	0
22	0
23	16428
24	25559
25	0
26	0
27	56230

LIGHT LINES ON PAGE POOR PRINT

28	61355	
29	0	
30	0	
31	47252	
32	36325	
33	0	
34	0	
35	9618	
36	5145	
37	0	
38	0	
39	436	
40	149	
41	0	
42	0	
43	2	
44	1	
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49	0	
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51	0	
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53	0	
54	0	
TOTAL =	262144	

COMPUTER GENERATED

ARCHIVE COPY

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AFMI012   AA        AA  FF           MM        MM      II      00    00      11              22    AFMI012
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AFMI012   AA        AA  FF           MM        MM  IIIIIIII&III   00    00  111111111111  222222222222  AFMI012
AFMI012   AA        AA  FF           MM        MM  IIIIIIIIIIII    00000000  111111111111  222222222222  AFMI012

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y175
IDENTIFICATION    Y175
IDENTIFICATION    Y175
IDENTIFICATION    Y175
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LIGHT LINES ON PAGE [POOR PRINT]

OUTPUT VECTOR ONES DISTRIBUTION

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7	0
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10	0
11	0
12	0
13	0
14	0
15	12
16	47
17	0
18	0
19	1094
20	2691
21	0
22	0
23	16428
24	25559
25	0
26	0
27	56230

LIGHT LINES ON PAGE POOR PRINT

28	61355
29	0
30	0
31	47252
32	36325
33	0
34	0
35	9618
36	5145
37	0
38	0
39	436
40	149
41	0
42	0
43	2
44	1
45	0
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47	0
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52	0
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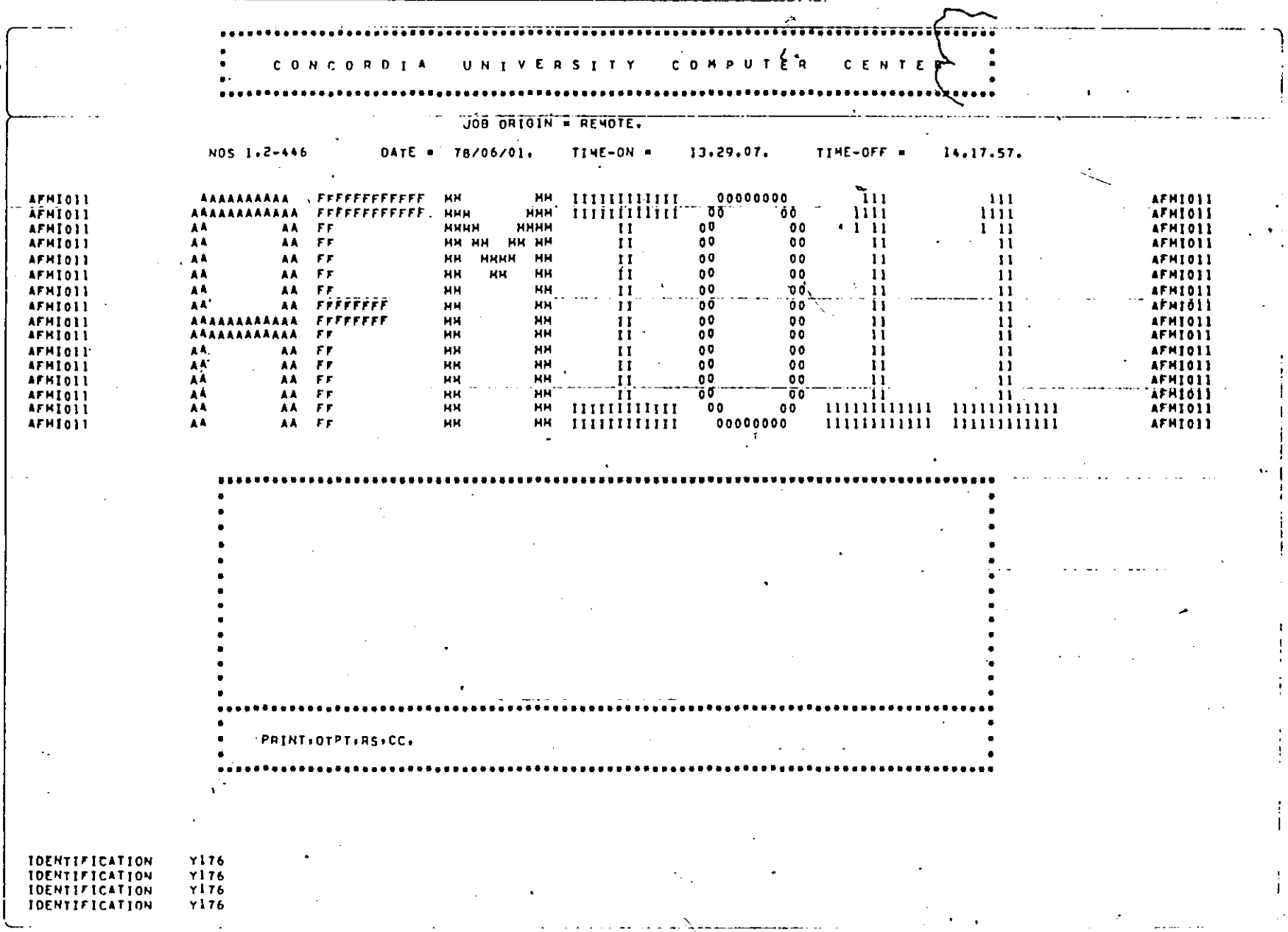
54	0
TOTAL =	262144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JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/06/01. TIME-ON = 13.29.07. TIME-OFF = 14.17.57.
AFMI011
PRINT,OTPT,RS,CC.
IDENTIFICATION Y176
IDENTIFICATION Y176
IDENTIFICATION Y176
IDENTIFICATION Y176

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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14	0
15	12
16	47
17	0
18	0
19	1094
20	2491
21	0
22	0
23	16428
24	25559
25	0
26	0
27	56230

LIGHT LINES ON PAGE [POOR PRINT]

28	61355
29	0
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32	36325
33	0
34	0
35	9618
36	5145
37	0
38	0
39	436
40	149
41	0
42	0
43	2
44	1
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47	0
48	0
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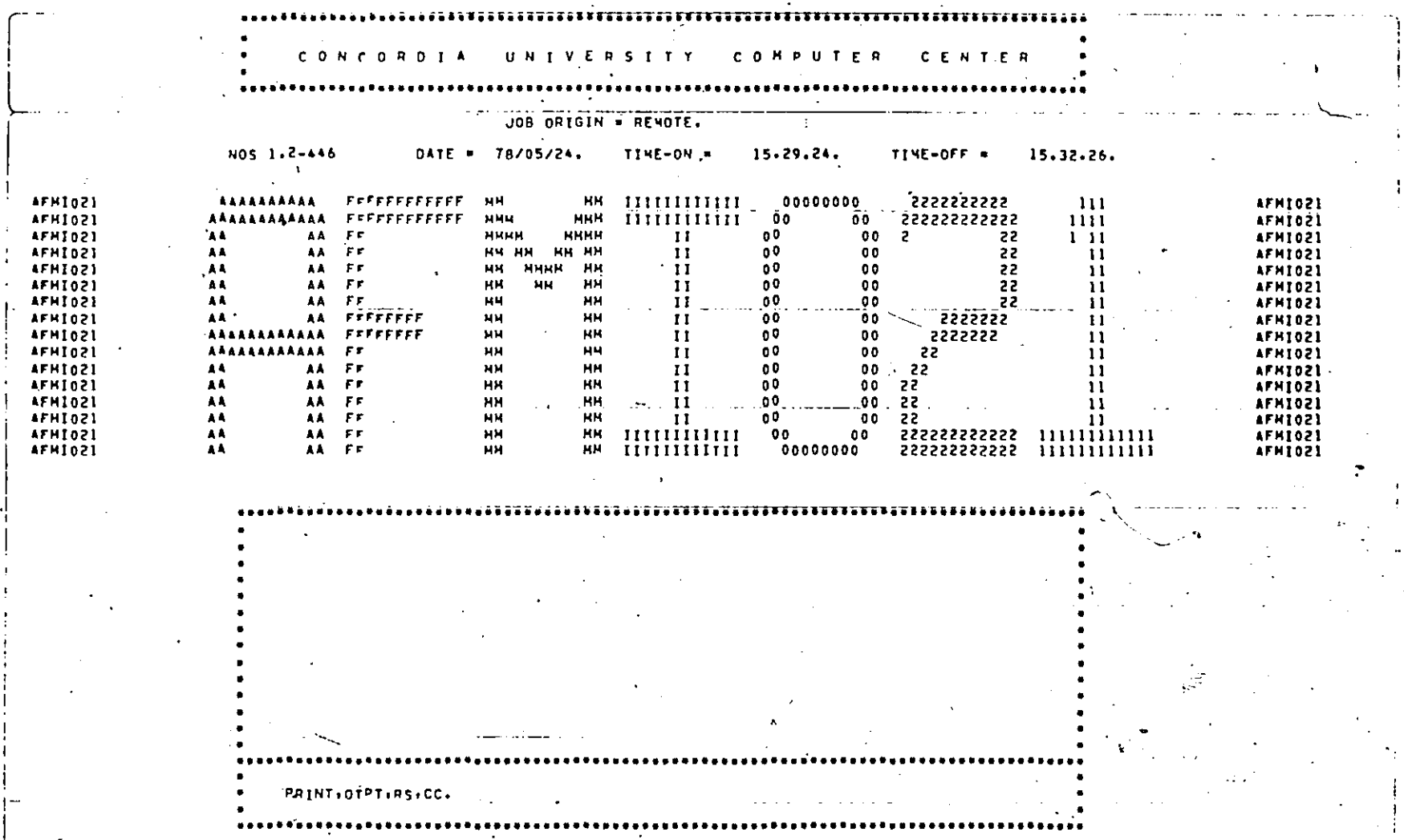
53	0
54	0
TOTAL #	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/05/24. TIME-ON = 15.29.24. TIME-OFF = 15.32.26.
AFMI021 AA AA FF MM MM II 00 00 22 11 AFMI021
PRINT,OTPT,RS,CC.
IDENTIFICATION Y177
IDENTIFICATION Y177
IDENTIFICATION Y177
IDENTIFICATION Y177

LIGHT LINES ON PAGE POOR PRINT

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	1
16	10
17	0
18	0
19	443
20	1108
21	0
22	0
23	9597
24	16386
25	0
26	0
27	47287

LIGHT LINES ON PAGE POOR PRINT

CONCORDIA UNIVERSITY - COMPUTER CENTER

28	56300
29	0
30	0
31	56195
32	47182
33	0
34	0
35	16440
36	9660
37	0
38	0
39	1887
40	422
41	0
42	0
43	13
44	4
45	0
46	0
47	0
48	0
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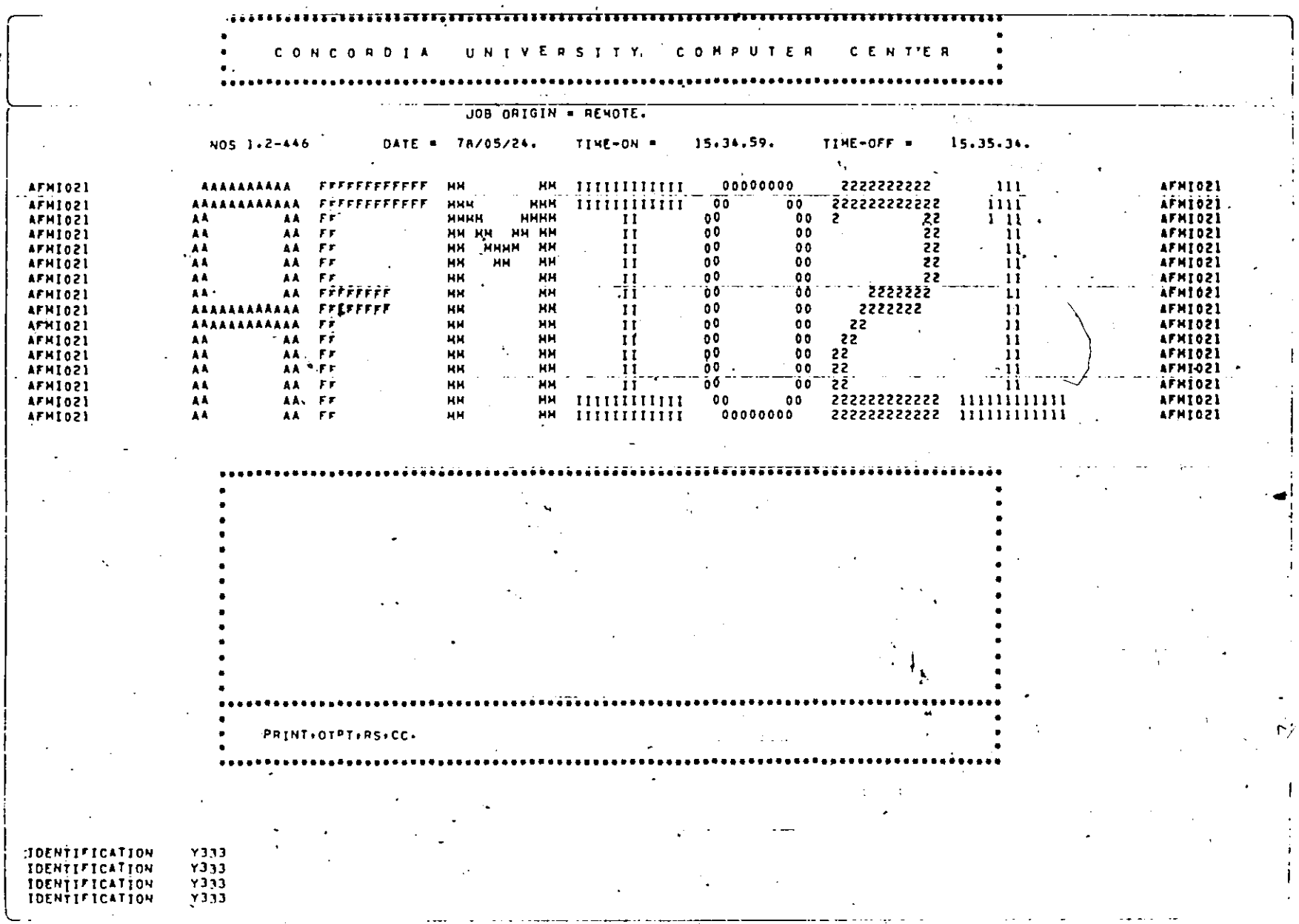
51	0
52	0
53	0
54	0
TOTAL =	242144


CONCORDIA UNIVERSITY. COMPUTER CENTER
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NOS 1.2-446 DATE = 78/05/24. TIME-ON = 15.34.59. TIME-OFF = 15.35.34.
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AFMI021 AAAAAAAAAAAA FFFFFFFFFFFF MMMM MMMM IIIIIIIIIIII 00 00 222222222222 1111 AFMI021
AFMI021 AA AA FF MMMMM MMMMM II 00 00 2 22 1 11 AFMI021
AFMI021 AA AA FF MM MM MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MMMM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FFFFFFFF MM MM II 00 00 2222222 11 AFMI021
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AFMI021 AAAAAAAAAAAA FF MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MM II 00 00 22 11 AFMI021
AFMI021 AA AA FF MM MM IIIIIIIIIIII 00 00 222222222222 111111111111 AFMI021
AFMI021 AA AA FF MM MM IIIIIIIIIIII 00000000 222222222222 111111111111 AFMI021
PRINT,OTPT,RS,CC.
IDENTIFICATION Y333
IDENTIFICATION Y333
IDENTIFICATION Y333
IDENTIFICATION Y333

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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9	0
10	0
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13	0
14	0
15	14
16	54
17	0
18	0
19	1086
20	2448
21	0
22	0
23	16434
24	25670
25	0
26	0
27	56250

LIGHT LINES ON PAGE [POOR PRINT]

COMPUTER CENTER

COLUMBIA UNIVERSITY

28	81260
29	0
30	0
31	47203
32	36450
33	0
34	0
35	9666
36	5088
37	0
38	0
39	414
40	162
41	0
42	0
43	6
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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AFMI012         AA        AA  FF           MMMM    MMMM      II        00      00     1 11     2          22        AFMI012
AFMI012         AA        AA  FF           MM MM  MM MM      II        00      00       11               22        AFMI012
AFMI012         AA        AA  FF           MM  MMMM  MM      II        00      00       11               22        AFMI012
AFMI012         AA        AA  FF           MM   MM   MM      II        00      00       11               22        AFMI012
AFMI012         AA        AA  FF           MM        MM      II        00      00       11               22        AFMI012
AFMI012         AA        AA  FFFFFFFF     MM        MM      II        00      00       11          2222222        AFMI012
AFMI012         AAAAAAAAAAAA  FFFFFFFF     MM        MM      II        00      00       11        2222222          AFMI012
AFMI012         AAAAAAAAAAAA  FF           MM        MM      II        00      00       11      22                 AFMI012
AFMI012         AA        AA  FF           MM        MM      II        00      00       11    22                   AFMI012
AFMI012         AA        AA  FF           MM        MM      II        00      00       11  22                     AFMI012
AFMI012         AA        AA  FF           MM        MM      II        00      00       11  22                     AFMI012
AFMI012         AA        AA  FF           MM        MM      II        00      00       11  22                     AFMI012
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AFMI012         AA        AA  FF           MM        MM  IIIIIIIIIII    00000000   11111111111  2222222222222     AFMI012

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y335
IDENTIFICATION    Y335
IDENTIFICATION    Y335
IDENTIFICATION    Y335
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LIGHT LINES ON PAGE | POOR PRINT

OUTPUT VECTOR ONES DISTRIBUTION

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3	0
4	0
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9	0
10	0
11	0
12	0
13	0
14	0
15	18
16	53
17	0
18	0
19	1058
20	2455
21	0
22	0
23	16518
24	25649
25	0
26	0
27	56110

28	61235
29	0
30	0
31	47342
32	36415
33	0
34	0
35	9582
36	5109
37	0
38	0
39	442
40	155
41	0
42	0
43	2
44	1
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

```
    CONCORDIA   UNIVERSITY   COMPUTER   CENTER

                        JOB ORIGIN = REMOTE.

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AFMI012        AA        AA   FF            MM MM  MM MM       II      00      00      11                 22        AFMI012
AFMI012        AA        AA   FF            MM  MMMM  MM       II      00      00      11                 22        AFMI012
AFMI012        AA        AA   FF            MM   MM   MM       II      00      00      11                 22        AFMI012
AFMI012        AA        AA   FF            MM        MM       II      00      00      11                 22        AFMI012
AFMI012        AA        AA   FFFFFFFF      MM        MM       II      00      00      11          2222222          AFMI012
AFMI012        AAAAAAAAAAAA   FFFFFFFF      MM        MM       II      00      00      11        2222222            AFMI012
AFMI012        AAAAAAAAAAAA   FF            MM        MM       II      00      00      11      22                   AFMI012
AFMI012        AA        AA   FF            MM        MM       II      00      00      11    22                     AFMI012
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AFMI012        AA        AA   FF            MM        MM       II      00      00      11  22                       AFMI012
AFMI012        AA        AA   FF            MM        MM       II      00      00      11  22                       AFMI012
AFMI012        AA        AA   FF            MM        MM  IIIIIIIIIIII  00      00  111111111111  2222222222222     AFMI012
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    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y336
IDENTIFICATION    Y336
IDENTIFICATION    Y336
IDENTIFICATION    Y336
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LIGHT LINES ON PAGE [POOR PRINT]

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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6	0
7	0
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9	0
10	0
11	0
12	0
13	0
14	0
15	17
16	91
17	0
18	0
19	1665
20	2469
21	0
22	0
23	16497
24	25607
25	0
26	0
27	56145

28	61305
29	0
30	0
31	47307
32	36345
33	0
34	0
35	9603
36	5151
37	0
38	0
39	435
40	141
41	0
42	0
43	3
44	3
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

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AFMI021  AA        AA  FF            HH HH HH HH      II       00      00             22      11          AFMI021
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AFMI021  AA        AA  FF            HH        HH      II       00      00             22      11          AFMI021
AFMI021  AA        AA  FFFFFFFF      HH        HH      II       00      00      2222222        11          AFMI021
AFMI021  AAAAAAAAAAAA  FFFFFFFF      HH        HH      II       00      00    2222222          11          AFMI021
AFMI021  AAAAAAAAAAAA  FF            HH        HH      II       00      00  22                 11          AFMI021
AFMI021  AA        AA  FF            HH        HH      II       00      00  22                 11          AFMI021
AFMI021  AA        AA  FF            HH        HH      II       00      00  22                 11          AFMI021
AFMI021  AA        AA  FF            HH        HH      II       00      00  22                 11          AFMI021
AFMI021  AA        AA  FF            HH        HH      II       00      00  22                 11          AFMI021
AFMI021  AA        AA  FF            HH        HH  IIIIIIIIIIII  00      00  2222222222222  111111111111  AFMI021
AFMI021  AA        AA  FF            HH        HH  IIIIIIIIIIII   00000000   2222222222222  111111111111  AFMI021

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y337
IDENTIFICATION    Y337
IDENTIFICATION    Y337
IDENTIFICATION    Y337
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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14	0
15	3
16	14
17	0
18	0
19	431
20	1082
21	0
22	0
23	9627
24	16458
25	0
26	0
27	47247

LIGHT LINES ON PAGE | POOR PRINT

28	55196	
29	0	
30	0	
31	55235	
32	47282	
33	0	
34	0	
35	16437	
36	9606	
37	0	
38	0	
39	1089	
40	438	
41	0	
42	0	
43	13	
44	2	
45	0	
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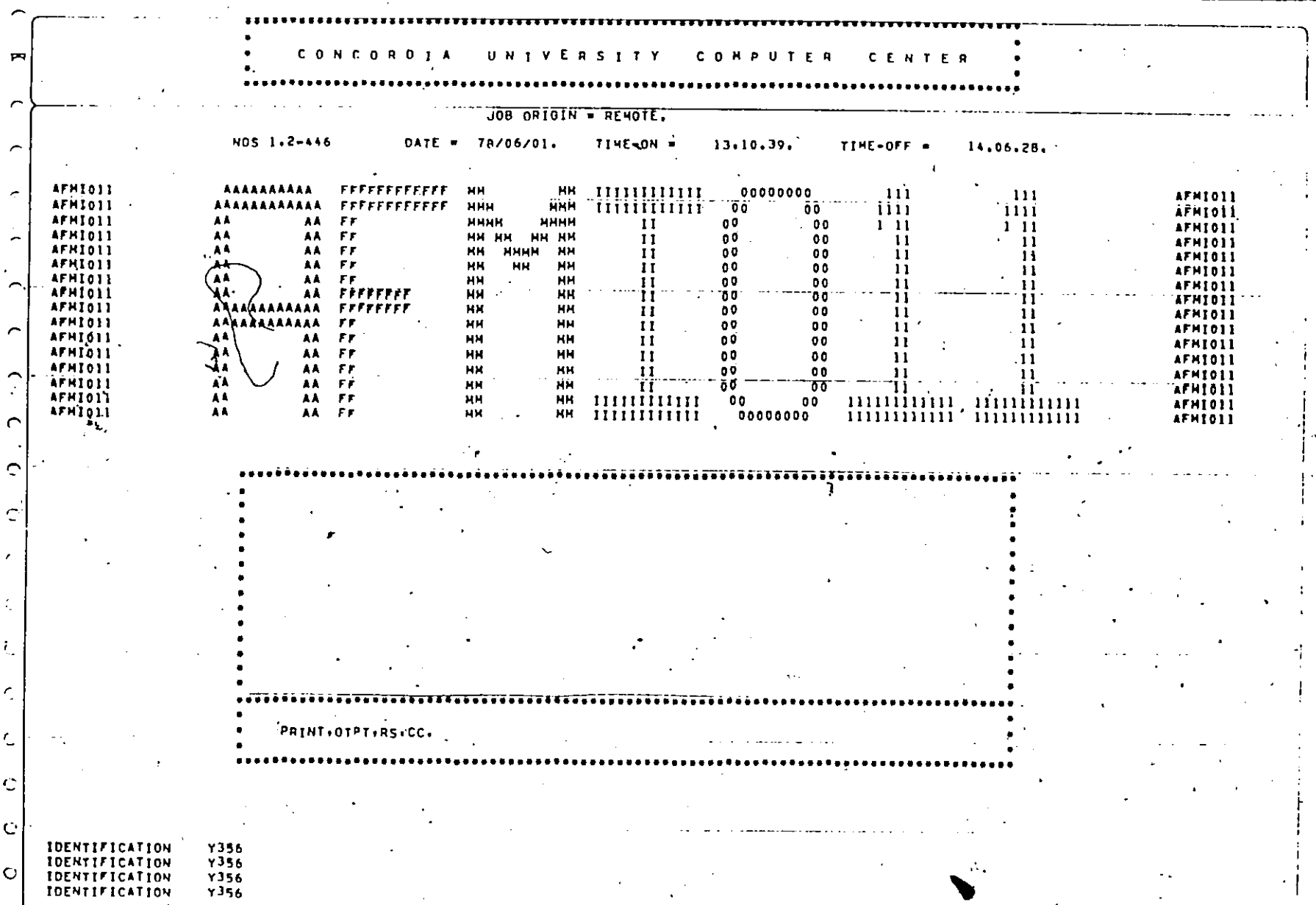
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JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/06/01. TIME-ON = 13.10.39. TIME-OFF = 14.06.28.
AFMI011
PRINT,OTPT,RS,CC.
IDENTIFICATION Y356
IDENTIFICATION Y356
IDENTIFICATION Y356
IDENTIFICATION Y356

LIGHT LINES ON PAGE POOR PRINT

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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3	0
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7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	14
16	84
17	0
18	0
19	1886
20	2448
21	0
22	0
23	16434
24	25670
25	0
26	0
27	56250

LIGHT LINES ON PAGE POOR PRINT

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32	36450	
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34	0	
35	9666	
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38	0	
39	414	
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45	0	
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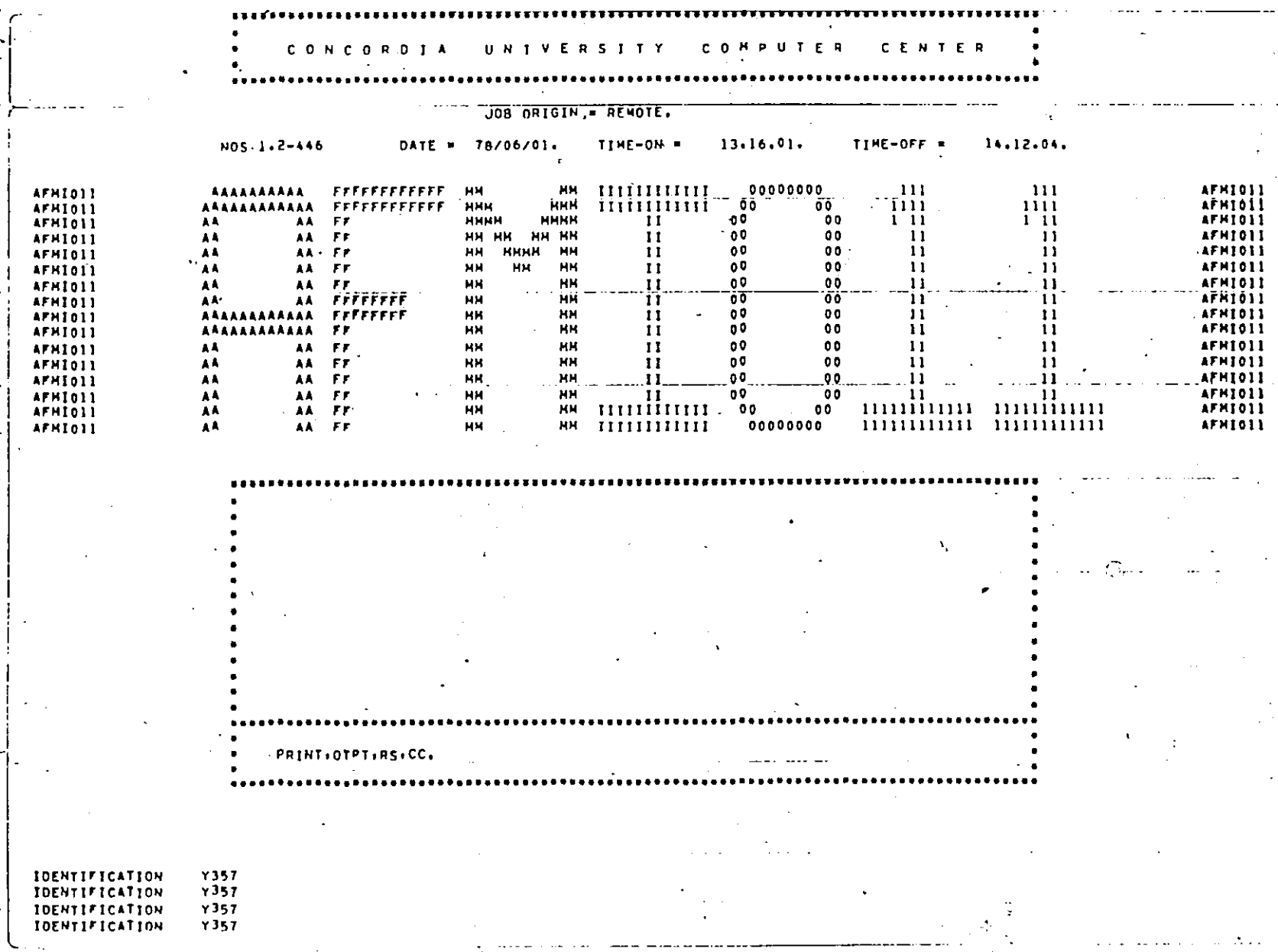
TOTAL =	262144	


CONCORDIA UNIVERSITY COMPUTER CENTER
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NOS 1.2-446 DATE = 78/06/01. TIME-ON = 13.16.01. TIME-OFF = 14.12.04.
AFMI011
PRINT,OTPT,RS,CC.
IDENTIFICATION Y357
IDENTIFICATION Y357
IDENTIFICATION Y357
IDENTIFICATION Y357

LIGHT LINES ON PAGE POOR PRINT

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
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3	0
4	6
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	6
14	0
15	3
16	14
17	0
18	0
19	431
20	1082
21	0
22	6
23	9627
24	16458
25	0
26	0
27	47247

28	56196
29	0
30	0
31	56225
32	47282
33	0
34	0
35	16437
36	9606
37	0
38	0
39	1089
40	438
41	0
42	0
43	13
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45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

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    CONCORDIA  UNIVERSITY  COMPUTER  CENTER

                    JOB ORIGIN = REMOTE.

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AFMI011         AAAAAAAAAAAA  FFFFFFFFFFF  MMM      MMM  IIIIIIIIIII  00      00   1111         1111         AFMI011
AFMI011         AA      AA    FF           MMMM    MMMM      II      00      00  1 11         1 11         AFMI011
AFMI011         AA      AA    FF           MM MM  MM MM      II      00      00    11           11         AFMI011
AFMI011         AA      AA    FF           MM  MMMM  MM      II      00      00    11           11         AFMI011
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AFMI011         AA      AA    FF           MM        MM      II      00      00    11           11         AFMI011
AFMI011         AA      AA    FFFFFFFF     MM        MM      II      00      00    11           11         AFMI011
AFMI011         AAAAAAAAAAAA  FFFFFFFF     MM        MM      II      00      00    11           11         AFMI011
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AFMI011         AA      AA    FF           MM        MM      II      00      00    11           11         AFMI011
AFMI011         AA      AA    FF           MM        MM      II      00      00    11           11         AFMI011
AFMI011         AA      AA    FF           MM        MM  IIIIIIIIIII  00      00  111111111111 111111111111 AFMI011
AFMI011         AA      AA    FF           MM        MM  IIIIIIIIIII   00000000   111111111111 111111111111 AFMI011

    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y365
IDENTIFICATION    Y365
IDENTIFICATION    Y365
IDENTIFICATION    Y365
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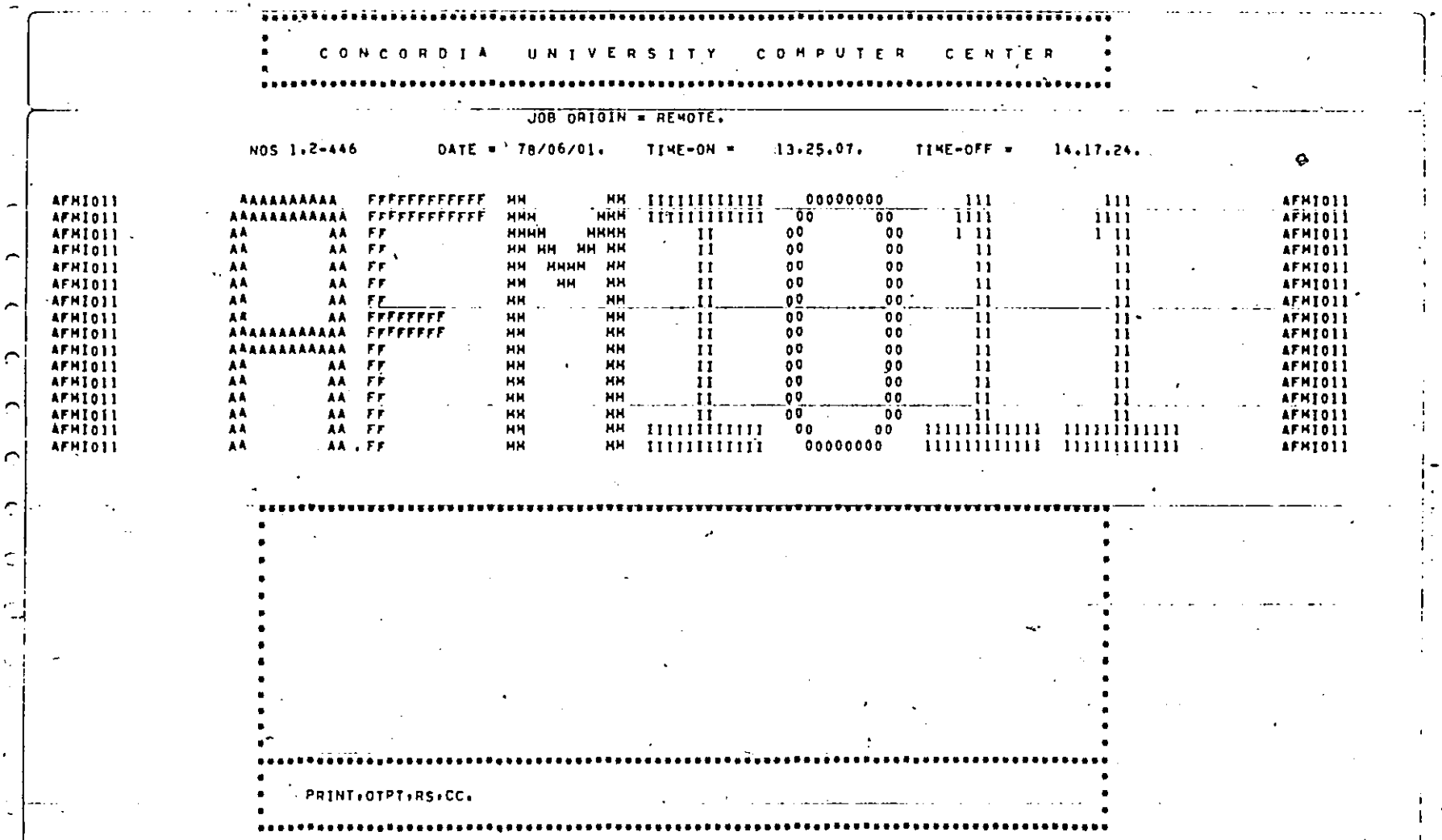
OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	14
16	56
17	0
18	0
19	1686
20	2448
21	0
22	0
23	16434
24	25670
25	0
26	0
27	56250

LIGHT LINES ON PAGE POOR PRINT

28	61200
29	0
30	0
31	47202
32	36450
33	0
34	0
35	9666
36	5088
37	0
38	0
39	414
40	162
41	0
42	0
43	6
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144


CONCORDIA UNIVERSITY COMPUTER CENTER
JOB ORIGIN = REMOTE.
NOS 1.2-446 DATE = 78/06/01. TIME-ON = 13.25.07. TIME-OFF = 14.17.24.
AFMI011
PRINT,OTPT,RS,CC.
IDENTIFICATION Y367
IDENTIFICATION Y367
IDENTIFICATION Y367
IDENTIFICATION Y367

LIGHT LINES ON PAGE POOR PRINT

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	3
16	14
17	0
18	0
19	431
20	1082
21	0
22	0
23	9627
24	16458
25	0
26	0
27	47247

LIGHT LINES ON PAGE POOR PRINT

CONCORDIA UNIVERSITY COMPUTER CENTER

28	56190
29	0
30	0
31	56225
32	47282
33	0
34	0
35	16437
36	9606
37	0
38	0
39	1089
40	438
41	0
42	0
43	13
44	2
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	282144

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                    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                                        JOB ORIGIN = REMOTE.

     NOS 1.2-446        DATE = 78/05/24.    TIME-ON =    15.49.40.     TIME-OFF =    15.49.53.

AFMI021          AAAAAAAAAA   FFFFFFFFFFF  MM        MM  IIIIIIIIIII   00000000     2222222222       111              AFMI021
AFMI021         AAAAAAAAAAAA  FFFFFFFFFFF  MMM      MMM  IIIIIIIIIII  00      00  2222222222222    1111              AFMI021
AFMI021         AA        AA  FF           MMMM    MMMM      II       00      00  2          22     1 11              AFMI021
AFMI021         AA        AA  FF           MM MM  MM MM      II       00      00             22      11              AFMI021
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AFMI021         AA        AA  FF           MM   MM   MM      II       00      00             22      11              AFMI021
AFMI021         AA        AA  FF           MM        MM      II       00      00             22      11              AFMI021
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    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y377
IDENTIFICATION    Y377
IDENTIFICATION    Y377
IDENTIFICATION    Y377
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OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	3
16	3
17	0
18	0
19	139
20	431
21	0
22	0
23	5169
24	9615
25	0
26	0
27	36315

28	47277
29	0
30	0
31	61345
32	56185
33	0
34	0
35	25577
36	16467
37	0
38	0
39	2481
40	1077
41	0
42	0
43	46
44	15
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
TOTAL =	262144

```
    C O N C O R D I A   U N I V E R S I T Y   C O M P U T E R   C E N T E R

                              JOB ORIGIN = REMOTE.

    NOS 1.2-446        DATE =  78/05/24.    TIME-ON =    15.54.45.     TIME-OFF =    15.55.14.

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AFMI021         AA        AA  FF            MMMM  MMMM      II       00      00  2          22    1 11          AFMI021
AFMI021         AA        AA  FF            MM MMMM MM      II       00      00             22      11          AFMI021
AFMI021         AA        AA  FF            MM  MMMM  MM     II       00      00             22      11          AFMI021
AFMI021         AA        AA  FF            MM   MM   MM     II       00      00             22      11          AFMI021
AFMI021         AA        AA  FF            MM        MM     II       00      00             22      11          AFMI021
AFMI021         AA        AA  FFFFFFFF      MM        MM     II       00      00      2222222        11          AFMI021
AFMI021         AAAAAAAAAAAA  FFFFFFFF      MM        MM     II       00      00    2222222          11          AFMI021
AFMI021         AAAAAAAAAAAA  FF            MM        MM     II       00      00   22                11          AFMI021
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AFMI021         AA        AA  FF            MM        MM     II       00      00  22                 11          AFMI021
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AFMI021         AA        AA  FF            MM        MM     II       00      00  22                 11          AFMI021
AFMI021         AA        AA  FF            MM        MM  IIIIIIIIIIII   00      00  222222222222  111111111111  AFMI021
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    PRINT,OTPT,RS,CC.

IDENTIFICATION    Y777
IDENTIFICATION    Y777
IDENTIFICATION    Y777
IDENTIFICATION    Y777
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LIGHT LINES ON PAGE | POOR PRINT

OUTPUT VECTOR ONES DISTRIBUTION

ONES	POPULATION
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	36
20	144
21	0
22	0
23	2556
24	5196
25	0
26	0
27	25400

LIGHT LINES ON PAGE POOR PRINT

CONCORDIA UNIVERSITY COMPUTER CENTER

28	36180	
29	0	
30	0	
31	61560	
32	61560	
33	0	
34	0	
35	36180	
36	25400	
37	0	
38	0	
39	5196	
40	2556	
41	0	
42	0	
43	144	
44	36	
45	0	
46	0	
47	0	
48	0	
49	0	
50	0	
51	0	
52	0	
53	0	
54	0	
TOTAL =	242144	