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**Green University of Bangladesh**

**Department of Computer Science and Engineering (CSE)**

**Faculty of Sciences and Engineering**

**Semester: (Fall, Year: 2024), B.Sc. in CSE (Day)**

**Lab Report NO : 04**

**Course Title: OOP Lab**

**Course Code: CSE 202**

**Section: D9**

**Lab Experiment Name:**  Polymorphism

**Student Details**

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**Lab Date : 14/09/24**

**Submission Date : 20/10/24**

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**[For Teachers use only: Don’t write anything inside this box]**

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| **Lab Report Status**  **Marks: ………………………………… Signature: .....................**  **Comments: .............................................. Date: ..............................** |

**1. INTRODUCTION**

The purpose of this lab reports is to know the concepts of Constructors and Method Overloading in java program. Here, we will see how to calculate area and perimeter of square and rectangle. In this lab report our aim is to solve some real-world problems efficiently.

**2. OBJECTIVES**

The primary objectives of this lab report are as follows:

• Understand Constructors

• Method overloading

**3. IMPLEMENTATION**

Task 1: Write a java program that will create a class “Shape” from which you can create two objects like - “Rectangle” and “Square”. Add the following:

• Determine the attributes of both objects according to your choice (length and breadth).

• Initialize a parameterized constructors for both objects, that will receive the value of (length) and (length, breadth) from main() function.

• Declare two overloading methods “CalculateArea()” and two overloading methods “CalculatePerimeter()” in the Shape class. Return the calculated area and perimeter in main() function for both Square and Rectangle, with the help of a object and print the values.

Solution:

class Shape{

    int length;

    int breadth;

    Shape(int i){

        this.length = i;

    }

    Shape(int j, int k){

        this.length = j;

        this.breadth = k;

    }

    public int CalculateArea(int i){

        return (i\*i);

    }

    public int CalculateArea(int j, int k){

        return (j\*k);

    }

    public int CalculatePerimeter(int i){

        return (4\*i);

    }

    public int CalculatePerimeter(int j, int k){

        return 2\*(j+k);

    }

}

public class lb4 {

    public static void main(String[] args) {

        Shape Square = new Shape(5);

        Shape Rectangle = new Shape(6,13);

        int SA = Square.CalculateArea(Square.length);

        int SP = Square.CalculatePerimeter(Square.length);

        int RA = Rectangle.CalculateArea(Rectangle.length, Rectangle.breadth);

        int RP = Rectangle.CalculatePerimeter(Rectangle.length, Rectangle.breadth);

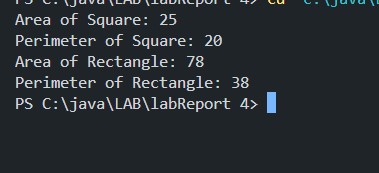
        System.out.println("Area of Square: "+SA+"\n"+"Perimeter of Square: "+SP);

        System.out.println("Area of Rectangle: "+RA+"\n"+"Perimeter of Rectangle: "+RP);

    }

}

Output:



**4. DISCUSSION**

The problem revolves around calculating the area and perimeter of a square and a rectangle using constructors and method overloading in Java. Two constructors are defined—one for the square and another for the rectangle, each with different parameters. Additionally, we implemented two methods for calculating the area and two for calculating the perimeter, utilizing the concept of method overloading to handle both shapes efficiently.