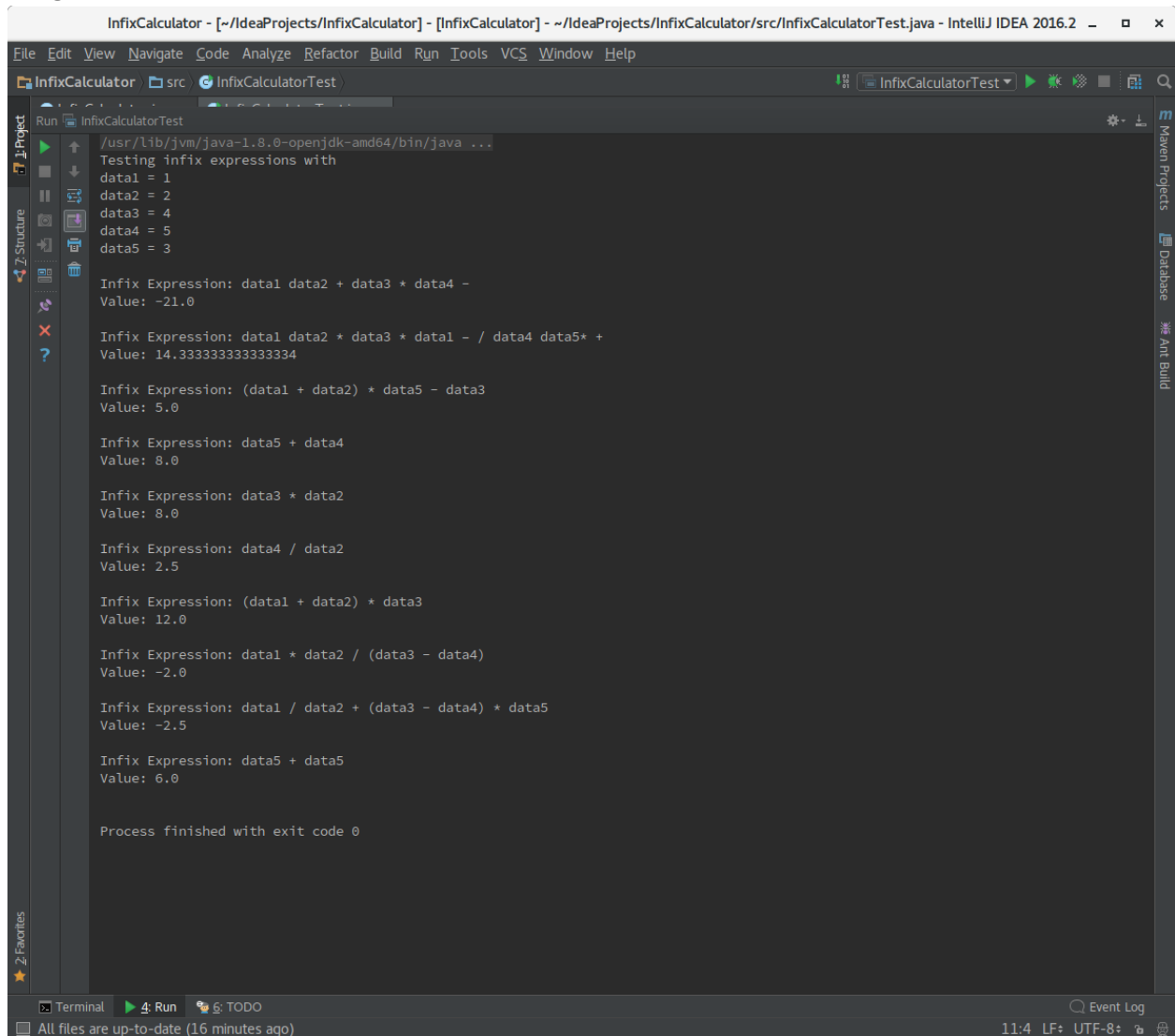


Micah Courey  
CSC400: Data Structures and Algorithms  
Critical Thinking Module 4  
Option #2: Infix Calculator  
April 16th, 2017

## Program Screenshots

### Program Output



```
InfixCalculator - [~/IdeaProjects/InfixCalculator] - [InfixCalculator] - ~/IdeaProjects/InfixCalculator/src/InfixCalculatorTest.java - IntelliJ IDEA 2016.2
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
InfixCalculator src InfixCalculatorTest
Run InfixCalculatorTest
/usr/lib/jvm/java-1.8.0-openjdk-amd64/bin/java ...
Testing infix expressions with
data1 = 1
data2 = 2
data3 = 4
data4 = 5
data5 = 3

Infix Expression: data1 data2 + data3 * data4 -
Value: -21.0

Infix Expression: data1 data2 * data3 * data1 - / data4 data5 * +
Value: 14.333333333333334

Infix Expression: (data1 + data2) * data5 - data3
Value: 5.0

Infix Expression: data5 + data4
Value: 8.0

Infix Expression: data3 * data2
Value: 8.0

Infix Expression: data4 / data2
Value: 2.5

Infix Expression: (data1 + data2) * data3
Value: 12.0

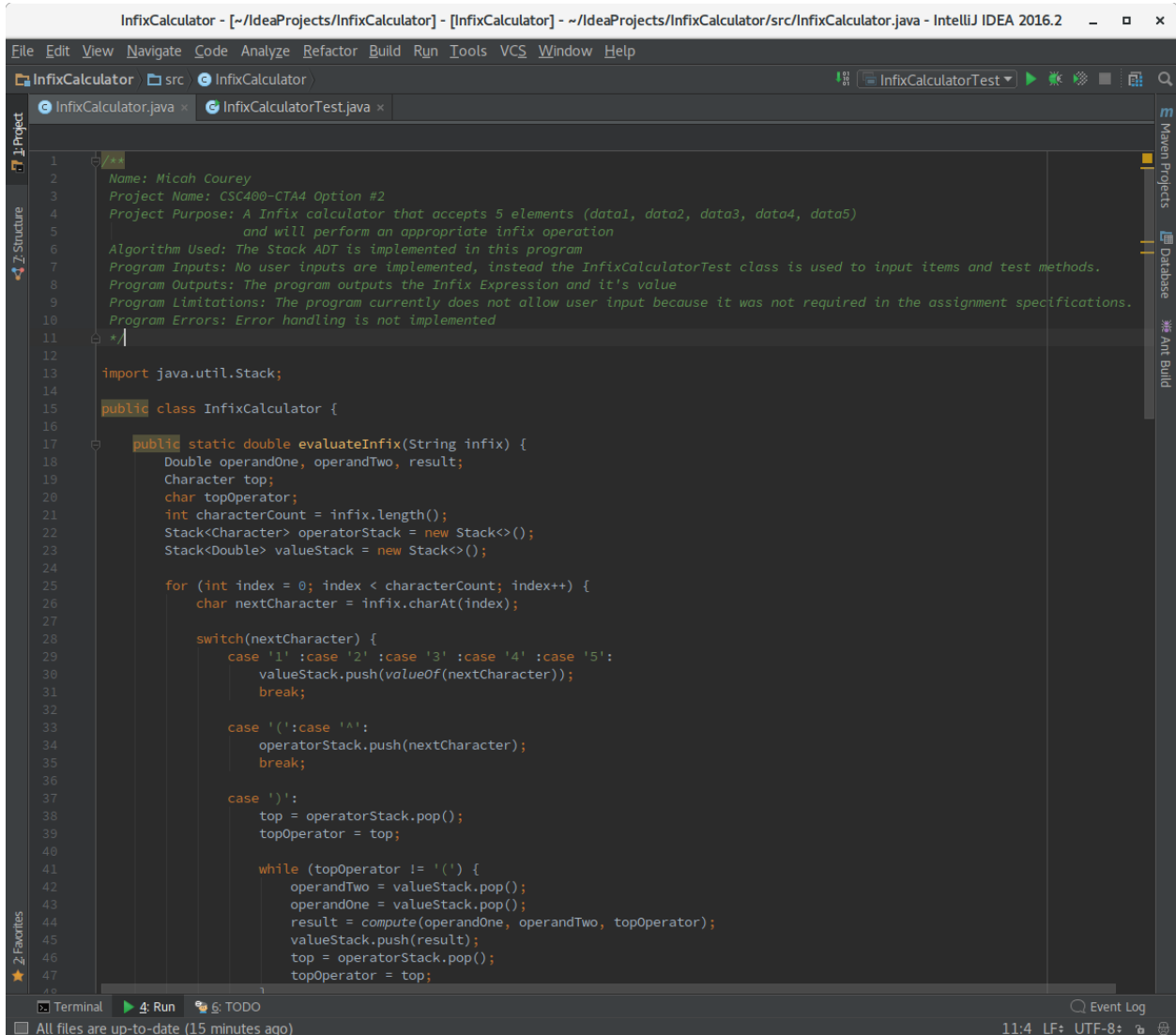
Infix Expression: data1 * data2 / (data3 - data4)
Value: -2.0

Infix Expression: data1 / data2 + (data3 - data4) * data5
Value: -2.5

Infix Expression: data5 + data5
Value: 6.0

Process finished with exit code 0
```

## InfixCalculator Class



```
InfixCalculator - [~/IdeaProjects/InfixCalculator] - [InfixCalculator] - ~/IdeaProjects/InfixCalculator/src/InfixCalculator.java - IntelliJ IDEA 2016.2
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

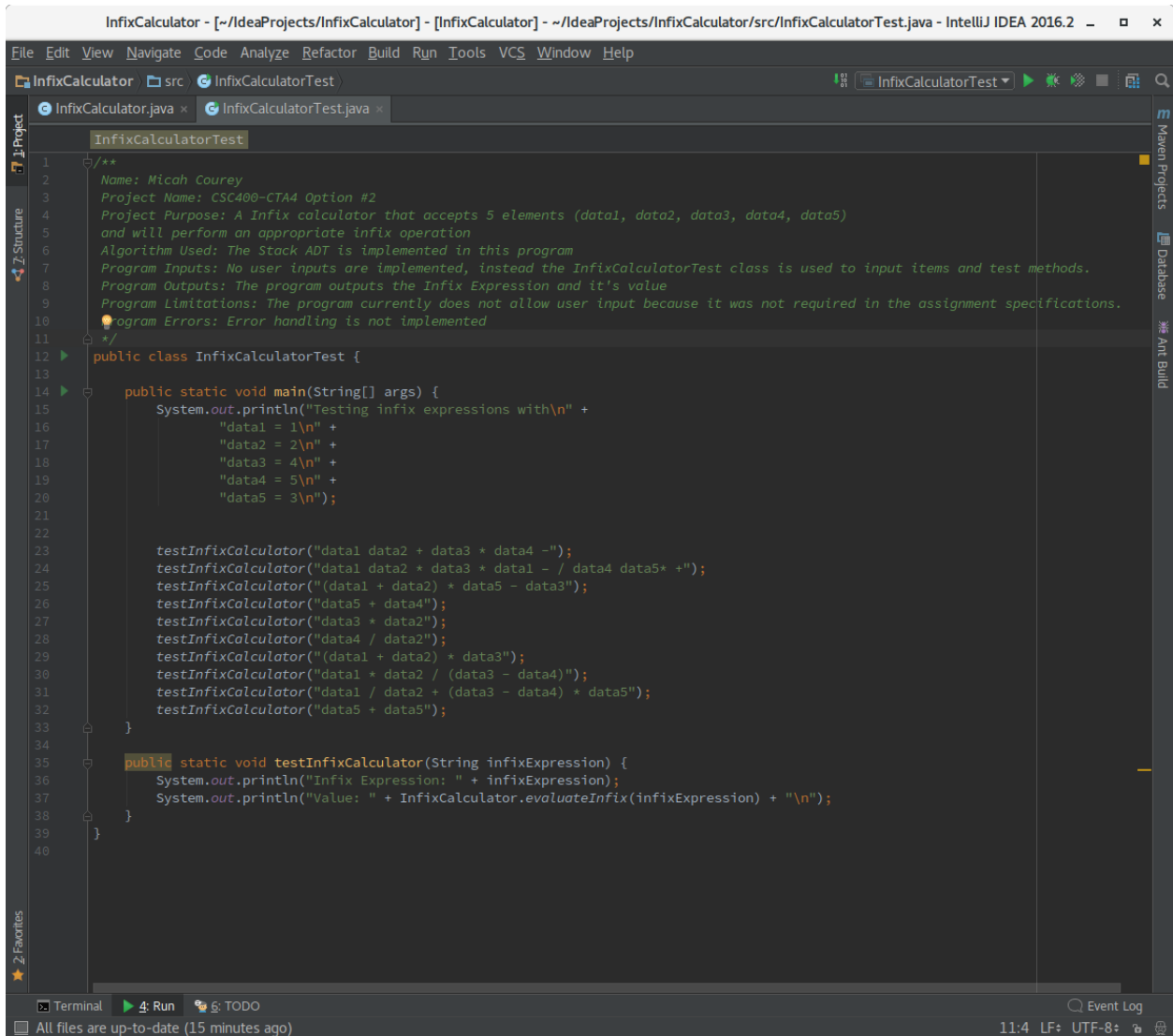
InfixCalculator src InfixCalculatorTest
InfixCalculator.java InfixCalculatorTest.java

1 /**
2  * Name: Micah Courey
3  * Project Name: CSC400-CTA4 Option #2
4  * Project Purpose: A Infix calculator that accepts 5 elements (data1, data2, data3, data4, data5)
5  * and will perform an appropriate infix operation
6  * Algorithm Used: The Stack ADT is implemented in this program
7  * Program Inputs: No user inputs are implemented, instead the InfixCalculatorTest class is used to input items and test methods.
8  * Program Outputs: The program outputs the Infix Expression and it's value
9  * Program Limitations: The program currently does not allow user input because it was not required in the assignment specifications.
10 * Program Errors: Error handling is not implemented
11 */
12
13 import java.util.Stack;
14
15 public class InfixCalculator {
16
17     public static double evaluateInfix(String infix) {
18         Double operandOne, operandTwo, result;
19         Character top;
20         char topOperator;
21         int characterCount = infix.length();
22         Stack<Character> operatorStack = new Stack<>();
23         Stack<Double> valueStack = new Stack<>();
24
25         for (int index = 0; index < characterCount; index++) {
26             char nextCharacter = infix.charAt(index);
27
28             switch(nextCharacter) {
29                 case '1':case '2':case '3':case '4':case '5':
30                     valueStack.push(valueOf(nextCharacter));
31                     break;
32
33                 case '(':case '^':
34                     operatorStack.push(nextCharacter);
35                     break;
36
37                 case ')':
38                     top = operatorStack.pop();
39                     topOperator = top;
40
41                     while (topOperator != '(') {
42                         operandTwo = valueStack.pop();
43                         operandOne = valueStack.pop();
44                         result = compute(operandOne, operandTwo, topOperator);
45                         valueStack.push(result);
46                         top = operatorStack.pop();
47                         topOperator = top;
48                     }
49             }
50         }
51         return valueStack.pop();
52     }
53 }
```

Terminal Run TODO Event Log

All files are up-to-date (15 minutes ago) 11:4 LF: UTF-8

## InfixCalculatorTest Class



```
InfixCalculator - [~/IdeaProjects/InfixCalculator] - [InfixCalculator] - ~/IdeaProjects/InfixCalculator/src/InfixCalculatorTest.java - IntelliJ IDEA 2016.2
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

InfixCalculator src InfixCalculatorTest
InfixCalculatorTest
1 /**
2  * Name: Micah Courey
3  * Project Name: CSC400-CTA4 Option #2
4  * Project Purpose: A Infix calculator that accepts 5 elements (data1, data2, data3, data4, data5)
5  * and will perform an appropriate infix operation
6  * Algorithm Used: The Stack ADT is implemented in this program
7  * Program Inputs: No user inputs are implemented, instead the InfixCalculatorTest class is used to input items and test methods.
8  * Program Outputs: The program outputs the Infix Expression and it's value
9  * Program Limitations: The program currently does not allow user input because it was not required in the assignment specifications.
10 * Program Errors: Error handling is not implemented
11 */
12 public class InfixCalculatorTest {
13
14     public static void main(String[] args) {
15         System.out.println("Testing infix expressions with\n" +
16             "data1 = 1\n" +
17             "data2 = 2\n" +
18             "data3 = 4\n" +
19             "data4 = 5\n" +
20             "data5 = 3\n");
21
22         testInfixCalculator("data1 data2 + data3 * data4 -");
23         testInfixCalculator("data1 data2 * data3 * data1 - / data4 data5 * +");
24         testInfixCalculator("(data1 + data2) * data5 - data3");
25         testInfixCalculator("data5 + data4");
26         testInfixCalculator("data3 * data2");
27         testInfixCalculator("data4 / data2");
28         testInfixCalculator("(data1 + data2) * data3");
29         testInfixCalculator("data1 * data2 / (data3 - data4)");
30         testInfixCalculator("data1 / data2 + (data3 - data4) * data5");
31         testInfixCalculator("data5 + data5");
32     }
33
34     public static void testInfixCalculator(String infixExpression) {
35         System.out.println("Infix Expression: " + infixExpression);
36         System.out.println("Value: " + InfixCalculator.evaluateInfix(infixExpression) + "\n");
37     }
38 }
39
40
Terminal Run TODO
All files are up-to-date (15 minutes ago) 11:4 LF: UTF-8
```