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CMSC335: Object Oriented Programming

University of Maryland Global Campus

Professor Mujeye

**UML Diagram:**Diagram

Description automatically generated

**Test Cases:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case | Input | Expected Output | Actual Output | Pass? |
| 1 | **1**  **50** | **Select from the menu below:**  **You selected a Circle.**  **What is the radius?**  **The area is: 7853.981633974483** | **Select from the menu below:**  **You selected a Circle.**  **What is the radius?**  **The area is: 7853.981633974483** | **Yes** |
| 2 | **7**  **30**  **75** | **Select from the menu below:**  **You selected a Cone.**  **What is the base radius?**  **What is the cone height?**  **The volume is: 70685.83470577035** | **Select from the menu below:**  **You selected a Cone.**  **What is the base radius?**  **What is the cone height?**  **The volume is: 70685.83470577035** | **Yes** |
| 3 | **!**  **4**  **t** | **Select from the menu below:**  **Invalid entry! Please type in a number between 1 and 10**  **You selected a Triangle.**  **What is the base?**  **Please enter a positive real number (ex. 3.5).** | **Select from the menu below:**  **Invalid entry! Please type in a number between 1 and 10**  **You selected a Triangle.**  **What is the base?**  **Please enter a positive real number (ex. 3.5).** | **Yes** |

**Snapshots of Test Run:**

Graphical user interface, text

Description automatically generatedGraphical user interface, text, application, email

Description automatically generated Graphical user interface, text, application, email

Description automatically generated

**Lessons Learned:**

For this project, I used IntelliJ IDE. Most of this project was reliant on Inheritance and Polymorphism. Inheritance occurs when one class is an extension/subclass/child class of a parent class where some of their methods derive from their parent classes. Polymorphism occurs when one class accesses a function/method of another class. Making the Shape class, TwoDimensionalShape and ThreeDImensionalShape classes, and all the shape classes was pretty straightforward because I have had experience using getters and setters for classes that the driver class would need to access. I did get a little bit of assistance of the Driver class just to refresh my memory on polymorphism. For the driver class, I implemented exception handling so that the program does not crash if the user enters an invalid value for either choosing a shape to construct or entering a measurement for a specific shape. The program’s functionality to calculate the area of a 2D shape and the volume of a 3D shape is undoubtedly consistent with the correct results.