OBJECT ORIENTED PROGRAMMING WITH JAVA 8– LAB 2

Q1. Write a program to find if a given year is leap year or not.

Program:

```
import java.util.Scanner;
class Year
{
  public static void main(String[] args)
  {
    Scanner SC= new Scanner (System.in);
    System.out.println("Enter the Year");
    int Year= SC.nextInt();
    if((Year%4 == 0 && Year%100 != 0) || (Year%400 ==0))
    {
      System.out.println(Year + " is a Leap Year. " );
    }
    else
     {
       System.out.println(Year + " is not a Leap Year. " );
     }
    }
  }
```

Output:

```
E:\java notes>javac Year.java

E:\java notes>java Year
Enter the Year
1980
1980 is a Leap Year.
```

Q2. Write a program to check whether a given number is prime or not.

Output:

```
E:\java notes>java Numbers
Enter the Number
6
6 is not a Prime No.

E:\java notes>java Numbers
Enter the Number
2
2 is a Prime No.
```

Program:

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

```
class Numbers
{
  public static void main(String[] args)
   {
     Scanner SC= new Scanner(System.in);
     System.out.println("Enter the Number");
     int num=SC.nextInt();
     int i, a=0;
     if (num==0 || num==1)
     {
       System.out.println(num + " Number is not a Prime no. : ");
     }
     else if(num>=2)
     {
            for(i = 1; i<=num; i++)
            {
             if (num % 1 == 0){
             a++;  }
            }
     }
     if (a == 2)
     {
       System.out.println(num+ " is a Prime No.");
     }
     else{
          System.out.println(num+ " is not a Prime No.");
       }
      }
}
```

Q3. Write a program to find the factorial of a number.

Program:

```
import java.util.Scanner;
 class Factorial
 {
   public static void main(String[] args)
   {
      Scanner SC = new Scanner(System.in);
      System.out.println("Enter a No. :");
      int num = SC.nextInt();               // read number entered by user
      long factorial = 1;                  // to calculate factorial of the number
       for(int i = 1; i<= num ; i++){
          factorial *= i ;}
      System.out.println("Factorial of the " + num + " is " + factorial);
  }}
```

Output:

```
E:\java notes>java Factorial
Enter a No. :
5
Factorial of the 5 is 120
```

Q4. Write a program to calculate the grade of a student based on the marks entered by user in
each subject. No: of subjects is entered by the user. Program prints the grade based on the following logic.
If the average of marks is >= 80 then prints Grade 'A'
If the average is <80 and >=60 then prints Grade 'B'
If the average is <60 and >=40 then prints Grade 'C'
else prints Grade 'D'

program:

```
import java.util.Scanner;
 class CalculateGrade
 {
   public static void main (String args[])
   {
    Scanner SC = new Scanner (System.in);
    System.out.println("Enter the number of subjects");
    int subjects = SC.nextInt();
    int TotalMarks = 0 ;              //enter marks for each subject and calculate totalmarks.
    for (int i = 1; i <= subjects ; i++) {
        System.out.println("Enter marks for subjects : " + i  );
        int marks= SC.nextInt();
        TotalMarks += marks;
        }
    float avg=(float) TotalMarks/subjects;
    char grade ;                    // grades calculation based on marks.
    if (avg >= 80 ) {
        grade = 'A';
       }
       else if (avg >= 60) {
        grade = 'B';
       }
       else if (avg >= 40) {
        grade = 'C' ;
       }
        else {
         grade = 'd'  ;  }
    System.out.println("Average Marks : " + avg);
    System.out.println("Grade : " + grade);
   }
}
```

Output :

```
E:\java notes>java CalculateGrade
Enter the number of subjects
4
Enter marks for subjects : 1
70
Enter marks for subjects : 2
80
Enter marks for subjects : 3
90
Enter marks for subjects : 4
95
Average Marks : 83.75
Grade : A
```

Q5. Write a program to convert a binary number to a decimal number.

Program :

```
import java.util.Scanner;
class BinarytoDecimal
{
  public static void main(String args[])
  {
    Scanner SC = new Scanner(System.in);
    System.out.println("Enter a binary number : ");
    int n = SC.nextInt();
    int decimal= 0, p=0;
    while ( n != 0 )
    {
      decimal+= ((n % 10) * Math.pow(2, p));
      n = n/10;
      p++ ;
    }
    System.out.println("decimal : " + decimal);
  }
}
```

Output :

```
E:\java notes>java BinarytoDecimal
Enter a binary number :
1111
decimal : 15

E:\java notes>java BinarytoDecimal
Enter a binary number :
0111
decimal : 7
```

Q6. Write a program to demonstrate switch case for displaying the corresponding day for each
number. (eg: case 0, display the day as Sunday)

program :

```
import java.util.Scanner;
class Days
{
  public static void main (String args [])
  {
    Scanner SC = new Scanner(System.in);
    System.out.println("Enter the number : ");
    int DayNumber = SC.nextInt();
    String day;
    switch (DayNumber){
        case 0:
```

```
                day = "Sunday";
                break;
            case 1:
                day = "Monday";
                break;
            case 2:
                day = "Tuesday";
                break;
            case 3:
                day = "Wednesday";
                break;
                 case 4:
                day = "Thursday";
                break;
            case 5:
                day = "Friday";
                break;
            case 6:
                day = "Saturday";
                break;
            default:
                day = "Enter a valid day number";
        }
         System.out.println("Day is : " + day);

    }
}
```

Output:

```
E:\java notes>java Days
Enter the number :
5
Day is : Friday

E:\java notes>java Days
Enter the number :
6
Day is : Saturday
```

Q7. Write a program to print the multiplication table of a given number.

Program :

```
import java.util.Scanner;
class MulTable
{
  public static void main(String args[])
  {
        Scanner SC = new Scanner(System.in);
        System.out.println("Enter the number :");
        int num = SC.nextInt();
        System.out.println("Multiplication Table for : " + num);
        for (int i = 1; i<=10 ; i++)
        {
          int result = num * i;
```

```
            System.out.println(num + "*" + i + "=" + result);
          }
    }
}
```

Output:

```
Multiplication Table for : 9
9*1=9
9*2=18
9*3=27
9*4=36
9*5=45
9*6=54
9*7=63
9*8=72
9*9=81
9*10=90
```

Q8. Write a program to generate the first n Fibonacci numbers.

Program :

```
import java.util.Scanner;
class FiboNum
{
 public static void main(String args[])
  {
        Scanner SC = new Scanner(System.in);
        System.out.println("Enter the number : ");
        int num = SC.nextInt();
        int first = 0;
        int second = 1;
        System.out.println(" The first " + num + "fibonacci numbers are : ");
        for (int i=1; i <= num; i++){
           System.out.println(first + " ");
           int next = first + second;
           first = second;
           second = next;            }}}
```

Output :

```
E:\java notes>java FiboNum
Enter the number :
6
 The first 6fibonacci numbers are :
0
1
1
2
3
5
```

Q9. Write a program to print the following Right Triangle Star Pattern where number of rows
is given as input.

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

Program:

```
import java.util.Scanner;
class RtTriangleStar
{
  public static void main(String args[])
   {
     Scanner SC = new Scanner(System.in);
     System.out.print("Enter the number of rows :");
     int nrows = SC.nextInt();
     int i, j;
      for ( i = 1; i <= nrows ; i++){
            for ( j = 1; j <= i ; ++j){
                System.out.print("*");
           }
          System.out.println();
    }
}
}
```

Output:

```
E:\java notes>java RtTriangleStar
Enter the number of rows :5
*
**
***
****
*****
```

Q10. A cloth shop offers a discount of 10% for purchases made up to Rs.1000, 12% for
purchases between 1000 and 1500 and 15% for purchases more than 1500. Write a program to implement the above scheme for a given sales amount and print out the sales
value, discount and net amount payable by the customer.

Program:

```
import java.util.Scanner;
 class Discount
 {
   public static void main(String args[])
   {
     Scanner SC = new Scanner(System.in);
     System.out.print("Enter the sales amount :");
     double salesamount = SC.nextFloat();
     double discount = 0.0;          //calculate discount and net amount payable
      if (salesamount <= 1000) {
        discount = salesamount*0.10;
     }
     else if(salesamount > 1000 && salesamount <= 1500){
```

```
        discount = salesamount*0.12;
    }
    else {
         discount = salesamount*0.15;
    }
    double netamount = salesamount - discount ;
    System.out.println("Sales Amount : Rs. " + salesamount);
    System.out.println("Discount : Rs. " + discount);
    System.out.println("Net Amount Payable : Rs. " + netamount);
    }
}
```

Output:

```
E:\java notes>javac Discount.java

E:\java notes>java Discount
Enter the sales amount :1600
Sales Amount : Rs. 1600.0
Discount : Rs. 240.0
Net Amount Payable : Rs. 1360.0

E:\java notes>java Discount
Enter the sales amount :6000
Sales Amount : Rs. 6000.0
Discount : Rs. 900.0
Net Amount Payable : Rs. 5100.0
```