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Advanced Searching of Java methods

Swathy Sagar

Student, Christ Knowledge City College, kerala, India

Abstract - *In traditional, Java Methods are searched by using keywords (e.g. sum of two numbers). This method displays so many Java Methods based on the search. But this searching result are not accurate. In order to make accurate searching, we use signature of Java Methods, sample input and sample output. Our technique searches existing Java Methods that have the same signature. Then execute the selected Java Methods based on the sample input. After that, the results of the execution is compared with the sample output. Once the matching found the Java Method is displayed.*

***Key Words*: Java method, Signature**

1. INTRODUCTION

Information searching is a part of learning process. There are three types of searches. They are Known-item search, Factual search, Subject search. Known-item search is an item to be able to identify and locate it. Factual search happens when concrete facts are available. Subject search involves searching for information on a topic that you might not be able to define fully. In contrast to searching, browsing is nontargeted searching. In traditional, Java Methods are searched by using keywords (e.g. sum of two numbers). This method displays so many Java Methods based on the search. But this searching result are not accurate. In order to make accurate searching, we use signature of Java Methods, sample input and sample output. Our technique searches existing Java Methods that have the same signature. Then execute the selected Java Methods based on the sample input. After that, the results of the execution is compared with the sample output. Once the matching found the Java Method is displayed. "Towards Automated Generation of Java Methods: A way of automated Reuse-Based Programming [1]", used to refer the Java method's signature. In Java, a method signature is a part of the method declaration. Method signature consists of method name and a parameter list (number of parameters, type of the parameters and order of the parameters). The reason for the emphasis on just the method name and parameter list is because of the overloading. Method signature does not includes the return type of the method. A class cannot have two methods with same signature. If we try to declare two methods with same signature you will get a compile time error. The return type and exceptions are not considered as part it.

2. METHODOLOGY

Java Method searching is implemented using the Java Development Kit software, Tomcat server and xampp database.

1) The **Java Development Kit (JDK)** is an implementation of either one of the Java Platform, Standard Edition, etc released by Oracle Corporation [11].
2) The **Apache Tomcat software** is an open source implementation of the Java Servlet, JavaServer pages, Java Expression Language and Java WebSocket technologies [9].
3) **XAMPP** is a free and open-source cross-platform web server solution stack package developed by Apache Friends [10].

The Java method searching implemented as a open website. The first step is to search the Java Methods based on its signature.

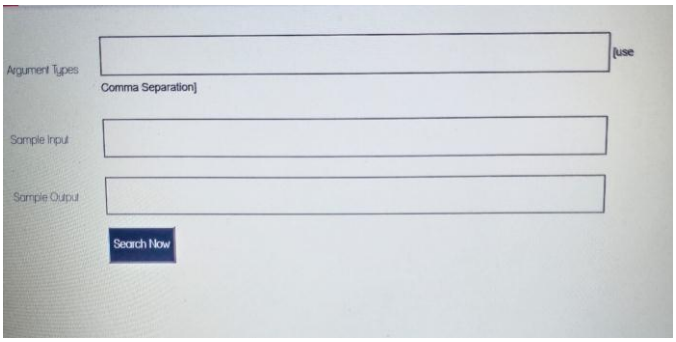

Fig-1: Search form

The search form contains argument types, sample input and sample output. Information can be passed to methods as parameter. Parameters are the variables inside the method. Parameters can be specified after the method name, inside the parentheses. We can add many parameters, just separate them with a comma. When working with multiple parameters, the method call must have the same number of arguments.

For example,

```
public class Names
{
  static void myName(String name)
    {
      System.out.println(name );
```

```
    }
  public static void main(String[] args)
  {
     myName("Anna");
     myName("Anju");
     myName("Usha");
   }
}
```

Whenever any method is called during the execution of the program there are some values passed with the method. These values are called arguments. An argument when passed with a method replaces with those variables which were used during the method definition and the method is then executed with these values. From the above example, name is a parameter, while Anna, Anju and Usha are arguments. In Java, there are two types of data type exist, they are primitive data types and non-primitive data types. The primitive data types include byte, short, int, long, float, double, char and Boolean. The non-primitive data types include String, Arrays and Classes. Argument types such as int, float, String, char etc. For example, if we want code addition of two numbers.

Fill the search form like this,

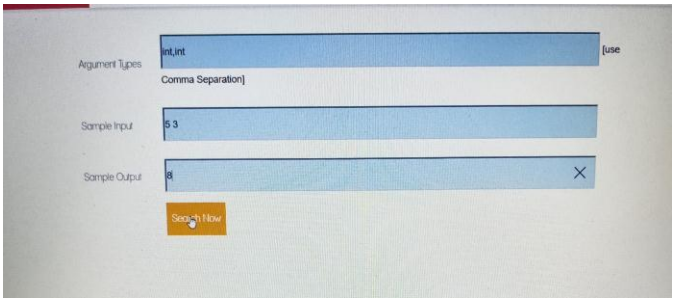

Fig -2: Searching

Based on the argument types Java Methods are selected from the database. Based on the given sample input and sample output execute the selected Java Methods.

Fig-3: Result of searching

After that, the results of the execution is compared with the sample output. Once the matching found the Java Method is displayed.

```
class AddNew{
        public static void main(String[] args){
                int num1 =Integer.parseInt(args[0]);
                int num2 =Integer.parseInt(args[1]);

                int num3 = new AddNew().addtwonumbers(num1, num2);
                System.out.println(num3);
        }
        int addtwonumbers(int num1, int num2){
                int num3 =num1+num2;
                return num3;
        }
}
```

Fig -4: Code for addition

3. COMPARISON

3.1 Traditional Method

Traditional way the Java Methods are searched by using keywords (e.g. sum of two numbers). This method displays so many Java Methods based on the search. Disadvantages of this way are,

1) Searching results are not accurate.
2) Time consuming.
3) It is difficult to get the exact Java Method.

3.2 Proposed Method

For accurate searching, our technique searches existing Java Methods that have the same signatures and based on the sample input execute the Java Methods. After that, the result of execution is compared with the sample output. Advantages of this technology are,

1) Searching results are accurate.
2) No time consuming.
3) It is easy to get the exact Java Method.
4) We can easily download the code.

The future works may include more space for storing Java Method code in the database and implementation of complicated Java Methods.

4. RESULT

The Java Methods searched based on Java Method's signature, sample input, and sample output work successfully. Most of the Java Methods are searched and displayed its code successfully. This methodology helps to search accurate Java Methods very easily.

5. CONCLUSIONS

In this paper, we proposed a technique to searching Java Methods from given argument types, sample input and sample output. As a result, many Java Methods are searched successfully.

Compared to the traditional searching of Java methods it is very easy and no time consuming. People can search exact Java Methods code very easily and they didn't need to search it a long time in various websites.

This paper have some future works.

1) It needs more space for storing the Java Method code in the database.
2) Some of the Java Methods are not worked.
3) Implementation of complicated Java Methods.

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