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LAB 6

Q1)

```java
import java.util.*;

class DOB{
        int date;
        int month;
        int year;
}

class Person{
        private String name;
        private DOB dob = new DOB();
        Person(){
                name = "";
                dob.date = 1;
                dob.month = 1;
                dob.year = 2001;
        }
        Person(int dt,int mth, int yr, String Name){
                name = Name;
                dob.date = dt;
                dob.month = mth;
                dob.year = yr;
        }
        String getName(){
                return name;
        }
        DOB getDOB(){
                return dob;
        }
}

class CollegeGraduate extends Person{
        private int yog;
        private float gpa;
        CollegeGraduate(){
                super();
                yog = 0;
                gpa = 0;
        }
        CollegeGraduate(int dt, int mth, int yr, String Name, int YearOG, float GPA){
                super(dt,mth,yr,Name);
                yog = YearOG;
                gpa = GPA;
        }
        int getYOG(){
```
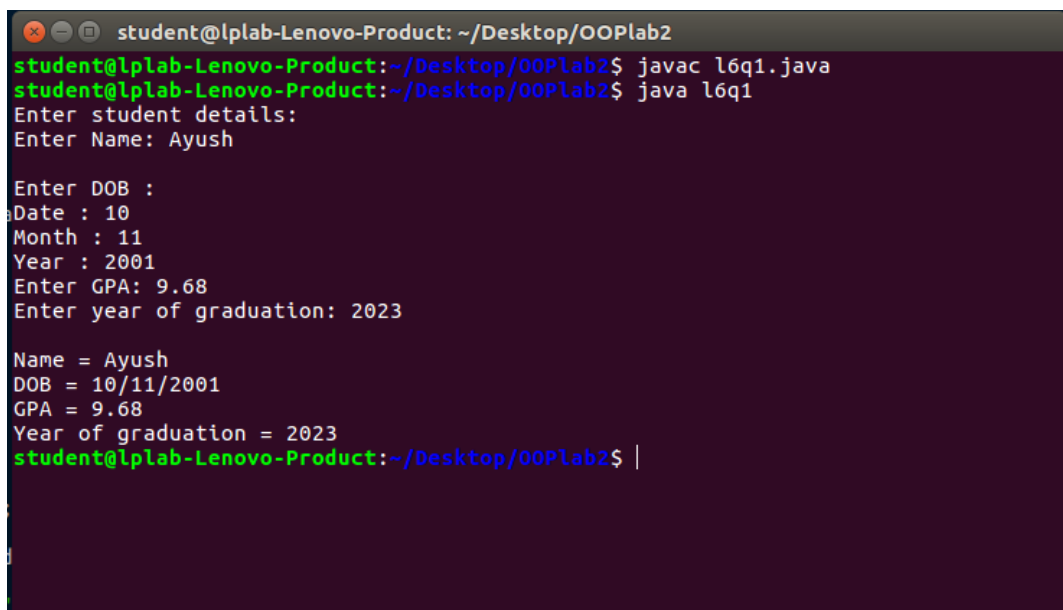
```java
            return yog;
        }
        float getGPA(){
            return gpa;
        }
        void display(){
            System.out.println("\nName = "+getName());
            DOB dob = getDOB();
            System.out.println("DOB = "+dob.date+"/"+dob.month+"/"+dob.year);
            System.out.println("GPA = "+ getGPA());
            System.out.println("Year of graduation = "+ getYOG());
        }
}

class l6q1{
        public static void main(String[] args){
            Scanner sc = new Scanner(System.in);
            System.out.println("Enter student details:");
            int dt,mth,yr,yog;
            String Name;
            float GPA;
            System.out.print("Enter Name: ");
            Name = sc.next();
            System.out.println("\nEnter DOB :");
            System.out.print("Date : ");
            dt = sc.nextInt();
            System.out.print("Month : ");
            mth = sc.nextInt();
            System.out.print("Year : ");
            yr = sc.nextInt();
            System.out.print("Enter GPA: ");
            GPA = sc.nextFloat();
            System.out.print("Enter year of graduation: ");
            yog = sc.nextInt();
            CollegeGraduate C = new CollegeGraduate(dt,mth,yr,Name,yog,GPA);
            C.display();
        }
}
```
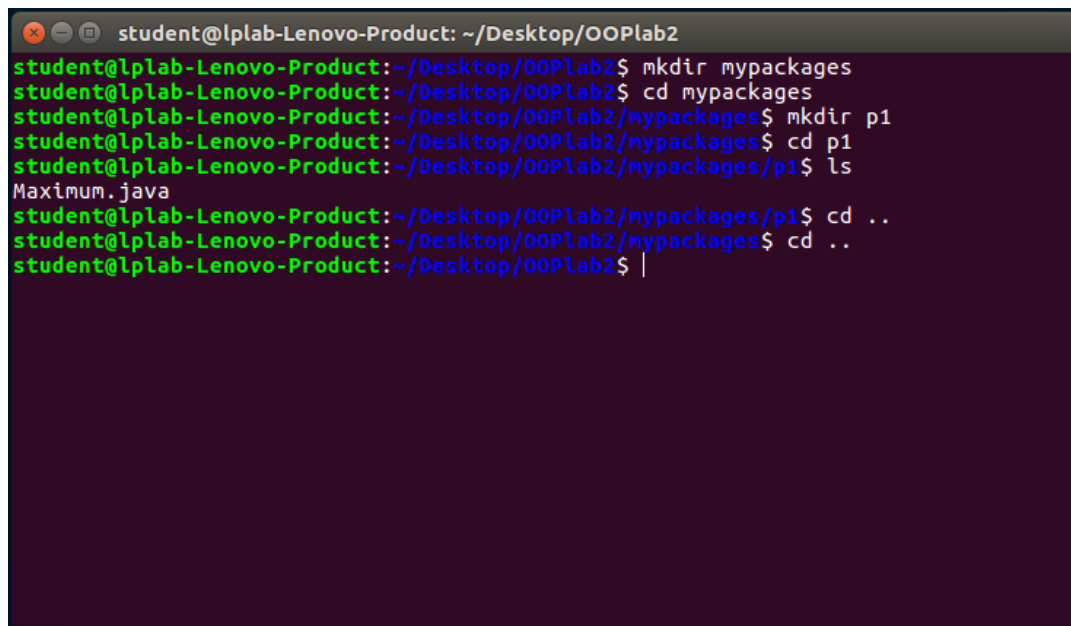


```
student@lplab-Lenovo-Product: ~/Desktop/OOPlab2
student@lplab-Lenovo-Product:~/Desktop/OOPlab2$ javac l6q1.java
student@lplab-Lenovo-Product:~/Desktop/OOPlab2$ java l6q1
Enter student details:
Enter Name: Ayush

Enter DOB :
Date : 10
Month : 11
Year : 2001
Enter GPA: 9.68
Enter year of graduation: 2023

Name = Ayush
DOB = 10/11/2001
GPA = 9.68
Year of graduation = 2023
student@lplab-Lenovo-Product:~/Desktop/OOPlab2$
```

Q2)



       "mypackages/p1/Maximum.java" is the location to store the package

**Maximum.java in package p1 in mypackages:**

package mypackages.p1;

```java
public class Maximum{
        public int max(int m1, int m2, int m3){
                if(m1>m2){
                        if(m1>m3){
                                return m1;
                        }
                        else{
                                return m3;
                        }
                }
                else{
                        if(m2>m3){
                                return m2;
                        }
                        else{
                                return m3;
                        }
                }
        }
        public float max(float m1, float m2, float m3){
                if(m1>m2){
                        if(m1>m3){
                                return m1;
                        }
                        else{
                                return m3;
```

```java
				}
			}
			else{
				if(m2>m3){
					return m2;
				}
				else{
					return m3;
				}
			}
		}
		public int max(int arr[]){
			int maximum = arr[0];
			int i;
			for(i=1;i<arr.length;++i){
				if(maximum<arr[i]){
					maximum = arr[i];
				}
			}
			return maximum;
		}
		public int max(int arr[][]){
			int maximum = arr[0][0];
			int i,j;
			for(i=0;i<arr.length;++i){
				for(j=0;j<arr[i].length;++j){
					if(maximum<arr[i][j]){
						maximum = arr[i][j];
					}
				}
			}
			return maximum;
		}
}
```

**l6q2.java in current directory:**

```java
import java.util.*;
import mypackages.p1.Maximum;

class l6q2{
	public static void main(String[] args){
		Scanner sc = new Scanner(System.in);
		Maximum A = new Maximum();
		int a,b,c,d;
		float a1,b1,c1,d1;
		int ar[] = new int[5];
		int arr[][] = new int[3][3];
		int d2,d3;
		System.out.println("Enter 3 integers : ");
```
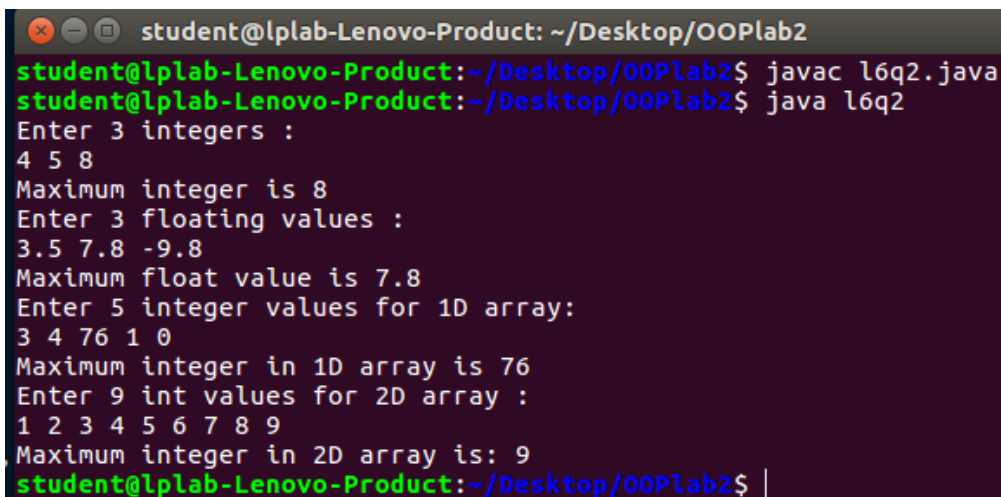
```
            a = sc.nextInt();
            b = sc.nextInt();
            c = sc.nextInt();
            d = A.max(a,b,c);
            System.out.println("Maximum integer is "+ d);
            System.out.println("Enter 3 floating values : ");
            a1 = sc.nextFloat();
            b1 = sc.nextFloat();
            c1 = sc.nextFloat();
            d1 = A.max(a1,b1,c1);
            System.out.println("Maximum float value is "+ d1);
            System.out.println("Enter 5 integer values for 1D array: ");
            for(int i = 0; i < 5; ++i){
                    ar[i] = sc.nextInt();
            }
            d2 = A.max(ar);
            System.out.println("Maximum integer in 1D array is "+ d2);
            System.out.println("Enter 9 int values for 2D array : ");
            for(int i = 0; i < 3; ++i){
                    for(int j = 0; j < 3; ++j){
                            arr[i][j] = sc.nextInt();
                    }
            }
            d3 = A.max(arr);
            System.out.println("Maximum integer in 2D array is: "+ d3);
        }
}
```

Q3)

```java
import java.util.*;

abstract class Figure{
        double dim1;
        double dim2;
        Figure(double d1, double d2){
                dim1 = d1;
                dim2 = d2;
        }
        abstract double area();
}

class Rectangle extends Figure{
        Rectangle(double d1, double d2){
                super(d1,d2);
        }
        double area(){
                return dim1*dim2;
        }
}

class Triangle extends Figure{
        Triangle(double d1, double d2){
                super(d1,d2);
        }
        double area(){
                return 0.5*dim1*dim2;
        }
}

class Square extends Figure{
        Square(double d1, double d2){
                super(d1,d2);
        }
        double area(){
                return dim1*dim1;
        }
}

class l6q3{
        public static void main(String[] args){
                Scanner sc = new Scanner(System.in);
                double dim1, dim2;
                System.out.println("Enter length and breadth of rectangle : ");
                dim1 = sc.nextDouble();
                dim2 = sc.nextDouble();
                Rectangle r = new Rectangle(dim1,dim2);
                Figure fig = r;
                System.out.println("The area of rectangle is "+fig.area());
```
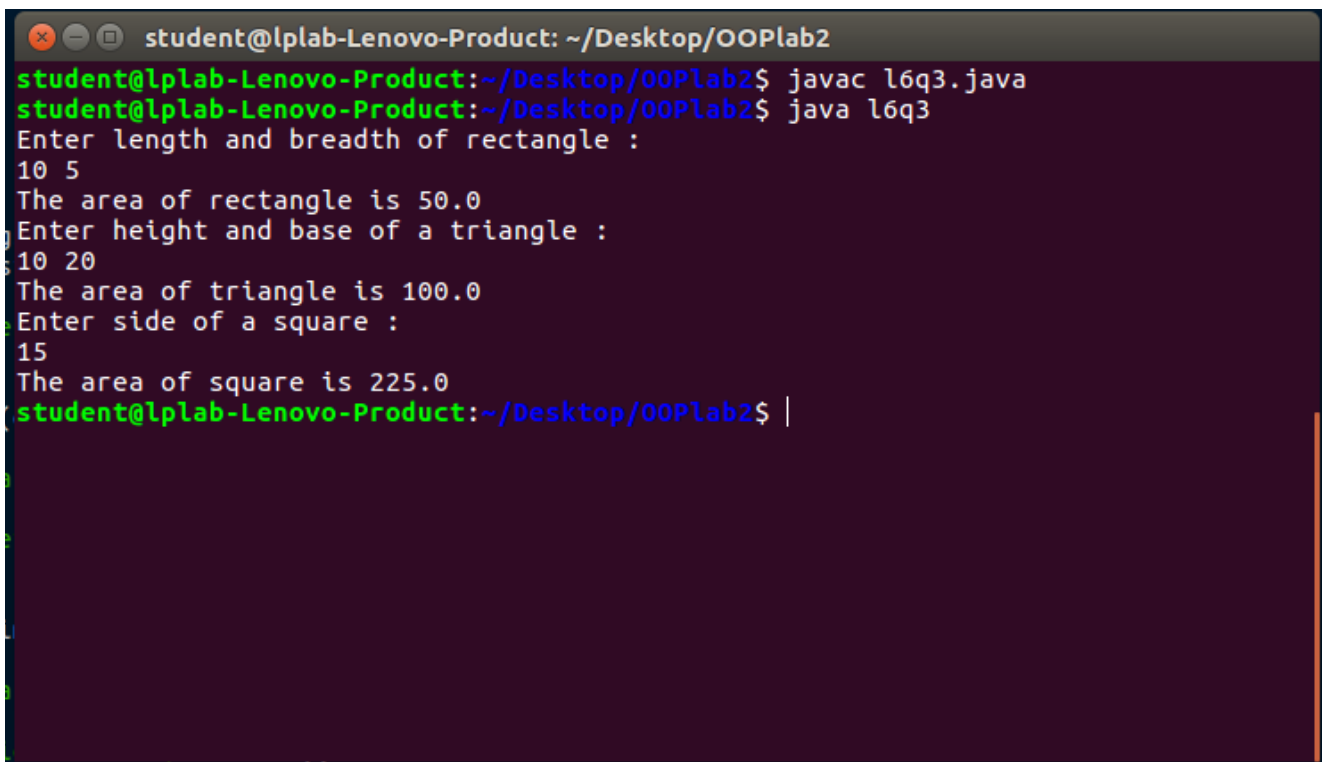
```java
            System.out.println("Enter height and base of a triangle : ");
            dim1 = sc.nextDouble();
            dim2 = sc.nextDouble();
            Triangle t = new Triangle(dim1,dim2);
            fig = t;
            System.out.println("The area of triangle is "+fig.area());

            System.out.println("Enter side of a square : ");
            dim1 = sc.nextDouble();
            Square s = new Square(dim1,dim1);
            fig = s;
            System.out.println("The area of square is "+fig.area());
        }
    }
```

```
student@lplab-Lenovo-Product: ~/Desktop/OOPlab2
student@lplab-Lenovo-Product:~/Desktop/OOPlab2$ javac l6q3.java
student@lplab-Lenovo-Product:~/Desktop/OOPlab2$ java l6q3
Enter length and breadth of rectangle :
10 5
The area of rectangle is 50.0
Enter height and base of a triangle :
10 20
The area of triangle is 100.0
Enter side of a square :
15
The area of square is 225.0
student@lplab-Lenovo-Product:~/Desktop/OOPlab2$
```