## Course Code : CSE2008  Course Title : Programming in java

## Lab sheet 1

## Programs for Module 1

1. In an Examination hall students of second and third year sit in odd and even number positions consecutively. The teacher asks one of the students to find the sum of even and odd positions separately. The total seating capacity of an exam hall is 100. Develop a software application to perform the above operations. (Task01 – L1)

**Solution:**

```
public class Odd_Even
{
public static void main(String args[])
{
int sumeven=0, sumodd=0;
for(int i=1;i<=100;i++)
        {
                if(i%2==0)
                {
                sumeven = sumeven+i;
                }
                else
                {
                sumodd = sumodd+i;
                }
         }
System.out.println("The sum of even positions is "+ sumeven);
System.out.println("The sum of odd positions is "+ sumodd);
}
}
```

**Output**

The sum of even positions is 2550
The sum of odd positions is 2500

2. A Teacher gives a box containing 5 chits to a student and asks him to pick one chit. Each chit contains a arithmetic operation to be performed by the student. The student can pick only one chit at a time. The 5 chits contain basic arithmetic operations like addition, subtraction, multiplication,division and modulus. Demonstrate the same situation using java program. (Task01-L1)

**Solution:**

```
import java.util.Scanner;
```

```
public class ArithmeticDemo {
	public static void main(String[] args) {
		int a,b,c=0;
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the values of a,b");
		a=sc.nextInt();
		b=sc.nextInt();
		System.out.println("1:Addition\n2:Substraction\n3:Multiplication\
n4:Division");
		System.out.println("Enter choice");
		int ch=sc.nextInt();
		switch(ch)
		{
		case 1: c=a+b;
				break;
		case 2: c=a-b;
				break;
		case 3: c=a*b;
				break;
		case 4: if(b!=0)
			{
			c=a/b;
			break;
			}
			else
			{
			System.out.println("Division is not possible");
			break;
			}
		default: System.out.println("Invalid choice");
			break;
		}
		System.out.println("The result is "+c);
	}
	}
```

**Output:**

```
Enter the values of a,b
20 3
1:Addition
2:Substraction
3:Multiplication
4:Division
```

Enter choice
3
The result is 60

3. Swiggy App is celebrating its birthday, so it wants to give 80% discount for those customers who have order number which is prime and others will get 50% discount. Help the application to identify the discounted rate for customers. Write suitable java program. (Task01-L2)

**Solution**

```
import java.util.Scanner;
public class Prime {
public static void main(String[] args) {
        int n, i;
        boolean flag=false;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter order number");
        n = sc.nextInt();
        if(n==1)
                System.out.println("The customer will get 50% discount");
        else
        {
                for(i=2;i<n;i++)
                {
                        if(n%i==0)
                        {
                                System.out.println("The customer will get 50% discount");
                                flag=true;
                                break;
                        }
                }
                if(flag==false)
                        System.out.println("The customer will get 80% discount");
        }
        }
}
```

**Output**

Enter order number
9
The customer will get 50% discount

4. Shyam has coding competition in his school, he has to draw the following pattern. Suggest a solution to Shyam for winning the competition. (Task01 – L2)

```
    *
   ***
  *****
 *******
*********
```

**Solution**

```
import java.util.Scanner;
public class Pattern
{
public static void main(String args[]){
int n, s, i, j;
Scanner scan = new Scanner(System.in);
System.out.println("Enter number of rows: ");
n=scan.nextInt();
for(i = 1; i <= n; i++)
{
//for loop for displaying space
for(s = i; s < n; s++)
{
System.out.print(" ");
}
//for loop to display star equal to row number
for(j = 1; j <= (2 * i - 1); j++)
{
System.out.print("*");
}
// ending line after each row
```

```
System.out.println();
}
}
}
```

**Output**

```
Enter number of rows:
5
        *
       ***
      *****
     *******
    *********
```

5. Define a class called CommandLine, develop a program in Java that accepts two floats and integers as its command line arguments and perform addition, multiplication, subtraction and division and display the result. (Task02 – L1)

**Solution:**

```
class CommandLine{
public static void main(String args[]){
   int a,b;
   float c,d;
   a=Integer.parseInt(args[0]);
   b=Integer.parseInt(args[1]);
   c=Float.parseFloat(args[2]);
   d=Float.parseFloat(args[3]);
   System.out.println("Integer Arithmetic Operations\n");
   System.out.println("Addition is " +(a+b));
   System.out.println("Subtraction is " +(a-b));
   System.out.println("Division is " +(a/b));
   System.out.println("Multiplication is " +(a*b));

   System.out.println("Real Arithmetic Operations\n");
   System.out.println("Addition is " +(c+d));
   System.out.println("Subtraction is " +(c-d));
   System.out.println("Division is " +(c/d));
```

```
   System.out.println("Multiplication is " +(c*d));
}}
```

**Output:**

- javac CommandLine.java
- java CommandLine 10 20 6.5 4.5

  Integer Arithmetic Operations
  Addition: 30
  Subtraction: -10
  Multiplication: 200
  Division: 0

  Real Arithmetic Operations
  Addition: 12
  Subtraction: 2.0
  Multiplication: 29.25
  Division: 1.444

6. A teacher gave a project to student in the classroom to find the area of different shapes. A student has to find the area of different shapes based on the choice of different parameters and display the results. Demonstrate the same using Java Program (Task02 – L1)

**Solution:**

```
public class Students
{
   void area(int x)
   {
      System.out.println("The area of the square is "+Math.pow(x, 2)+" sq units");
   }
   void area(int x, int y)
   {
      System.out.println("The area of the rectangle is "+ (x*y) +" sq units");
   }
   void area(double x)
   {
      double z = 3.14 * x * x;
      System.out.println("The area of the circle is "+z+" sq units");
   }
    public static void main(String args[])
```

```
    {
      Students ob = new Students();
      ob.area(5);
      ob.area(11,12);
      ob.area(2.5);
    }
}
```

**Output:**

```
The area of the square is 25.0 sq units
The area of the rectangle is 132 sq units
The area of the circle is 19.625 sq units
```

7. Create a class named 'Rectangle' with two data members- length and breadth and a method to calculate the area which is 'length*breadth'. The class has three constructors which are (Task02 – L1)

i -having no parameter - values of both length and breadth are assigned zero.
ii - having two numbers as parameters - the two numbers are assigned as length and breadth respectively.
iii - having one number as parameter - both length and breadth are assigned that number. Now, create objects of the 'Rectangle' class having none, one and two parameters and print their areas.

**Solution**

```
import java.util.*;
class Rectangle
{
int length;
int breadth;
void area() // method
{
int area=length*breadth;
System.out.println(area);
}
Rectangle() // constructor with no parameter
{
length=0;
breadth=0;
}
Rectangle(int len)// constructor with one parameter
```

```
{
length=len;
breadth=len;
}
Rectangle(int l,int b) // constructor with two parameters
{
length=l;
breadth=b;
}
Rectangle(Rectangle r) //copy constructor
{
length=r.length;
breadth=r.breadth;
}
public static void main(String args[])
{
int len, br;
Rectangle r1= new Rectangle();
System.out.print("Area of object r1 : ");
r1.area();
Scanner input= new Scanner(System.in);
System.out.println("Enter the length and breadth");
len=input.nextInt();
br=input.nextInt();
Rectangle r2= new Rectangle(len, br);
System.out.print("Area of object r2 : ");
r2.area();
Rectangle r3= new Rectangle(50);
System.out.print("Area of object r3 : ");
r3.area();
Rectangle r4= new Rectangle(r2);
System.out.print("Area of object r4 : ");
r4.area();}}
```

**Output:**

```
Area of object r1 : 0
Enter the length and breadth
2 3
Area of object r2 : 6
Area of object r3 : 2500
Area of object r4 : 6
```

8. AVR apartments uses a common water tank to supply water for every block. The D block uses 20 litres of water and E block uses 40 litres of water every time. Each time the water level of the tank reduces based on the usage of each block The maintenance person fills the tank thrice with 50litres each time. Display the current water level in the tank.

**Solution**:

```
import java.util.Scanner;
class Dblock
{
   int u;
   Dblock(int usage) //parameterized constructor
   {
      u = usage;
   }
}
class Eblock //parameterized constructor
{
   int u;
   Eblock(int usage)
   {
      u=usage;
   }
}
public class Labexercise3
{
   public static void main(String args[])
   {
   Scanner s = new Scanner(System.in);
   int maxlevel;
   int currentlevel=0;
   System.out.println("Enter maximum level of tank");
   maxlevel = s.nextInt();
   int choice;
   currentlevel=maxlevel;
   while(currentlevel>= 150)
   {
   System.out.println("Which block used water 1. D Block 2. E Block");
   choice=s.nextInt();
   switch(choice)
   {
      case 1:
         Dblock obj1 = new Dblock(20);
         currentlevel = currentlevel-obj1.u;
```

```
            break;
        case 2:
            Eblock obj2 = new Eblock(40);
            currentlevel= currentlevel-obj2.u;
            break;
        default:
            System.out.println("Invalid choice");

    }
    System.out.println("Currentlevel water level is "+ currentlevel);
    if(currentlevel<=150)
        System.out.println("Call Facility Manager to fill water tank");
    else
        System.out.println("Don't Call Facility Manager to fill water tank");
    }
}
}
```

**Output**

```
Enter maximum level of tank
200
Which block used water 1. D Block 2. E Block
2
Currentlevel water level is 160
Don't Call Facility Manager to fill water tank
Which block used water 1. D Block 2. E Block
1
Currentlevel water level is 140
Call Facility Manager to fill water tank
```

9. The company XYZ has decided to give some bonus only for employees which belong to IT department. Hence design an application where you can set same bonus amount and department for some employee objects . Depending upon the employee's salary calculate the final salary with bonus. Display company information and employee information separately. Demonstrate the same using java program.

**Solution**

```
import java.util.*;
public class Employee {
    double fixedsal;
    double finalsalary;
    int eid;
```

```
    static String company_name,dept_name;
    static double bonus;
    static
    {
    company_name = "XYZ";
    dept_name="IT";
    bonus=10.0;
    }
    void calculatesalary()
    {
       Scanner s = new Scanner(System.in);
       System.out.println("Enter your fixed salary");
       fixedsal = s.nextDouble();
       System.out.println("Enter your Id");
       eid= s.nextInt();
       finalsalary = fixedsal + (bonus/100)*fixedsal;
    }
    static void displaycompanydata()
    {
    System.out.println("Company Name : " + company_name);
    System.out.println("Department Name : " + dept_name);
    System.out.println("Bonus : " + bonus + "%");
    }
    void displayemployeedata()
    {
       System.out.println("Id is : "+eid);
       System.out.println("Final Salary with Bonus : " + finalsalary);

    }
    public static void main(String args[]) {
    displaycompanydata();
    Employee e1 = new Employee();
    Employee e2 = new Employee();
    e1.calculatesalary();
    e1.displayemployeedata();
    e2.calculatesalary();
    e2.displayemployeedata();

    }
}
```

**Output**

```
Company Name : XYZ
Department Name : IT
Bonus : 10.0%
Enter your fixed salary
40000
Enter your Id
111
Id is : 111
Final Salary with Bonus : 44000.0
Enter your fixed salary
60000
Enter your Id
222
Id is : 222
Final Salary with Bonus : 66000.0
```

10. The edubuddy is online learning platform and students can enroll in online courses only when they have access-key for the course. Design a java application which checks if the access-key entered by the student is valid or invalid and display suitable message. Demonstrate the scenario for two student objects.

**Solution**

```
import java.util.Scanner;
class Students {
   public int id, key;
   private int accesskey = 1310;
   public void checkaccess(int key)
   {
      if(key == accesskey)
      {
         System.out.println("You are provided the access for this course");
         System.out.println("Duration of access : 3 months");
      }
      else
      {
        System.out.println("Access Key is wrong ");
        System.out.println("You are not provided the access for this course");
      }
   }

}
public class Access
   {
```

```
    public static void main(String args[]) {
    Students s1 = new Students();
    Students s2 = new Students();
    Scanner s = new Scanner(System.in);
    System.out.println("Enter your id and key");
    s1.id = s.nextInt();
    s1.key = s.nextInt();
    s1.checkaccess(s1.key);
    System.out.println("Enter your id and key");
    s2.id = s.nextInt();
    s2.key = s.nextInt();
    s2.checkaccess(s2.key);
}
}
```

**Output**

```
Enter your id and key
122
1310
You are provided the access for this course
Duration of access : 3 months
Enter your id and key
124
7878
Access Key is wrong
You are not provided the access for this course
```