LAB 1

Program to find total, average of given two numbers by using function with default arguments, static data members and this keyword

LAB 2

Program to illustrate class and objects

Definitions

- Import – Keyword used when importing a package. When we import a package we can use the classes and methods present in that package as a part of our program.

  Syntax : import package_name

- Scanner class – Used to get user input. It is found in the java.util package. We need to create an object of scanner class to call the input methods

  Syntax : Scanner object_name = new Scanner(System.in)

Where System.in means we are taking input from the standard console

- Class – A class is like a blueprint for an object. It shows us the properties and methods that all objects can have and use. The class keyword is used to define a class.

  Syntax : class class_name { //properties and methods }

By convention, class name usually starts with a capital letter

- Float – It is a primitive datatype. Decimal numbers are called floating point 'float'.

  Syntax : float variable_name_1, ….., variable_name_n;

- Public – If a method or property is defined as public, it can be accessed outside of the class.
- This – It is a keyword used to refer to the current instance of the class. It can also be used to invoke the constructor of the class.
- Static – A static method can be called without the creation of an object.
- Main – Every program must have a main function. This is where the execution of the program begins.

  Syntax : public static void main(String[] args) { //Code }

- New – The new keyword is used to create an object of a class.

Syntax : Class_name object_name = new Class_name(parameters);

Where parameters are used to initialize values of properties by using constructors. Parameters can be 0 or many.

- Println – It is the method used to output information onto the screen. It is a method of the print stream. The print stream is created by calling System.out

Syntax : System.out.println();

Code:

```
/* Program to find
   - Total
   - Average
   of 2 numbers using a function with
   - Default arguments
   - Static data members
   - this keyword */

import java.util.Scanner;

class Total {

    float A, B;

    public Total() {
        this.A = 2;
        this.B = 3;
    }

    public Total(float x, float y) {
        this.A = x;
        this.B = y;
    }

    float total() {
        return A + B;
    }

    float average() {
        return this.total() / 2;
    }

    //Static methods for the same functions
    public static float total(float A, float B) {
        return A + B;
    }

    public static float average(float A, float B) {
        return total(A, B) / 2;
    }
```

```
}

public class Lab1 {
    public static void main(String[] args) {

        try (Scanner sc = new Scanner(System.in)) {
            Total t1 = new Total();

            System.out.println("Using default values : ");
            System.out.println("A = " + t1.A + " and B = " + t1.B);
            System.out.println("Total = " + t1.total());
            System.out.println("Average = " + t1.average());
            System.out.println();

            System.out.println("Enter 2 numbers");
            float A = sc.nextFloat();
            float B = sc.nextFloat();
            System.out.println();

            Total t2 = new Total(A, B);

            System.out.println("Using values taken from user : ");
            System.out.println("A = " + t2.A + " and B = " + t2.B);
            System.out.println("Total = " + t2.total());
            System.out.println("Average = " + t2.average());
            System.out.println();

            System.out.println("Using values taken from user and using static methods :
");
            System.out.println("A = " + A + " and B = " + B);
            System.out.println("Total = " + Total.total(A, B));
            System.out.println("Average = " + Total.average(A, B));
        }
        System.out.println();
    }
}
```

Explaination:

- In this program, we first create an object t1 of class Total using the default constructor. This assigns the values 2 and 3 to A and B respectively. The total method of class Total is called on this object t1, and the result is printed. Then, we call the average method on t1 and print the result.
- We then take 2 values A and B as input from the user. We create a new object t2 using the parameterized constructor which assigns the values of A and B as given by the user. Then we calculate and print total and average similar to t1.
- The use of static method is shown by calling the static methods total and average with A and B as parameters. This is done without the use of objects to show that we can use static methods without having to create any object.

Output:

```
PS D:\NITJ\Sem 4\Java\Lab 1> javac Lab1.java
PS D:\NITJ\Sem 4\Java\Lab 1> java Lab1
Using default values :
A = 2.0 and B = 3.0
Total = 5.0
Average = 2.5

Enter 2 numbers
5.6 3.9

Using values taken from user :
A = 5.6 and B = 3.9
Total = 9.5
Average = 4.75

Using values taken from user and using static methods :
A = 5.6 and B = 3.9
Total = 9.5
Average = 4.75

PS D:\NITJ\Sem 4\Java\Lab 1>
```