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Abstract

A Java program which calculates the area or volume of various two-dimensional or three-dimensional shapes

CMSC 335 Object Oriented and concurrent programming

Project 1

**UML Class Diagram**

**A screenshot of a cell phone

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Figure 1 UML Class Diagram for Shape Program

**Setup and Installation Guide**

Unpack the folder into a directory of your choice. Open the console or command prompt depending on your Operating system and navigate to the directory where the files were placed. Type “javac main.java” in the console to compile the Java code, and then type “java main” to run the program. Once in the program, select a shape to calculate the area or volume. Once a shape is selected, enter in the required input one digit at a time followed by the enter key, or enter both digits with a space in-between. To exit the program, enter input “10” from the main menu.

**Lessons Learned**

This was a fun project that helped the author to understand how to properly use subclasses. The author learned specifically about using the keyword “super” in subclass constructors, as well as the @Override for methods contained within the superclass to change them to perform the proper calculation for area/volume of different shapes.

**Test Plan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Input** | **Expected Output** | **Pass/Fail** |
| 1 | 1, 5, 3.3 | Triangle Area is: 8.25 | Pass |
| 2 | 1, 6, x | Please enter valid input in correct format | Pass |
| 3 | 8, 2.2, 6.5 | Torus Volume is: 1834.759458162512 | Pass |
| 4 | 7, 6.432, 100 | Cylinder Volume is: 202067.2394788955 | Pass |
| 5 | 5, testing | Please enter valid input in correct format | Pass |
| 6 | 5, 250 | Cube Volume is: 1.5625E7 | Pass |
| 7 | 9, 300 | Circle area is: 282743.3388230814 | Pass |
| 8 | 2, 5, 34.3 | Rectangle Area is: 171.5 | Pass |
| 9 | 6, 100, 25 | Cone Volume is: 65449.84694978736 | Pass |
| 10 | 10 | Thank you for using the Area/Volume Calculator! The current date/time is: 11/01/2020 13:03 (the current system date/time will be printed) | Pass |

A screenshot of a computer

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Figure 2 Test Case 1

A screenshot of a computer

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Figure 3 Test Case 2

A screenshot of a computer

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Figure 4 Test Case 3

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Figure 5 Test Case 4

A screenshot of a computer

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Figure 6 Test Case 5

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Figure 7 Test Case 6

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Figure 8 Test Case 7

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Figure 9 Test Case 8

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Figure 10 Test Case 9

Graphical user interface, text

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Figure 11 Test Case 10