EXPERIMENT 7

// Introduction to User-Defined Functions or Methods in Java.

Prerequisite Knowledge -

- In Java, the user-defined functions or methods cannot be simply defined outside the main class. They can be defined only inside a user defined class, an interface or as an enum.

- **Syntax:**
  - **Declaring & Defining a Function:**

    return_type function_name **(**list of formal parameters**)**
    {
        body of function

        return outcome**;**
    }

  - **Calling a Function:**

    function_name(list of actual parameters);

    return_type - It is the data type of the final result computed or returned by a function.
    - ➔ The **'void'** return type specifies that although the function will work, it will not return any final result to the calling point.

    return - It is a keyword using which the final result computed by a function is returned or sent to its calling point.
    Parameter - It is the value on which a function works to perform a specific task.
    Formal Parameters - The parameters that are defined when a function is declared, and act as placeholders for the values that will be passed to the function are known as formal parameters.
    Actual Parameters - The parameters passed to a function when it is called are known as actual parameters. These are also called as **arguments**.

- **Ways of Calling a Function -**
    - **Call by Value -** When a function is called by value, a copy of the actual parameters is passed to it. Thus, in this mechanism, the actual parameters and the formal parameters are present at different memory locations.
    - **Call by Reference -** When a function is called by reference, the addresses of actual parameters are passed to the function. Thus, in this mechanism, the actual parameters and formal parameters of a function refer to the same memory locations.

        - Java does not support a direct call by reference mechanism for functions because there are no pointers and reference variables available explicitly in Java. But, this can be implemented for Java functions with the help of class and object manipulations.

PROGRAM 7

Write a program to implement a class which has three data members (two numbers & one for getting result) and four member functions which print the values of these data members, set values of these data members, add them up and subtract them respectively.

Source Code -

```
class FunctionDemo
{
   int num1,num2,res;

   void PrintValue()
   {
      System.out.println("Numbers are : " + num1 + " " + num2);
   }

   void SetValue(int n1, int n2)
   {
      num1 = n1; num2 = n2;
   }

   int Add()
   {
      res = num1+num2;
```

```
        return res;
    }

    int Sub()
    {
        return (num1-num2);
    }
}

class MainClass
{
        public static void main(String args[])
        {
                FunctionDemo fd1 = new FunctionDemo();

                fd1.PrintValue();
                int sum = fd1.Add();
                System.out.println("Sum of numbers = " + sum);

                fd1.SetValue(1,2);
                fd1.PrintValue();
                System.out.println("Difference of the numbers = " + fd1.Sub());
        }
}
```

Output -