ECSE 428 - Software Engineering in Practice

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Assignment B: Test Driven Development

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Table of Content

Summary

The goal of this document is to implement a Postal Rate calculator using Test Driven Development. Java and the jUnit framework were used to achieve this goal. The following list outlines the steps taken during the development process.

1. Identify a list of unit tests required to implement the task
2. Set up a unit test framework in the target environment for the appropriate language
3. For each unit test identified:
    a. Program the unit test
    b. Demonstrate that the unit test fails
    c. Write just enough code for the unit test to pass
    d. Refactor code
    e. Make sure previous unit tests still pass
    f. Continue to next unit test

Everytime a test fails, new code is added to make it pass. All the tests are then run together and it is only considered a success if all tests pass.

List of tests

1. No_args
2. Less_3args
3. More_3args
4. Length_out_of_range_low
5. Length_out_of_range_high
6. Width_out_of_range_low
7. Width_out_of_range_high
8. Height_out_of_range_low
9. Height_out_of_range_high
10. Weight_out_of_range_high
11. Girth_out_of_range_high
12. PostType_invalid
13. From_destination_invalid
14. To_destination_invalid
15. Regular_rate
16. Xpresspost_rate
17. Priority_rate

Tests Breakdown

The tests are considering the rates for the parcels using a standard envelopes. The following links were used for the calculations:
https://www.canadapost.ca/tools/pg/prices/CPprices-e.pdf
https://www.canadapost.ca/tools/pg/manual/PGpscanada-e.asp
https://www.canadapost.ca/cpotools/apps/far/business/findARate?execution=e5s1

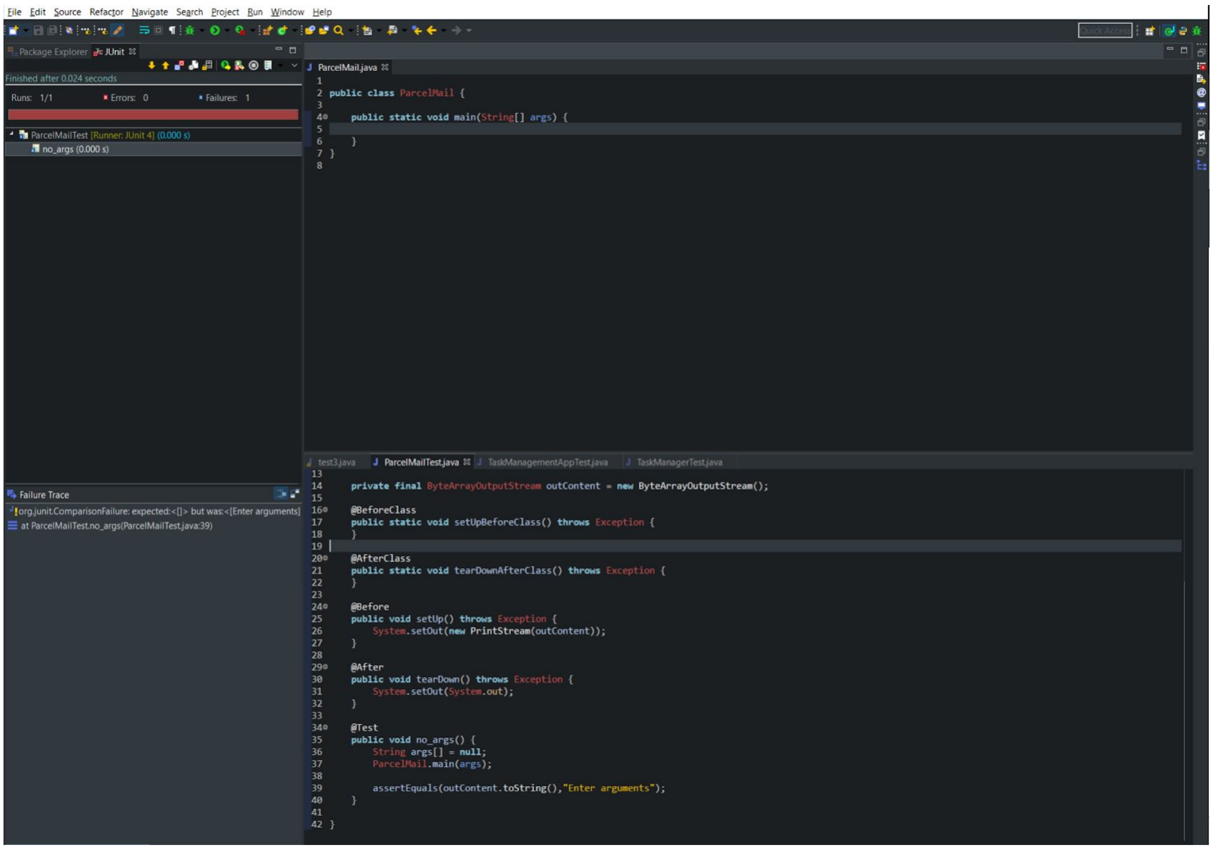
Documents and Parcels
Min : Length = 100 mm; Width = 70 mm; Height = 1 mm; Weight = None
Max : Length: 2 m; Length + Girth: 3 m; Weight = 30 kg

Where Girth = (height x 2) + (width x 2)

Test 1

1. Test name: No_args
2. Purpose: Test the program with no arguments
3. Call Setup: parcelmail
4. Expected Result: Usage: parcelmail from to len width height weight type

Test failure



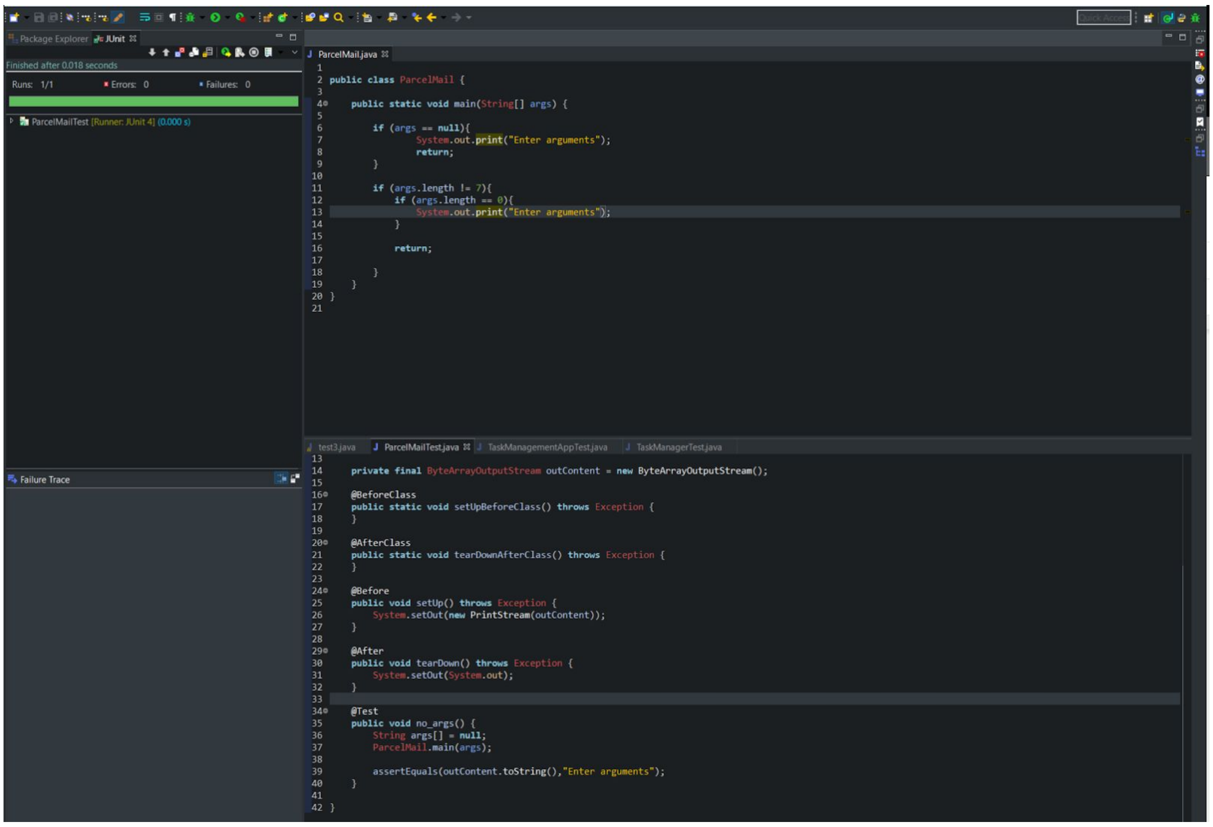
```
Finished after 0.024 seconds
Runs: 1/1    Errors: 0    Failures: 1
ParcelMailTest [Runner: JUnit 4] (0.000 s)
    no_args (0.000 s)
```

```java

public class ParcelMail {

    public static void main(String[] args) {

    }
}

```

```
org.junit.ComparisonFailure: expected:<[]> but was:<[Enter arguments]
at ParcelMailTest.no_args(ParcelMailTest.java:39)
```

```java

    private final ByteArrayOutputStream outContent = new ByteArrayOutputStream();

    @BeforeClass
    public static void setUpBeforeClass() throws Exception {
    }

    @AfterClass
    public static void tearDownAfterClass() throws Exception {
    }

    @Before
    public void setUp() throws Exception {
        System.setOut(new PrintStream(outContent));
    }

    @After
    public void tearDown() throws Exception {
        System.setOut(System.out);
    }

    @Test
    public void no_args() {
        String args[] = null;
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Enter arguments");
    }

}
```

Test Success



Finished after 0.018 seconds

Runs: 1/1 Errors: 0 Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.000 s)

ParcelMail.java

```java

public class ParcelMail {

    public static void main(String[] args) {

        if (args == null){
                System.out.print("Enter arguments");
                return;
        }

        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Enter arguments");
            }

            return;

        }
    }
}

```

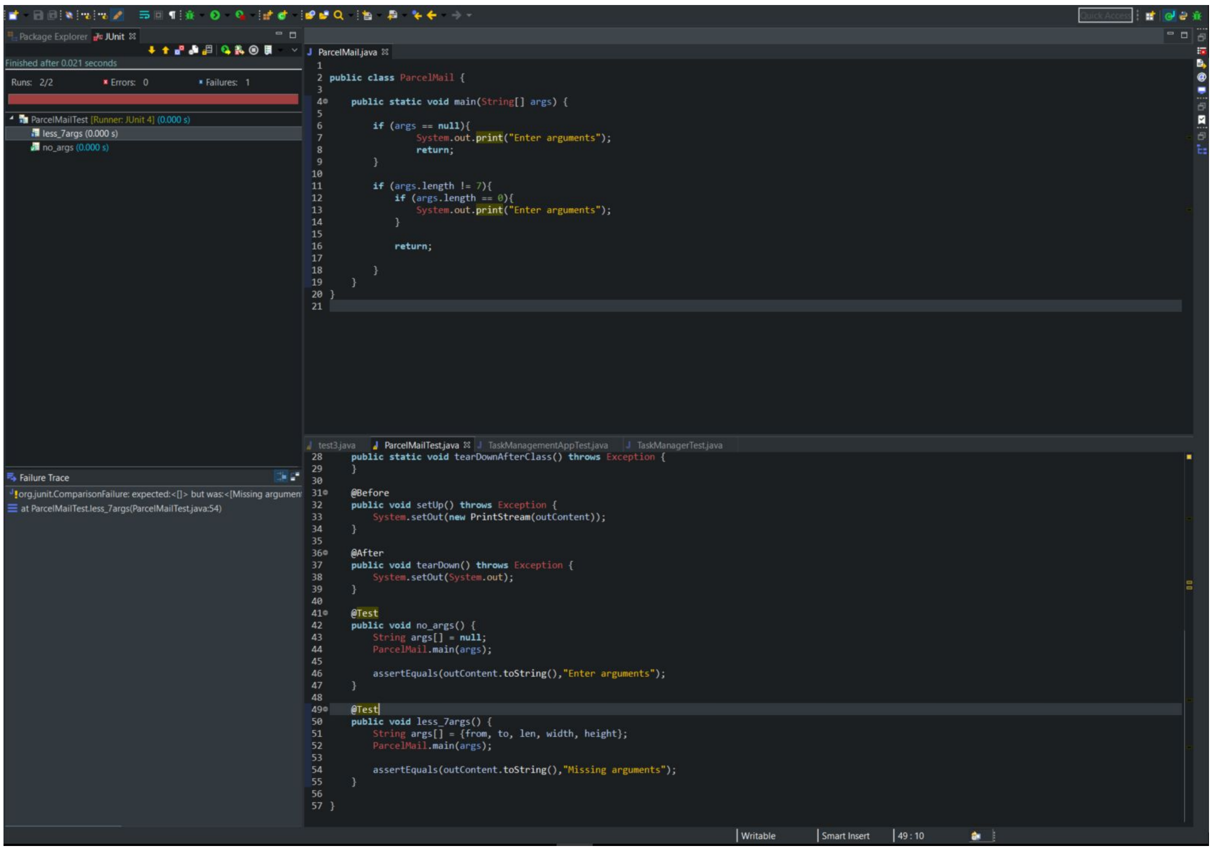
ParcelMailTest.java

```java

    private final ByteArrayOutputStream outContent = new ByteArrayOutputStream();

    @BeforeClass
    public static void setUpBeforeClass() throws Exception {
    }

    @AfterClass
    public static void tearDownAfterClass() throws Exception {
    }

    @Before
    public void setUp() throws Exception {
        System.setOut(new PrintStream(outContent));
    }

    @After
    public void tearDown() throws Exception {
        System.setOut(System.out);
    }

    @Test
    public void no_args() {
        String args[] = null;
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Enter arguments");
    }

}
```

Test 2

1. Test name: Less_7args
2. Purpose: Test the program with missing arguments
3. Call Setup: parcelmail from to len width height
4. Expected Result: Usage: parcelmail from to len width height weight type

Test Failure

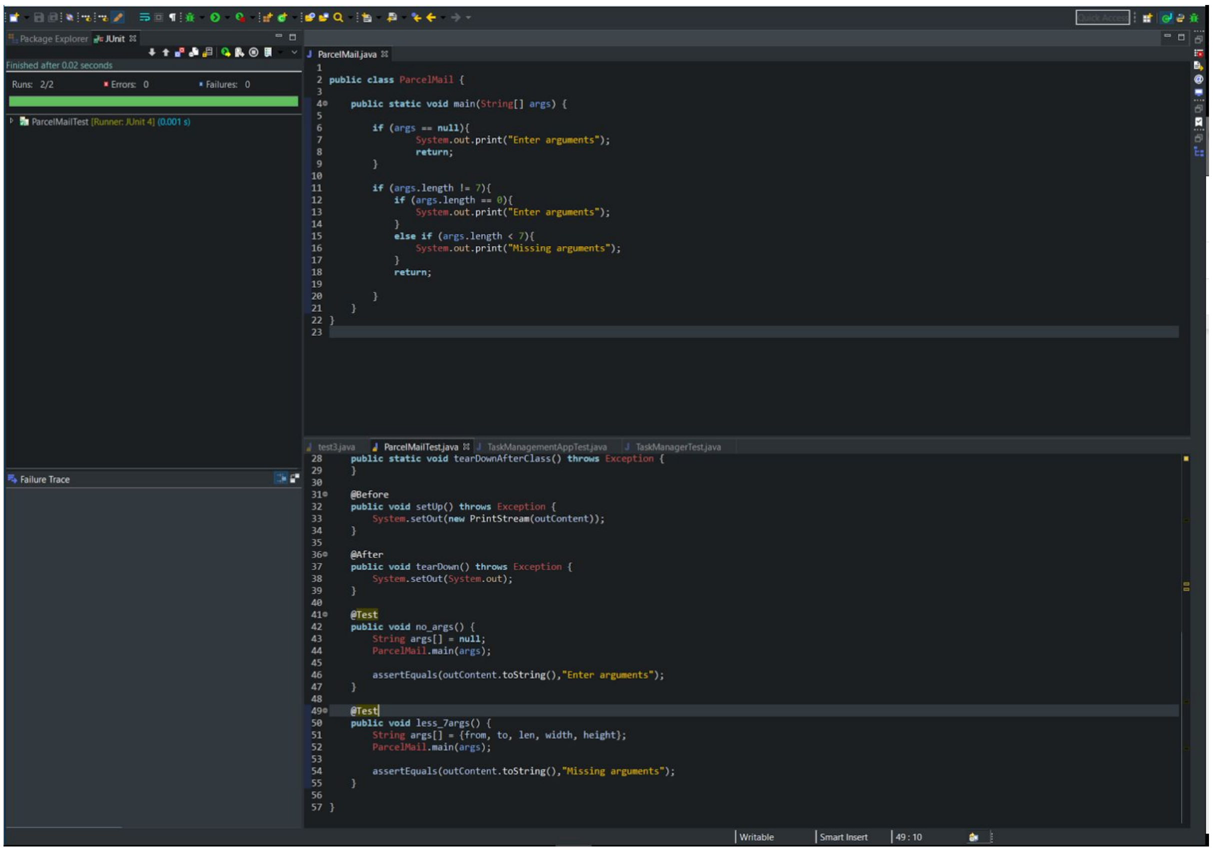


```
Finished after 0.021 seconds
Runs: 2/2    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.000 s)
    less_7args (0.000 s)
    no_args (0.000 s)

Failure Trace
org.junit.ComparisonFailure: expected:<[]> but was:<[Missing argumen
at ParcelMailTest.less_7args(ParcelMailTest.java:54)
```

```java

public class ParcelMail {

    public static void main(String[] args) {

        if (args == null){
                System.out.print("Enter arguments");
                return;
        }

        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Enter arguments");
            }

            return;

        }
    }
}

```

```java
    public static void tearDownAfterClass() throws Exception {
    }

    @Before
    public void setUp() throws Exception {
        System.setOut(new PrintStream(outContent));
    }

    @After
    public void tearDown() throws Exception {
        System.setOut(System.out);
    }

    @Test
    public void no_args() {
        String args[] = null;
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Enter arguments");
    }

    @Test
    public void less_7args() {
        String args[] = {from, to, len, width, height};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Missing arguments");
    }

}
```

Test Success



```
Finished after 0.02 seconds
Runs: 2/2    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.001 s)
```

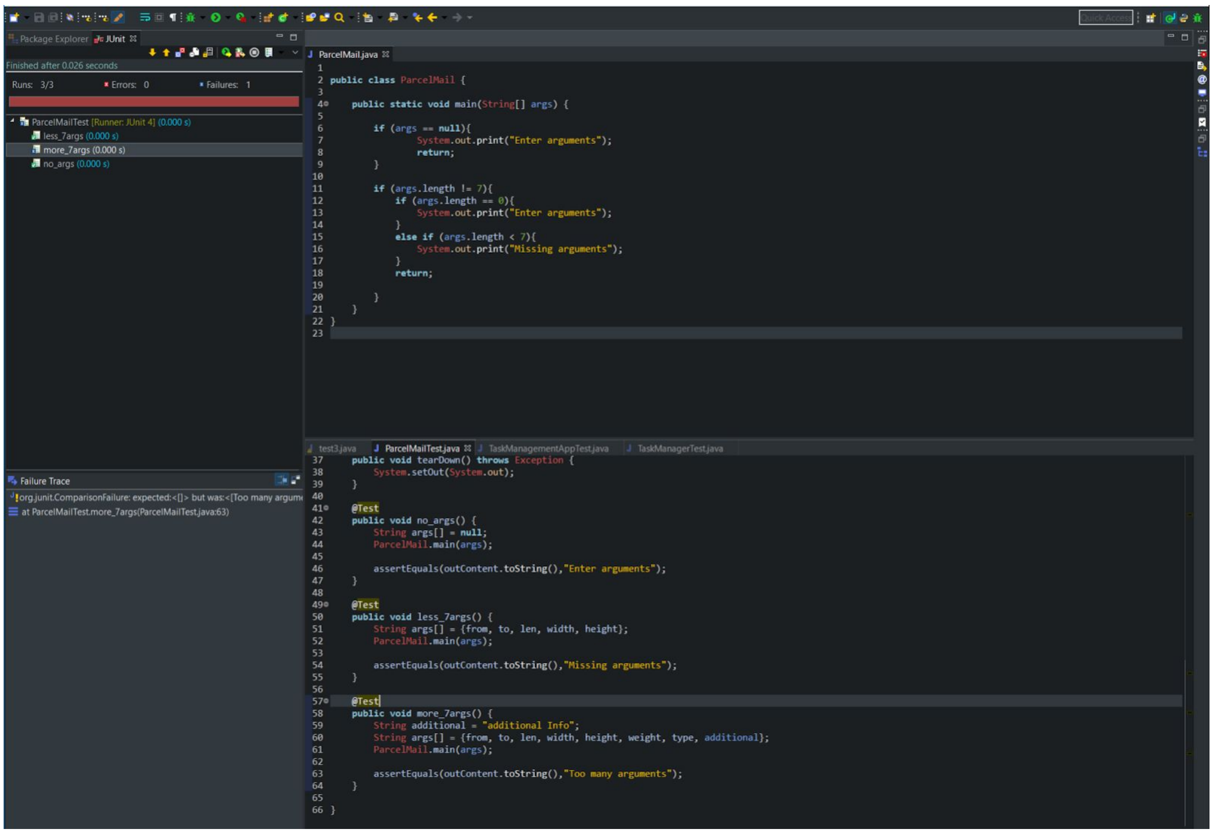
```java

public class ParcelMail {

    public static void main(String[] args) {

        if (args == null){
                System.out.print("Enter arguments");
                return;
        }

        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Enter arguments");
            }
            else if (args.length < 7){
                System.out.print("Missing arguments");
            }
            return;

        }
    }
}

```

```java
    public static void tearDownAfterClass() throws Exception {
    }

    @Before
    public void setUp() throws Exception {
        System.setOut(new PrintStream(outContent));
    }

    @After
    public void tearDown() throws Exception {
        System.setOut(System.out);
    }

    @Test
    public void no_args() {
        String args[] = null;
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Enter arguments");
    }

    @Test
    public void less_7args() {
        String args[] = {from, to, len, width, height};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Missing arguments");
    }

}
```

Test 3

1. Test name: More_7args
2. Purpose: Test the program with too many arguments
3. Call Setup: parcelmail from to len width height weight type additional
4. Expected Result: Usage: parcelmail from to len width height weight type

Test Failure



Finished after 0.026 seconds

Runs: 3/3 Errors: 0 Failures: 1

```
ParcelMailTest [Runner: JUnit 4] (0.000 s)
    less_7args (0.000 s)
    more_7args (0.000 s)
    no_args (0.000 s)
```

Failure Trace

```
org.junit.ComparisonFailure: expected:<[]> but was:<[Too many argum
at ParcelMailTest.more_7args(ParcelMailTest.java:63)
```

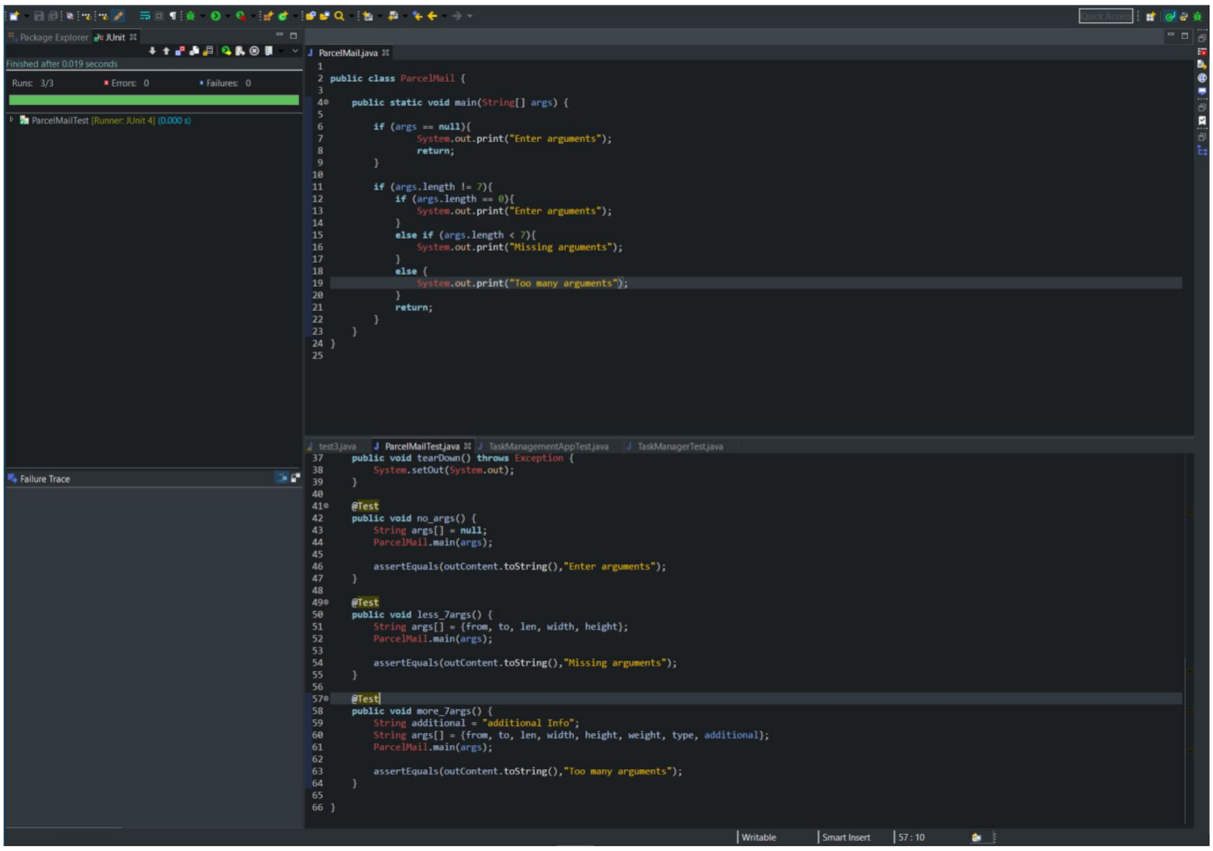
ParcelMail.java

```java

public class ParcelMail {

    public static void main(String[] args) {

        if (args == null){
                System.out.print("Enter arguments");
                return;
        }

        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Enter arguments");
            }
            else if (args.length < 7){
                System.out.print("Missing arguments");
            }
            return;

        }
    }
}

```

ParcelMailTest.java

```java
    public void tearDown() throws Exception {
        System.setOut(System.out);
    }

    @Test
    public void no_args() {
        String args[] = null;
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Enter arguments");
    }

    @Test
    public void less_7args() {
        String args[] = {from, to, len, width, height};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Missing arguments");
    }

    @Test
    public void more_7args() {
        String additional = "additional Info";
        String args[] = {from, to, len, width, height, weight, type, additional};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Too many arguments");
    }

}
```

Test Success


Finished after 0.019 seconds

Runs: 3/3 Errors: 0 Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.000 s)

ParcelMail.java

```java

public class ParcelMail {

    public static void main(String[] args) {

        if (args == null){
                System.out.print("Enter arguments");
                return;
        }

        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Enter arguments");
            }
            else if (args.length < 7){
                System.out.print("Missing arguments");
            }
            else {
                System.out.print("Too many arguments");
            }
            return;
        }
    }
}

```

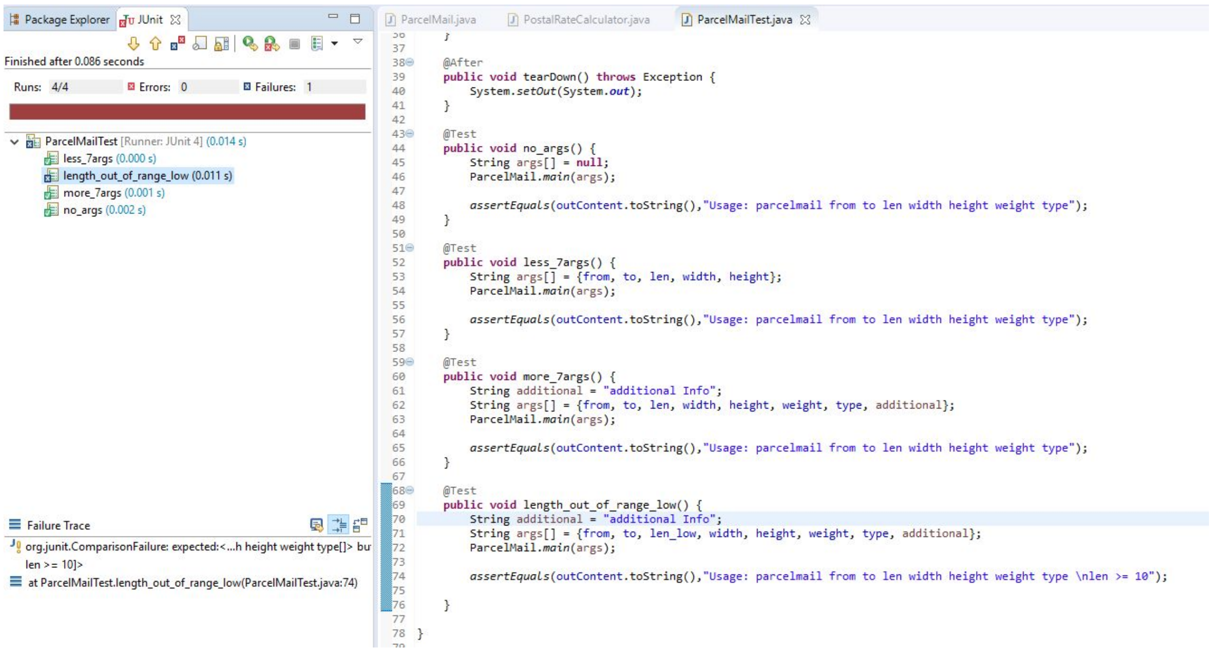
ParcelMailTest.java

```java
    public void tearDown() throws Exception {
        System.setOut(System.out);
    }

    @Test
    public void no_args() {
        String args[] = null;
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Enter arguments");
    }

    @Test
    public void less_7args() {
        String args[] = {from, to, len, width, height};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Missing arguments");
    }

    @Test
    public void more_7args() {
        String additional = "additional Info";
        String args[] = {from, to, len, width, height, weight, type, additional};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Too many arguments");
    }

}
```

Test 4

1. Test name: length_out_of_range_low
2. Purpose: Test the program with the length (cm) out of range too low
3. Call Setup: parcelmail H7S1A4 K1P0A9 5 50 50 5 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nlen >= 10

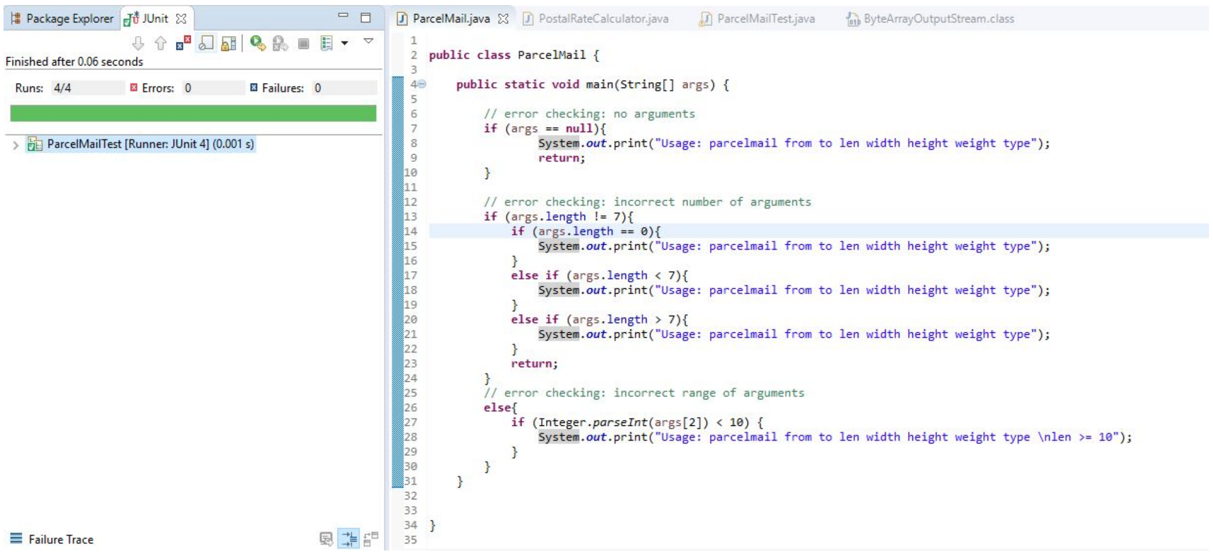
Test Failure



```
Finished after 0.086 seconds
Runs: 4/4    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.014 s)
    less_7args (0.000 s)
    length_out_of_range_low (0.011 s)
    more_7args (0.001 s)
    no_args (0.002 s)

Failure Trace
org.junit.ComparisonFailure: expected:<...h height weight type[]> bu
len >= 10]>
at ParcelMailTest.length_out_of_range_low(ParcelMailTest.java:74)
```

```java
    }

    @After
    public void tearDown() throws Exception {
        System.setOut(System.out);
    }

    @Test
    public void no_args() {
        String args[] = null;
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Usage: parcelmail from to len width height weight type");
    }

    @Test
    public void less_7args() {
        String args[] = {from, to, len, width, height};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Usage: parcelmail from to len width height weight type");
    }

    @Test
    public void more_7args() {
        String additional = "additional Info";
        String args[] = {from, to, len, width, height, weight, type, additional};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Usage: parcelmail from to len width height weight type");
    }

    @Test
    public void length_out_of_range_low() {
        String additional = "additional Info";
        String args[] = {from, to, len_low, width, height, weight, type, additional};
        ParcelMail.main(args);

        assertEquals(outContent.toString(),"Usage: parcelmail from to len width height weight type \nlen >= 10");

    }

}
```

Test Success



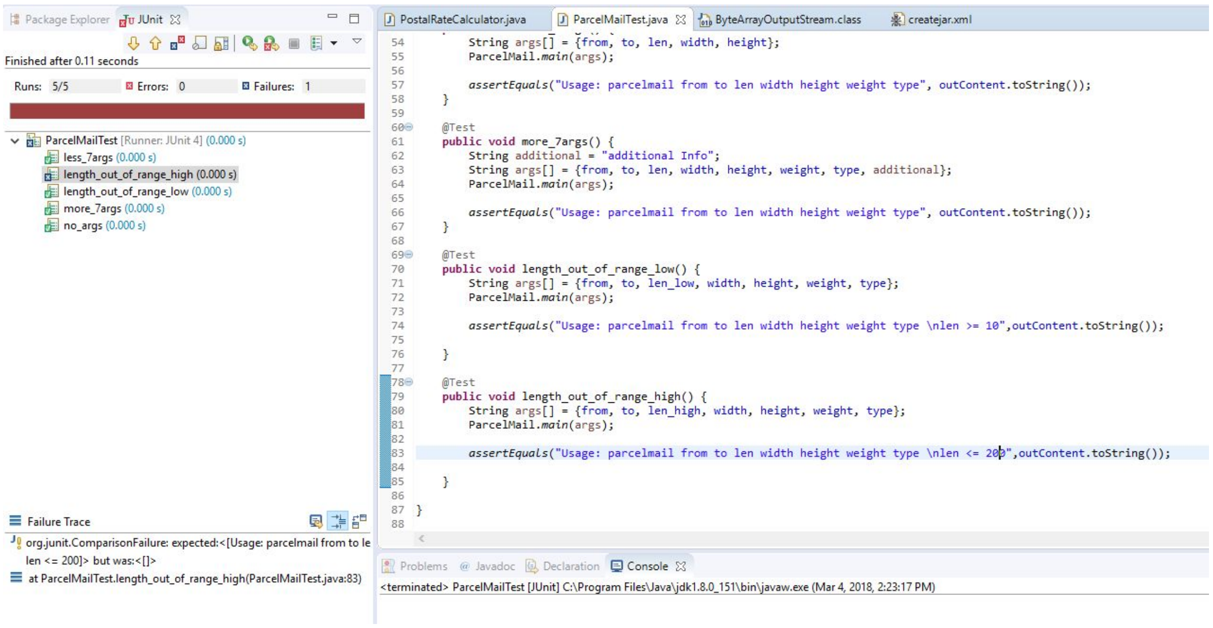
```
Finished after 0.06 seconds
Runs: 4/4    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.001 s)

Failure Trace
```

```java

public class ParcelMail {

    public static void main(String[] args) {

        // error checking: no arguments
        if (args == null){
            System.out.print("Usage: parcelmail from to len width height weight type");
            return;
        }

        // error checking: incorrect number of arguments
        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length < 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length > 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            return;
        }
        // error checking: incorrect range of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
        }
    }


}
```

Test 5

1. Test name: length_out_of_range_high
2. Purpose: Test the program with the length (cm) out of range too high
3. Call Setup: parcelmail H7S1A4 K1P0A9 300 50 50 5 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nlen $\leq$ 200

Test Failure

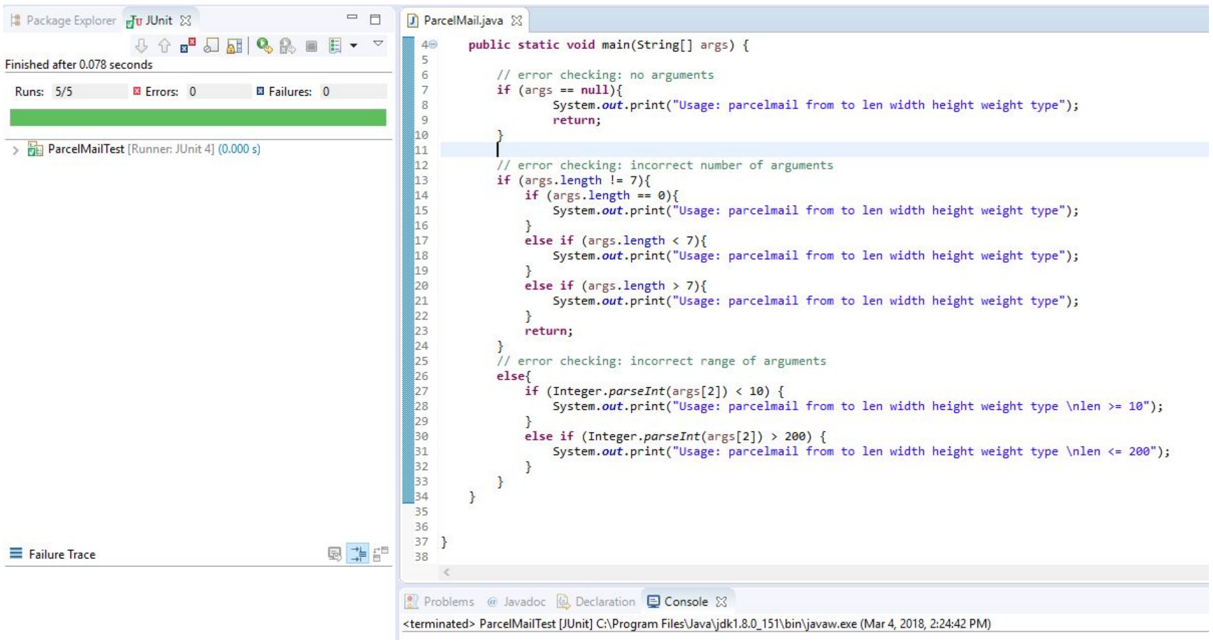


```
Finished after 0.11 seconds
Runs: 5/5    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.000 s)
    less_7args (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    more_7args (0.000 s)
    no_args (0.000 s)

Failure Trace
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
len <= 200]> but was:<[]>
at ParcelMailTest.length_out_of_range_high(ParcelMailTest.java:83)
```

```java
        String args[] = {from, to, len, width, height};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type", outContent.toString());
    }

    @Test
    public void more_7args() {
        String additional = "additional Info";
        String args[] = {from, to, len, width, height, weight, type, additional};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type", outContent.toString());
    }

    @Test
    public void length_out_of_range_low() {
        String args[] = {from, to, len_low, width, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nlen >= 10",outContent.toString());

    }

    @Test
    public void length_out_of_range_high() {
        String args[] = {from, to, len_high, width, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nlen <= 200",outContent.toString());

    }

}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 2:23:17 PM)
```

Test Success



```
Finished after 0.078 seconds
Runs: 5/5    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.000 s)

Failure Trace
```

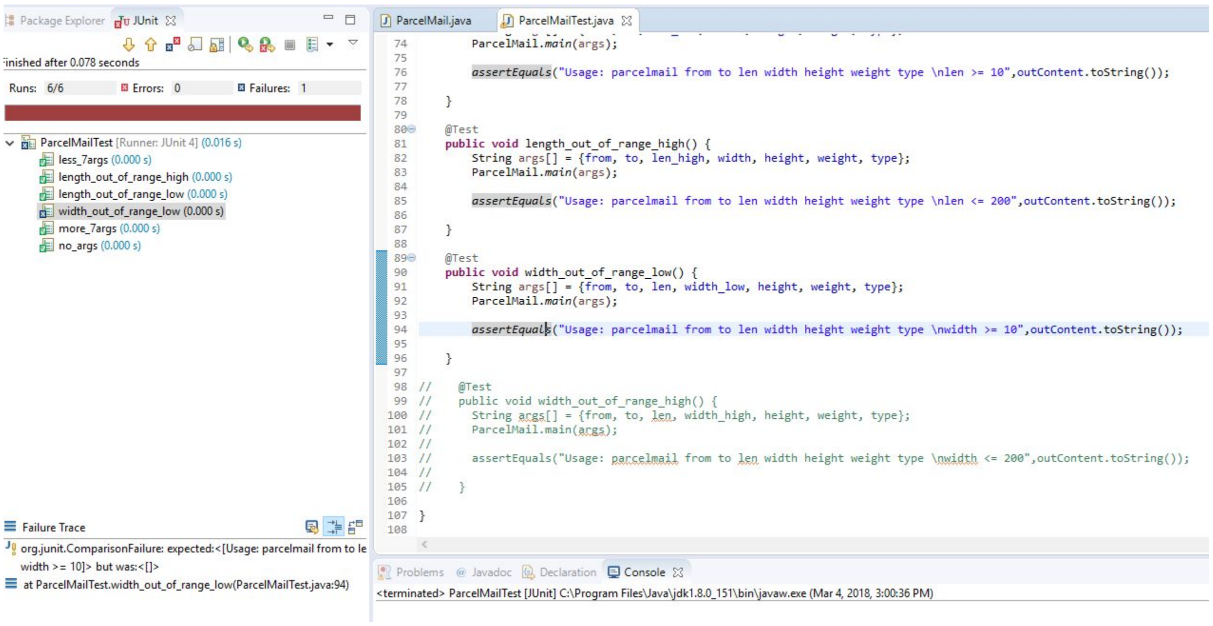
```java
    public static void main(String[] args) {

        // error checking: no arguments
        if (args == null){
                System.out.print("Usage: parcelmail from to len width height weight type");
                return;
        }

        // error checking: incorrect number of arguments
        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length < 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length > 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            return;
        }
        // error checking: incorrect range of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
        }
    }


}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 2:24:42 PM)
```

Test 6

1. Test name: width_out_of_range_low
2. Purpose: Test the program with the width (cm) out of range too low
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 5 50 5 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nwidth ≥ 7

Test Failure



Package Explorer | JUnit

Finished after 0.078 seconds

Runs: 6/6 Errors: 0 Failures: 1

- ParcelMailTest [Runner: JUnit 4] (0.016 s)
  - less_7args (0.000 s)
  - length_out_of_range_high (0.000 s)
  - length_out_of_range_low (0.000 s)
  - width_out_of_range_low (0.000 s)
  - more_7args (0.000 s)
  - no_args (0.000 s)

Failure Trace

```
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
width >= 10]> but was:<[]>
at ParcelMailTest.width_out_of_range_low(ParcelMailTest.java:94)
```

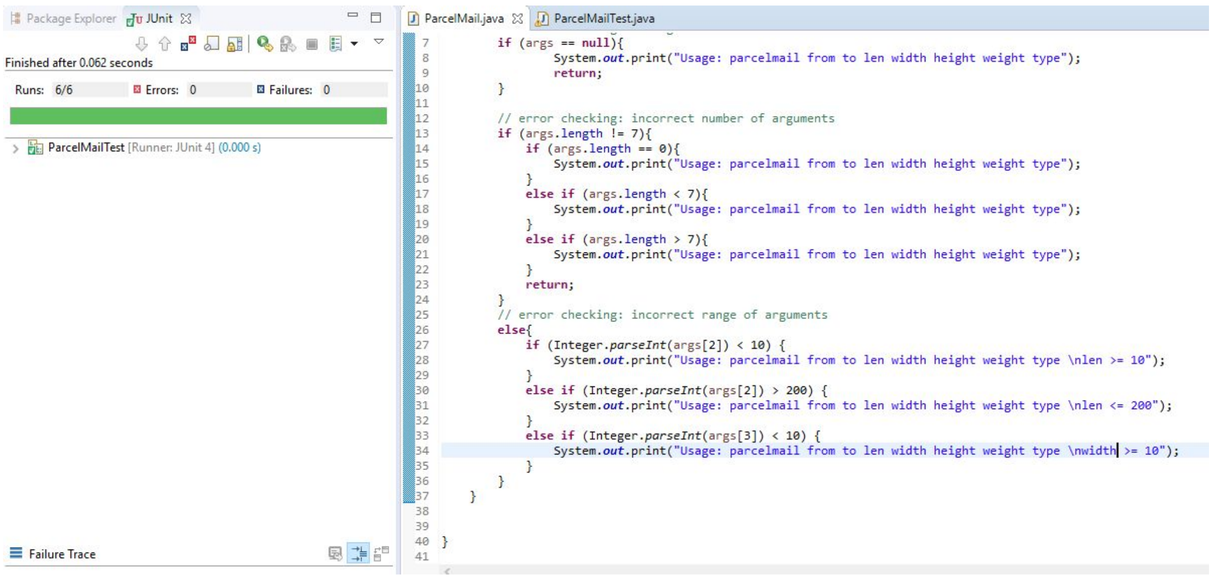
ParcelMail.java | ParcelMailTest.java

```
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nlen >= 10",outContent.toString());

    }

    @Test
    public void length_out_of_range_high() {
        String args[] = {from, to, len_high, width, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nlen <= 200",outContent.toString());

    }

    @Test
    public void width_out_of_range_low() {
        String args[] = {from, to, len, width_low, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth >= 10",outContent.toString());

    }

//    @Test
//    public void width_out_of_range_high() {
//      String args[] = {from, to, len, width_high, height, weight, type};
//      ParcelMail.main(args);
//
//      assertEquals("Usage: parcelmail from to len width height weight type \nwidth <= 200",outContent.toString());
//
//    }

}
```

Problems | Javadoc | Declaration | Console

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:00:36 PM)
```

Test Success



Package Explorer | JUnit

Finished after 0.062 seconds

Runs: 6/6 Errors: 0 Failures: 0

- ParcelMailTest [Runner: JUnit 4] (0.000 s)

Failure Trace

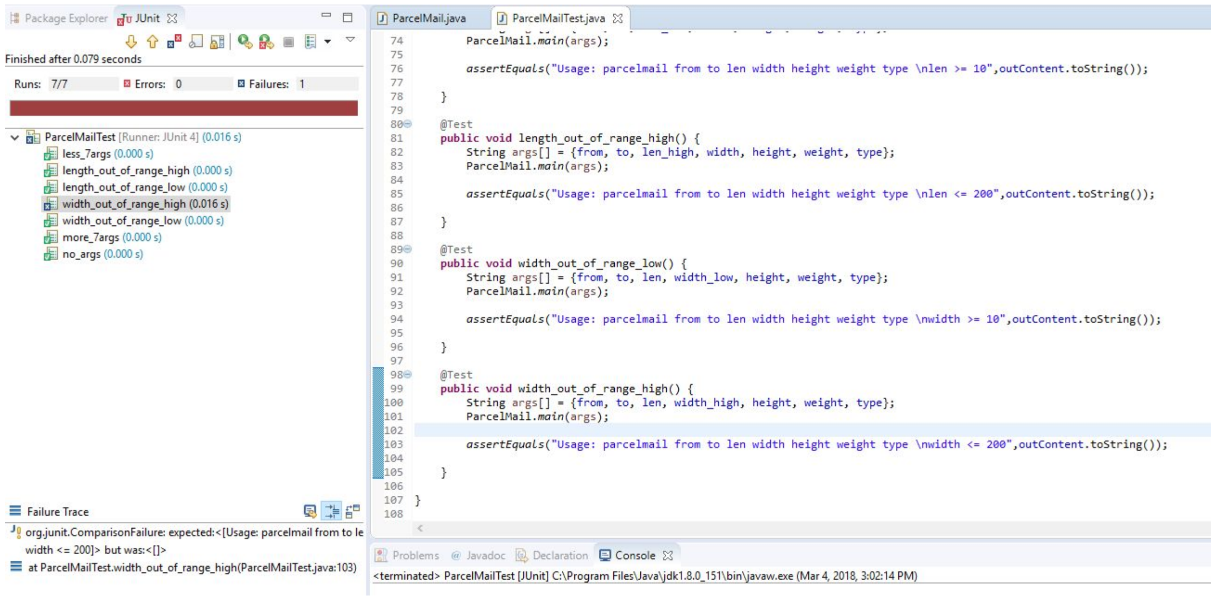
ParcelMail.java | ParcelMailTest.java

```
        if (args == null){
                System.out.print("Usage: parcelmail from to len width height weight type");
                return;
        }

        // error checking: incorrect number of arguments
        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length < 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length > 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            return;
        }
        // error checking: incorrect range of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
            else if (Integer.parseInt(args[3]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
            }
        }
    }


}
```

Test 7

1. Test name: width_out_of_range_high
2. Purpose: Test the program with the width (cm) out of range too high
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 500 50 5 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nwidth $\leq$ 200

Test Failure



Package Explorer | JUnit

Finished after 0.079 seconds

Runs: 7/7 Errors: 0 Failures: 1

```
ParcelMailTest [Runner: JUnit 4] (0.016 s)
    less_7args (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.016 s)
    width_out_of_range_low (0.000 s)
    more_7args (0.000 s)
    no_args (0.000 s)
```

Failure Trace

```
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
width <= 200]> but was:<[]>
at ParcelMailTest.width_out_of_range_high(ParcelMailTest.java:103)
```

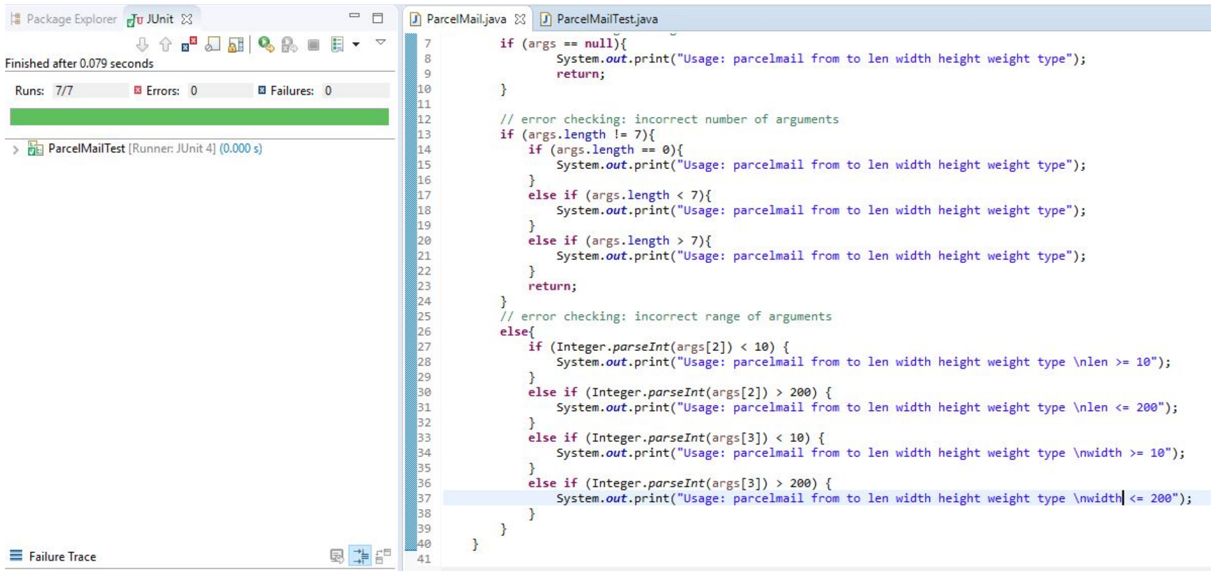
ParcelMail.java | ParcelMailTest.java

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nlen >= 10",outContent.toString());

    }

    @Test
    public void length_out_of_range_high() {
        String args[] = {from, to, len_high, width, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nlen <= 200",outContent.toString());

    }

    @Test
    public void width_out_of_range_low() {
        String args[] = {from, to, len, width_low, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth >= 10",outContent.toString());

    }

    @Test
    public void width_out_of_range_high() {
        String args[] = {from, to, len, width_high, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth <= 200",outContent.toString());

    }

}
```

Problems | Javadoc | Declaration | Console

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:02:14 PM)
```

Test Success



Package Explorer | JUnit

Finished after 0.079 seconds

Runs: 7/7 Errors: 0 Failures: 0

```
ParcelMailTest [Runner: JUnit 4] (0.000 s)
```

Failure Trace

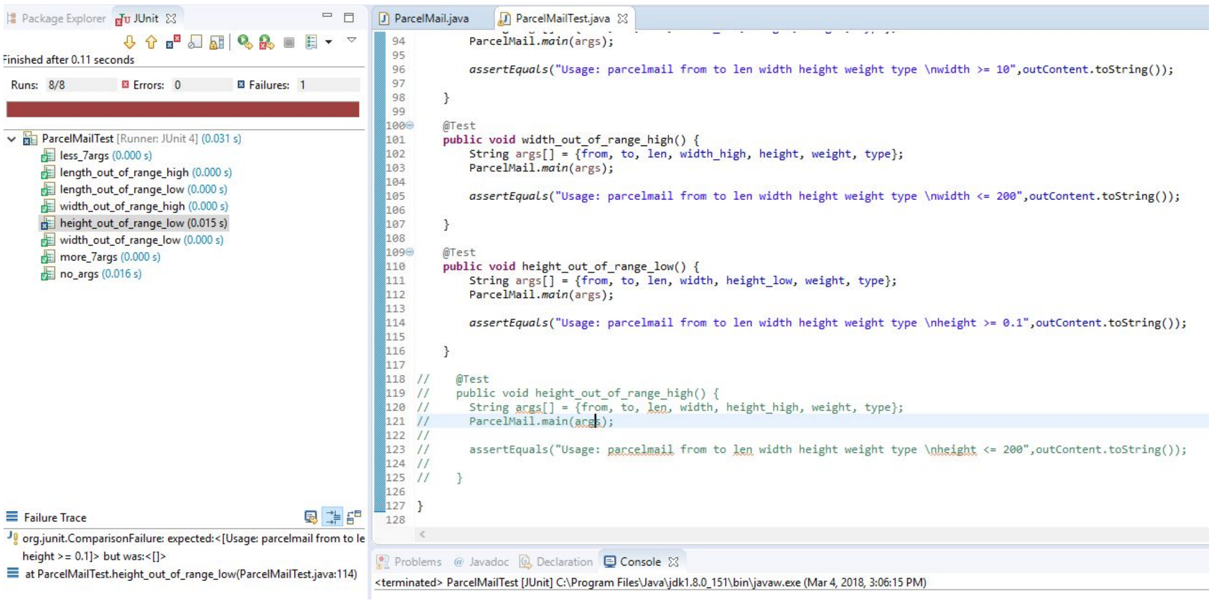
ParcelMail.java | ParcelMailTest.java

```java
        if (args == null){
                System.out.print("Usage: parcelmail from to len width height weight type");
                return;
        }

        // error checking: incorrect number of arguments
        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length < 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length > 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            return;
        }
        // error checking: incorrect range of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
            else if (Integer.parseInt(args[3]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
            }
            else if (Integer.parseInt(args[3]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth <= 200");
            }
        }
    }
```

Test 8

1. Test name: height_out_of_range_low
2. Purpose: Test the program with the height(cm) out of range too low
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 50 0 5 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nheight ≥ 0.1

Test Failure

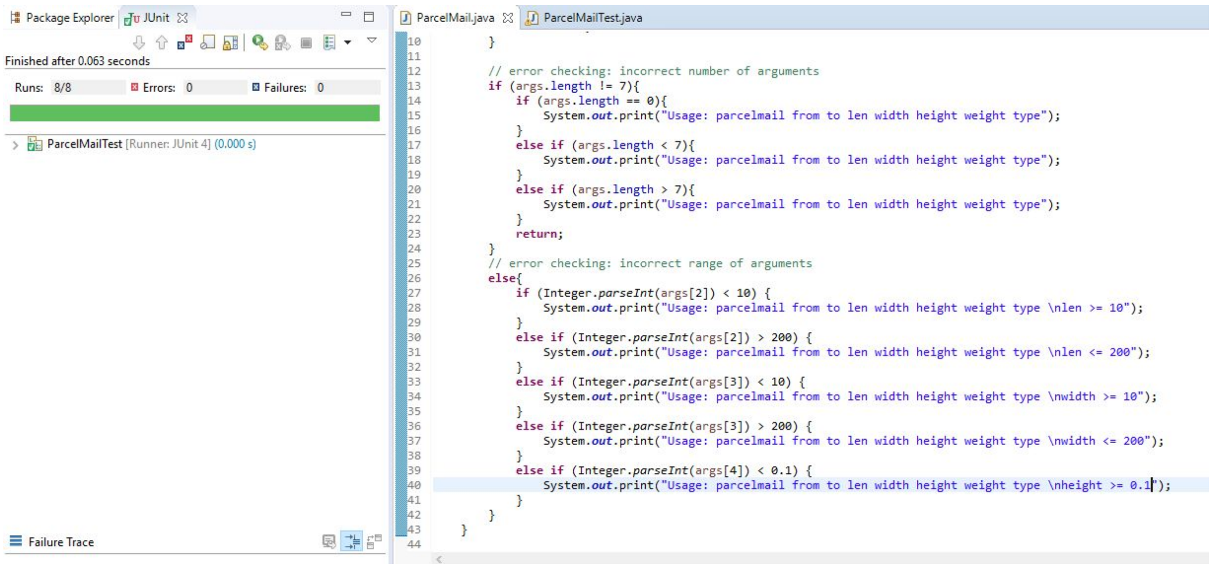


```
Finished after 0.11 seconds
Runs: 8/8    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.031 s)
    less_7args (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.000 s)
    height_out_of_range_low (0.015 s)
    width_out_of_range_low (0.000 s)
    more_7args (0.000 s)
    no_args (0.016 s)

Failure Trace
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
height >= 0.1]> but was:<[]>
at ParcelMailTest.height_out_of_range_low(ParcelMailTest.java:114)
```

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth >= 10",outContent.toString());

    }

    @Test
    public void width_out_of_range_high() {
        String args[] = {from, to, len, width_high, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth <= 200",outContent.toString());

    }

    @Test
    public void height_out_of_range_low() {
        String args[] = {from, to, len, width, height_low, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight >= 0.1",outContent.toString());

    }

//    @Test
//    public void height_out_of_range_high() {
//      String args[] = {from, to, len, width, height_high, weight, type};
//      ParcelMail.main(args);
//
//      assertEquals("Usage: parcelmail from to len width height weight type \nheight <= 200",outContent.toString());
//
//    }

}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:06:15 PM)
```

Test Success



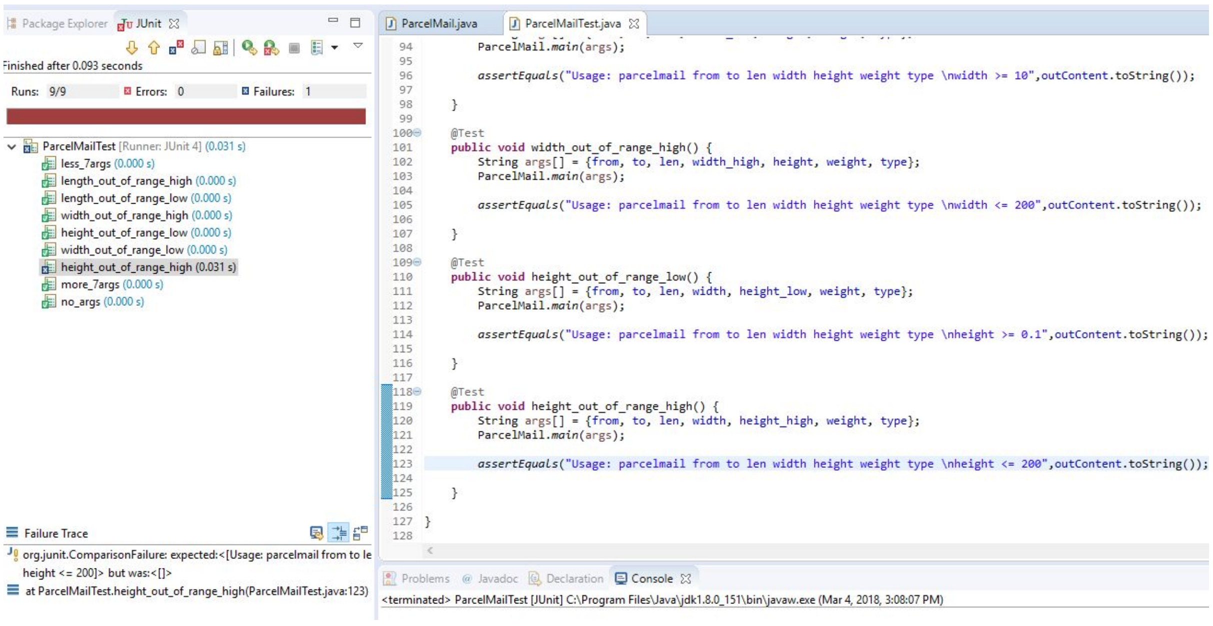
```
Finished after 0.063 seconds
Runs: 8/8    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.000 s)

Failure Trace
```

```java
        }

        // error checking: incorrect number of arguments
        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length < 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length > 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            return;
        }
        // error checking: incorrect range of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
            else if (Integer.parseInt(args[3]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
            }
            else if (Integer.parseInt(args[3]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth <= 200");
            }
            else if (Integer.parseInt(args[4]) < 0.1) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight >= 0.1");
            }
        }
    }
```

Test 9

1. Test name: height_out_of_range_high
2. Purpose: Test the program with the height(cm) out of range too high
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 50 300 5 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nheight ≤ 200

Test Failure



Package Explorer | JUnit

Finished after 0.093 seconds

Runs: 9/9 Errors: 0 Failures: 1

```
ParcelMailTest [Runner: JUnit 4] (0.031 s)
    less_7args (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.000 s)
    height_out_of_range_low (0.000 s)
    width_out_of_range_low (0.000 s)
    height_out_of_range_high (0.031 s)
    more_7args (0.000 s)
    no_args (0.000 s)
```

Failure Trace

```
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
height <= 200]> but was:<[]>
at ParcelMailTest.height_out_of_range_high(ParcelMailTest.java:123)
```

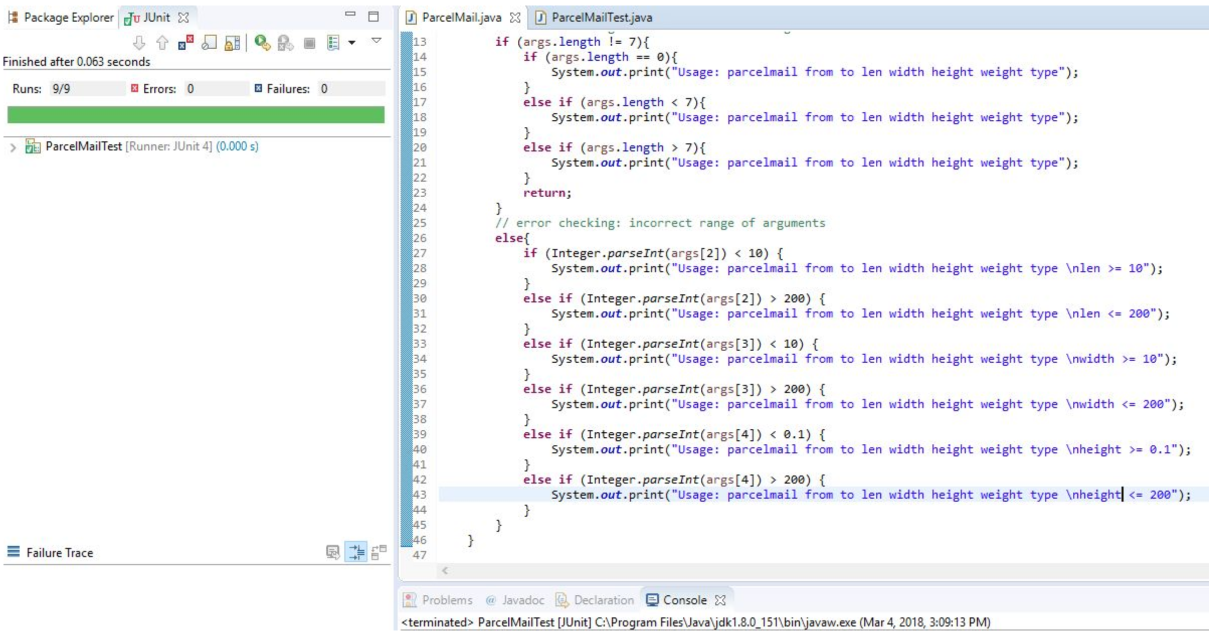
ParcelMail.java | ParcelMailTest.java

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth >= 10",outContent.toString());

    }

    @Test
    public void width_out_of_range_high() {
        String args[] = {from, to, len, width_high, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth <= 200",outContent.toString());

    }

    @Test
    public void height_out_of_range_low() {
        String args[] = {from, to, len, width, height_low, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight >= 0.1",outContent.toString());

    }

    @Test
    public void height_out_of_range_high() {
        String args[] = {from, to, len, width, height_high, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight <= 200",outContent.toString());

    }
}
```

Problems | Javadoc | Declaration | Console

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:08:07 PM)
```

Test Success



Package Explorer | JUnit

Finished after 0.063 seconds

Runs: 9/9 Errors: 0 Failures: 0

```
ParcelMailTest [Runner: JUnit 4] (0.000 s)
```

Failure Trace

ParcelMail.java | ParcelMailTest.java

```java
        if (args.length != 7){
            if (args.length == 0){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length < 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length > 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            return;
        }
        // error checking: incorrect range of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
            else if (Integer.parseInt(args[3]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
            }
            else if (Integer.parseInt(args[3]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth <= 200");
            }
            else if (Integer.parseInt(args[4]) < 0.1) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight >= 0.1");
            }
            else if (Integer.parseInt(args[4]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight <= 200");
            }
        }
    }
```

Problems | Javadoc | Declaration | Console

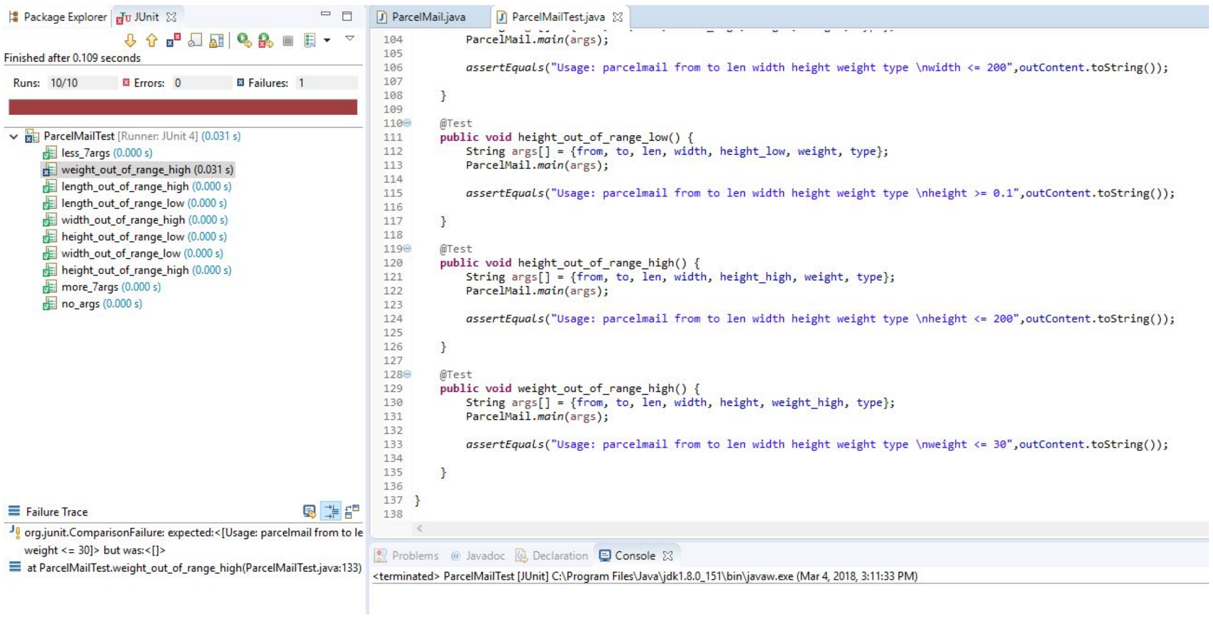
```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:09:13 PM)
```

Test 10

1. Test name: weight_out_of_range_high
2. Purpose: Test the program with the weight(kg) out of range too high
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 50 10 35 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nweight ≤ 30

(There is no minimum weight on canadapost.ca for the documents and parcels)

Test Failure

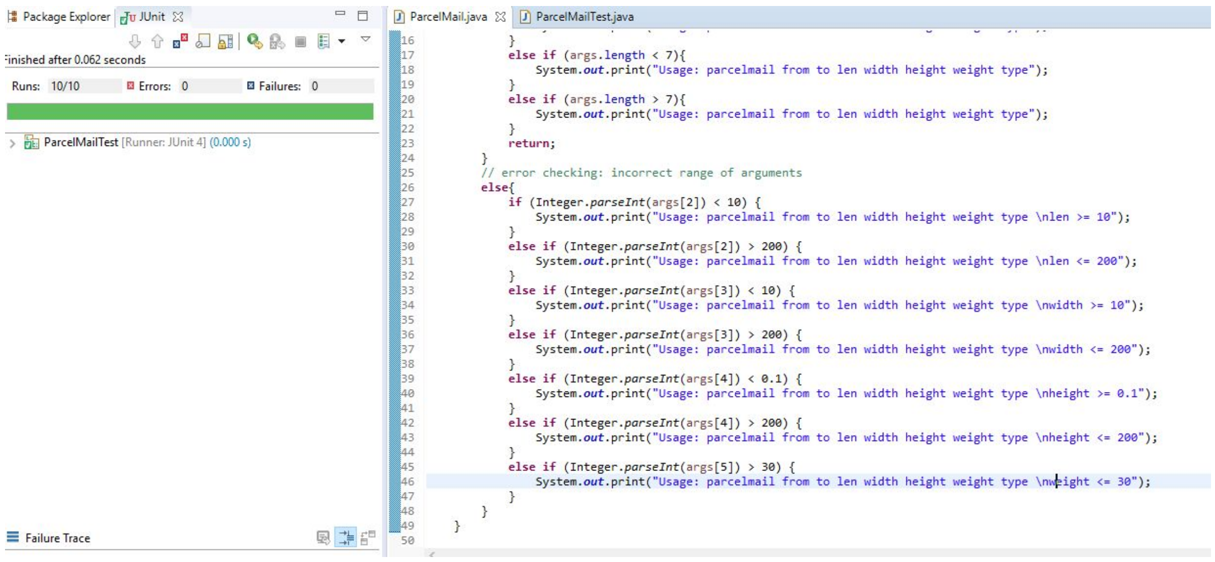


```
Finished after 0.109 seconds
Runs: 10/10    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.031 s)
    less_7args (0.000 s)
    weight_out_of_range_high (0.031 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.000 s)
    height_out_of_range_low (0.000 s)
    width_out_of_range_low (0.000 s)
    height_out_of_range_high (0.000 s)
    more_7args (0.000 s)
    no_args (0.000 s)

Failure Trace
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
weight <= 30]> but was:<[]>
at ParcelMailTest.weight_out_of_range_high(ParcelMailTest.java:133)
```

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nwidth <= 200",outContent.toString());

    }

    @Test
    public void height_out_of_range_low() {
        String args[] = {from, to, len, width, height_low, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight >= 0.1",outContent.toString());

    }

    @Test
    public void height_out_of_range_high() {
        String args[] = {from, to, len, width, height_high, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight <= 200",outContent.toString());

    }

    @Test
    public void weight_out_of_range_high() {
        String args[] = {from, to, len, width, height, weight_high, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nweight <= 30",outContent.toString());

    }
}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:11:33 PM)
```

Test Success



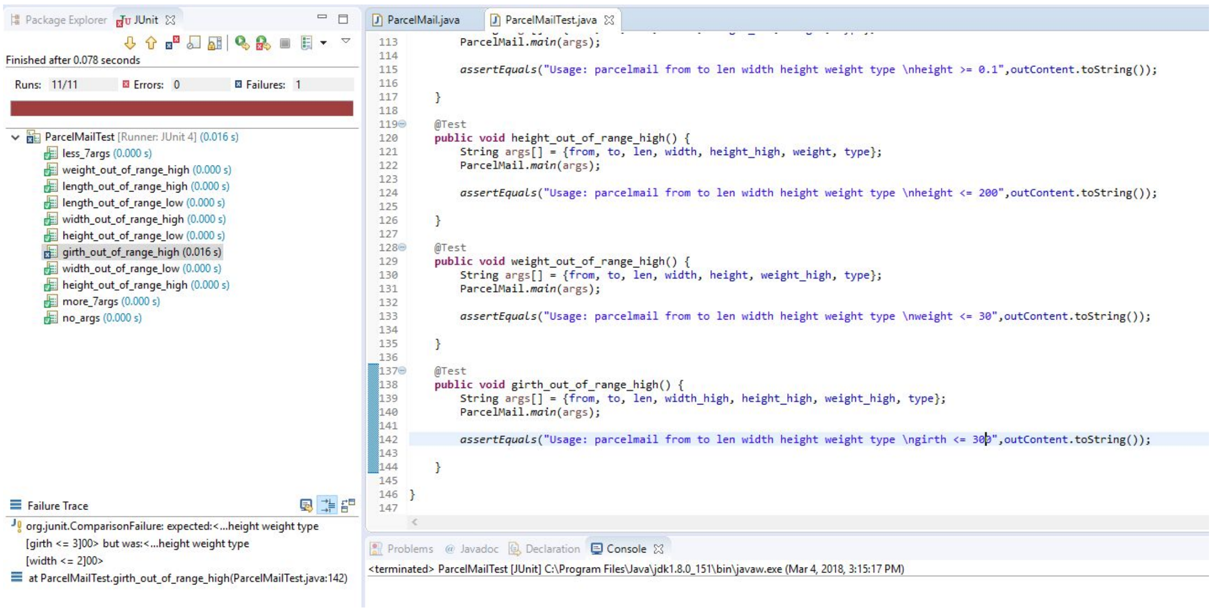
```
Finished after 0.062 seconds
Runs: 10/10    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.000 s)
```

```java
            }
            else if (args.length < 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            else if (args.length > 7){
                System.out.print("Usage: parcelmail from to len width height weight type");
            }
            return;
        }
        // error checking: incorrect range of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
            else if (Integer.parseInt(args[3]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
            }
            else if (Integer.parseInt(args[3]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth <= 200");
            }
            else if (Integer.parseInt(args[4]) < 0.1) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight >= 0.1");
            }
            else if (Integer.parseInt(args[4]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight <= 200");
            }
            else if (Integer.parseInt(args[5]) > 30) {
                System.out.print("Usage: parcelmail from to len width height weight type \nweight <= 30");
            }
        }
    }
```

Test 11

1. Test name: girth_out_of_range_high
2. Purpose: Test the program with the girth(cm) out of range too high.
   Girth = (height x 2) + (width x 2)
3. Call Setup: parcelmail H7S1A4 K1P0A9 150 150 10 35 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \ngirth ≤ 300

Test Failure

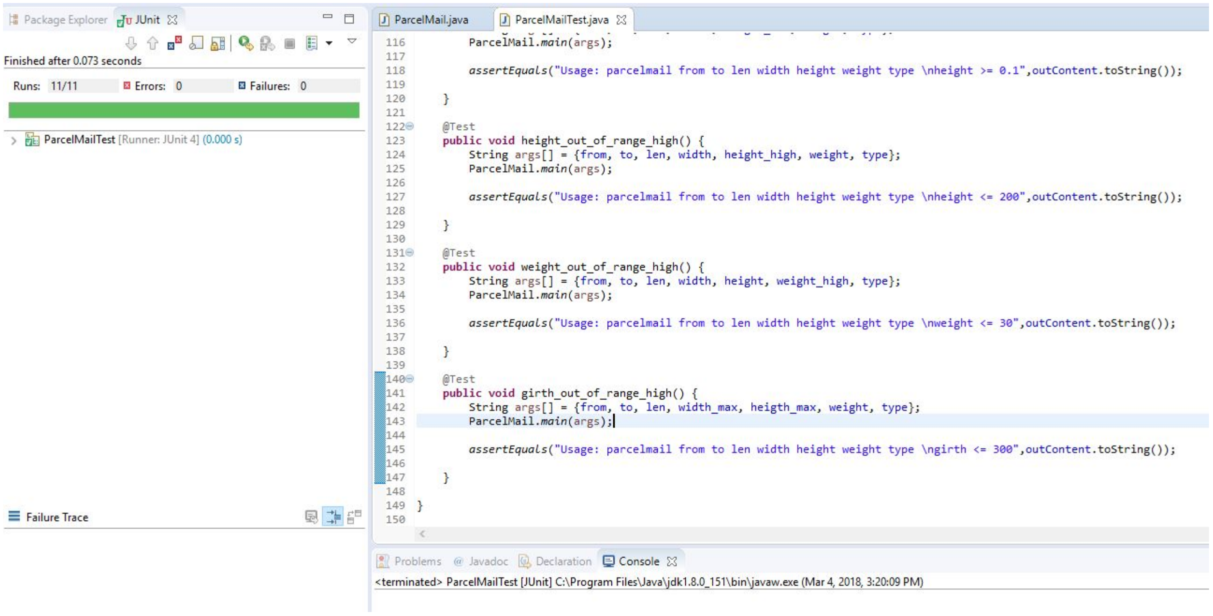


```
Finished after 0.078 seconds
Runs: 11/11    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.016 s)
    less_7args (0.000 s)
    weight_out_of_range_high (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.000 s)
    height_out_of_range_low (0.000 s)
    girth_out_of_range_high (0.016 s)
    width_out_of_range_low (0.000 s)
    height_out_of_range_high (0.000 s)
    more_7args (0.000 s)
    no_args (0.000 s)

org.junit.ComparisonFailure: expected:<...height weight type
[girth <= 3]00> but was:<...height weight type
[width <= 2]00>
at ParcelMailTest.girth_out_of_range_high(ParcelMailTest.java:142)
```

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight >= 0.1",outContent.toString());

    }

    @Test
    public void height_out_of_range_high() {
        String args[] = {from, to, len, width, height_high, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight <= 200",outContent.toString());

    }

    @Test
    public void weight_out_of_range_high() {
        String args[] = {from, to, len, width, height, weight_high, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nweight <= 30",outContent.toString());

    }

    @Test
    public void girth_out_of_range_high() {
        String args[] = {from, to, len, width_high, height_high, weight_high, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ngirth <= 300",outContent.toString());

    }

}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:15:17 PM)
```

Test Success



```
Finished after 0.073 seconds
Runs: 11/11    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.000 s)
```

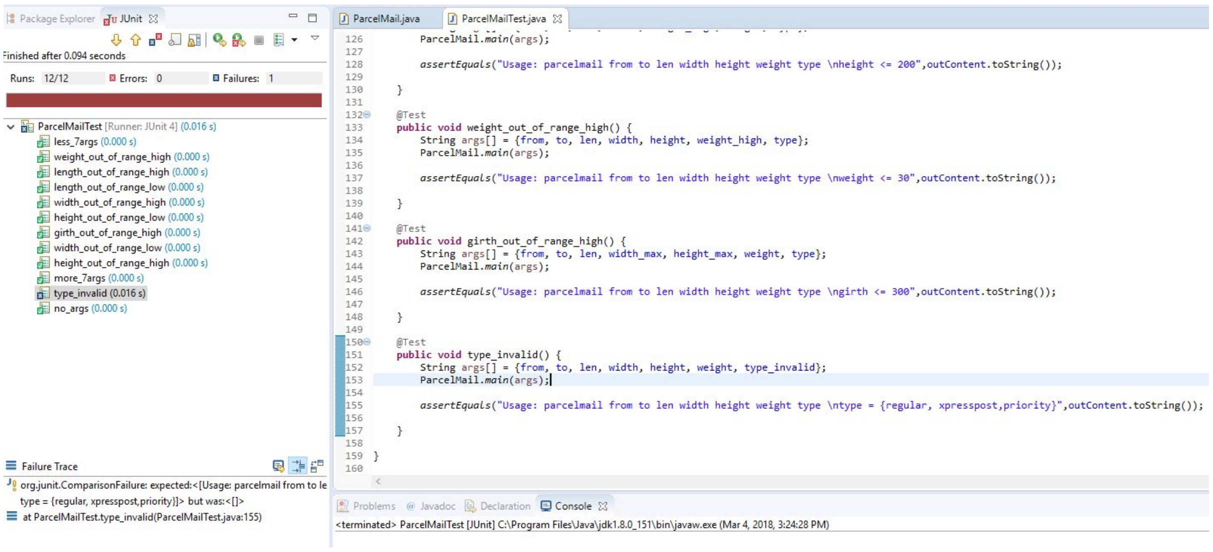
```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight >= 0.1",outContent.toString());

    }

    @Test
    public void height_out_of_range_high() {
        String args[] = {from, to, len, width, height_high, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight <= 200",outContent.toString());

    }

    @Test
    public void weight_out_of_range_high() {
        String args[] = {from, to, len, width, height, weight_high, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nweight <= 30",outContent.toString());

    }

    @Test
    public void girth_out_of_range_high() {
        String args[] = {from, to, len, width_max, heigth_max, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ngirth <= 300",outContent.toString());

    }

}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:20:09 PM)
```

Test 12

1. Test name: type_invalid
2. Purpose: Test the program with an invalid post type
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 50 10 15 express
4. Expected Result: Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}

Test Failure

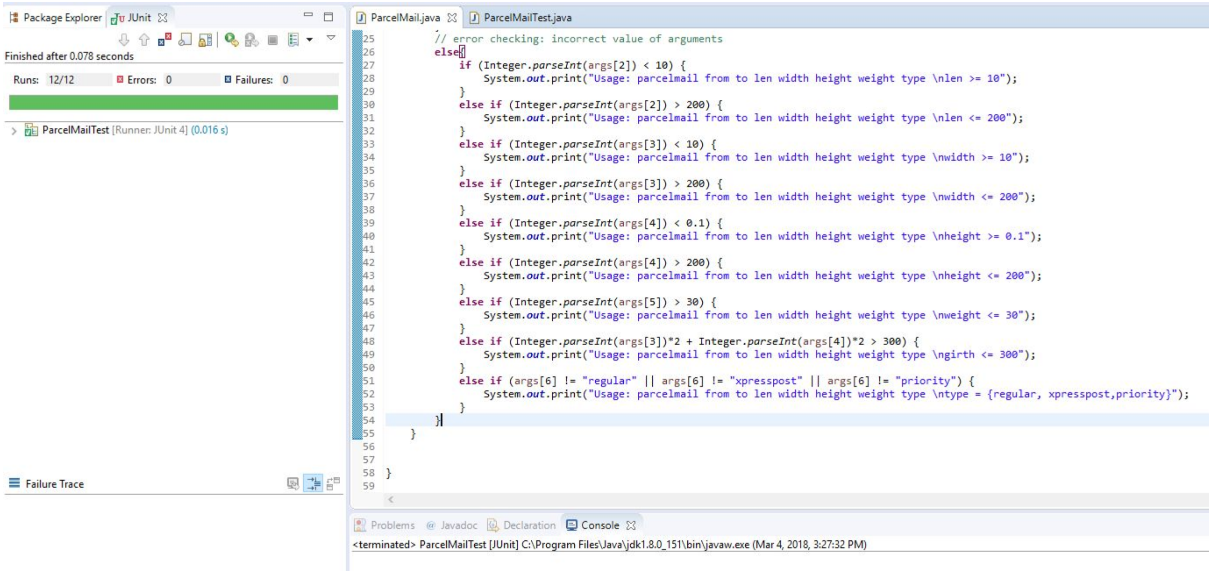


```
Finished after 0.094 seconds
Runs: 12/12    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.016 s)
    less_7args (0.000 s)
    weight_out_of_range_high (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.000 s)
    height_out_of_range_low (0.000 s)
    girth_out_of_range_high (0.000 s)
    width_out_of_range_low (0.000 s)
    height_out_of_range_high (0.000 s)
    more_7args (0.000 s)
    type_invalid (0.016 s)
    no_args (0.000 s)

Failure Trace
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
type = {regular, xpresspost,priority}]> but was:<[]>
at ParcelMailTest.type_invalid(ParcelMailTest.java:155)
```

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nheight <= 200",outContent.toString());

    }

    @Test
    public void weight_out_of_range_high() {
        String args[] = {from, to, len, width, height, weight_high, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nweight <= 30",outContent.toString());

    }

    @Test
    public void girth_out_of_range_high() {
        String args[] = {from, to, len, width_max, height_max, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ngirth <= 300",outContent.toString());

    }

    @Test
    public void type_invalid() {
        String args[] = {from, to, len, width, height, weight, type_invalid};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}",outContent.toString());

    }

}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:24:28 PM)
```

Test Success



```
Finished after 0.078 seconds
Runs: 12/12    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.016 s)

Failure Trace
```

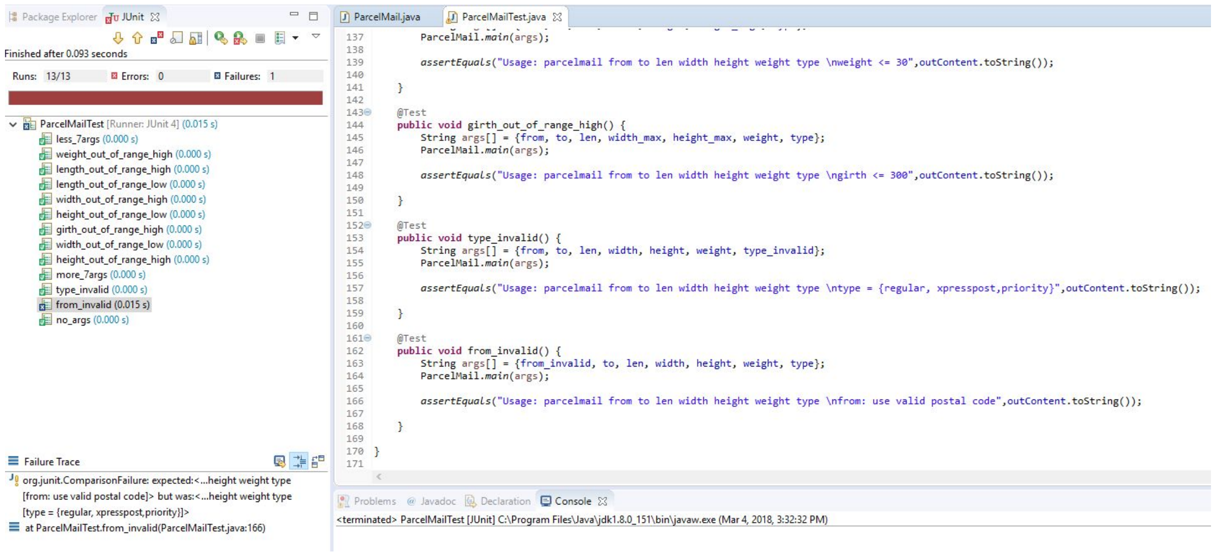
```java
        // error checking: incorrect value of arguments
        else{
            if (Integer.parseInt(args[2]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
            else if (Integer.parseInt(args[3]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
            }
            else if (Integer.parseInt(args[3]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth <= 200");
            }
            else if (Integer.parseInt(args[4]) < 0.1) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight >= 0.1");
            }
            else if (Integer.parseInt(args[4]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight <= 200");
            }
            else if (Integer.parseInt(args[5]) > 30) {
                System.out.print("Usage: parcelmail from to len width height weight type \nweight <= 30");
            }
            else if (Integer.parseInt(args[3])*2 + Integer.parseInt(args[4])*2 > 300) {
                System.out.print("Usage: parcelmail from to len width height weight type \ngirth <= 300");
            }
            else if (args[6] != "regular" || args[6] != "xpresspost" || args[6] != "priority") {
                System.out.print("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}");
            }
        }
    }


}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:27:32 PM)
```

Test 13

1. Test name: from_destination_invalid
2. Purpose: Test the program with an invalid from postal code
3. Call Setup: parcelmail aaabbb K1P0A9 150 150 10 35 regular
4. Expected Result: Usage: parcelmail from to len width height weight type \nfrom: use valid postal code

Test Failure


Package Explorer JUnit

Finished after 0.093 seconds

Runs: 13/13 Errors: 0 Failures: 1

```
ParcelMailTest [Runner: JUnit 4] (0.015 s)
    less_7args (0.000 s)
    weight_out_of_range_high (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.000 s)
    height_out_of_range_low (0.000 s)
    girth_out_of_range_high (0.000 s)
    width_out_of_range_low (0.000 s)
    height_out_of_range_high (0.000 s)
    more_7args (0.000 s)
    type_invalid (0.000 s)
    from_invalid (0.015 s)
    no_args (0.000 s)
```

Failure Trace

```
org.junit.ComparisonFailure: expected:<...height weight type
[from: use valid postal code]> but was:<...height weight type
[type = {regular, xpresspost,priority}]>
at ParcelMailTest.from_invalid(ParcelMailTest.java:166)
```

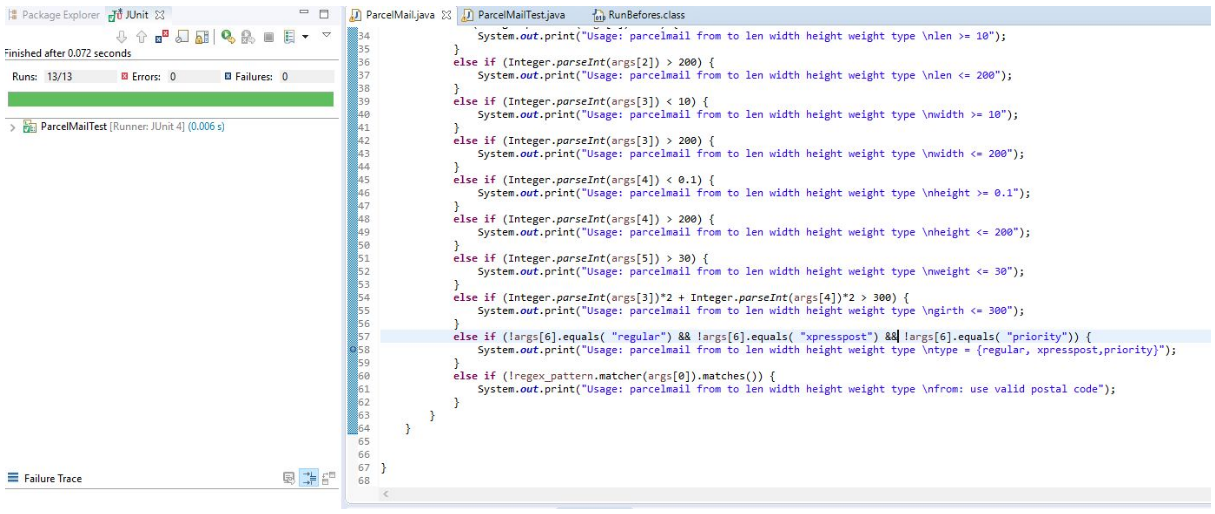
ParcelMail.java ParcelMailTest.java

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nweight <= 30",outContent.toString());

    }

    @Test
    public void girth_out_of_range_high() {
        String args[] = {from, to, len, width_max, height_max, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ngirth <= 300",outContent.toString());

    }

    @Test
    public void type_invalid() {
        String args[] = {from, to, len, width, height, weight, type_invalid};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}",outContent.toString());

    }

    @Test
    public void from_invalid() {
        String args[] = {from_invalid, to, len, width, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nfrom: use valid postal code",outContent.toString());

    }

}
```

Problems Javadoc Declaration Console

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:32:32 PM)
```

Test Success


Package Explorer JUnit

Finished after 0.072 seconds

Runs: 13/13 Errors: 0 Failures: 0

```
ParcelMailTest [Runner: JUnit 4] (0.006 s)
```

Failure Trace

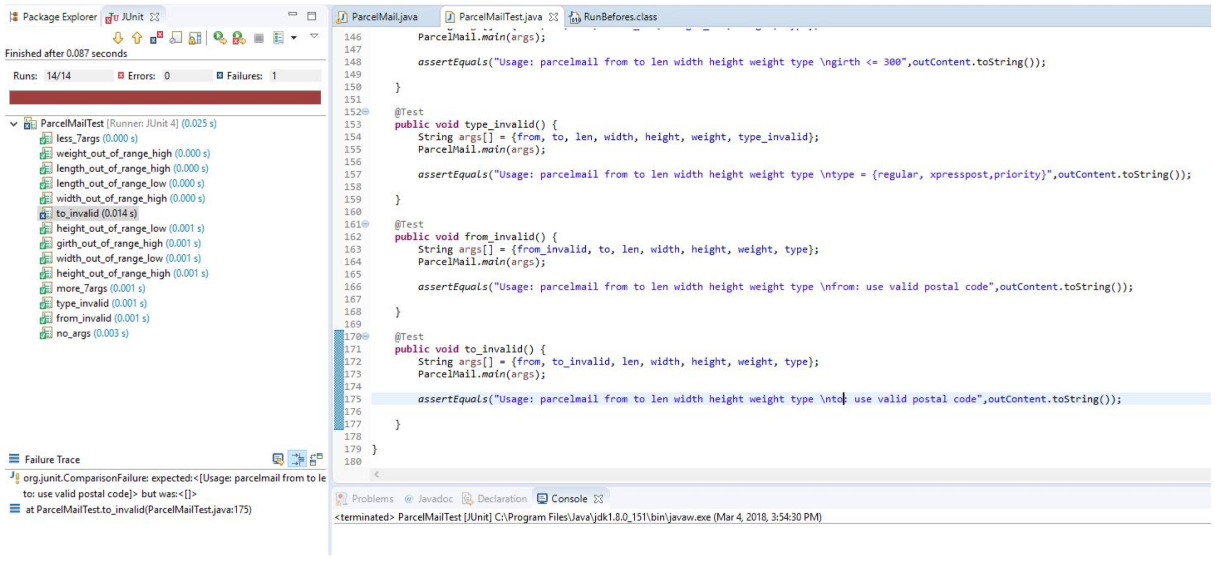
ParcelMail.java ParcelMailTest.java RunBefores.class

```java
                System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
            }
            else if (Integer.parseInt(args[2]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
            }
            else if (Integer.parseInt(args[3]) < 10) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
            }
            else if (Integer.parseInt(args[3]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nwidth <= 200");
            }
            else if (Integer.parseInt(args[4]) < 0.1) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight >= 0.1");
            }
            else if (Integer.parseInt(args[4]) > 200) {
                System.out.print("Usage: parcelmail from to len width height weight type \nheight <= 200");
            }
            else if (Integer.parseInt(args[5]) > 30) {
                System.out.print("Usage: parcelmail from to len width height weight type \nweight <= 30");
            }
            else if (Integer.parseInt(args[3])*2 + Integer.parseInt(args[4])*2 > 300) {
                System.out.print("Usage: parcelmail from to len width height weight type \ngirth <= 300");
            }
            else if (!args[6].equals( "regular") && !args[6].equals( "xpresspost") && !args[6].equals( "priority")) {
                System.out.print("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}");
            }
            else if (!regex_pattern.matcher(args[0]).matches()) {
                System.out.print("Usage: parcelmail from to len width height weight type \nfrom: use valid postal code");
            }
        }
    }


}
```

Test 14

1. Test name: to_destination_invalid
2. Purpose: Test the program with an invalid destination postal code
3. Call Setup: parcelmail H7S1A4 aaabbb 150 150 10 35 regular
4. Expected Result: Usage: parcelmail a2a1a2 h7s1a2 50 50 10 15 regular

Test Failure



Package Explorer | JUnit

Finished after 0.087 seconds

Runs: 14/14 Errors: 0 Failures: 1

```
ParcelMailTest [Runner: JUnit 4] (0.025 s)
    less_7args (0.000 s)
    weight_out_of_range_high (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    width_out_of_range_high (0.000 s)
    to_invalid (0.014 s)
    height_out_of_range_low (0.001 s)
    girth_out_of_range_high (0.001 s)
    width_out_of_range_low (0.001 s)
    height_out_of_range_high (0.001 s)
    more_7args (0.001 s)
    type_invalid (0.001 s)
    from_invalid (0.001 s)
    no_args (0.003 s)
```

Failure Trace

```
org.junit.ComparisonFailure: expected:<[Usage: parcelmail from to le
to: use valid postal code]> but was:<[]>
at ParcelMailTest.to_invalid(ParcelMailTest.java:175)
```

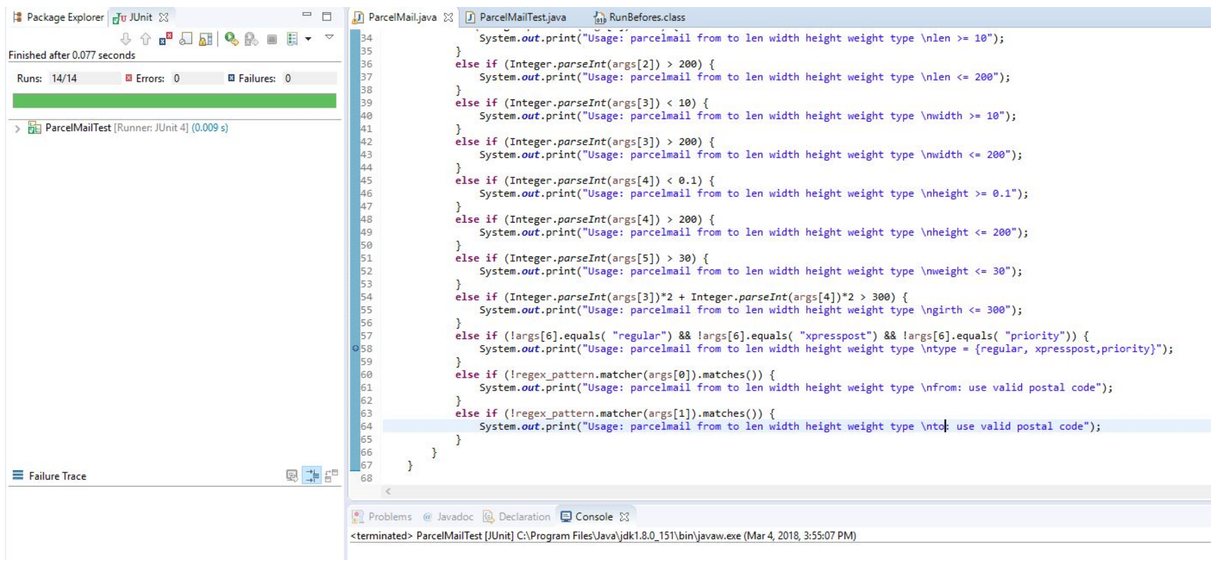
ParcelMail.java | ParcelMailTest.java | RunBefores.class

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ngirth <= 300",outContent.toString());

    }

    @Test
    public void type_invalid() {
        String args[] = {from, to, len, width, height, weight, type_invalid};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}",outContent.toString());

    }

    @Test
    public void from_invalid() {
        String args[] = {from_invalid, to, len, width, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nfrom: use valid postal code",outContent.toString());

    }

    @Test
    public void to_invalid() {
        String args[] = {from, to_invalid, len, width, height, weight, type};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nto: use valid postal code",outContent.toString());

    }

}
```

Problems | Javadoc | Declaration | Console

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:54:30 PM)
```

Test Success



Package Explorer | JUnit

Finished after 0.077 seconds

Runs: 14/14 Errors: 0 Failures: 0

```
ParcelMailTest [Runner: JUnit 4] (0.009 s)
```

Failure Trace

ParcelMail.java | ParcelMailTest.java | RunBefores.class

```java
                    System.out.print("Usage: parcelmail from to len width height weight type \nlen >= 10");
                }
                else if (Integer.parseInt(args[2]) > 200) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nlen <= 200");
                }
                else if (Integer.parseInt(args[3]) < 10) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nwidth >= 10");
                }
                else if (Integer.parseInt(args[3]) > 200) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nwidth <= 200");
                }
                else if (Integer.parseInt(args[4]) < 0.1) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nheight >= 0.1");
                }
                else if (Integer.parseInt(args[4]) > 200) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nheight <= 200");
                }
                else if (Integer.parseInt(args[5]) > 30) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nweight <= 30");
                }
                else if (Integer.parseInt(args[3])*2 + Integer.parseInt(args[4])*2 > 300) {
                    System.out.print("Usage: parcelmail from to len width height weight type \ngirth <= 300");
                }
                else if (!args[6].equals( "regular") && !args[6].equals( "xpresspost") && !args[6].equals( "priority")) {
                    System.out.print("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}");
                }
                else if (!regex_pattern.matcher(args[0]).matches()) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nfrom: use valid postal code");
                }
                else if (!regex_pattern.matcher(args[1]).matches()) {
                    System.out.print("Usage: parcelmail from to len width height weight type \nto: use valid postal code");
                }
            }
        }
```

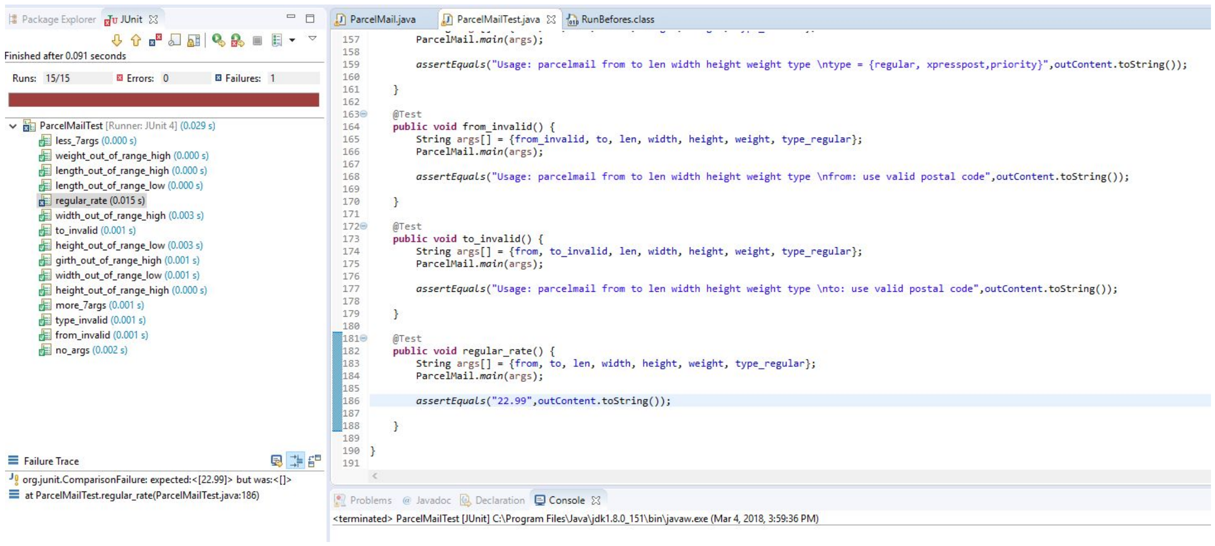
Problems | Javadoc | Declaration | Console

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:55:07 PM)
```

Test 15

1. Test name: regular_rate
2. Purpose: Test a regular parcel expedition to verify price
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 50 10 15 regular
4. Expected Result: 14.81

Test Failure

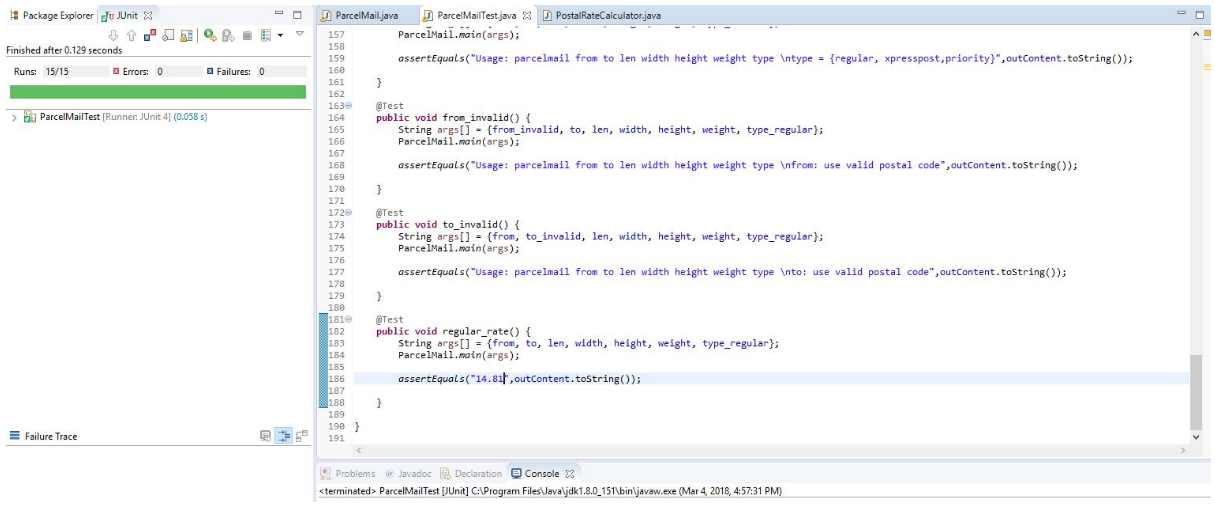


```
Finished after 0.091 seconds
Runs: 15/15    Errors: 0    Failures: 1

ParcelMailTest [Runner: JUnit 4] (0.029 s)
    less_7args (0.000 s)
    weight_out_of_range_high (0.000 s)
    length_out_of_range_high (0.000 s)
    length_out_of_range_low (0.000 s)
    regular_rate (0.015 s)
    width_out_of_range_high (0.003 s)
    to_invalid (0.001 s)
    height_out_of_range_low (0.003 s)
    girth_out_of_range_high (0.001 s)
    width_out_of_range_low (0.001 s)
    height_out_of_range_high (0.000 s)
    more_7args (0.001 s)
    type_invalid (0.001 s)
    from_invalid (0.001 s)
    no_args (0.002 s)

org.junit.ComparisonFailure: expected:<[22.99]> but was:<[]>
at ParcelMailTest.regular_rate(ParcelMailTest.java:186)
```

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}",outContent.toString());

    }

    @Test
    public void from_invalid() {
        String args[] = {from_invalid, to, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nfrom: use valid postal code",outContent.toString());

    }

    @Test
    public void to_invalid() {
        String args[] = {from, to_invalid, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nto: use valid postal code",outContent.toString());

    }

    @Test
    public void regular_rate() {
        String args[] = {from, to, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("22.99",outContent.toString());

    }

}
```

```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 3:59:36 PM)
```

Test Success



```
Finished after 0.129 seconds
Runs: 15/15    Errors: 0    Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.058 s)
```

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \ntype = {regular, xpresspost,priority}",outContent.toString());

    }

    @Test
    public void from_invalid() {
        String args[] = {from_invalid, to, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nfrom: use valid postal code",outContent.toString());

    }

    @Test
    public void to_invalid() {
        String args[] = {from, to_invalid, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nto: use valid postal code",outContent.toString());

    }

    @Test
    public void regular_rate() {
        String args[] = {from, to, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("14.81",outContent.toString());

    }

}
```

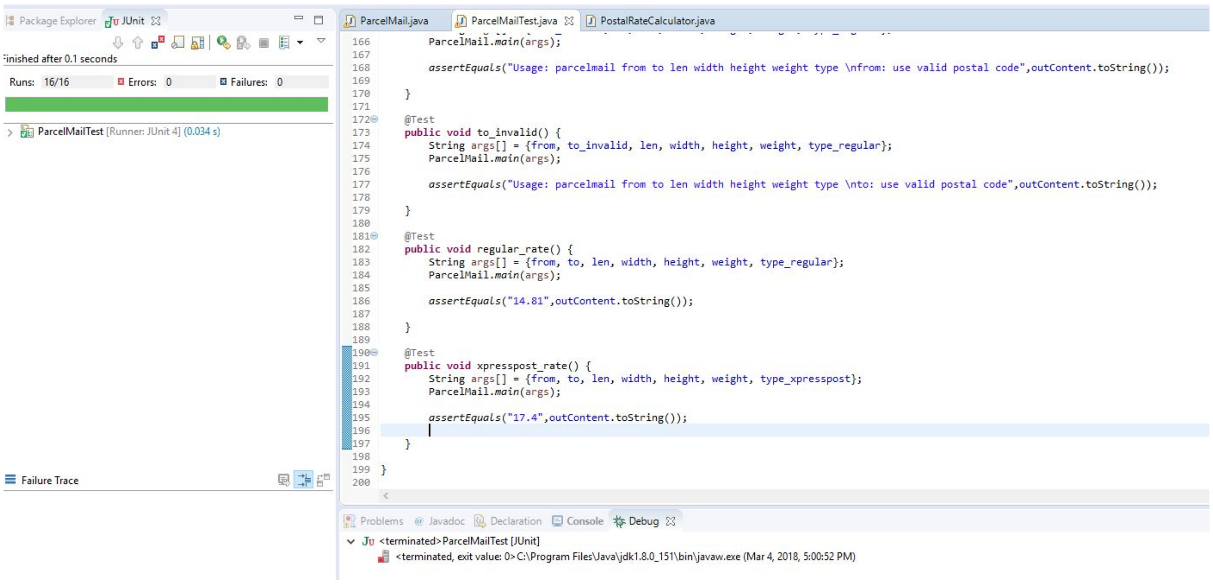
```
<terminated> ParcelMailTest [JUnit] C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 4:57:31 PM)
```

Test 16

1. Test name: xpresspost_rate
2. Purpose: Test a xpresspostparcel expedition to verify price
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 50 10 15 xpresspost
4. Expected Result: 17.4

This test does not fail because it uses the same code as Test 15 to calculate the expected result

Test Success



Finished after 0.1 seconds

Runs: 16/16 Errors: 0 Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.034 s)

```java
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nfrom: use valid postal code",outContent.toString());

    }

    @Test
    public void to_invalid() {
        String args[] = {from, to_invalid, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nto: use valid postal code",outContent.toString());

    }

    @Test
    public void regular_rate() {
        String args[] = {from, to, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("14.81",outContent.toString());

    }

    @Test
    public void xpresspost_rate() {
        String args[] = {from, to, len, width, height, weight, type_xpresspost};
        ParcelMail.main(args);

        assertEquals("17.4",outContent.toString());

    }

}
```

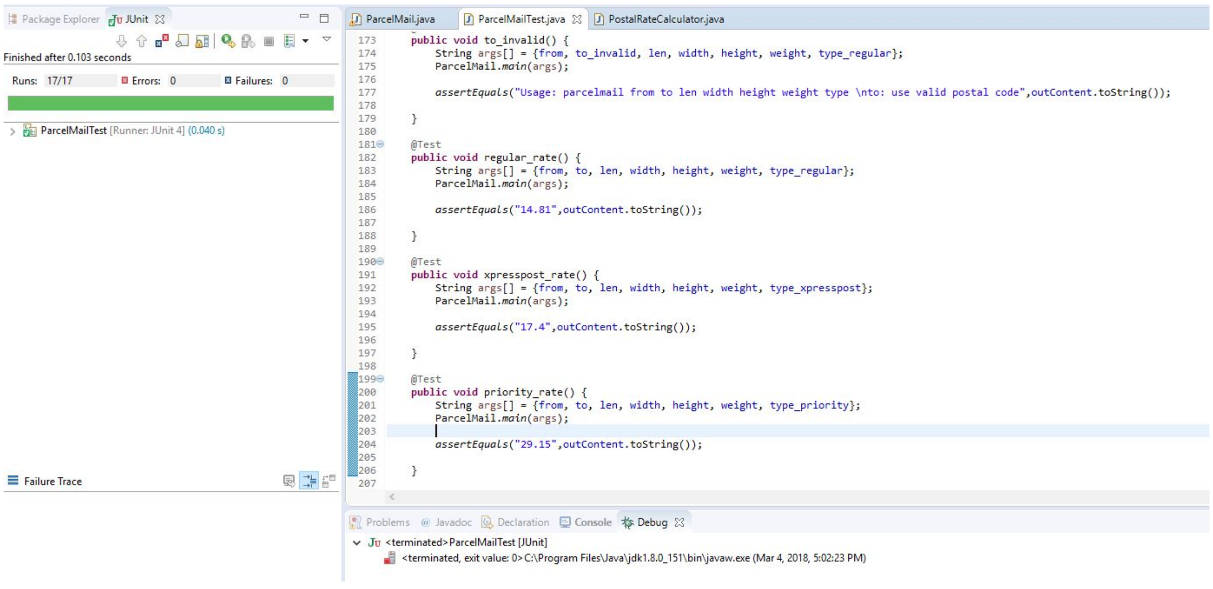
```
<terminated> ParcelMailTest [JUnit]
    <terminated, exit value: 0> C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 5:00:52 PM)
```

Test 17

1. Test name: priority_rate
2. Purpose: Test a priority parcel expedition to verify price
3. Call Setup: parcelmail H7S1A4 K1P0A9 50 50 10 15 priority
4. Expected Result: 40.75

This test does not fail because it uses the same code as Test 15 to calculate the expected result

Test Success



Finished after 0.103 seconds

Runs: 17/17 Errors: 0 Failures: 0

ParcelMailTest [Runner: JUnit 4] (0.040 s)

```java
    public void to_invalid() {
        String args[] = {from, to_invalid, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("Usage: parcelmail from to len width height weight type \nto: use valid postal code",outContent.toString());

    }

    @Test
    public void regular_rate() {
        String args[] = {from, to, len, width, height, weight, type_regular};
        ParcelMail.main(args);

        assertEquals("14.81",outContent.toString());

    }

    @Test
    public void xpresspost_rate() {
        String args[] = {from, to, len, width, height, weight, type_xpresspost};
        ParcelMail.main(args);

        assertEquals("17.4",outContent.toString());

    }

    @Test
    public void priority_rate() {
        String args[] = {from, to, len, width, height, weight, type_priority};
        ParcelMail.main(args);

        assertEquals("29.15",outContent.toString());

    }
```

```
<terminated> ParcelMailTest [JUnit]
    <terminated, exit value: 0> C:\Program Files\Java\jdk1.8.0_151\bin\javaw.exe (Mar 4, 2018, 5:02:23 PM)
```