Don Bosco Institute of Technology, Kurla(W)
Department of Electronics and Tele-Communication Engineering
ECL304 - Skill Lab: C++ and Java Programming
Sem III
2021-22

Lab Number:	**9**
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Title:

1. Write a java program to create an abstract class named Shape that contains two integers and an abstract method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea() that prints the area of the given shape.

Learning Objective:

Students will be able to implement abstract class and abstract method programs.

Learning Outcome:

- Understanding the abstraction concept and hiding of the unnecessary code.

Course Outcome:

ECL304.4	1. Implement different programming applications using packaging.

Theory:

- Explain in details about necessity of data hiding in any application / project.
  Data hiding is a software development technique specifically used in object-oriented programming (OOP) to hide internal object details (data members). Data hiding ensures exclusive data access to class members and protects object integrity by preventing unintended or intended changes.
  Data hiding is a method used in object-oriented programming to hide information within computer code. ... One advantage of data hiding is heightened security against hackers. Data hiding takes certain parts of code and hides those parts from the objects. The objects cannot directly access any data that is hidden.
- Explain abstract class and abstract methods.

Abstract class: is a restricted class that cannot be used to create objects (to access it, it must be inherited from another class).
Abstract method: can only be used in an abstract class, and it does not have a body. The body is provided by the subclass (inherited from)

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Algorithm :	1)first create main class abstractShape 2)create abstract class shape a=23 ,b=10 3)create abstract method printArea() 4)create class rectangle ,triangle ,circle extended by class Shape 5)in class rectangle print area of rectangle =a*b in class triangle print area of triangle =a*b/2 in class circle print area of circle =3.14*b*b 6)create object of class rectangle ,triangle ,circle 7)call the method printArea

Program:	package lab;
	
	abstract class Shape {
	float a=23 ,b=10;
	abstract void printArea();
	}
	
	class triangle extends Shape{
	void printArea()
	{System.out.println("Area of traingle is ="+a*b/2);
	}
	}
	class Circle extends Shape{
	void printArea()
	{System.out.println("Area of circle is ="+3.14*b*b);

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```
                    }
}
class Rectangle extends Shape{
          void printArea()
{System.out.println("Area of rectangle is ="+a*b);
                    }
}
public class abstractShape {
        public static void main(String[] args)
{


          Circle c=new Circle();
                triangle t=new triangle();
                Rectangle r=new Rectangle();
                t.printArea();
                c.printArea();
                r.printArea();
        }
}
```

Input given: **A=23 ,b=10**

Output Screenshot: