ECSE 428 – Software Engineering Practice Assignment B: Test Driven Development Winter 2014

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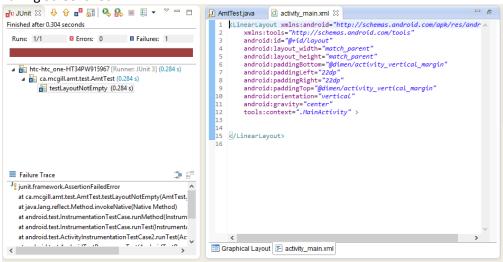
Domain Logic Tests

1. The layout contains any number of elements

Check if the application is properly formatted by verifying that that elements appear on screen Setup: None

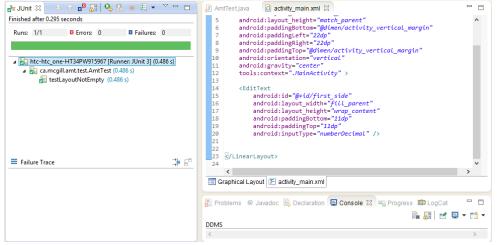
Expected Result: The layout should have elements in which the user can input their specifications

Failing Screenshot:



Code added

```
<EditText
android:id="@+id/first_side"
android:layout_width="fill_parent"
android:layout_height="wrap_content"
android:paddingBottom="11dp"
android:paddingTop="11dp"
android:hint="@+string/enter_first_side"
android:inputType="numberDecimal" />
```



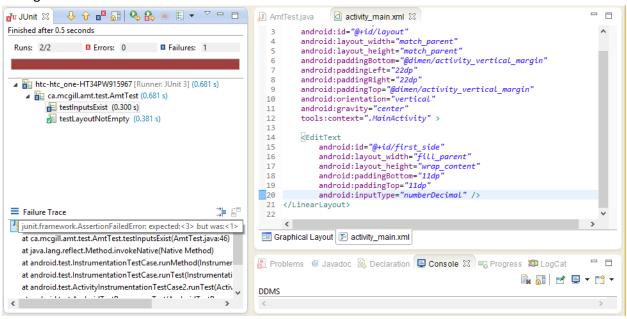
2. Three input fields exist

Verify that the input fields for the user exist

Setup: None

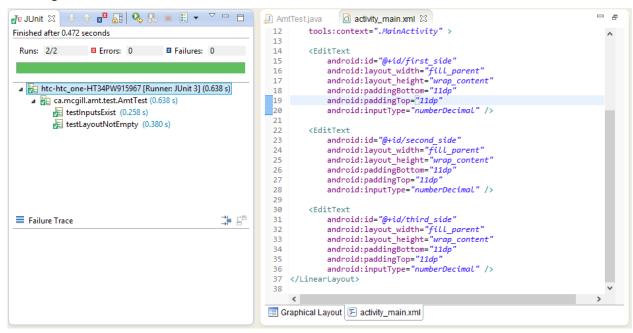
Expected result: The layout should contain three input fields, one for each side of the triangle

Failing Screenshot:



Code added:

```
<EditText
  android:id="@+id/second side"
  android:layout width="fill parent"
  android:layout_height="wrap_content"
  android:paddingBottom="11dp"
  android:paddingTop="11dp"
  android:hint="@+string/enter second side"
  android:inputType="numberDecimal" />
 <EditText
  android:id="@+id/third side"
  android: layout width="fill parent"
 android:layout height="wrap content"
  android:paddingBottom="11dp"
  android:paddingTop="11dp"
  android:hint="@+string/enter third side"
        android:inputType="numberDecimal" />
```

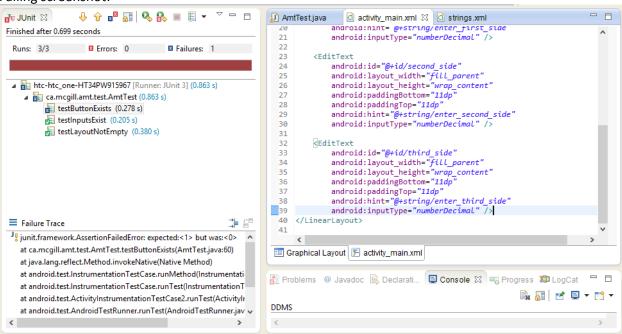


3. Submit button exists

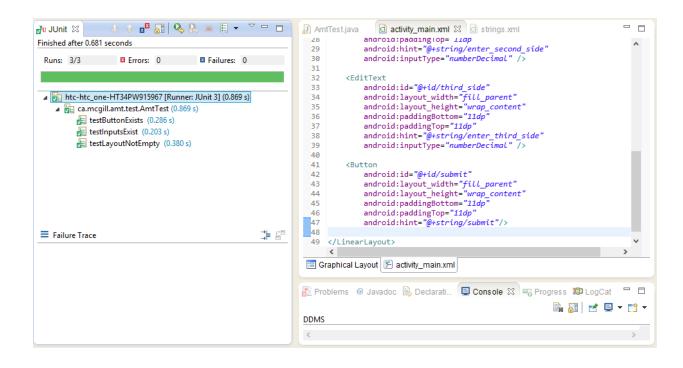
Setup: None

Expected result: The activity should display a button that a user presses to obtain a result for their input

Failing screenshot:



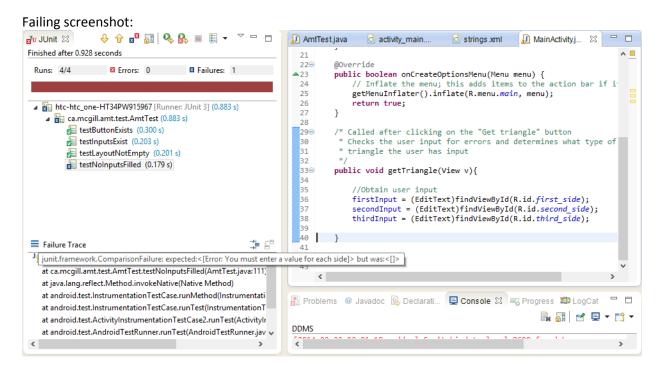
Code added:



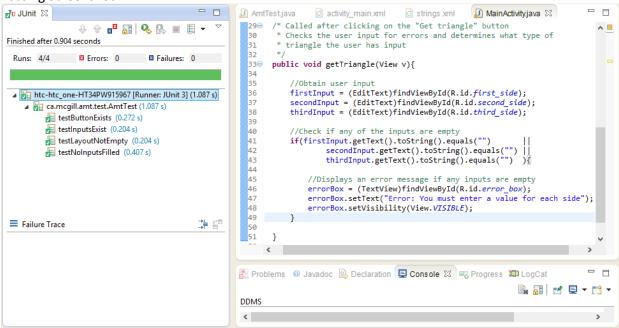
User Error Tests

1. None of the inputs are filled

Setup: Each input is left blank, then the submit button is pressed Expected result: An error message appears telling the user that all inputs must be filled



Code added:



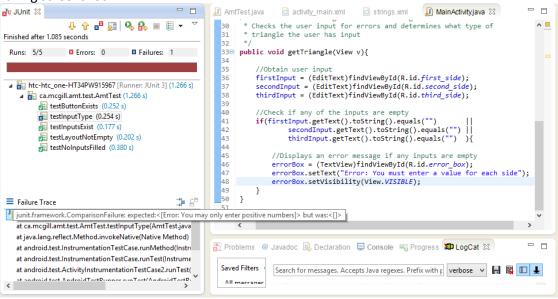
2. The input type is invalid

Verify that the user can only enter whole numbers

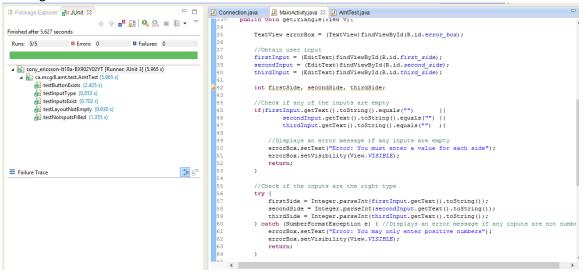
Setup: Input characters and negative numbers into the text fields

Expected Result: An error message appears telling the user they must only enter whole numbers

Failing screenshot:



Code added:



3. The input is out of bounds

The user must input numbers between 1 and 100 inclusive
Setup: Set values to numbers outside of the valid range
Expected Result: A message appears telling the user that they must only enter numbers between 1 and 100 inclusive

Failing screenshot:

```
Package Explorer du JUnit ⊠
                                                   _ _
                                                               🔝 MainActivity.java 🛭 🔝 AmtTest.java
                TextView errorBox = (TextView)findViewById(R.id.error box);
Finished after 5.701 seconds
  Runs: 6/6 ☐ Errors: 0 ☐ Failures: 1
                                                                                  //Obtain user input
firstInput = (EditText)findViewById(R.id.first_side);
secondInput = (EditText)findViewById(R.id.second_side);
thirdInput = (EditText)findViewById(R.id.third_side);

■ sony_ericsson-lt18a-BX902Y02YT [Runner: JUnit 3] (5.)
                                                                                 int firstSide, secondSide, thirdSide;

■ ca.mcgill.amt.test.AmtTest (5.988 s)

          testButtonExists (1.498 s)
testInputBounds (0.829 s)
testInputType (1.806 s)
testInputExist (0.478 s)
                                                                                   //Check if any of the inputs are
                                                                                  if (firstInput.getText().toString().equals("")
                                                                                              secondInput.getText().toString().equals("") |
thirdInput.getText().toString().equals("") )
           testLayoutNotEmpty (0.475 s)
testNoInputsFilled (0.902 s)
                                                                                        //Displays an error message if any inputs are empty
errorBox.setText("Error: You must enter a value for each side");
errorBox.setVisibility(View.VISIBLE);
                                                                                        return;
                                                                                   //Check if the inputs are the right type
Jog junit.framework.ComparisonFailure: expected: <Error: You at ca.mcgill.amt.test.AmtTest.testInputBounds(AmtTest.j
                                                                                  at android.test.InstrumentationTestCase.runMethod(Instr
    at android.test.InstrumentationTestCase.runTest(Instrum
   at android.test.ActivityInstrumentationTestCase2.runTest
   at android test AndroidTestRunner runTest(AndroidTestR
   at android.test.AndroidTestRunner.runTest(AndroidTestR
    at android.test.InstrumentationTestRunner.onStart(Instrui
    at\ and roid. app. Instrumentation SInstrumentation Thread.r
```

Code added:

4. The input does not create a triangle

The values of the sides the user entered does not create a triangle Setup: Set two of the inputs such that their sum is smaller than the third input Expected Result: An error message will appear telling the user that their inputs do not create a triangle

Failing Screenshot:

```
ª Package Explorer do JUnit ⊠
                                                                      thirdInput.getText().toString().equals("") ) {
                                                                                                    //Displays an error message if any inputs are empty errorBox.setText("Error: You must enter a value for each side"); errorBox.setVisibility(View.VISIBLE);
 Runs: 7/7 ■ Errors: 0 ■ Failures: 1

■ sony_ericsson-lt18a-BX902Y02YT [Runner: JUnit 3] (6-
     a ca.mcgill.amt.test.AmtTest (6.478 s)
            //Check if the inputs are the right type
                                                                                                    firstSide = Integer.parseInt(firstInput.getText().toString());
                                                                                                    secondSide = Integer.parseInt(secondInput.getText().toString());
thirdSide = Integer.parseInt(thirdInput.getText().toString());
            testLayoutNotEmpty (0.451 s)
testNoInputsFilled (0.801 s)
                                                                                                    | secondSide < 1 || firstSide > 100 || secondSide < 1 || secondSide > 100 || thirdSide < 1 || thirdSide > 100 ) {
                                                                                                           //Displays an error message if any number is out of bounds errorBox.setText("Error: You must enter numbers between 1 and 100 inclusive"); errorBox.setVisibility(View.VISIBLE);
 Journal junit.framework.ComparisonFailure: expected:<Error: The at ca.mcgill.amt.test.AmtTest.testlsTriangle(AmtTest.java
    at android.test.InstrumentationTestCase.runMethod(Instr
    at android.test.InstrumentationTestCase.runTest(Instrum
                                                                                             } catch (NumberFormatException e) { //Displays an error message if any inputs are not numbers
  errorBox.setText("Error: You may only enter positive numbers");
  errorBox.setVisibility(View.VISIBLE);
    at android.test.ActivityInstrumentationTestCase2.runTest
at android.test.AndroidTestRunner.runTest(AndroidTestR
    at android.test.AndroidTestRunner.runTest(AndroidTestR
    at android.test.InstrumentationTestRunner.onStart(InstrumentationStartumentationThread.r
```

Code added:

```
III Package Explorer Ju JUnit ⊠
                                                             □ D MainActivity.java 🛭 D AmtTest.java
                                                                                                                              Triangle.java
                      firstSide = Integer.parseInt(firstInput.getText().toString());
Finished after 8.871 seconds
                                                                                                        secondSide = Integer.parseInt(secondInput.getText().toString());
thirdSide = Integer.parseInt(thirdInput.getText().toString());
  Runs: 7/7 ☐ Errors: 0 ☐ Failures: 0
                                                                                                       //Check if the inputs are within the valid range if(firstSide < 1 || firstSide > 100 || seconSide < 1 || sly seconSide > 100 || thirdSide < 1 || thirdSide > 100 ) {

■ sony_ericsson-lt18a-BX902Y02YT [Runner: JUnit 3] (9.

      a ca.mcgill.amt.test.AmtTest (9.190 s)
              # testButtonExists (2.971 s)
                                                                                                               //Displays an error message if any number is out of bounds
             testButtonExists (2.971's)
testInputBounds (2.684's)
testInputType (0.628's)
testInputsExist (0.551's)
                                                                                                                                                                         enter numbers between 1 and 100 inclusive");
                                                                                                               errorBox.setText("Error: You must ente
errorBox.setVisibility(View.VISIBLE);
              testlsTriangle (0.902 s)
             testLayoutNotEmpty (0.651 s) testNoInputsFilled (0.803 s)
                                                                                                        //Check if the inputs actually create a triangle else if((firstSide + secondSide) < thirdSide | | (firstSide + thirdSide | < secondSide | (secondSide | thirdSide) < firstSide > [[]
 Failure Trace
                                                           →
                                                                                                               //Displays an error message
errorBox.setText("Error: The lengths entered do not create a triangle");
                                                                                                               errorBox.setVisibility(View.VISIBLE):
                                                                                                 } catch (NumberFormatException e) { //Displays an error message if any inputs are not numbers
  errorBox.setVext("Error: You may only enter positive numbers");
  errorBox.setVisibility(View.VISIBLE);
                                                                                                        return;
```

Triangle Business Rules

1. Isosceles

The user entered the same value for 2 sides.

Set up: Set 2 inputs to have the same value.

Expected result: A message will appear telling the user that the inputs form an isosceles triangle.

Failing screenshot:

```
☐ Package Explorer ☐ JUnit 🏻
                                                                                                                                                                                                                                                           □ □ MainActivity.java ⋈ 🎵 AmtTest.java 🗓 Triangle.java
                                                                                    firstSide = Integer.parseInt(firstInput.getText().toString());
secondSide = Integer.parseInt(secondInput.getText().toString());
thirdSide = Integer.parseInt(thirdInput.getText().toString());
Finished after 6.755 seconds
        Runs: 8/8 ☐ Errors: 0 ☐ Failures: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                         //Check if the inputs are within the valid range if(firstSide < 1 || firstSide > 100 || secondSide < 1 || sly secondSide > 100 || thirdSide < 1 || thirdSide > 100 ) {
    and sony_ericsson-It18a-BX902Y02YT [Runner: JUnit 3] (6:

and camegillamttest.AmtTest (6:988 s)

and testButtonExists (1:370 s)

and testInputBounds (1:329 s)

and testInputBound (1:329 s)

and testInputBound (1:329 s)

and testInputBounds (1:329 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          //Displays an error message if any number is out of bounds outputBox.setText("Error: You must enter numbers between 1 and 100 inclusive"); outputBox.setText("Displays (Niew.VISIBED);
                                                                                                                                                                                                                                                                                                                                                                                                                                             //Displays an error message
outputBox.setText("Error: The lengths entered do not create a triangle");
outputBox.setVisibility(View.VISIBLE);
}
      Failure Trace
                    at ca.mcgill.amt.test.AmtTest.testlsIsosceles(AmtTest.java
                    at android.test.InstrumentationTestCase.runMethod(Instr
                                                                                                                                                                                                                                                                                                                                                                                                            ) catch (NumberFormatException e) { //Displays an error message if any inputs are not numbers outputBox.setText("Error: You may only enter positive numbers"); outputBox.setVisibility(View.VISIBLE);
                    at android.test.InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.runTestCase.ru
                at android.test.Instrumentation TestCase.run Test(Instrum
at android.test.Activij(Instrumentation TestCase.ZunTest
at android.test.AndroidTestRunner.runTest(AndroidTestR
at android.test.AndroidTestRunner.runTest(AndroidTestR
at android.test.InstrumentationTestRunner.onStart(Instru
at android.test.InstrumentationTestRunner.onStart(Instru
at android.app.InstrumentationSInstrumentationThread.r
```

Code added:



2. Equilateral

The user entered the same value for all three sides.

Set up: Set all three inputs to have the same value.

Expected result: A message will appear telling the user that the inputs form an equilateral triangle.

Failing screenshot:

```
Package Explorer du JUnit ⊠
                                                                                                                                      🗆 🗖 🔝 MainActivity.java 🗯 🔝 AmtTest.java 🕒 Triangle.java

↓ ↑ □□ □□ | Q, □ □ □ □ ▼ ▼
                                                                                                                                                                                                                                                     //Displays an error message if any number is out of bounds outputBox.setText("Error: You must enter numbers between 1 and 100 inclusive");
 Finished after 14.774 seconds
                                                                                                                                                                                                                                                      outputBox.setVisibility(View.VISIBLE);
    Runs: 9/9 ☐ Errors: 0 ☐ Failures: 1
                                                                                                                                                                                                                                  //Check if the inputs actually create a triangle
else if((firstSide + secondSide) < thirdSide ||
(firstSide + thirdSide) < secondSide |
(secondSide + thirdSide) < firstSide) {

■ sony_ericsson-lt18a-BX902Y02YT [Runner: JUnit 3] (15)

■ ca.mcgill.amt.test.AmtTest (15.341 s)

                           Camegillamit.test.Amit lest (1).

EstButtonExists (2.901 s)

EstInputBounds (0.833 s)

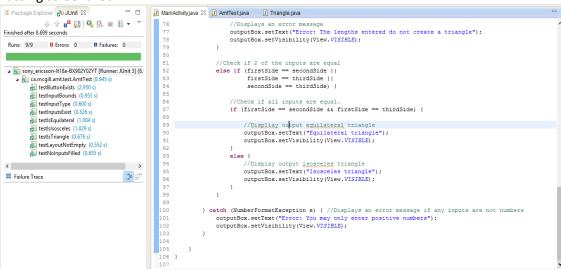
EstInputType (0.780 s)

EstInputExist (0.983 s)

EstInputExist (0.983 s)

EstIsEquilateral (0.578 s)
                                                                                                                                                                                                                                                   //Displays an error message outputBox.setText("Error: The lengths entered do not create a triangle"); outputBox.setVastblity(View.VISIBLE);
                            testsbusceles (1.3635)
testsTriangle (5.751 s)
testLayoutNotEmpty (1.005 s)
testNoInputsFilled (1.080 s)
                                                                                                                                                                                                                    else if (firstSide == secondSide ||
    firstSide == thirdSide ||
    secondSide == thirdSide) {
  <
                                                                                                                                                                                                                                                   //Display output isosceles triangle
outputBox.setText("Isosceles triangle");
outputBox.setVisibility(View.VISIBLE);
  Failure Trace
          at ca.mcgill.amt.test.AmtTest.testlsEquilateral(AmtTest.ja
          at android.test.InstrumentationTestCase.runMethod(Instr
at android.test.InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCase.runTest(InstrumentationTestCas
                                                                                                                                                                                                                      } catch (NumberFormatException e) { //Displays an error message if any inputs are not numbers
                                                                                                                                                                                                                                     outputBox.setText("Error: You may only enter positive numbers");
outputBox.setVisibility(View.VISIBLE);
          at android.test.ActivityInstrumentationTestCase2.runTest
          at android.test.AndroidTestRunner.runTest(AndroidTestR
at android.test.AndroidTestRunner.runTest(AndroidTestR
          at android.test.InstrumentationTestRunner.onStart(Instrui
           at android.app.Instrumentation$InstrumentationThread.r
```

Code added:



3. Scalene

The user entered 3 different values for 3 sides.

Set up: Set 3 inputs to have different values.

Expected result: A message will appear telling the user that the inputs form a scalene triangle.

Failing screenshot:



Code added:

```
else {
```

```
//Display output <u>scalene</u> triangle
outputBox.setText("Scalene triangle");
outputBox.setVisibility(View.VISIBLE);
}
```

