**Project 2 – Shapes GUI Developer’s Guide**

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CMSC 335: Object-Oriented and Concurrent Programming

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**Compile and Run Shapes GUI Program**

**Note:** Program was developed using openJDK 16.0.2.

**COMPILING:** unzip Lindley\_Shapes\_GUI.zip, open your preferred terminal and changed directory (cd) to

the unzipped Lindley\_ShapesGUI folder. Once in folder, enter the command: javac main\_SWING.java.

**Running:** Once program is compiled, remain in the same folder and enter the command java main\_SWING.java, then GUI will open to allow interaction with program.

**UML:** UML Diagram can be viewed from image included named “UML” for larger picture. Can also view

UML.puml through an IDE extension like PlantUML.

**Test Plan**

**Part I:**

The first part of the test plan is to test functionality of GUI under normal expected conditions to ensure all part of GUI work correctly including correctness of math calculations.

* Achieved by testing each shapes creation through GUI and comparing programs calculation for area or volume to my own calculations

**Part II:**

The second part of the test plan is to test the handling of unintended inputs and user behavior by the program.

* Achieved by:
  + Testing various inputs that are not positive integer or decimal values.
  + Not following intended flow of the program by selecting shapes, then changing shapes after input has been entered.

**Test Part I – Test 1:**

Ensure all parts of GUI are accessible and work properly, try every shape without closing program to ensure no issues arise after longer runs of program.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Run#** | **Input** | **Expected Behavior** | **Actual Behavior** | **Pass / Fail** |
| **1** | Select all Shapes from Combo Box, enter 5 for parameters, Display Shape, show area/volume, clear after each shape | All shapes have appropriate parameter fields, display image, display area/volume, and clear properly | All shapes have appropriate parameter fields, display image, display area/volume, and clear properly | Pass – after missing image fixed |
| **2** | Select all shapes, enter parameters, clear, then try another shape and display that shape | All partially complete shape operations are cleared when clear is pressed and new shape is unaffected by previous shape | All partially complete shape operations are cleared when clear is pressed and new shape is unaffected by previous shape | Pass |

**RUN 1.1:**

**Graphical user interface

Description automatically generated**

**Clear pressed:**

**Graphical user interface, text

Description automatically generated**

**RUN 1.2:**

**Graphical user interface, application

Description automatically generated**

**Clear pressed:**

**Graphical user interface, website

Description automatically generated**

**RUN 1.6:**

**Graphical user interface

Description automatically generated**

**Clear pressed:**

**Graphical user interface, website

Description automatically generated**

**RUN 1.8:**

**Noticed here that Sphere did not work, because missing image. Added image fixed issue. Reran test from beginning.**

**A screenshot of a computer

Description automatically generated with medium confidence**

**RUN 2.1**

**Graphical user interface

Description automatically generated with medium confidence**

**Clear Pressed, then switch to cylinder**

**Graphical user interface, application

Description automatically generated**

**RUN 2.9**

**Graphical user interface, application

Description automatically generated**

**Clear pressed, switched to rectangle:**

**Graphical user interface, application

Description automatically generated**

**Test Part I – Test 2:**

Ensure programs calculations are correct for each shape

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Run#** | **Input** | **Expected Behavior** | **Actual Behavior** | **Pass / Fail** |
| **1** | ---Circle---  Radius 1:  12  Radius 2:  0.0453322  Radius 3: 584783 | Area 1:  452.38934  Area 2:  6.456×10-3  Area 3:  1.07433×1012 | Area 1:  452.39  Area 2:  6.455999E-3  Area 3:  1.074334E12 | Pass |
| **2** | ---Triangle---  Base 1:  12  Height 1:  15  Base 2:  .0002345  Height 2:  .001234  Base 3:  500334  Height 3:  234556 | Area 1:  90  Area 2:  1.44687×10-7  Area 3:  5.86782×1010 | Area 1:  90.00  Area 2:  1.446865E-7  Area 3:  5.867817E10 | Pass |
| **3** | ---Rectangle---  Length 1:  23  Width 1:  43  Length 2:  .000123  Width 2:  .0000432  Length 3:  23567745  Width 3:  24662253 | Area 1:  989  Area 2:  5.3136×10-9  Area 3:  5.81234×1014 | Area 1:  989.00  Area 2:  5.3136E-9  Area 3:  5.812337E14 | Pass |
| **4** | ---Square---  Edge 1:  56  Edge 2:  .0000043  Edge 3:  3453456 | Area 1:  3136  Area 2:  1.849×10-11  Area 3:  1.19264×1013 | Area 1:  3136.00  Area 2:  1.849E-11  Area 3:  1.192636E13 | pass |
| **5** | ---Cube---  Edge 1:  33  Edge 2:  .000054  Edge 3:  947848989 | Volume 1:  35937  Volume 2:  1.57464×10-13  Volume 3:  8.51564×1026 | Volume 1:  3.5937E4  Volume 2:  1.57464E-13  Volume 3:  8.515643E26 | Pass |
| **6** | ---Cone---  Radius 1:  12  Height 1:  7  Radius 2:  .00034  Height 2:  .00023  Radius 3:  5006994  Height 3:  23456678 | Volume 1:  1055.57513  Volume 2:  2.78429×10-11  Volume 3:  6.15814×1020 | Volume 1:  1055.58  Volume 2:  2.784289E-11  Volume 3:  6.158136E20 | Pass |
| **7** | ---Cylinder---  Radius 1:  25  Height 1:  52  Radius 2:  .000345  Height 2:  .000453  Radius 3:  2342342  Height 3:  5889493 | Volume 1:  1.02102×105  Volume 2:  1.69389×10-10  Volume 3:  1.01515×1020 | Volume 1:  1.021018E5  Volume 2:  1.693894E-10  Volume 3:  1.015146E20 | Pass |
| **8** | ---Sphere---  Radius 1:  54  Radius 2:  .00034  Radius 3:  345635 | Volume 1:  6.59584×105  Volume 2:  1.64636×10-10  Volume 3:  1.72958×1017 | Volume 1:  6.595837E5  Volume 2:  1.646362E-10  Volume 3:  1.729584E17 | Pass |
| **9** | ---Torus---  Major Radius 1:  50  Minor Radius 1:  34  Major Radius 2:  .000999  Minor Radius 2:  .000333  Major Radius 3:  9898989  Minor Radius 3:  4545454 | Volume 1:  1.14093×106  Volume 2:  2.18667×10-9  Volume 3:  4.03715×1021 | Volume 1:  1.140926E6  Volume 2:  2.186672E-9  Volume 3:  4.037152E21 | Pass |

Note: pressing clear after verifying each shapes calculation then entering next set of parameters for the shape. Also noticed here that previous decimal format will not display small numbers, so added a new small number format for small areas/volumes that is used when a shape has small volume/area, otherwise decimal format remains 0.0. Also made spacing a bit nicer.

**RUN 1.1:**

**Graphical user interface, application

Description automatically generated**

**RUN 4.2:**

**Graphical user interface, application, Word

Description automatically generated**

**RUN 6.3:**

**Graphical user interface, application

Description automatically generated**

**RUN 9.4:**

**Graphical user interface, application

Description automatically generated**

**Test Part 2 – Test 1:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Run#** | **Input** | **Expected Behavior** | **Actual Behavior** | **Pass / Fail** |
| **1** | Try negative input all shapes | “Dimensions must decimal non-negative numbers” – Popup window, then clear GUI of improper input, allow retry after clicking select shape again | “Dimensions must decimal non-negative numbers” – Popup window, then clear GUI of improper input, allow retry after clicking select shape again | Pass |
| **2** | Try string input all shapes | “Dimensions must decimal non-negative numbers” – Popup window, then clear GUI of improper input, allow retry after clicking select shape again | “Dimensions must decimal non-negative numbers” – Popup window, then clear GUI of improper input, allow retry after clicking select shape again | Pass |
| **3** | Try special character input all shapes | “Dimensions must decimal non-negative numbers” – Popup window, then clear GUI of improper input, allow retry after clicking select shape again | “Dimensions must decimal non-negative numbers” – Popup window, then clear GUI of improper input, allow retry after clicking select shape again | Pass |

**Run 1.1:**

**Graphical user interface, application

Description automatically generated**

**After clicking OK:**

**Graphical user interface, application

Description automatically generated**

**Run 1.6:**

**Graphical user interface

Description automatically generated**

**After clicking OK and select shape:**

**Graphical user interface, application

Description automatically generated**

**Run 2.4:**

**Graphical user interface, application

Description automatically generated**

**RUN 2.9:**

**Graphical user interface, application

Description automatically generated**

**After clicking display shape:**

**Graphical user interface, application

Description automatically generated**

**RUN 3.4**

**Graphical user interface, application

Description automatically generated**

**After clicking display shape**

**Graphical user interface, application

Description automatically generated**

**After Clicking OK**

**Graphical user interface

Description automatically generated**

**RUN 3.7:**

**Graphical user interface

Description automatically generated**

**After clicking display shape**

**Graphical user interface, application

Description automatically generated**

**After clicking okay**

**Graphical user interface, application

Description automatically generated**

**UML (UML.jpg image included in project folder for better viewing)**

**Diagram

Description automatically generated**

**LESSONS LEARNED**

One of the main lessons I learned was that reading the entire project specification multiple times throughout working on a project can be extremely helpful in the completion of a project and may even save time. This was learned on this project, because I read the grading of the project a few times and realized it was not required to include a screenshot of every single test run in the documentation. This saved me a lot of time for this project, and I recall on the last project, half my time working on the documentation seemed to be spent screen capturing and pasting. I have also had times in the past where I missed a vital point in a project and did not realize until the last-minute causing verry stressful nights. Hopefully I included enough screenshots for this project.

I also learned that I really need to take the time before I start a project brainstorming how I want to complete the project. After seeing your partial code guidance for this week’s project, I realized I could have made my first project much cleaner. I also think if I spend more time brainstorming I will have more ideas of how to complete a project and I can spend more time reviewing JAVA and seeing if my ideas are actually implantable with JAVA, instead of just starting a project by opening a editor and start to code with what I am comfortable with.