# OOP Lab
# Week 5 Assignment Submission

**Swamiraju Satya Praveen Varma**
**200905044**
**Batch B1**
**10**

1. **Design an interface called Series with the following methods**
    1.
        1. **getNext (returns the next number in the series)**
        2. **reset(to restart the series)**
        3. **setStart (to set the value from which the series should start)**

**Design two classes named ByTwos and ByFives to implement the methods of the interface Series such that it generates a series of numbers, each two/five greater than the previous one. Also design a class which will include the main method for referencing the interface.**

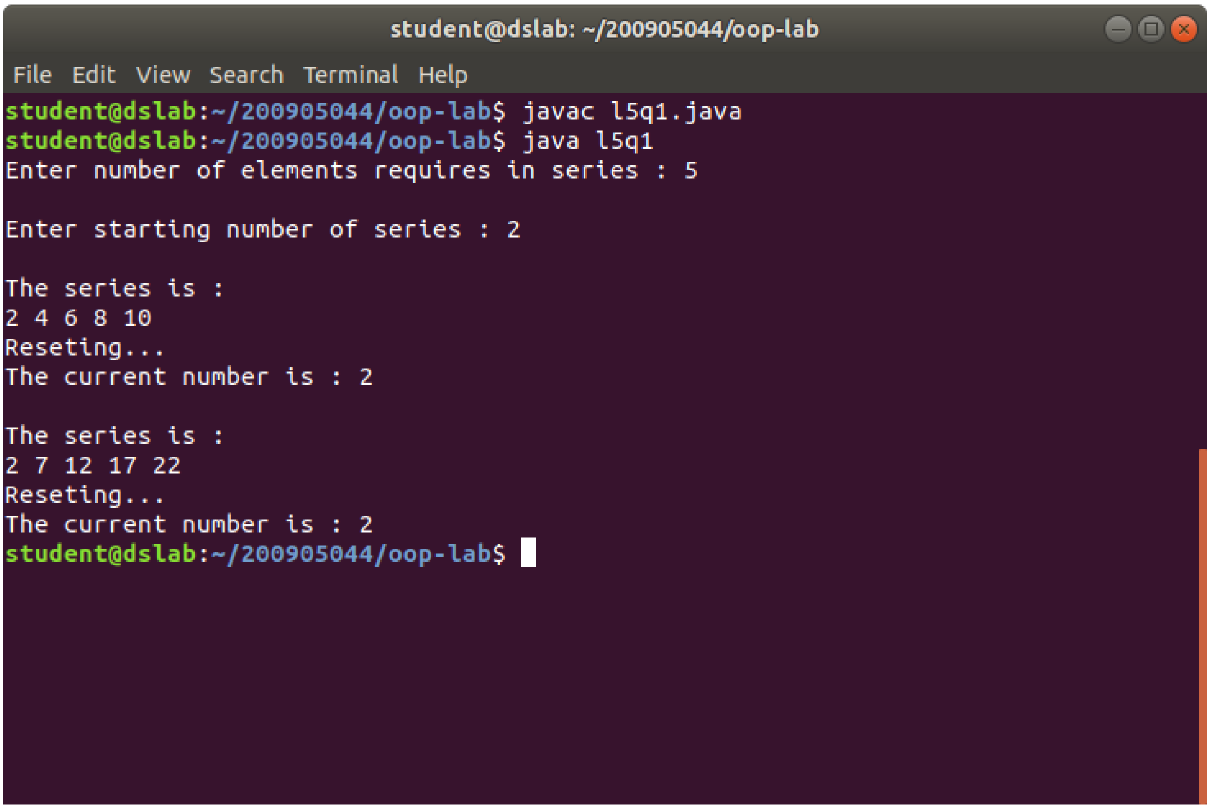
## Solution:-

```
import java.util.*;

interface Series{

public int getNext();

public void reset();

public void setStart(int a);

}

class ByTwos implements Series{

int val;

int start;

ByTwos(){
```

```
val = 0;

start = 0;

}

public int getNext() {

val+=2;

return val;

}

public void reset(){

val = start;

}

public void setStart(int a){

start = a;

val = a;

}

}
class ByFives implements Series{

int val;

int start;

ByFives(){

val = 0;

start = 0;

}
```

```
public int getNext() {
val+=5;
return val;
}
public void reset(){
val = start;
}
public void setStart(int a){
start = a;
val = a;
}
}
class l5q1{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
ByTwos s = new ByTwos();
Series var = s;
ByFives ss = new ByFives();
Series variable = ss;
System.out.print("Enter number of elements requires in series :
"); int n = sc.nextInt();
System.out.print("\nEnter starting number of series : ");

int a = sc.nextInt();

var.setStart(a);

System.out.print("\nThe series is : \n" + a);

for(int i=0;i<n-1;i++){

System.out.print(" " + var.getNext());

}

System.out.println("\nReseting...");

var.reset();

System.out.println("The current number is : " +a);

variable.setStart(a);

System.out.print("\nThe series is : \n" + a);

for(int i=0;i<n-1;i++){

System.out.print(" " + variable.getNext());

}

System.out.println("\nReseting...");

variable.reset();

System.out.println("The current number is : " +a);

}

}
```

## Sample Input/Output:


student@dslab: ~/200905044/oop-lab
File Edit View Search Terminal Help

```
student@dslab:~/200905044/oop-lab$ javac l5q1.java
student@dslab:~/200905044/oop-lab$ java l5q1
Enter number of elements requires in series : 5

Enter starting number of series : 2

The series is :
2 4 6 8 10
Reseting...
The current number is : 2

The series is :
2 7 12 17 22
Reseting...
The current number is : 2
student@dslab:~/200905044/oop-lab$ 
```

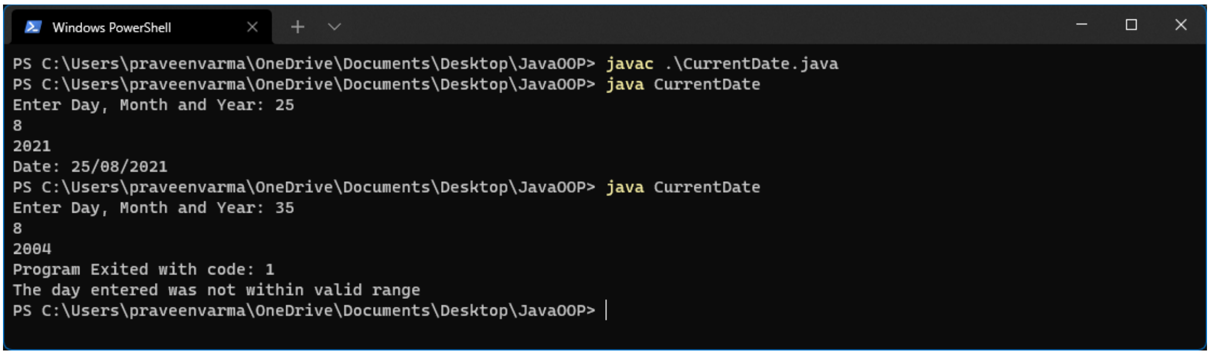
**Question 2) Define a class CurrentDate with data members day, month and year. Define a method createDate() to create date object by reading values from keyboard. Throw a user defined exception by name InvalidDayException if the day is invalid and InvalidMonthException if month is found invalid and display current date if the date is valid. Write a test program to illustrate the functionality.**

**Solution:**

```
import java.util.*;

class InvalidDayException extends Exception
{
        private int error;

        public InvalidDayException(int error)
        {
                this.error = error;
        }

        public int getError()
        {
                return this.error;
        }
}

class InvalidMonthException extends Exception
{
        private int error;

        public InvalidMonthException(int error)
        {
                this.error = error;
        }

        public int getError()
        {
                return this.error;
        }
}

public class CurrentDate
{
        int day;
        int month;
        int year;

        public CurrentDate()
        {
                this.day = 1;
                this.month = 1;
                this.year = 2000;
```

```
	}

	public CurrentDate(int day, int month, int year)
	{
		try
		{
			if(this.isDateValid(day, month, year) == true)
			{
				this.day = day;
				this.month = month;
				this.year = year;
				this.display();
			}
		}
		catch(InvalidDayException err)
		{
			System.out.println("Program  Exited  with  code:  " + err.getError());
			System.out.println("The day entered was not within valid range");
		}
		catch (InvalidMonthException err)
		{
			System.out.println("Program Exited with code: " + err.getError());
			System.out.println("The month entered was not within valid range");
		}
	}

	boolean isDateValid(int d, int m, int y) throws
InvalidMonthException, InvalidDayException
	{
		int mdays[] = {0, 31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30,
		31}; boolean b = false;
		if(y % 4 == 0 || y % 400 == 0 && y % 100 != 0)
		{
			mdays[2] = 29;
		}

		if(m < 1 || m > 12)
		{
			b = false;
			throw new InvalidMonthException(1);
		}
		else
		{
			if(d < 1 || d > mdays[m])
			{
				b = false;
				throw new InvalidDayException(1);
			}
			else
			{
				b = true;
			}
		}
		return b;
	}

	void display()
	{
		String dd = "" + this.day;
		String mm = "" + this.month;
		String yy = "" + this.year;
		if(this.day < 10)
			dd = "0" + this.day;
		if(this.month < 10)
			mm = "0" + this.month; System.out.println("Date:
		" + dd + "/" + mm + "/" + yy);
	}

	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		CurrentDate date = new CurrentDate();
		int d, m, y;
		System.out.print("Enter Day, Month and Year:
		"); d = sc.nextInt();
		m = sc.nextInt();
		y = sc.nextInt();
		date = new CurrentDate(d, m, y);

}
}
```

## Sample Input/Output:



```
PS C:\Users\praveenvarma\OneDrive\Documents\Desktop\JavaOOP> javac .\CurrentDate.java
PS C:\Users\praveenvarma\OneDrive\Documents\Desktop\JavaOOP> java CurrentDate
Enter Day, Month and Year: 25
8
2021
Date: 25/08/2021
PS C:\Users\praveenvarma\OneDrive\Documents\Desktop\JavaOOP> java CurrentDate
Enter Day, Month and Year: 35
8
2004
Program Exited with code: 1
The day entered was not within valid range
PS C:\Users\praveenvarma\OneDrive\Documents\Desktop\JavaOOP>
```

**Question 3:Design a class Student with the methods , getNumber and putNumber to read and display the Roll No. of each student and getMarks() and putMarks() to read and display their marks.**
**Create an Interface called Sports with a method putGrade() that will display the grade obtained by a student in sports.Design a class called Result that will implement the method putGrade() and generate the final result based on the grade in sports and the marks obtained from the superclass Student.Include appropriate instance variables for the class.**

**Solution:-**

**“Student.java”**

```
import java.util.*;
import java.io.*;
class Student{
int roll_num;
float marks;
public int getNumber(){
return roll_num;}
public void putNumber(int n){
roll_num = n;}
public float getMarks(){
return marks;}
public void putMarks(float n){
marks = n;}
}
interface Sports{
public void putGrade(char g);
}
```

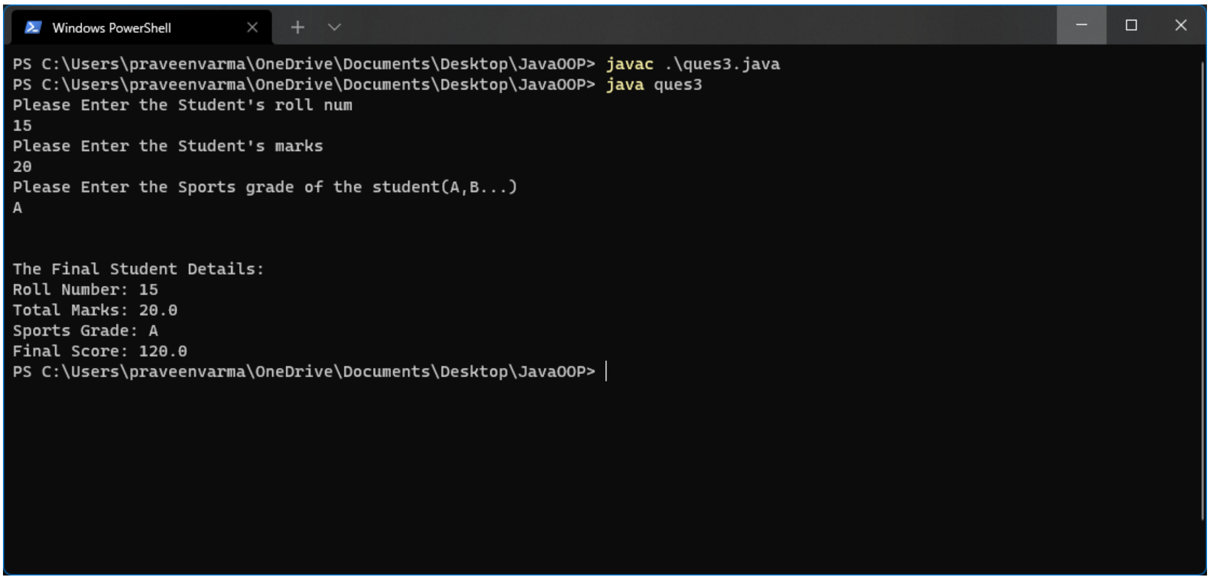
**“Result.java”**

```
class Result extends Student implements Sports{
float final_score;
char sport_grade;
public void putGrade(char g){
sport_grade = g;
}
public float finalGrade()
{
if (sport_grade == 'A')
final_score = marks+100;
else if (sport_grade == 'B')
final_score = marks+90;
else if (sport_grade == 'C')
final_score = marks+80;
else if (sport_grade == 'D')
final_score = marks+70;
else
final_score = marks+60;
return final_score;
}

}
```

**“ques3.java”**

```
public class ques3{
public static void main(String[] args){
Scanner sc = new Scanner(System.in);

System.out.println("Please Enter the Student's roll num");
int roll_num;
float marks;
roll_num = sc.nextInt();
System.out.println("Please Enter the Student's marks");
marks = sc.nextFloat();
Result test1 = new Result();
test1.putNumber(roll_num);
test1.putMarks(marks);
char grade;
System.out.println("Please Enter the Sports grade of the student(A,B...)");
grade = sc.next().charAt(0);
test1.putGrade(grade);
System.out.println("\n");
System.out.println("The Final Student Details: ");
System.out.println("Roll Number: "+test1.getNumber());
System.out.println("Total Marks: "+test1.getMarks());
System.out.println("Sports Grade: "+test1.sport_grade);
System.out.println("Final Score: "+test1.finalGrade());}
}
```

## Sample Input/Output:



```
PS C:\Users\praveenvarma\OneDrive\Documents\Desktop\JavaOOP> javac .\ques3.java
PS C:\Users\praveenvarma\OneDrive\Documents\Desktop\JavaOOP> java ques3
Please Enter the Student's roll num
15
Please Enter the Student's marks
20
Please Enter the Sports grade of the student(A,B...)
A


The Final Student Details:
Roll Number: 15
Total Marks: 20.0
Sports Grade: A
Final Score: 120.0
PS C:\Users\praveenvarma\OneDrive\Documents\Desktop\JavaOOP>
```

# THANK YOU!