The Application of Intersection in the Set Theory for Instagram Hashtags

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Abstract— **Technology is developing rapidly with the advent of social media, which paper messages are substitutes for electronic messages that make someone is easier to communicate with others. Many social media exist. The famous ones are Facebook, Instagram, Twitter, and others. With so many social media emerging, every social media must have differences with other social media. Instagram has quite a lot of users, especially in student organizations on campus. The hashtags feature of Instagram makes it is easy to search what to find for people, and group them according to the hashtags used. This paper studies an implementation of intersection operators and applies the intersection operator to classification of Instagram's hashtags.**

Keywords-Set; Slice; Instagram; Organization

I. INTRODUCTION

The organization is a place to accommodate students, which is useful in developing a mind-set in organizing on campus and in social life. The organization aims to develop the talents, interests and potential possessed, where the talents possessed by these students continue developing with the organization [1]. Student Organizations in UIN Sunan Kalijaga Yogyakarta at university level consist of several organizations such as UIN Sunan Kalijaga, UIN Sports UKM Yogyakarta, Karate Inka UKM UIN SUKA, Nusa Fences UIN SUKA Yogyakarta, and Sociology of Religion.

Now, many universities are more focused on student organizations, they are either at the university or faculty level, with the presence of those student organizations, talent, interest and potential possessed by students will be more developed [2]. By utilizing existing technologies such as Instagram, information for students of UIN Sunan Kalijaga Yogyakarta, which relate to student organizations activities to develop students' talents, interests and potential, such as seminars, workshops, and training can be provided [3].

In searching for information, many students use social media such as Instagram by searching for the name of Student Organizations or hashtag used. In this case, research will be conducted on how to classify information with a hashtag that is often used by Sunan Kalijaga Yogyakarta UIN organization [4].

Some previous research has focused on the use of social media by government organizations or public relations work. The first research tended to utilize Twitter social media as a tool of building relationships between organizations and the public. With the introduction of each new technology, research has shown that public relations is slowly adopting new media [5]. The second research shows that public relations practitioners are quick to adopt new media, finding public relations practitioners seen comfortable with emerging tools such as e-mail and arguing that this new technology could be used to create information, receive and disseminate information instantly [6]. The third study of the use of hashtags in social media in online counselling activities to pay tax. This media raises awareness of tax paying; it has a positive influence on attention, interest, search, action, and share [7].

In the case of this study, the intersection operator method will be used by searching for the hashtag Instagram that is often used by Sunan Kalijaga Yogyakarta UIN organization. By using this method, the search will be narrowed down in finding information available at UIN Sunan Kalijaga University in Yogyakarta [8]. Another aim of this research is to implement the intersection operator by using operations in sets. Thus, we do not use intersection operators directly.

II. LITERATURE REVIEW

A. Organizations

An organization is a part of an entity that enables a community to make an accomplishment that cannot be done individually. In the organization there is organizational behaviour that describes behaviour of people in the organization, the relationship between individuals around the organization and those outside the organization [1][2][9].

There are several things to consider in organizational behaviour. It is shown in Table 1.

TABLE I. ORGANIZATIONAL BEHAVIOUR

First	Organizational behaviour is a way of thinking, activity behaviour that exists at the individual group, and organizational level.
Second	Organizational behaviour is a discipline that includes theories, methods and principles from various disciplines.
Third	In Organizations, there is human orientation where there are behaviours, perceptions, feelings, and learning capacities.
Fourth	Organizational behaviour is performance oriented, and organizational goals are to increase productivity and how the organization can achieve shared goals
Fifth	The external environment greatly influences the organization.
Sixth	To reach this organization it is necessary to use scientific method, which are very dependent on the discipline of science

B. Social Media

Social media is an electronic media for socializing with each other and done online that allows a person to interact with one another without being limited by the available space and time. With the development of technology, which is now developing quickly, it brings up various social media applications that make it easier for people to interact with distant families or find new friends.

Every social media has its own characteristics to show their advantages or differences with one another. For example, Instagram. It has a hashtag to facilitate the search for what is sought by the user [4].

C. Intersection of Set Operation

A set is a collection of objects that have conditions, which are specific and clear [10]. A set itself has several set operations namely intersection, union, complement, etc.

A slice set is a new set that is formed from two other sets, namely A and B sets. The new set has elements taken from the intersection of those two sets; it means that the elements are both owned by those two sets [11].
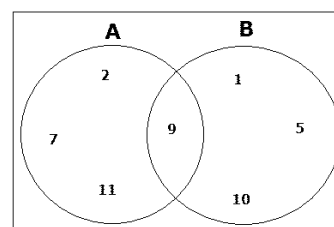

Figure 1. Set intersection

Figure 1 is an example of intersection, which has an equation that is displayed on Equation 1.

$A \cap B$	(1)

Intersection of set A and set B is a set, whose members are elements of set A and set B.

III. RESEARCH METHOD

In this research, we use a research method consisting of a literature study, which used the results of other people's research as a reference, data collection by observing social media from five UIN organizations, and analysed the hashtags that are often used by five organizations in UIN Sunan Kalijaga. All of these stages are implemented to achieve our goal.

A. Literature Study

We will use several references that have been provided by several other researchers. Using some of these references helps us to achieve our goals. It is especially the references related to the general understanding of the intersection set.

B. Data Collection

Data collection is done by finding information from organization social media in UIN, one of which is Instagram. We focus on the usages of hashtags, which is often used to facilitate the search information.

C. Analysis

At this stage, we analyse the usage of intersection operation to find the same hashtag or the hashtag that is often used by UIN organization on Instagram. By knowing the hashtags, we can identify hashtags that are used frequently.

IV. FINDING AND DISCUSSION

There is some data used in this research. These data are gathered after surveys on several organizations' Instagram. We obtained five accounts as presented in Table 2.

TABLE 2. RESEARCH DATA.

Student Organization	Link	Hashtag
UIN Sunan Kalijaga	https://www.instagram.com/p/B2LqZN1gV4u/	#uinsuka, #pmbuinsuka, #s2uinsuka, #infopmb, #uinsk
UKM Olahraga UIN Yogyakarta	https://www.instagram.com/p/B2LDuL-AXy4/	#haornas2019, #uinsuka
UKM Karate Inkai UIN SUKA	https://www.instagram.com/p/BtOSMdTlip0/	#uinsuka, #inkai, #uinsk, #uinjogja, #uin
Pagar Nusa UIN SUKA Yogyakarta	https://www.instagram.com/p/B1vxsRNnuf8/	#pagarnusaindo, #uinsuka, #uinsukalijaga, #pbak2019, #uin
Sosiologi Agama uinsuka	https://www.instagram.com/p/B2JpZ6wncPt/	#sosiologi, #uinsuka, #uinsk, #uin, jogja

Intersection operation looks for the same value of several sets. In this research, the authors use five sets using the name of UIN SUKA Yogyakarta organization, where the value of the set is the hashtag that is often used by students' organizations in UIN.

A. Finding

The application of intersection to the set in this research is implemented by using JavaScript programming language.


```javascript
const hashtagUinSuka = new Array(
  "#uinsuka",
  "#pmbuinsuka",
  "#s2uinsuka",
  "#infopmb",
  "$uinsk"
);
const hashtagUkmOlahraga = new Array("#haornas2019", "#uinsuka");
const hashtagKarate = new Array(
  "#uinsuka",
  "#inkai",
  "#uinsk",
  "#uinjogja",
  "#uin"
);
const hashtagPagarNusa = new Array(
  "#pagarnusaindo",
  "#uinsuka",
  "#uinsukalijaga",
  "#pbak2019",
  "#uin"
);
const hashtagSosiologiAgama = new Array(
  "#sosiologi",
  "#uinsuka",
  "#uinsk",
  "#uin",
  "#jogja"
);
```

Figure 2. Defining sets

Figure 2 shows the definition of a variable containing the hashtag set. After the set variable is created, then the function is made to perform intersection.


```javascript
function intersection(sets) {
  let result = [];

  for (let i = 0; i < sets.length; i++) {
    let currentList = sets[i];
    for (let y = 0; y < currentList.length; y++) {
      let currentValue = currentList[y];
      if (result.indexOf(currentValue) === -1) {
        if (
          sets.filter(function(set) {
            return set.indexOf(currentValue) === -1;
          }).length === 0
        ) {
          result.push(currentValue);
        }
      }
    }
  }
  return result;
}
```

Figure 1. Intersection function

Figure 3 shows the source code of the function for implementing an intersection with parameters in the form of collections in an array. The function has a return value in the form of an element that every set in the parameter has.

```
const result = intersection([hashtagUinSuka, hashtagKarate]);
console.log(result)
```
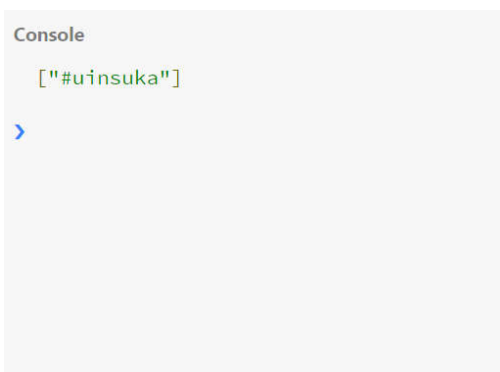
Figure 2. Intersection function calling

Figure 3. Return value of intersection function

Figure 4 shows the source code for calling intersection functions. Figure 5 shows the console that shows the result of the intersection function. Four intersections will be performed to get five results of intersection operations as shown in Table 3.

TABLE 3. INTERSECTION RESULT

H1	H2	H3	H4	H5	Hastag Irisan
UIN Sunan Kalijaga	UKM Olahraga UIN Yogyakarta				#uinsuka
UIN Sunan Kalijaga		UKM Karate Inkai UIN SUKA			#uinsuka
UIN Sunan Kalijaga			Pagar Nusa UIN SUKA Yogyakarta		#uinsuka
UIN Sunan Kalijaga				sosiologi agama uinsuka	#uinsuka
UIN Sunan Kalijaga	UKM Olahraga UIN Yogyakarta	UKM Karate Inkai UIN SUKA	Pagar Nusa UIN SUKA Yogyakarta	sosiologi agama uinsuka	#uinsuka

B. Discussion

Based on the results given in Table 3, the hashtag named #uinsuka is used frequently. The results are obtained from the application of intersection on the hashtag set from Students Organization Social Media. The intersection operation is performed by checking the availability of an element in a set, here we use `indexOf` function. If that element does not exist in the set, we create a new set containing elements that do not exist.

V. CONCLUSION

The application of set theory to the use of hashtags at UIN Students Organization can be implemented in our program. Based on this research, we could implement intersection operators by applying other set operators.

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