TEST PLAN

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CMSC 335

Project 2

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Lessons Learned

This project further helped me learn more about the details regarding Java GUI and how to use more of the features of each Swing and AWT component. I also learned more about how to use images in Java, particularly the ImageIcon class. I learned more about event listeners and event handlers. This project also helped reinforce my knowledge and for me to gain more experience working with Java classes, polymorphism, and inheritance. I feel I did better with Object Orientation and organization in this project. I basically reworked the structure of the first program. Trying to keep more organized by creating a class “DataValues” to hold all the return methods for area and volume. This helped me keep better track of what was happening and helped me not get lost. I feel there is still significant room for improvement. However, with only a week to complete it is hard to understand and implement every change that I would like to do.

How to Run Program

I created and ran this program using VSCode. Which can be dowonloaded at https://code.visualstudio.com Including the UML using the drawio extension.

Here is how to run and compile program using the Command Prompt:

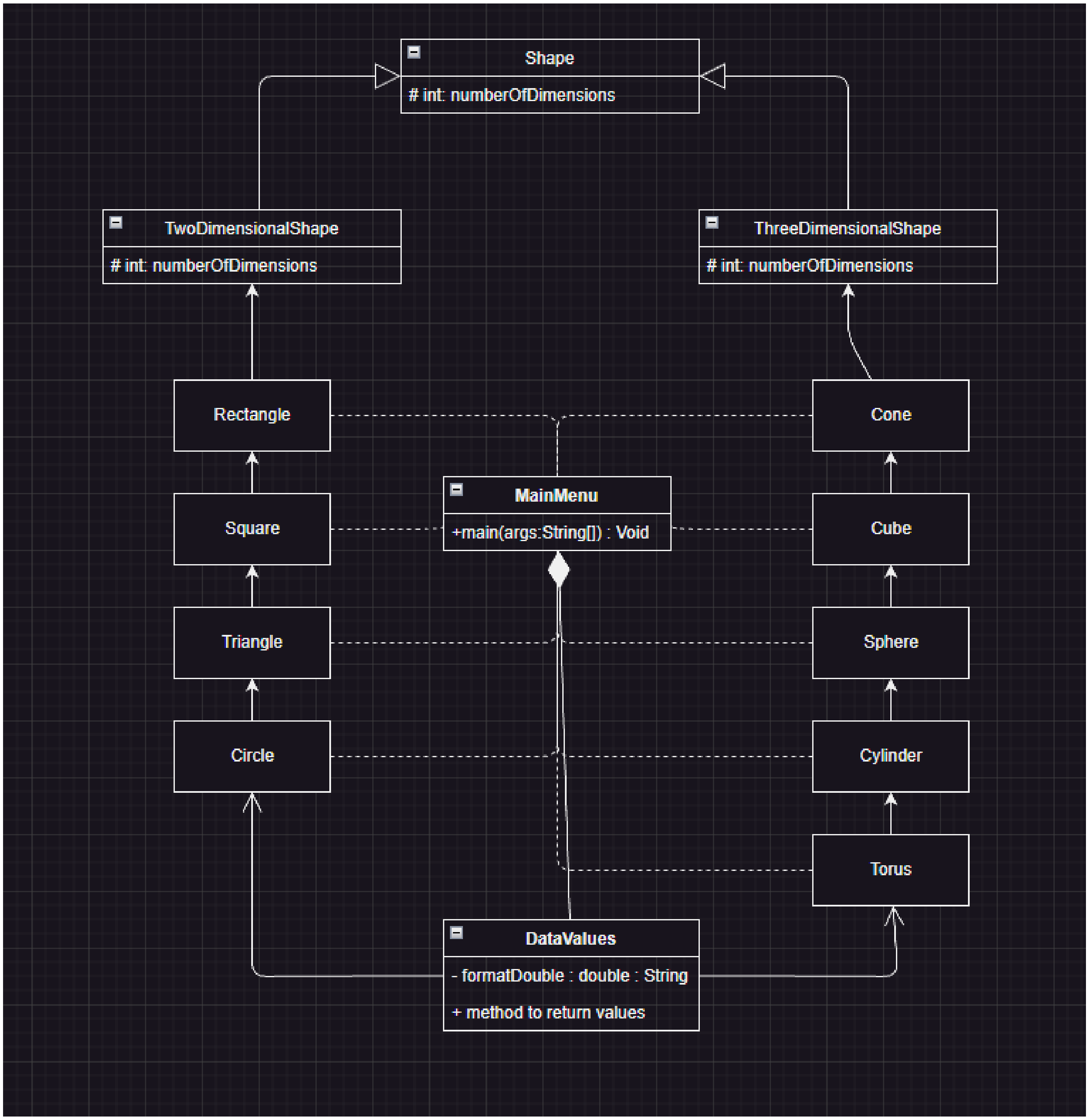
1. Save all the .java files and images in a directory named Project_2. Or whatever you choose.
2. Open the command prompt or terminal.
3. Navigate to the directory using the cd command.
4. Compile all the classes using the command javac *.java.
5. Run the program using the command java Main.

After running the program, you should see the GUI menu displayed on the screen. Follow the prompts to construct the various shapes and get their respective volumes or areas.

UML Diagram

Figure i

UML Diagram – Diagram showing object's relationship to classes.


Shape
# int: numberOfDimensions
TwoDimensionalShape
# int: numberOfDimensions
ThreeDimensionalShape
# int: numberOfDimensions
Rectangle
Cone
Square
MainMenu
+main(args:String[]) : Void
Cube
Triangle
Sphere
Circle
Cylinder
Torus
DataValues
- formatDouble : double : String
+ method to return values

Test Cases

Testing Valid Input

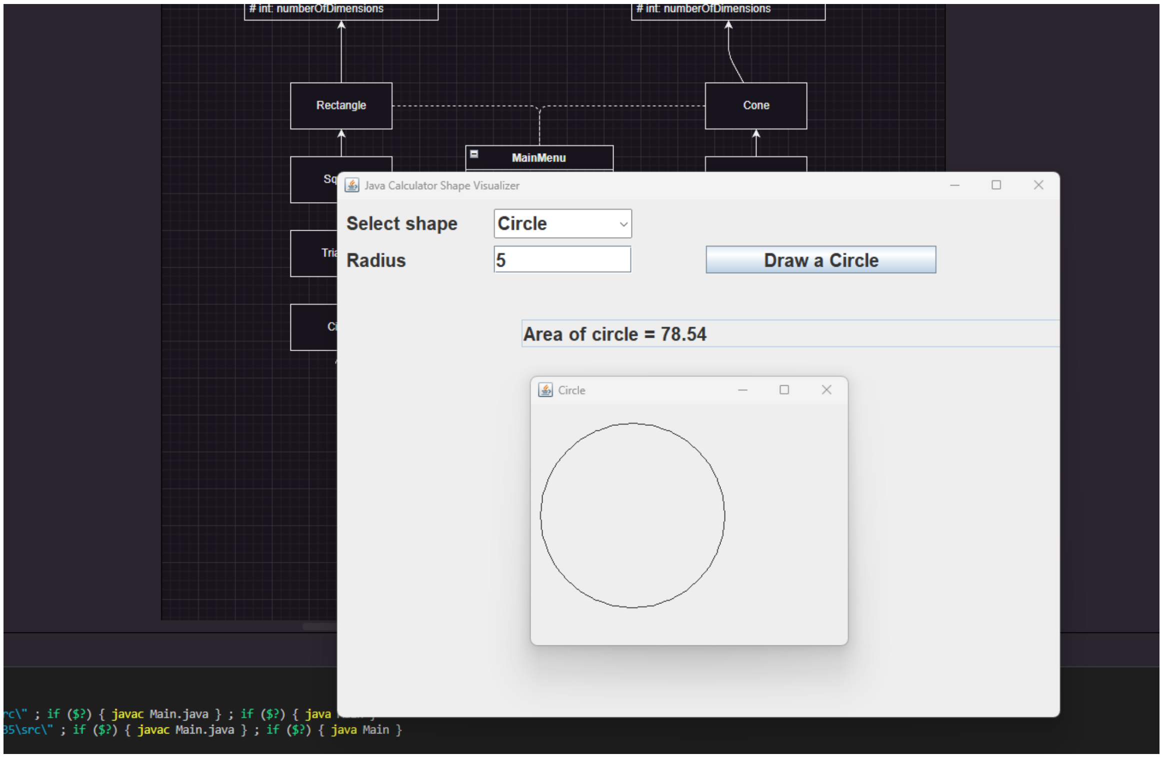
Test Case 1 - Circle

1. Circle | radius = 5

   Expected output: area of the circle is 78.54. Display of a Drawn Circle representing the input radius and area.

Figure 1:

Test case 1 - Circle



# int: numberOfDimensions
# int: numberOfDimensions
Rectangle
Cone
MainMenu
Sq
Tri
C
Java Calculator Shape Visualizer
Draw a Circle
Circle

Select shape: Circle

Radius: 5

Area of circle = 78.54

```
rc\" ; if ($?) { javac Main.java } ; if ($?) { java
35\src\" ; if ($?) { javac Main.java } ; if ($?) { java Main }
```

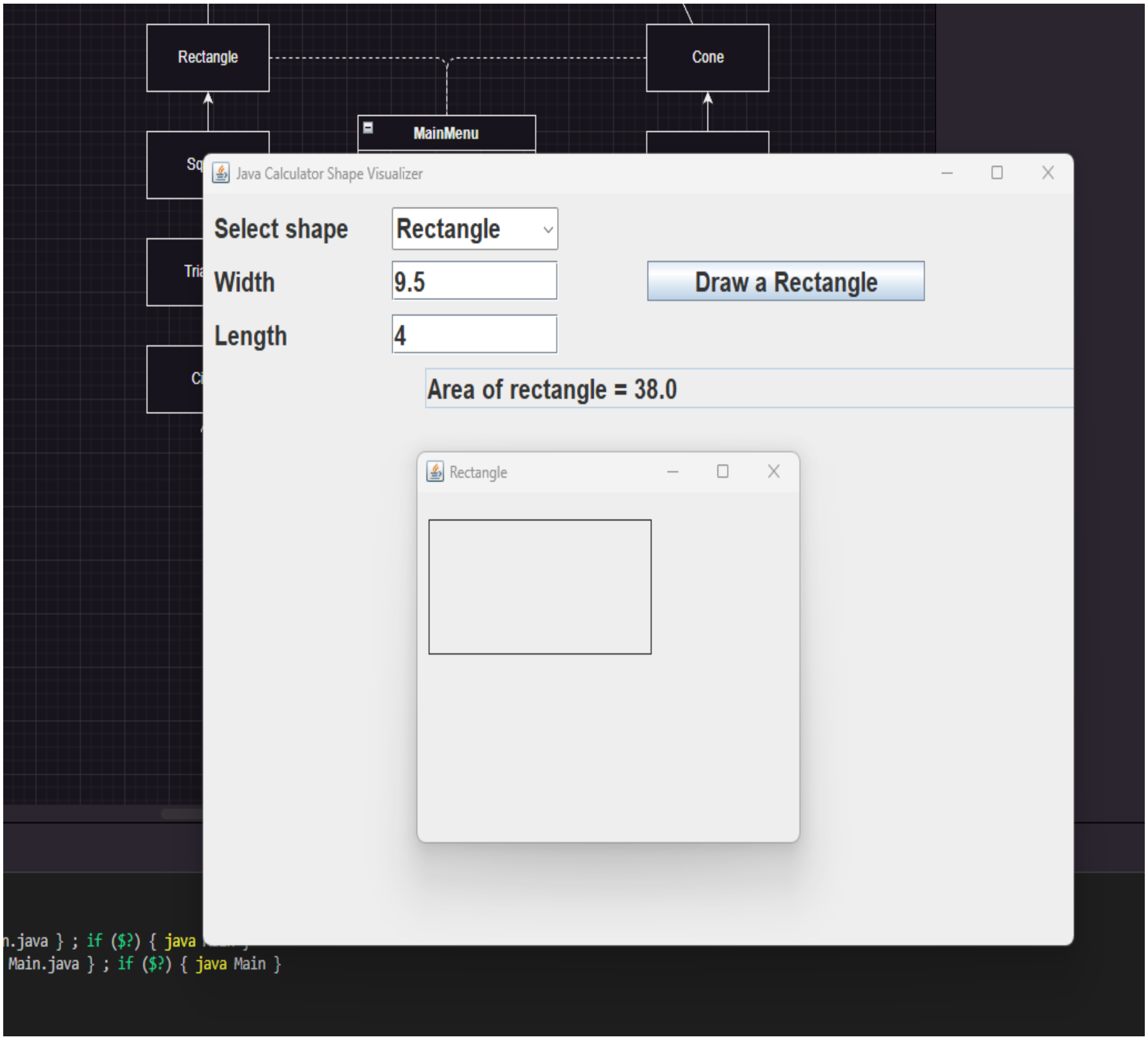
Test Case 2 - Rectangle

2. Rectangle| length = 4 | width = 9.5

   Expected output: area of the rectangle is 38.0. Display of a Drawn Rectangle representing the input and area.

Figure 2:

Test case 2 - Rectangle



Select shape: Rectangle

Width: 9.5

Length: 4

Area of rectangle = 38.0

```
n.java } ; if ($?) { java
 Main.java } ; if ($?) { java Main }
```

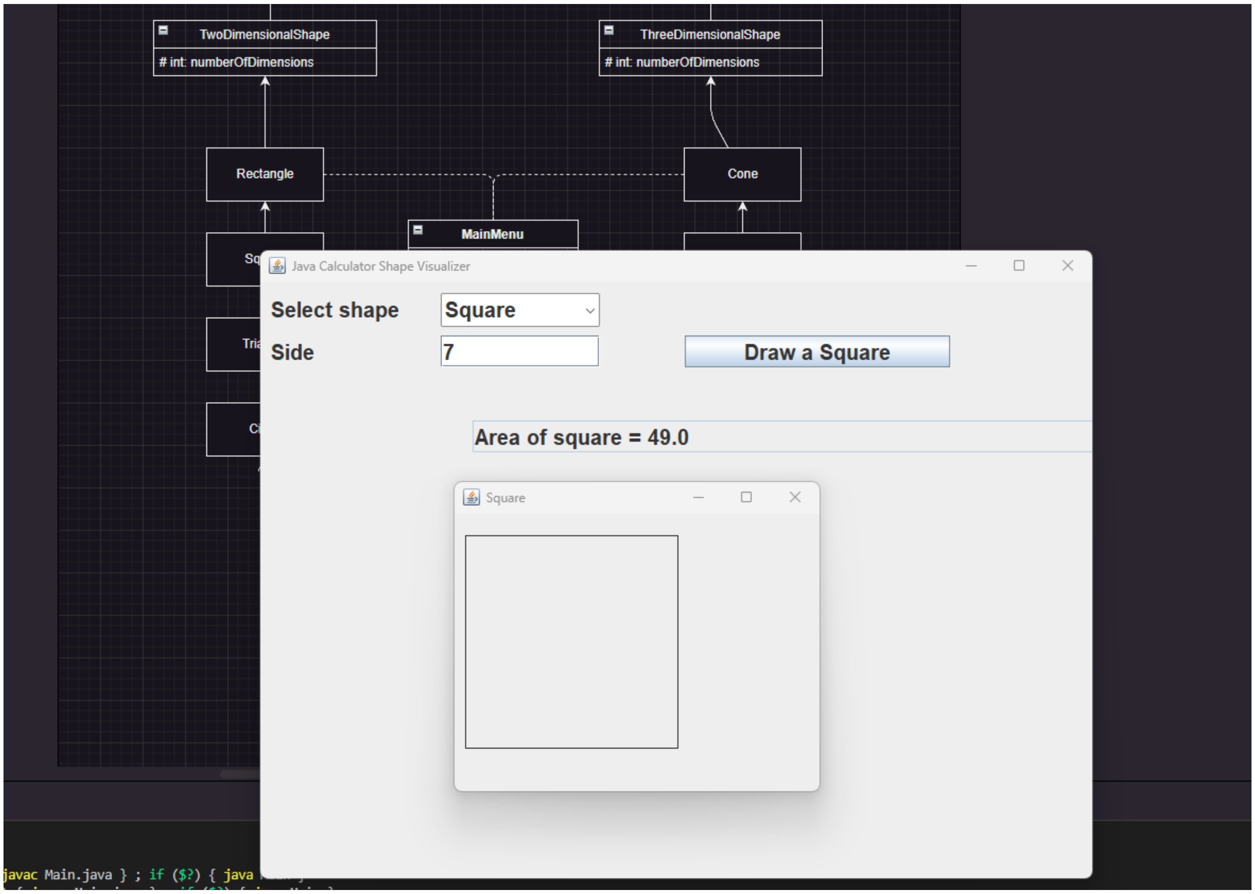
Test Case 3 - Square

3. Square | side = 7

   Expected output: area of the square is 49.0 Display of a Drawn Square representing the input and area.

Figure 3

Test case 3 – Square



Select shape Square

Side 7

Area of square = 49.0

```
javac Main.java } ; if ($?) { java
```

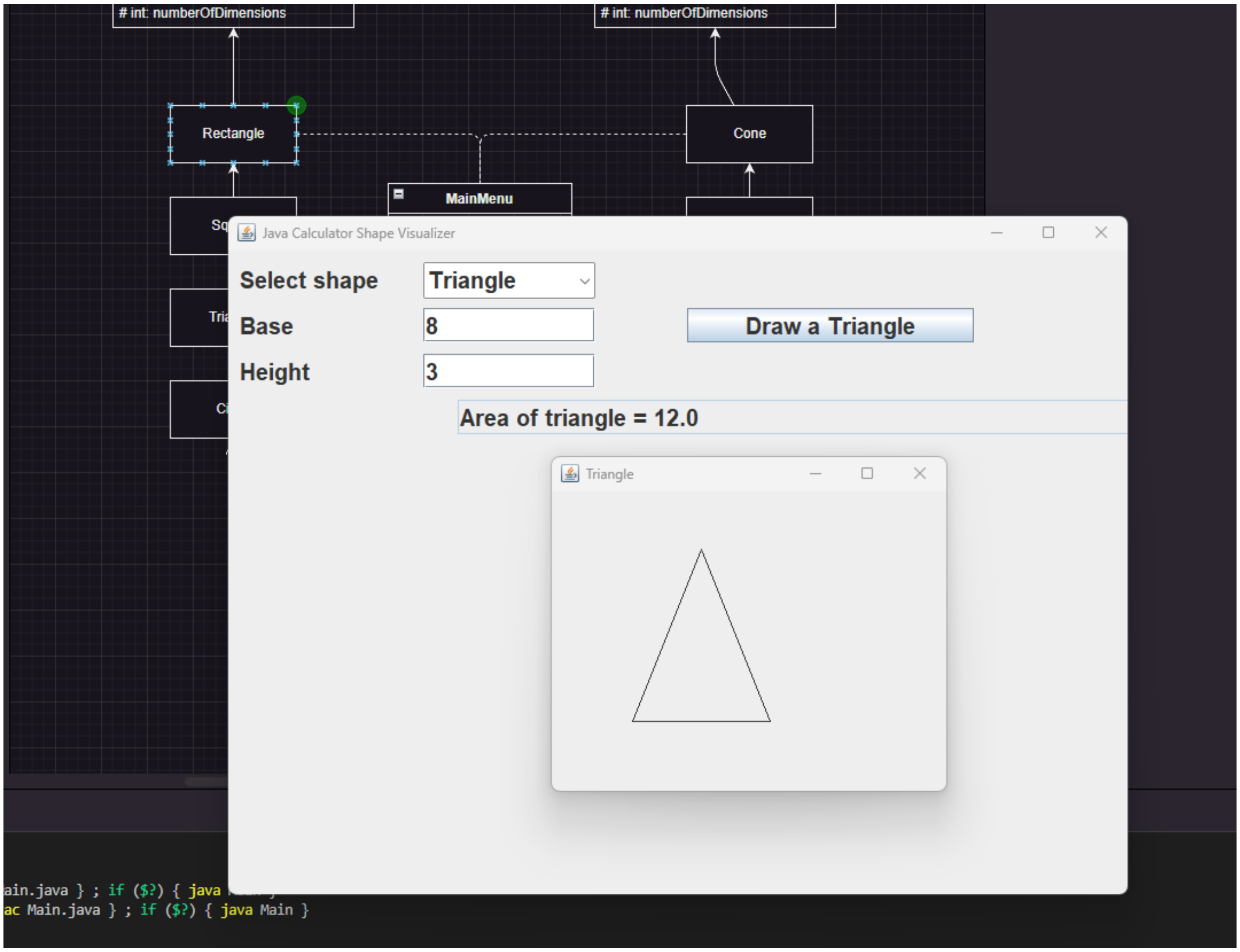
Test Case 4 - Triangle

4. Triangle | base = 8 | height = 3

   Expected output: area of the triangle is 12.0 Display of a Drawn Triangle representing the input and area.

Figure 4

Test case 4 – Triangle



# int: numberOfDimensions
# int: numberOfDimensions
Rectangle
Cone
MainMenu
Sq
Tri
Ci
Java Calculator Shape Visualizer
Draw a Triangle
Triangle

Select shape: Triangle

Base: 8

Height: 3

Area of triangle = 12.0

```
ain.java } ; if ($?) { java
ac Main.java } ; if ($?) { java Main }
```

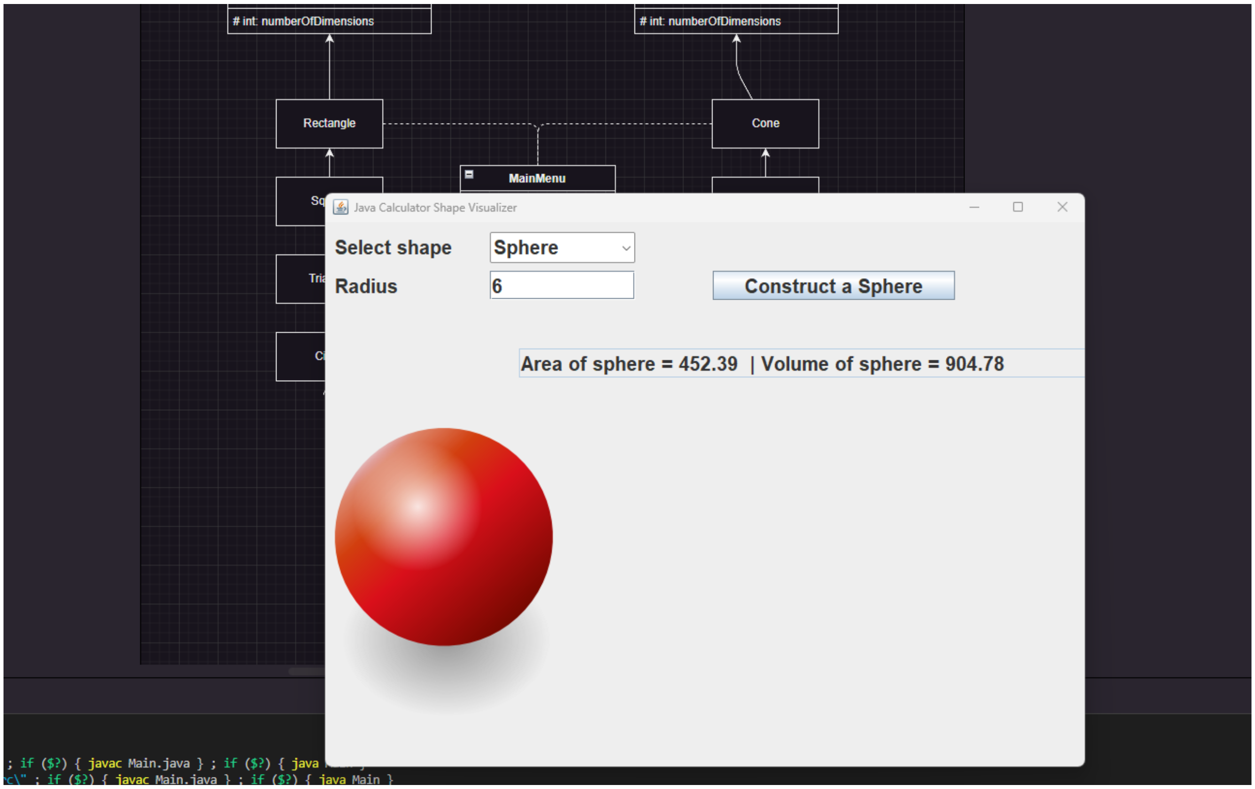
Test Case 5 - Sphere

5. Sphere | radius = 6

   Expected output: area of sphere = 452.39 | volume of sphere = 904.78 Display of an image representing the sphere.

Figure 5

Test case 5 - Sphere



# int: numberOfDimensions
# int: numberOfDimensions
Rectangle
Cone
MainMenu
Sq
Tri
Ci
Java Calculator Shape Visualizer
Construct a Sphere

Select shape: Sphere

Radius: 6

Area of sphere = 452.39 | Volume of sphere = 904.78

```
; if ($?) { javac Main.java } ; if ($?) { java
rc\" ; if ($?) { javac Main.java } ; if ($?) { java Main }
```

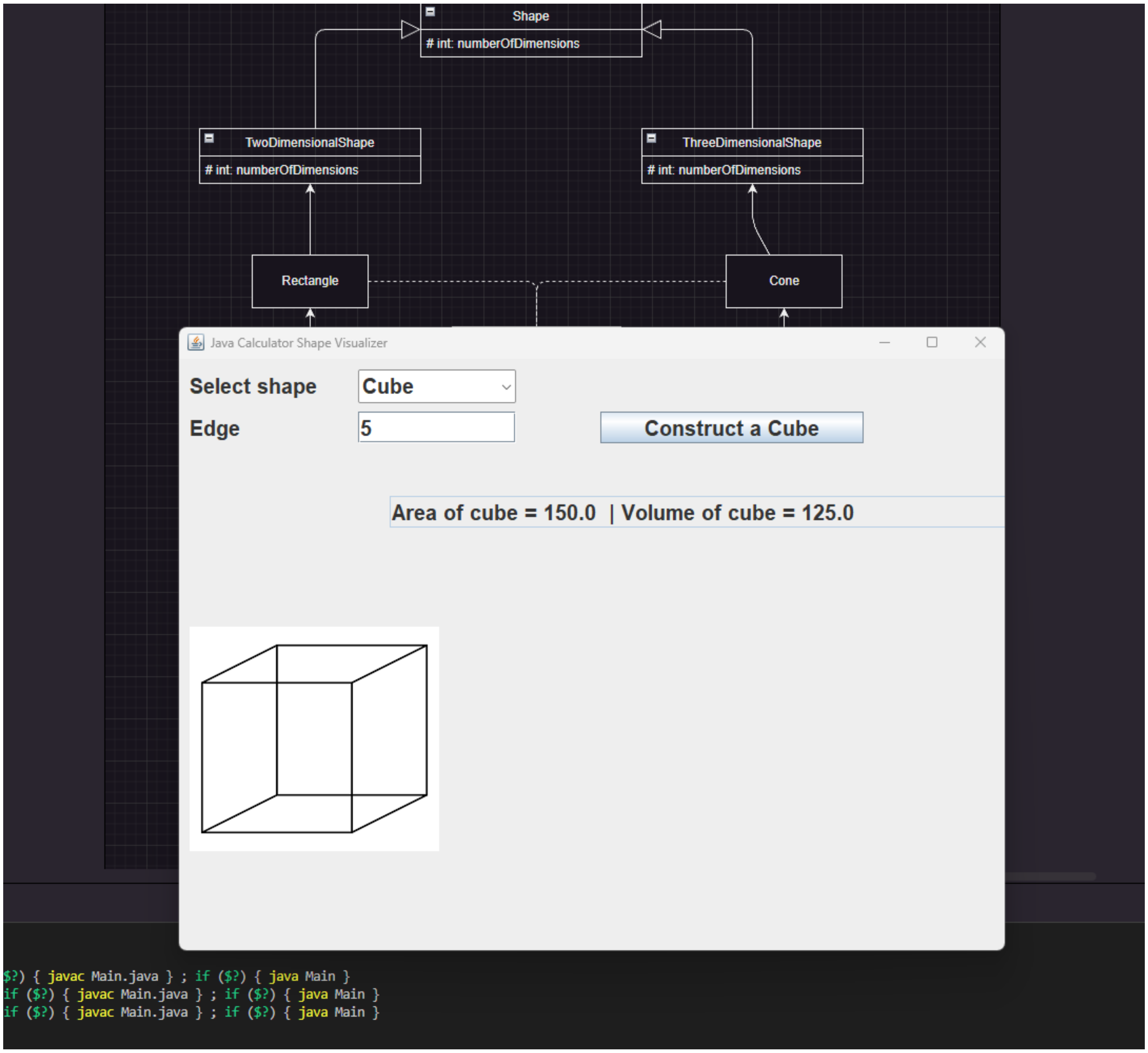
Test Case 6 - Cube

6. Cube | Edge = 5

   Expected output: area of a cube=150 volume of cube =125.0 Display of an image representing the cube.

Figure 6

Test case 6 – Cube


Shape
# int: numberOfDimensions
TwoDimensionalShape
# int: numberOfDimensions
ThreeDimensionalShape
# int: numberOfDimensions
Rectangle
Cone
Java Calculator Shape Visualizer
Construct a Cube

Select shape: Cube

Edge: 5

Area of cube = 150.0 | Volume of cube = 125.0

```
$?) { javac Main.java } ; if ($?) { java Main }
if ($?) { javac Main.java } ; if ($?) { java Main }
if ($?) { javac Main.java } ; if ($?) { java Main }
```

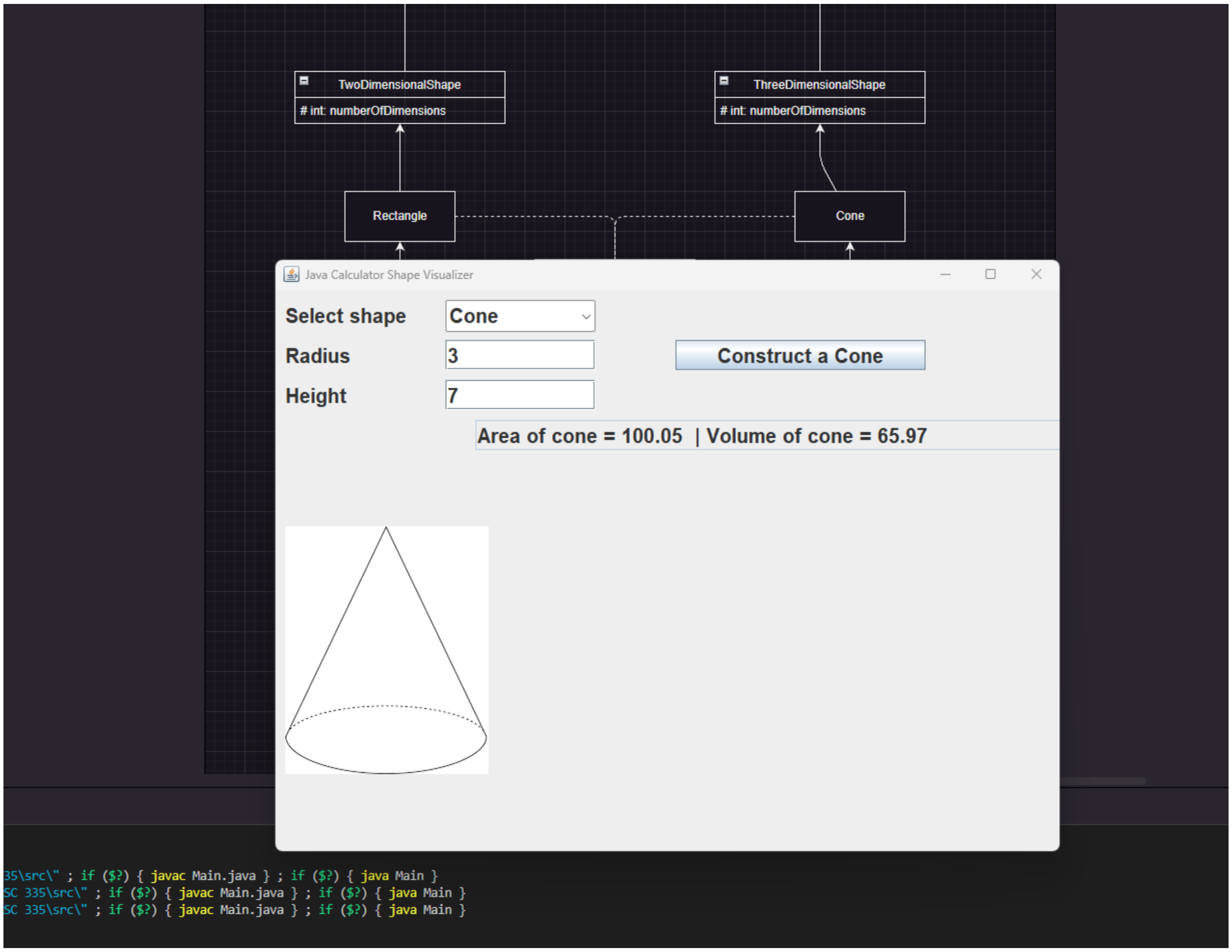
Test Case 7 - Cone

7. Cone | radius = 3 | height = 7

   Expected output: area of cone =100.5 volume of the cone = 65.97. Display of an image representing the cone.

Figure 7

Test case 7 – Cone


TwoDimensionalShape
# int: numberOfDimensions
ThreeDimensionalShape
# int: numberOfDimensions
Rectangle
Cone
Java Calculator Shape Visualizer
Construct a Cone

Select shape: Cone

Radius: 3

Height: 7

Area of cone = 100.05 | Volume of cone = 65.97

```
35\src\" ; if ($?) { javac Main.java } ; if ($?) { java Main }
SC 335\src\" ; if ($?) { javac Main.java } ; if ($?) { java Main }
SC 335\src\" ; if ($?) { javac Main.java } ; if ($?) { java Main }
```

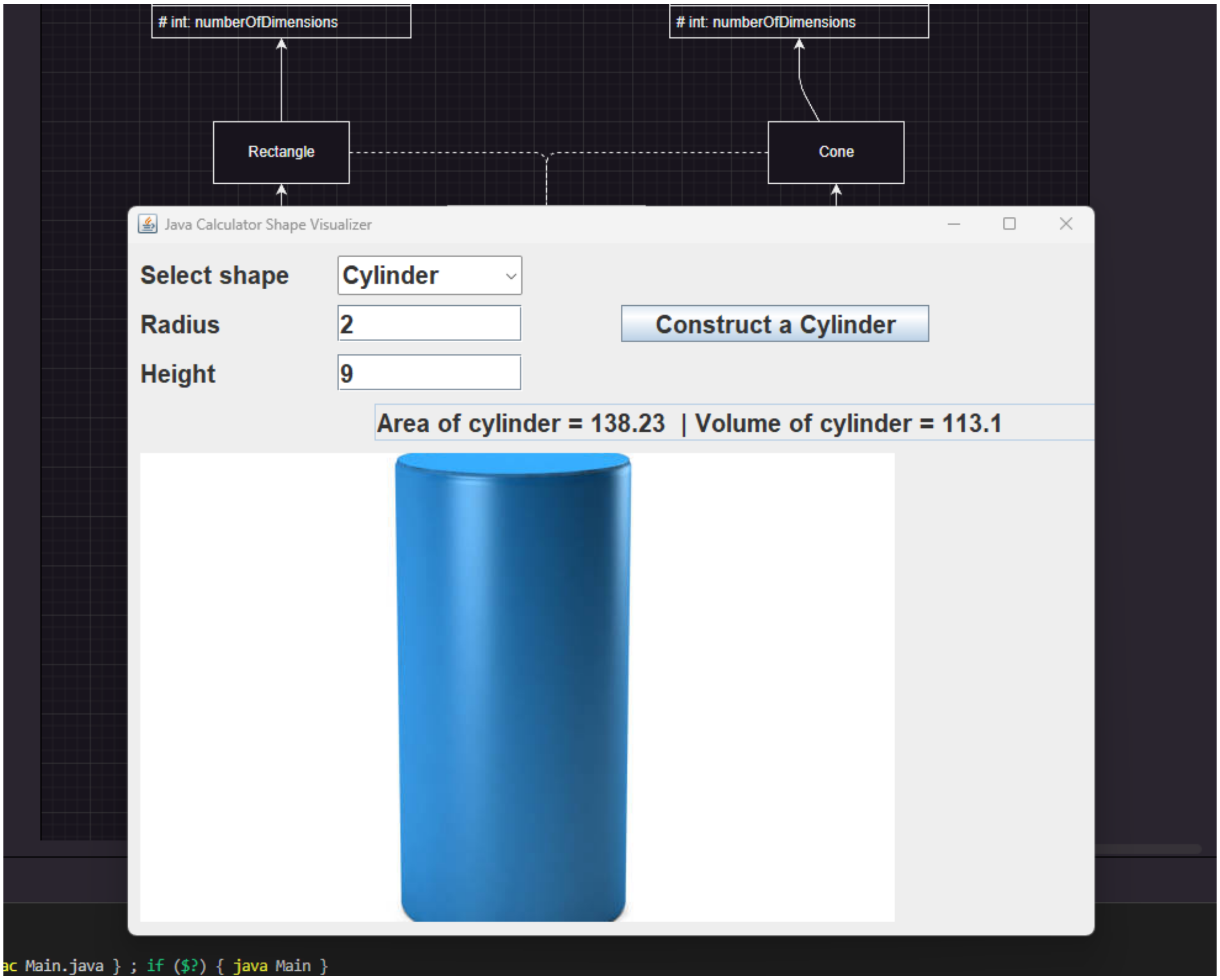
Test Case 8 - Cylinder

8. Cylinder | radius = 2 | height = 9

   Expected output: area of cylinder =138.23 volume of the cylinder = 113.10 Display of an image representing the cylinder.

Figure 8

Test case 8 – Cylinder



# int: numberOfDimensions
# int: numberOfDimensions
Rectangle
Cone
Java Calculator Shape Visualizer
Construct a Cylinder

Select shape: Cylinder

Radius: 2

Height: 9

```
Area of cylinder = 138.23  | Volume of cylinder = 113.1
```

```
ac Main.java } ; if ($?) { java Main }
```

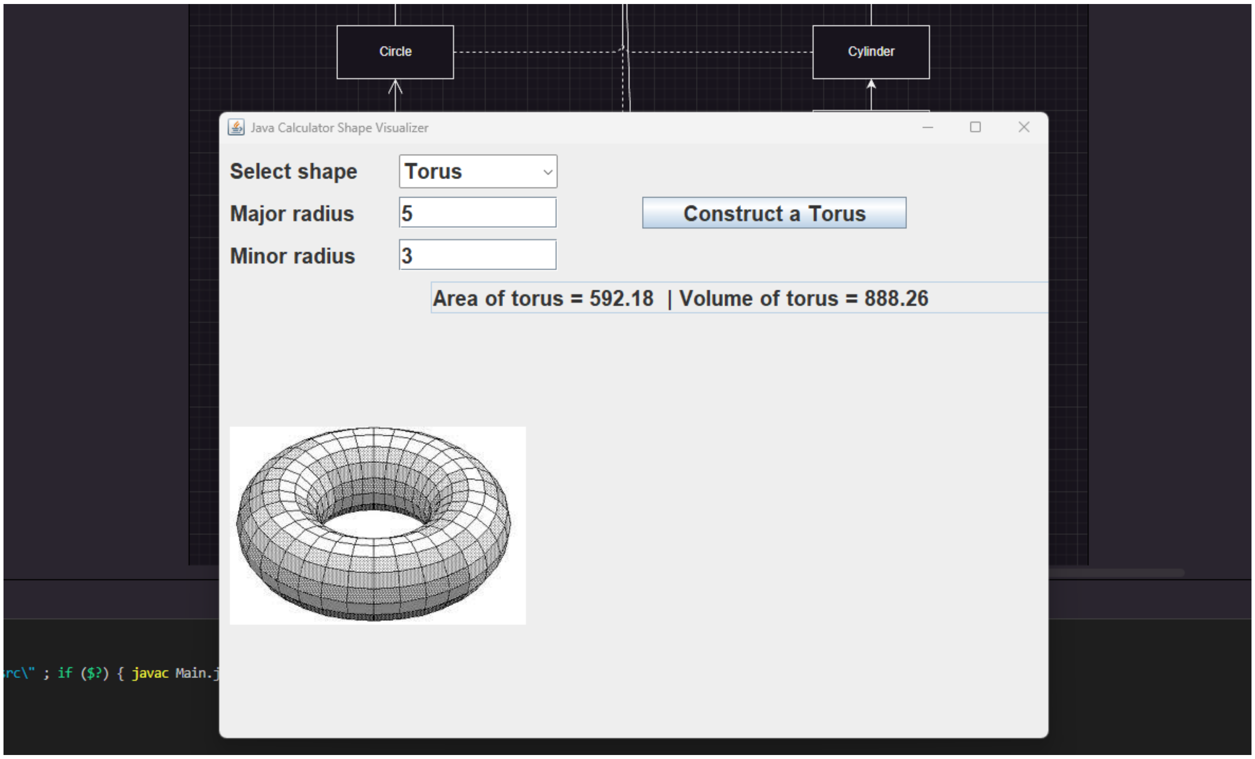
Test Case 9 - Torus

9. Torus | major radius = 5 | minor radius = 3

   Expected output: area of torus =592.18 volume of the torus is 88.26 Display of an image representing the torus.

Figure 9

Test case 9 – Torus



Select shape: Torus

Major radius: 5

Minor radius: 3

```
Area of torus = 592.18  | Volume of torus = 888.26
```

```
rc\" ; if ($?) { javac Main.j
```

Testing Valid Input

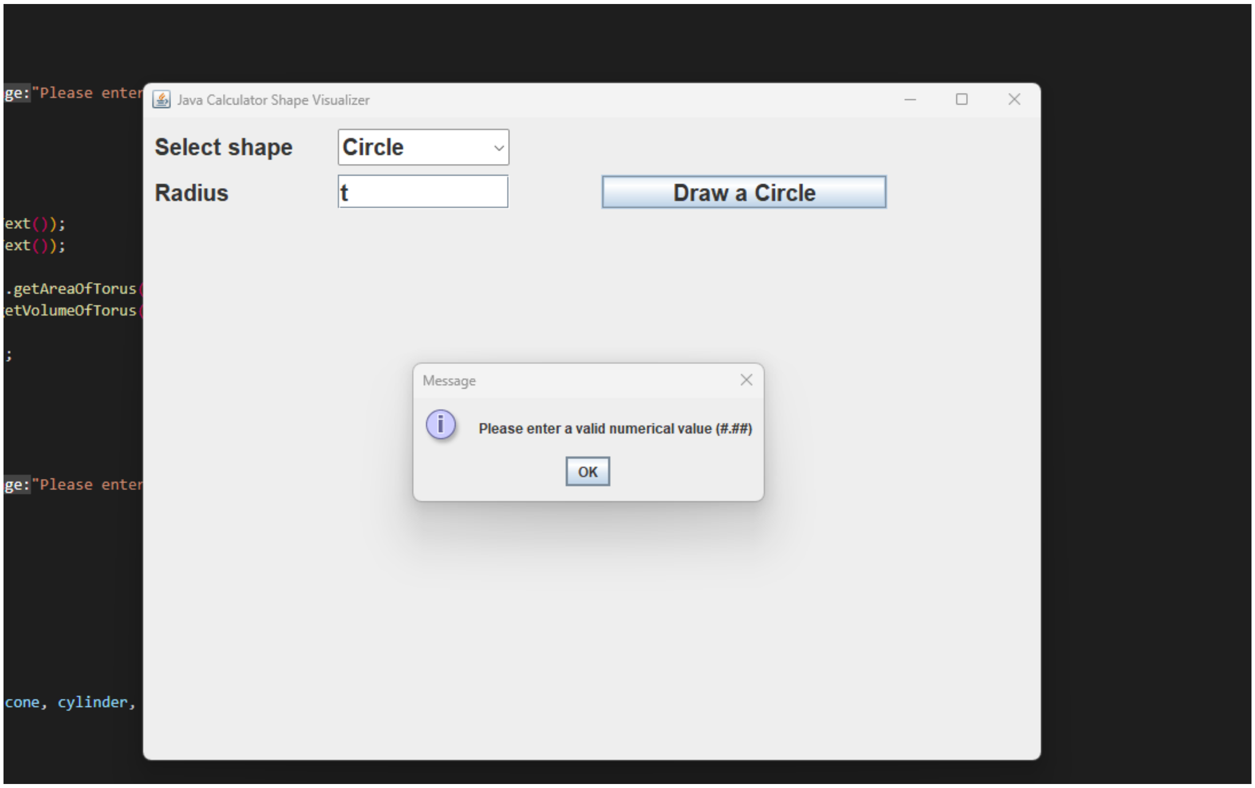
Test Case 10 – Invalid Circle

10. Circle | radius = t

Expected output: Error message for invalid input

Figure 10

Test case 10 – Invalid input for a Circle



Select shape: Circle

Radius: t

Please enter a valid numerical value (#.##)

```
ge:"Please enter


ext());
ext());

.getAreaOfTorus
etVolumeOfTorus

;


ge:"Please enter


cone, cylinder,
```

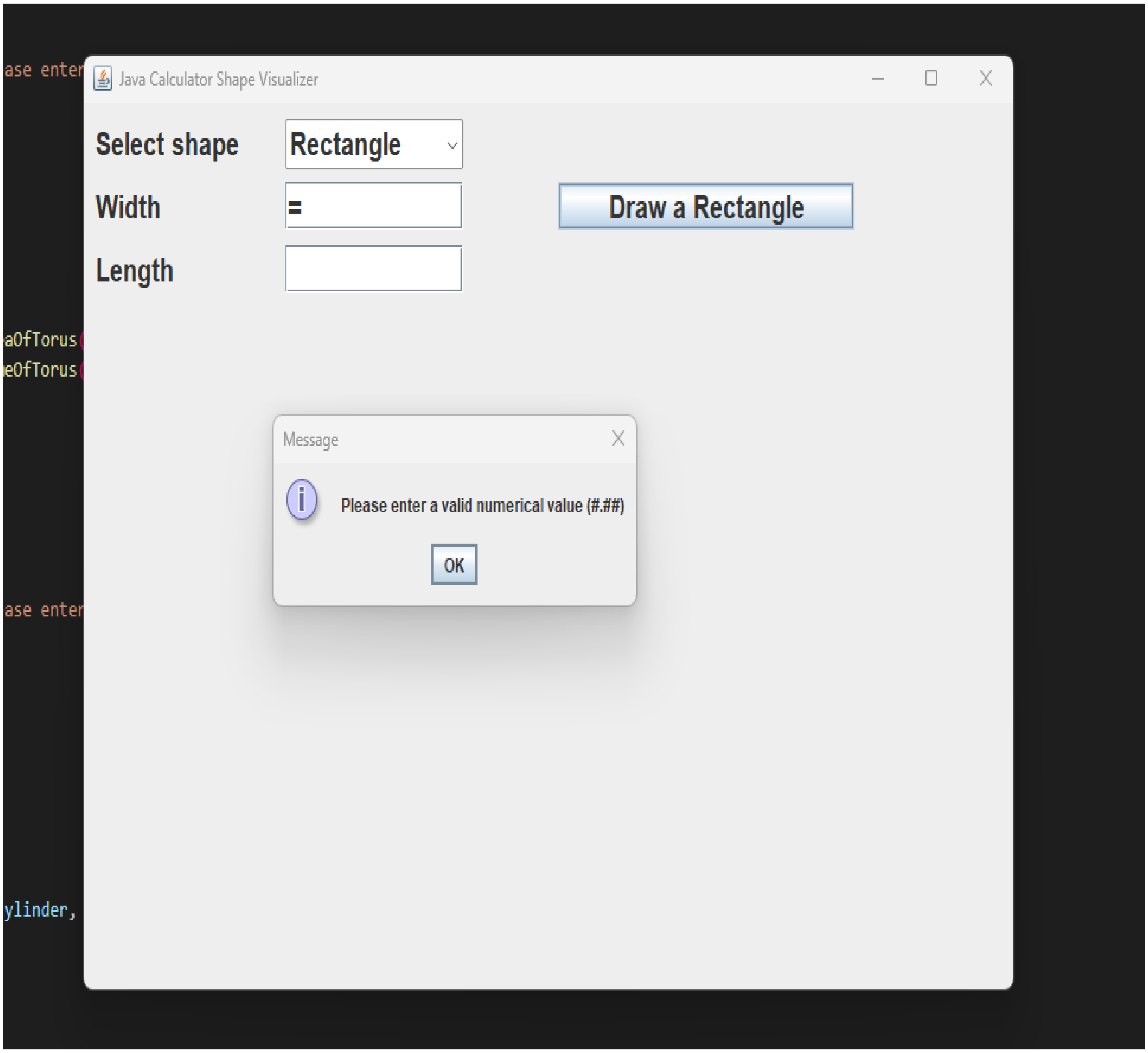
Test Case 11 – Invalid Rectangle

11. Rectangle | Wdith = =

Expected output: Error message for invalid input

Figure 11

Test case 11 – Invalid input for a Rectangle



Select shape Rectangle

Width =

Length

Please enter a valid numerical value (#.##)

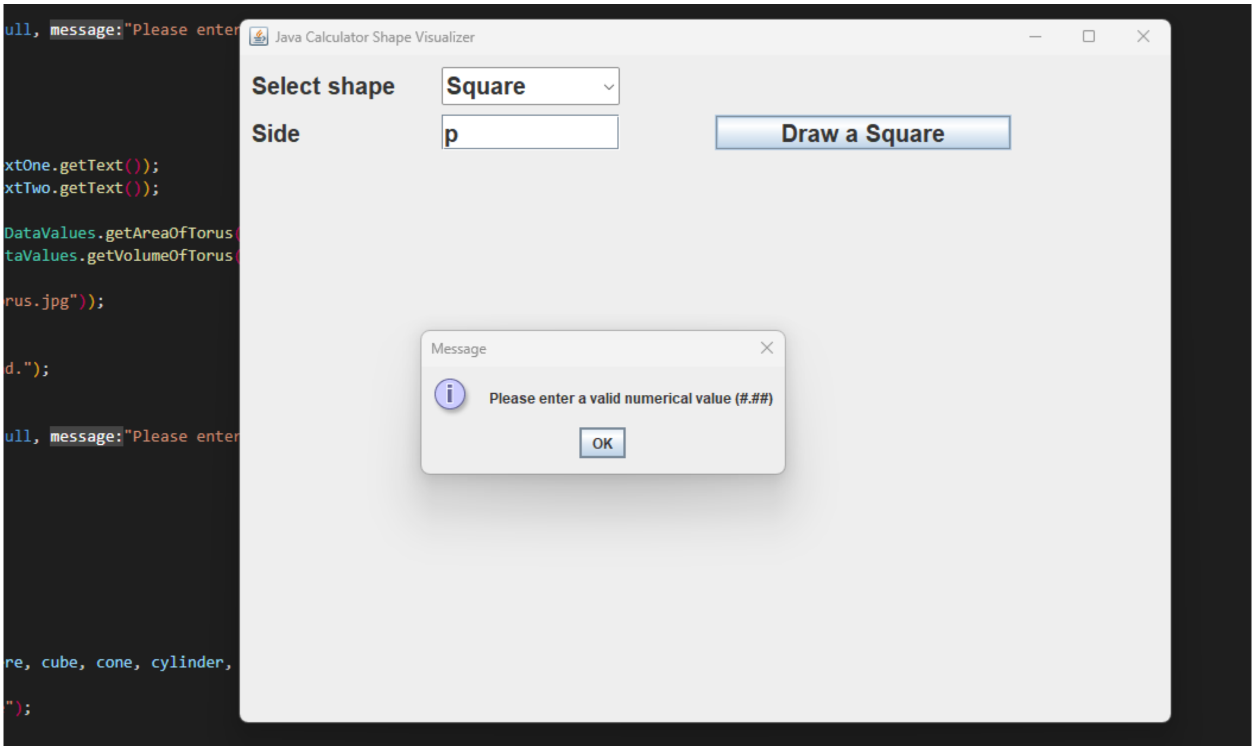
Test Case 12 – Invalid Square

12. Square | side = p

Expected output: Error message for invalid input

Figure 12

Test case 12 – Invalid input for a Square



```
ull, message:"Please enter



xtOne.getText());
xtTwo.getText());

DataValues.getAreaOfTorus(
taValues.getVolumeOfTorus(

rus.jpg"));


d.");


ull, message:"Please enter






re, cube, cone, cylinder,

");
```

Select shape: Square

Side: p

Please enter a valid numerical value (#.##)

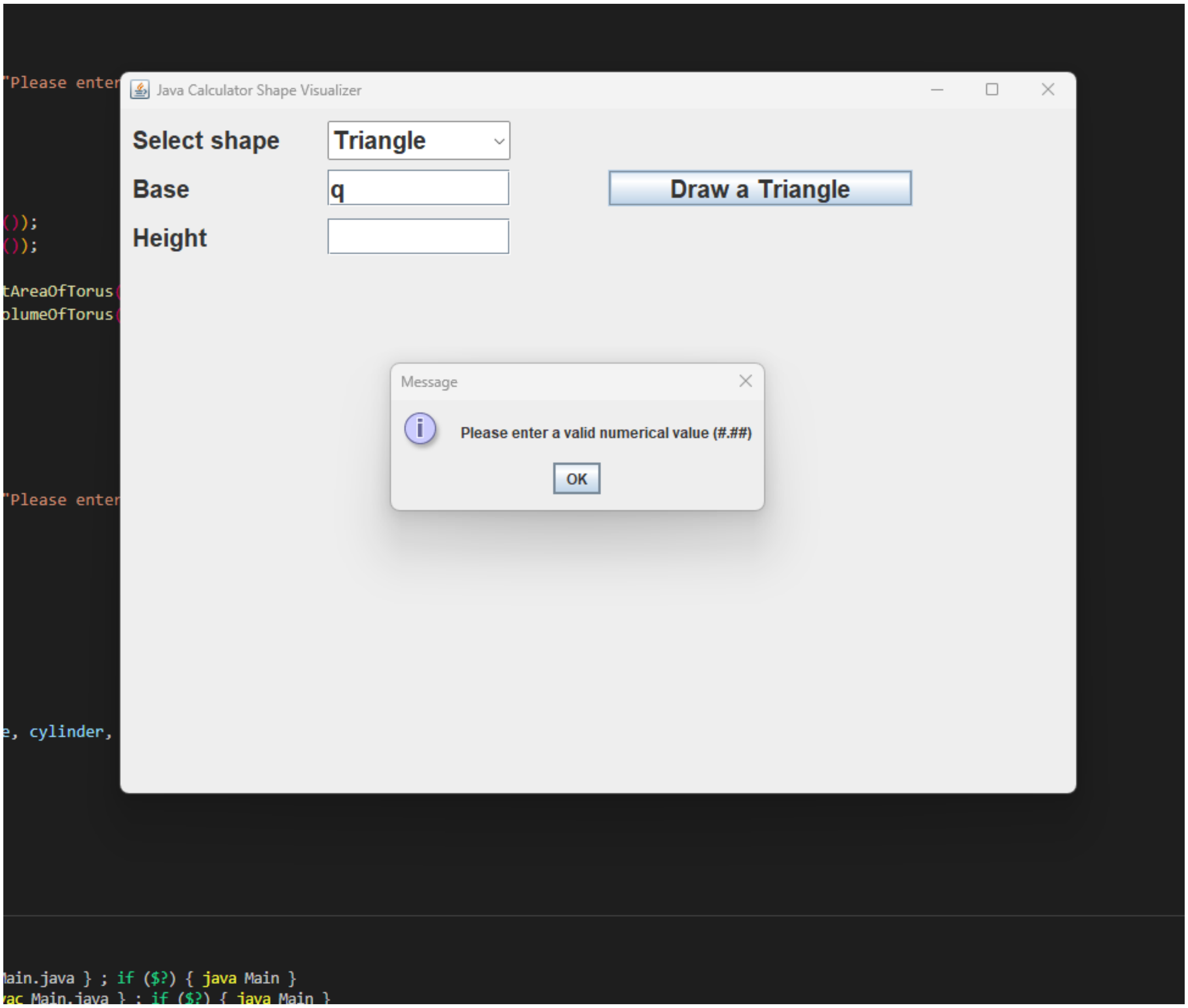
Test Case 13 – Invalid Triangle

13. Triangle | Base = q

Expected output: Error message for invalid input

Figure 13

Test case 13 – Invalid input for a Triangle



Select shape: Triangle

Base: q

Height:

Please enter a valid numerical value (#.##)

```
"Please enter
());
());
tAreaOfTorus
olumeOfTorus
"Please enter
e, cylinder,
lain.java } ; if ($?) { java Main }
vac Main.java } ; if ($?) { java Main }
```

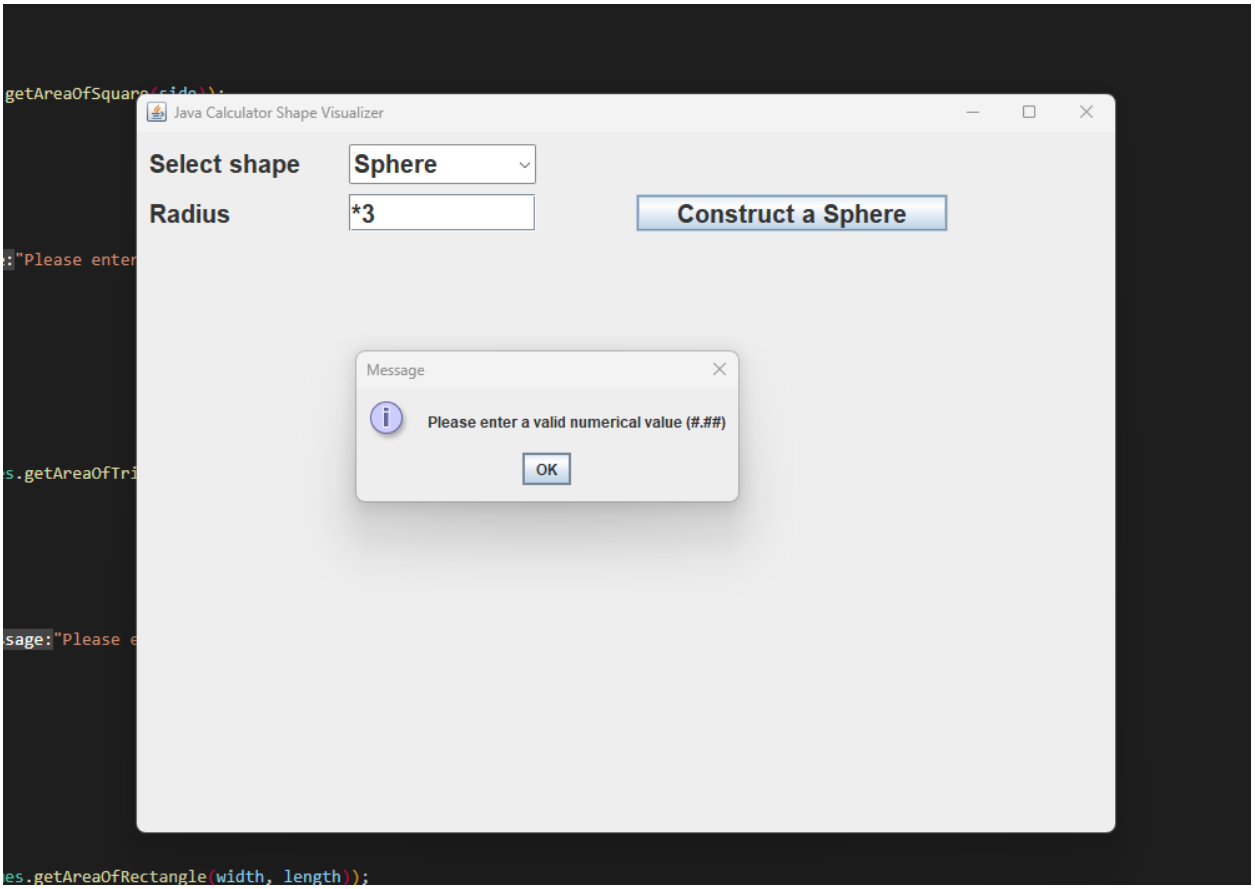
Test Case 14– Invalid Sphere

14. Sphere | radius = *3 | continue? = y

Expected output: Error message for invalid input

Figure 14

Test case 14 – Invalid input for a Sphere



```
getAreaOfSquare(side));
:"Please enter
s.getAreaOfTri
sage:"Please e
es.getAreaOfRectangle(width, length));
```

Select shape: Sphere

Radius: *3

Please enter a valid numerical value (#.##)

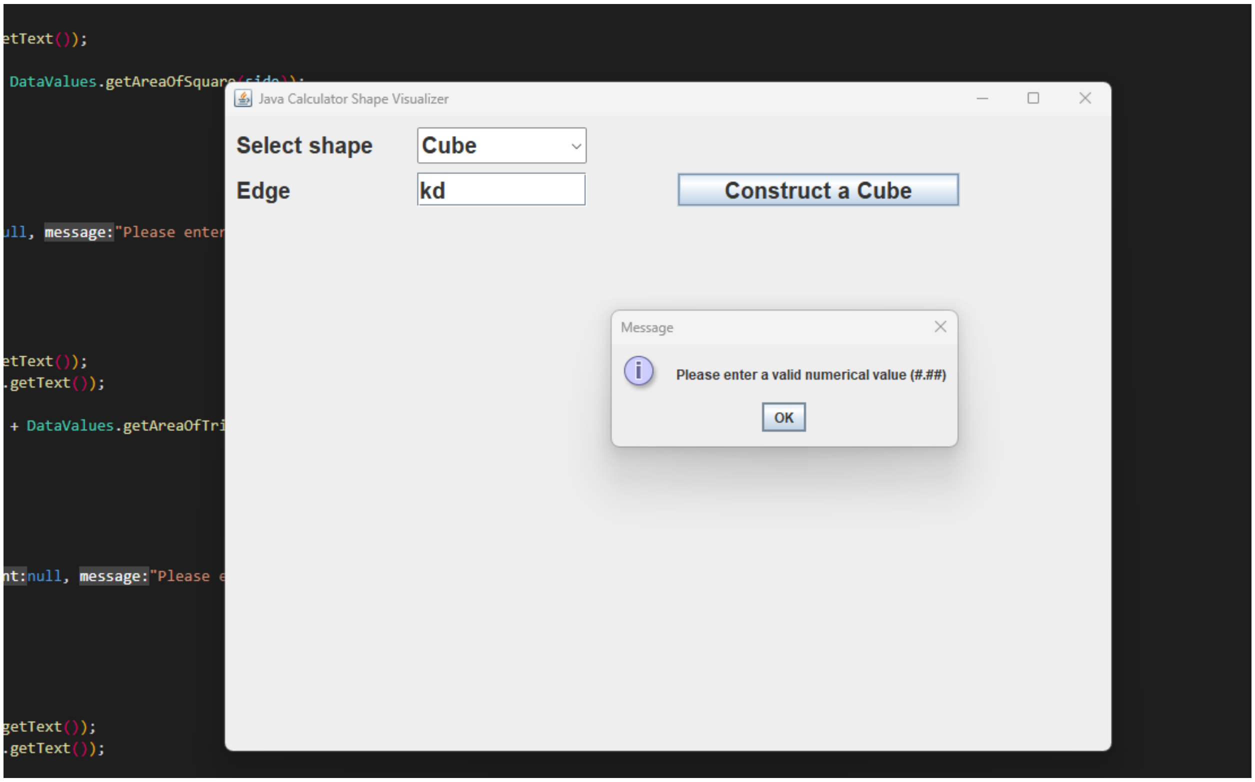
Test Case 15 – Invalid Cube

15. Cube | Edge = kd

Expected output: Error message for invalid input

Figure 15

Test case 15 – Invalid input for a Cube



```
etText());
 DataValues.getAreaOfSquare(side));

ull, message:"Please enter

etText());
.getText());
 + DataValues.getAreaOfTri

nt:null, message:"Please e

getText());
.getText());
```

Java Calculator Shape Visualizer

Select shape: Cube

Edge: kd

Message

Please enter a valid numerical value (#.##)

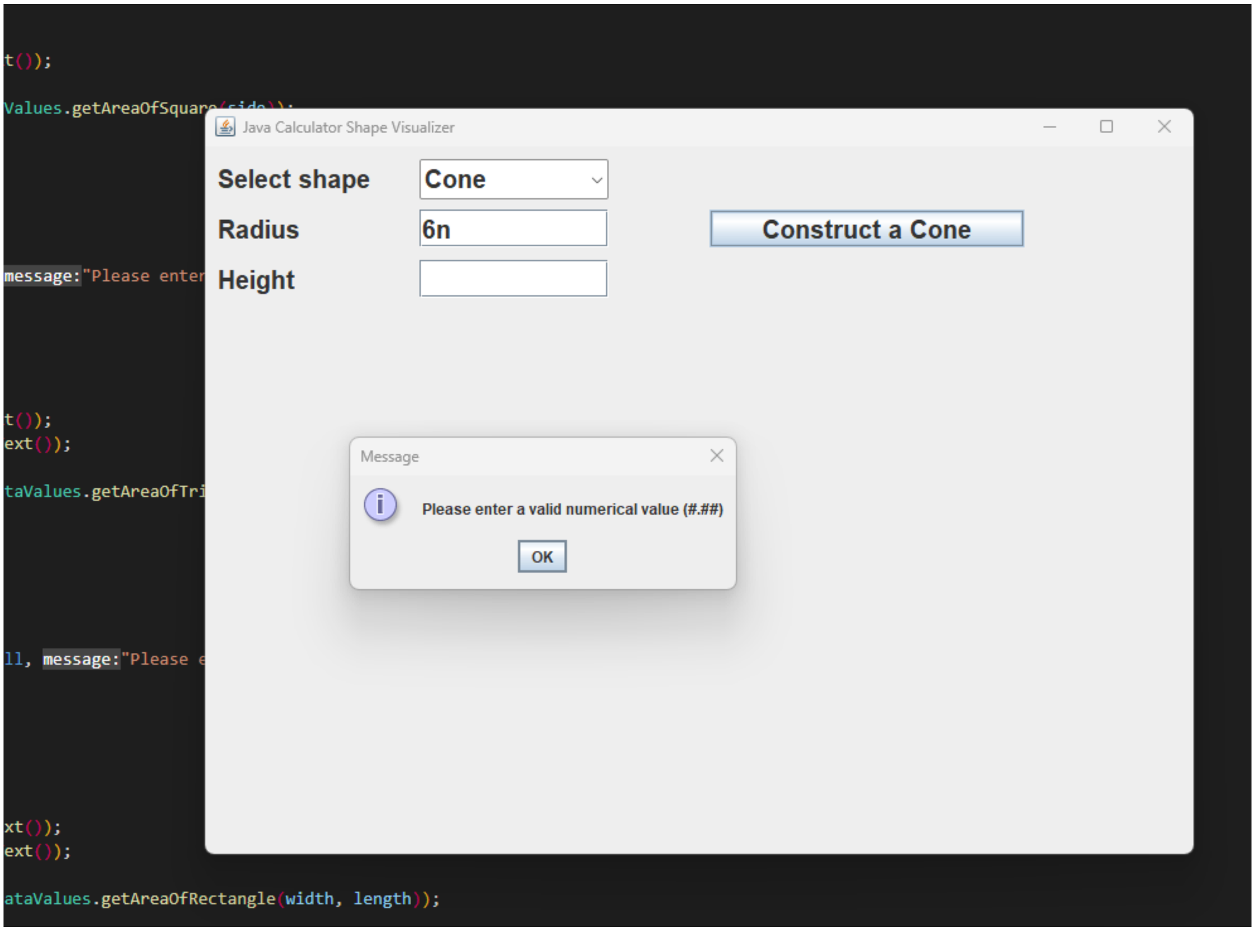
Test Case 16 – Invalid Cone

16. Cone| radius = 6n

Expected output: Error message for invalid input

Figure 16

Test case 16 – Invalid input for a Cone



```
t());

Values.getAreaOfSquare(side));

message:"Please enter

t());
ext());

taValues.getAreaOfTri

ll, message:"Please e

xt());
ext());

ataValues.getAreaOfRectangle(width, length));
```

Select shape: Cone

Radius: 6n

Height:

Message

Please enter a valid numerical value (#.##)

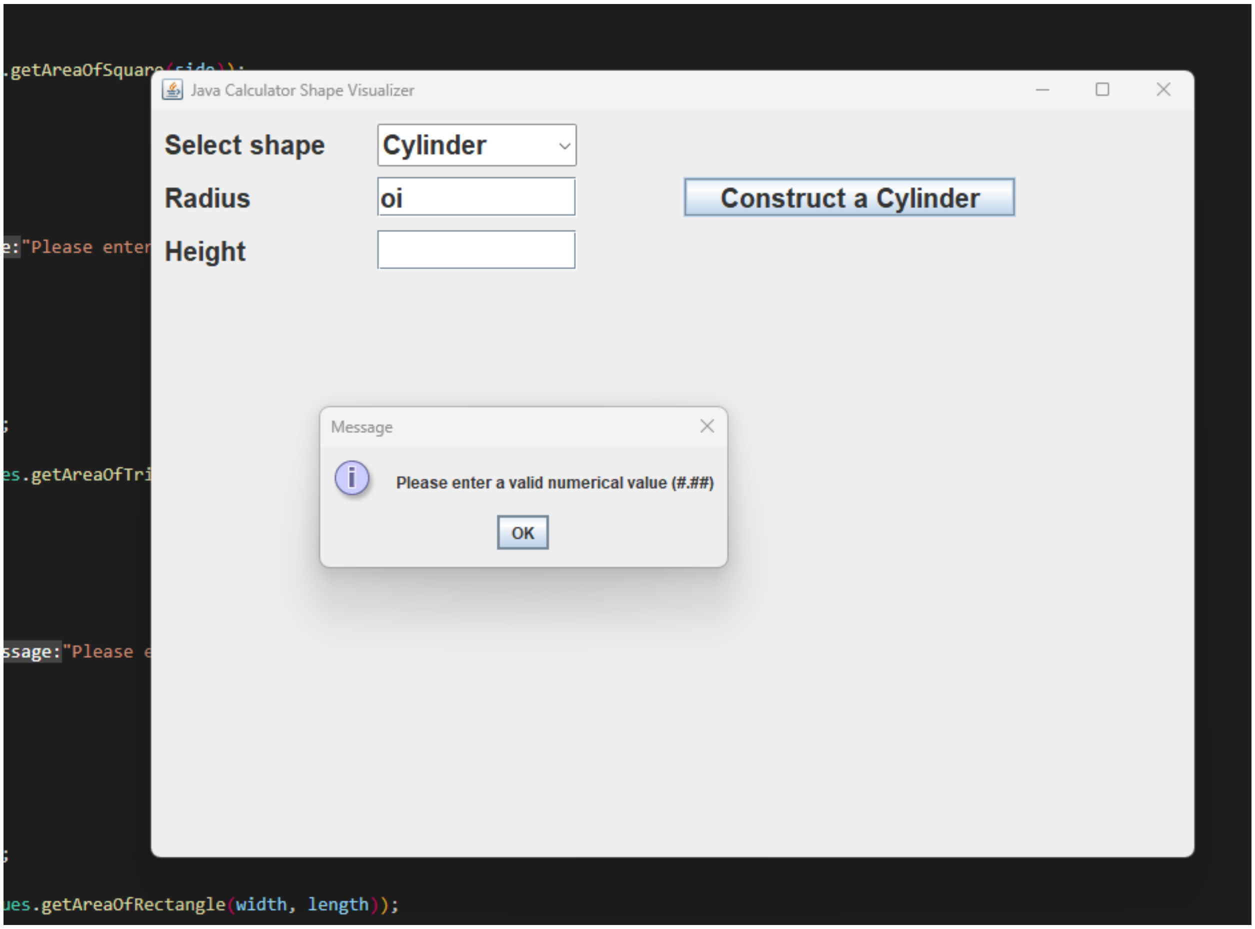
Test Case 17 – Invalid Cylinder

17. Cylinder | radius = oi| continue? = y

Expected output: Error message for invalid input

Figure 17

Test case 17 – Invalid input for a Cylinder



```
.getAreaOfSquare(side));
e:"Please enter
;
es.getAreaOfTri
ssage:"Please e
;
ues.getAreaOfRectangle(width, length));
```

Select shape: Cylinder

Radius: oi

Height:

Please enter a valid numerical value (#.##)

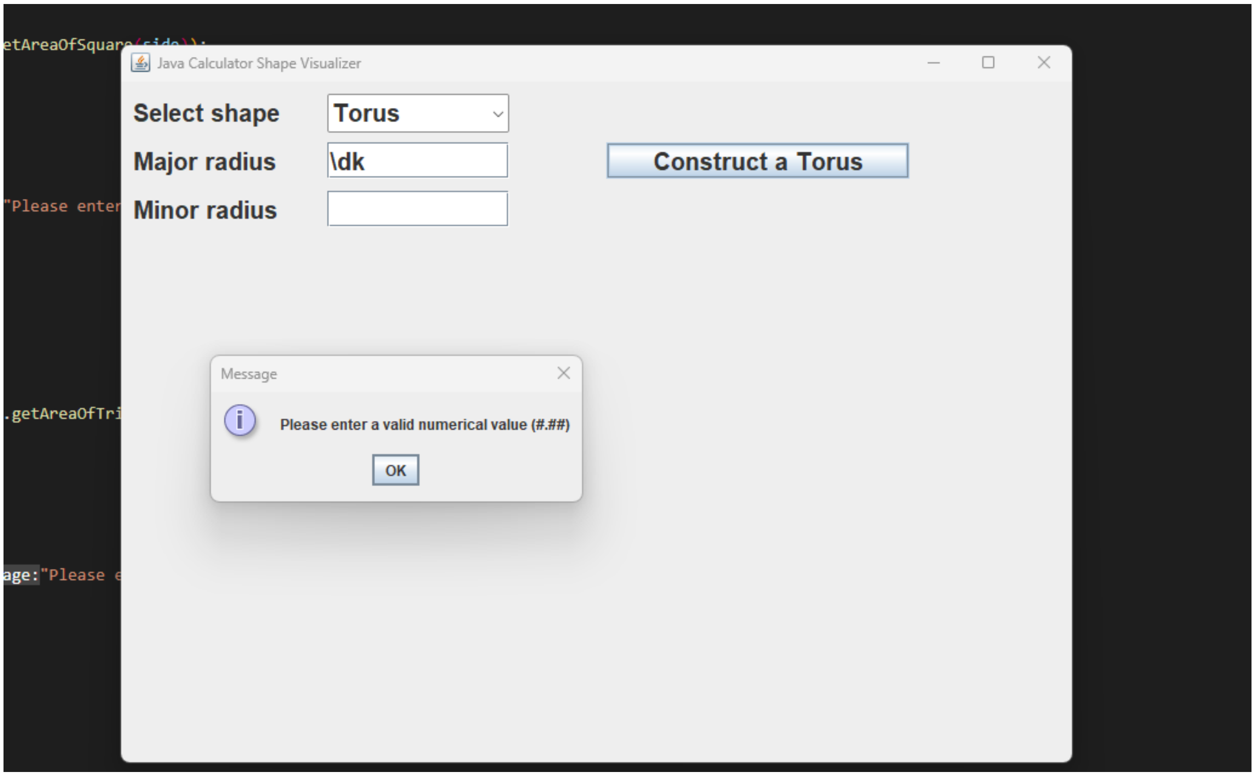
Test Case 18 – Invalid Torus

18. Torus | radius = \dk|

Expected output: Error message for invalid input

Figure 18

Test case 19 – Invalid input for a Torus and continuation of program



```
etAreaOfSquare(side));
"Please enter
.getAreaOfTri
age:"Please e
```

Select shape: Torus

Major radius: \dk

Minor radius:

Please enter a valid numerical value (#.##)