Object Oriented Programming Lab

(CS 32203)

Assignment - 2

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1. **You are required to maintain your own record that includes your name, father's name, date of birth, age (computed with respect to the current date). The age includes years, months and days. You are required to show your record on the display screen such as: for displaying your name, it should display like "Name of the student:" followed by its value. Display of each entity should starts with new line. Use scanner class for getting the input from keyboard.**

PROGRAM:

```
import java.time.LocalDate;
import java.time.Period;
import java.util.Scanner;

public class StudentInfo {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter student name : ");
        String name = sc.nextLine();

        System.out.println("Enter student father's name : ");
        String fatherName = sc.nextLine();

        System.out.println("Enter DOB (YYYY-MM-DD) format : ");
        String dateOfBirth = sc.nextLine();

        LocalDate dob = LocalDate.parse(dateOfBirth);
        LocalDate today = LocalDate.now();
        Period age = Period.between(dob,today);

        System.out.println("Name of the student : "+name);
        System.out.println("Father's name : "+fatherName);
```

```
            System.out.println("Age : "+age.getYears() + " Years
    "+age.getMonths()+ " Months "+age.getDays()+ " Days");
        }
    }
```

OUTPUT:

```
sandeep@sandeeps-Air Programs % javac StudentInfo.java
sandeep@sandeeps-Air Programs % java StudentInfo.java
Enter student name :
Sandeep Kumar singh
Enter student father's name :
Shashikant Singh
Enter DOB (YYYY-MM-DD) format :
1997-07-15
Name of the student : Sandeep Kumar singh
Father's name : Shashikant Singh
Age : 24 Years 7 Months 15 Days
sandeep@sandeeps-Air Programs %
```

2. You are required to repeat the problem 1 with constraint that, use buffer class(bufferedReader) in place of Scanner class for taking the input from keyboard.

PROGRAM:

```
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.time.LocalDate;
import java.time.Period;

public class Student {
    public static void main(String[] args) {
        InputStreamReader inputStreamReader= new
InputStreamReader(System.in);
        BufferedReader inn = new BufferedReader(inputStreamReader);

        String name=null;
        String fatherName=null;
        String dateOfBirth=null;
        try
        {
            System.out.println("Enter student name : ");
```

```
                name = inn.readLine();

                System.out.println("Enter student father's name : ");
                fatherName = inn.readLine();

                System.out.println("Enter DOB (YYYY-MM-DD) format : ");
                dateOfBirth = inn.readLine();
            }catch (IOException e)
            {}

            LocalDate dob = LocalDate.parse(dateOfBirth);
            LocalDate today = LocalDate.now();
            Period age = Period.between(dob,today);

            System.out.println("Name of the student : "+name);
            System.out.println("Father's name : "+fatherName);
            System.out.println("Age : "+age.getYears() + " Years
    "+age.getMonths()+ " Months "+age.getDays()+ " Days");
        }
}
```

OUTPUT:

```
sandeep@sandeeps-Air Programs % javac Student.java
sandeep@sandeeps-Air Programs % java Student.java
Enter student name :
Sandeep Kumar Singh
Enter student father's name :
Shashikant Singh
Enter DOB (YYYY-MM-DD) format :
1997-07-15
Name of the student : Sandeep Kumar Singh
Father's name : Shashikant Singh
Age : 24 Years 7 Months 15 Days
sandeep@sandeeps-Air Programs %
```

3. You are required to compute perimeter of a rectangle where length and breadth are taken as float and double respectively from the keyboard. Consider length and breadth as integer while computing its perimeter and computed perimeters displayed as double.

PROGRAM:

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

```
public class Rectangle {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter length of rectangle in float: ");
        float length = sc.nextFloat();

        System.out.println("Enter breath of rectangle in double:
");
        Double breath = sc.nextDouble();

        Double perimeter = 2*(Math.ceil(length)+Math.ceil(breath));

        System.out.println("Perimeter is : "+perimeter);
    }
}
```

OUTPUT:

```
sandeep@sandeeps-Air Programs % javac Rectangle.java
sandeep@sandeeps-Air Programs % java Rectangle.java
Enter length of rectangle in float:
12.6
Enter breath of rectangle in double:
123.84
Perimeter is : 274.0
sandeep@sandeeps-Air Programs %
```

4. five integer numbers from the keyboard and check whether these numbers are prime.

PROGRAM:

```
import java.util.Scanner;

public class Prime {
    public static boolean isPrime(int n){
        boolean flag = true;
        for (int i=2; i<=Math.sqrt(n); i++){
            if (n%i == 0){
                flag = false;
                break;
            }
        }
```

```
        return flag;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter five numbers: ");
        int a = sc.nextInt();
        int b = sc.nextInt();
        int c = sc.nextInt();
        int d = sc.nextInt();
        int e = sc.nextInt();

        if (isPrime(a))
            System.out.println(a+" is prime");
        else
            System.out.println(a+ " is not prime");

        if (isPrime(b))
            System.out.println(b+" is prime");
        else
            System.out.println(b+ " is not prime");

        if (isPrime(c))
            System.out.println(c+" is prime");
        else
            System.out.println(c+ " is not prime");

        if (isPrime(d))
            System.out.println(d+" is prime");
        else
            System.out.println(d+ " is not prime");

        if (isPrime(e))
            System.out.println(e+" is prime");
        else
            System.out.println(e+ " is not prime");
    }
}
```

OUTPUT:

```
sandeep@sandeeps-Air Programs % javac Prime.java
sandeep@sandeeps-Air Programs % java Prime.java
Enter five numbers:
12 11 43 55 29
12 is not prime
11 is prime
43 is prime
55 is not prime
29 is prime
sandeep@sandeeps-Air Programs %
```

5. Repeat problem 4 for computing greatest common divisor (GCD) and least common multiple (LCM) for five integers entered from keyboard. (You should not use the concept of array).

PROGRAM:

```
import java.util.Scanner;
public class GcdAndLcm {
    public static int gcd(int a,int b){
        if (b==0)
            return a;
        return gcd(b,a%b);
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter four numbers: ");
        int a = sc.nextInt();
        int b = sc.nextInt();
        int c = sc.nextInt();
        int d = sc.nextInt();
        int gcd = gcd(a,b);
        gcd = gcd(gcd,c);
        gcd = gcd(gcd,d);

        int lcm = (a*b)/gcd(a,b);
        lcm = (lcm*c)/gcd(c,lcm);
        lcm = (lcm*d)/gcd(d,lcm);
        System.out.println("GCD of ("+a+","+b+","+c+","+d+") is :
"+gcd);
        System.out.println("LCM of ("+a+","+b+","+c+","+d+") is :
"+lcm);
```

```
        }
    }
```

OUTPUT:

```
sandeep@sandeeps-Air Programs % javac GcdAndLcm.java
sandeep@sandeeps-Air Programs % java GcdAndLcm.java
Enter four numbers:
12 65 34 54
GCD of (12,65,34,54) is : 1
LCM of (12,65,34,54) is : 119340
sandeep@sandeeps-Air Programs %
```

6. **You are required to convert your marks evaluated out of 100 to the corresponding grades, as used in MNNIT Allahabad, with the use of if-else control statement only.**

PROGRAM:

```
import java.util.Scanner;

public class Grade {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter marks (0-100) : ");
        float marks = sc.nextFloat();
        String grade = " ";
        if (marks>=85){
            grade = "A+";
        }else if (marks>=75){
            grade = "A";
        }else if (marks>=60){
            grade = "B+";
        }else if (marks>=45){
            grade = "B";
        }else if (marks>=33){
            grade = "C";
        }else {
            grade = "F";
        }

        System.out.println("Your marks is : "+marks+ " and
grade is : "+grade);
    }
}
```

OUTPUT:

```
[sandeep@sandeeps-Air Programs % javac Grade.java
[sandeep@sandeeps-Air Programs % java Grade.java
Enter marks (0-100) :
76
Your marks is : 76.0 and grade is : A
sandeep@sandeeps-Air Programs %
```

```
[sandeep@sandeeps-Air Programs % javac Grade.java
[sandeep@sandeeps-Air Programs % java Grade.java
Enter marks (0-100) :
97
Your marks is : 97.0 and grade is : A+
sandeep@sandeeps-Air Programs %
```

7. Repeat the problem 6 with the use of switch control statement.

PROGRAM:

```
import java.util.Scanner;

public class GradeSwitch {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter marks (0-100) : ");
        float marks = sc.nextFloat();
        String grade = " ";
        switch ((int)marks/10){
            case 10:
            case 9:
                grade = "A+";
                break;
            case 8:
                grade = "A";
                break;
            case 7:
                grade = "B+";
                break;
            case 6:
                grade = "B";
                break;
            case 5:
            case 4:
                grade = "C";
                break;
```

```
                    case 3:
                        grade = "D";
                        break;
                    default:
                        grade = "F";
                }

                System.out.println("Your marks is : "+marks+ " and
        grade is : "+grade);
            }
        }
```

OUTPUT:

```
[sandeep@sandeeps-Air Programs % javac Grade.java
[sandeep@sandeeps-Air Programs % java Grade.java
Enter marks (0-100) :
97
Your marks is : 97.0 and grade is : A+
sandeep@sandeeps-Air Programs %
```

```
[sandeep@sandeeps-Air Programs % javac Grade.java
[sandeep@sandeeps-Air Programs % java Grade.java
Enter marks (0-100) :
76
Your marks is : 76.0 and grade is : A
sandeep@sandeeps-Air Programs %
```

8. There are two monkeys whose states are one of two available (smiling and not smiling). The monkeys will be dangerous in either both are smiling or not. Compute the dangerous status of monkeys.

PROGRAM:

```
import java.util.Scanner;

public class MonkeySmile {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter monkey first is smile (y/n): ");
        char monkeyFirst = sc.next().charAt(0);
        System.out.println("Enter monkey second is smile (y/n): ");
        char monkeySecond = sc.next().charAt(0);
```

```
            if (monkeyFirst==monkeySecond)
                System.out.println("dangerous status of monkeys.");
            else
                System.out.println("good status of monkeys.");

        }
    }
```

OUTPUT:

```
sandeep@sandeeps-Air Programs % javac MonkeySmile.java
sandeep@sandeeps-Air Programs % java MonkeySmile.java
Enter monkey first is smile (y/n):
y
Enter monkey second is smile (y/n):
n
good status of monkeys.
sandeep@sandeeps-Air Programs %
```

```
sandeep@sandeeps-Air Programs % javac MonkeySmile.java
sandeep@sandeeps-Air Programs % java MonkeySmile.java
Enter monkey first is smile (y/n):
n
Enter monkey second is smile (y/n):
n
dangerous status of monkeys.
sandeep@sandeeps-Air Programs %
```