Test Plan

Nelson Villatoro

CMSC115

Chapter 9, Project 1

December 10, 2024

**Program Goals & Objectives**

This program illustrates the creation and utilization of a Rectangle class for the project's scope. It generates two Rectangle objects with distinct dimensions and displays their width and height. Subsequently, the program computes and displays each rectangle's area and perimeter. The program showcases object-oriented programming principles, constructor invocation, and mathematical computations using those concepts.

**Program Functional Requirements**

1. The program must instantiate at least two Rectangle objects with given width and height values.
2. The program must provide both a default constructor (with predefined dimensions) and a parameterized constructor (accepting user-specified dimensions).
3. The program must compute the area and perimeter of each rectangle using appropriate methods in the Rectangle class.
4. The program must display each rectangle’s dimensions (width and height), along with its computed area and perimeter.

**Program Pseudocode**

START

Initialize Rectangle1 with width of 4 and height of 40

Initialize Rectangle2 with width of 3.5 and height of 35.9

Calculate Rectangle1's area by multiplying width and height

Calculate Rectangle1's perimeter using 2 times (width plus height)

Calculate Rectangle2's area by multiplying width and height

Calculate Rectangle2's perimeter using 2 times (width plus height)

Display Rectangle1's properties:

Output width

Output height

Output area

Output perimeter

Display Rectangle2's properties:

Output width

Output height

Output area

Output perimeter

END

**Program Flowchart**

**A diagram of a rectangle

Description automatically generated**

**Table 1 – Traceability Matrix**

**(Note: Program was modified to ease creation of traceability matrix)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case | Input/Output | Expected Result | Actual Result | Outcome  (Pass/Fail) |
| 1a | Enter width for rectangle:  five | Handle invalid input appropriately | InputMismatchException | Fail |
| 2a | Enter width for rectangle:  5  Enter height for rectangle:  10 | Rectangle Properties:  Width: 5.0  Height: 10.0  Area: 50.0  Perimeter: 30.0 | Rectangle Properties:  Width: 5.0  Height: 10.0  Area: 50.0  Perimeter: 30.0 | Pass |
| 3a | Enter width for rectangle:  12  Enter height for rectangle:  -10 | Invalid input when height is negative | Rectangle Properties:  Width: 12.0  Height: -10.0  Area: -120.0  Perimeter: 4.0 | Fail |