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CMSC335: Object Oriented Programming

University of Maryland Global Campus

Professor Mujeye

**UML Diagram:**

Diagram

Description automatically generated

Diagram

Description automatically generated

**Test Cases:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case | Input | Expected Output | Actual Output | Pass? |
| 1 | **Cone**  **X: 180**  **Y: 90**  **Radius: 90**  **Height: 20** | **Volume = 169646.00** | **Volume = 169646.00** | **Yes** |
| 2 | **Circle**  **X: 0**  **Y: 0**  **Radius: 90** | **Area = 25446.90** | **Area = 25446.90** | **Yes** |
| 3 | **Rectangle**  **X:40**  **Y:30**  **Length: 180**  **Width: 100** | **Area: 18000** | **Area: 18000** | **Yes** |

**Snapshots of Test Run:**

A picture containing graphical user interface

Description automatically generatedGraphical user interface

Description automatically generated with medium confidence

A picture containing graphical user interface

Description automatically generatedGraphical user interface, application

Description automatically generated

A picture containing shape

Description automatically generatedGraphical user interface, table

Description automatically generated

**Lessons Learned:**

This project was a continuation of the previous project for this class. Like last time, I have my shape class, sub-classes 2dshape and 3dshape and their subclasses. Only this time, my objective was to create a GUI to display a window asking for the aspects and coordinates of the shape. If the shape is 2D, the program will use Graphics2D to draw the respective shape and it’s area according to the user’s input for both grid coordinates and measurement aspects. If the shape is 3D, entering the measurement aspects for a shape will not affect the size of the shape because the program will not draw 3d shapes like it did for the 2D. Instead, the program will load an image of the respective 3D shape from a file input and display it once the user enters aspects to calculate the volume of the shape. For this GUI, I used a JFrame, JTextField, JLabel, DrawingPanel, JPanel, JMenu, JMenuBar, and JOptionPane as components of the GUI. The GUI uses Swing and AWT. I also made additional classes such as DrawingPanel which I made a subclass of JPanel, and ShapeDimension which contains the name and value of the shape. Graphics2D is used for the 2D shapes, while BufferedImage is used for the 3D shapes. Most importantly, the user must press the enter key after typing in values of the shape’s volume/area. For the 3D shape, the program will display an image of the respective shape from file input, regardless of the user’s input for the volume. For the 2D shape, however, the program will draw the shape (using Graphics2D) based on the values the user inputs for the area of the shape.