**Lab 3 : Classes and Objects**

**Introduction**

The heart of object orientation are two concepts that we have to understand first: Objects and Classes, these form the basis of all programming in object-oriented languages. In this laboratory activity the student will practice how to create a Java class and define its elements such as attributes and methods. Also, it will teach the student on how to instantiate an object of a class using constructors.

**Objectives**

At the end of this practical session the student should be able to:

* Create a Java class and define its elements.
* Create multiple constructors to instantiate objects and to define attribute values.
* Call class methods using an objects.

**Tools/Software Requirements**

* NetBeans IDE 7.2 and above

**Description**

Objects are created from classes. The class describes the kind of object; the object represents individual instantiations of the class. In relation to this concept, your first task in this exercise is to test and run the given program below and answer the questions in **Table 1**. Comments are provided line of code to give a short description about the different parts of the program.

Program Example: WaterCalculator.java Class

This program accepts 2 integer input from the user, then the program will display what type of operation does the user want to perform. The user must select the number of the operation and the program will display the result.

*See Page 2 and 3 for the complete program.*

**Program Example:**

//this import statement is used to

import java.util.\*;

public class BasicCalculator {

double input1;

double input2;

double result = 0;

public BasicCalculator(double n1,double n2){

input1 = n1;

input2 = n2;

}

public double getResult(int op){

if(op==1){

return input1+input2;

}

else if(op==2){

return input1-input2;

}

else if(op==3){

return input1\*input2;

}

else if(op==4){

return input1/input2;

}

else

return 0;

}

public static void main(String[]args){

Scanner console = new Scanner(System.in);

double value1,value2;

int ops;

System.out.print("Enter 1st number: ");

value1 = console.nextDouble();

System.out.print("Enter 2nd number: ");

value2 = console.nextDouble();

System.out.println("Choose what operation is to be performed:\n1.Addtion \n2.Subtraction \n3.Multiplication \n4.Division");

ops = console.nextInt();

BasicCalculator calc1 = new BasicCalculator(value1,value2);

System.out.println("The result is: "+calc1.getResult(ops));

}

}

**TABLE 1: Provide the output for each row with the given input. (1pt each correct answer)**

|  |  |
| --- | --- |
| **What will be the output of the program for the following input:** | **OUTPUT: Paste your answer for each row.** |
| **First input = 10**  **Second input = 5**  **Operation = 1** | **The result is: 15.0** |
| **First input = 100**  **Second input = 50**  **Operation = 2** | **The result is: 50.0** |
| **First input = 20**  **Second input = 10**  **Operation = 3** | **The result is: 200.0** |
| **First input = 1000**  **Second input = 10**  **Operation = 4** | **The result is: 100.0** |

**Lab Tasks**

For your laboratory assignment read and analyze the given problem below and write the Java program to solve the problem.

**POS: Point of Sale**

Point of sale is the place where retail transactions is completed. It is the point at which customer makes a payment to the store in exchange for goods or service. At the point of sale the cashier will calculate the amount purchased by the customer and display it on the screen. To get the total amount to be paid by the customer, the cashier just multiply the number of items purchased by the customer to 60.5 riyals. The cashier can give discount by entering the total discount on the system and deduct the total discount to the customer’s total bill but if no discount is given, the customer will have to pay the full amount. Your task is to, create a Class Java program that will perform the different task above.

**Deliverables**

After your program is already checked by your instructor and provided you with your marks, you should upload the whole project in Edmodo in zip or rar format.

**import java.util.\*;**

**public class Amount {**

**static Scanner input=new Scanner(System.in);**

**double item;**

**double discount;**

**int number;**

**public Amount(int t) {**

**item=t;**

**}**

**public double getTotal() {**

**return item\*60.5;**

**}**

**public double getTotal(int op) {**

**if (op==1)**

**{**

**System.out.println("Enter number of discount: ");**

**discount=input.nextInt();**

**return item\*(60.5)-discount;**

**}**

**else if (op==2)**

**{**

**return item\*60.5;**

**}**

**return 0;**

**}**

**public static void main(String[] args) {**

**int result;**

**int ops;**

**System.out.print("Enter number of items: ");**

**result=input.nextInt();**

**Amount comp1=new Amount(result);**

**System.out.println("total amount is "+comp1.getTotal());**

**System.out.println("Is there is a discount: \n1.yes\n2.no");**

**ops=input.nextInt();**

**System.out.println("Total to be paid is: "+comp1.getTotal(ops));**

**}**

**}**