CS 180 Project 3

1 Simple Calculator

Project assigned on: Friday Feb 10th 2012
Project due date: Thursday Feb 16th 11:59 p.m. 2012

1.1 Description

In this project, your program will output the result of a specified arithmetic calculation based on user inputs: an operator, and two operands. You read the operation to be performed (+, -, *, or /) using the Scanner class. You also read two operands (of type double) on which the operation needs to be performed. Then, output the result of performing that operation on the two operands. Figure 4 shows the overall requirements of the project.

2 Learning objectives

1. Learn how to use selection statements (switch and if-else).
2. Learn how to perform basic input validation.

3 Project Setup

Create a project3 folder in your cs180 folder. Save all your Java source files in this project3 folder. You will be turning in the contents of this folder when the project is completed.

Note: Use the following commands if needed:

% cd ~/cs180
% mkdir project3
% cd project3
% pwd
/u/u9x/yourlogin/cs180/project3
% drJava

4 Project Details

4.1 Input Details

Your program reads the operator and two operands as shown below in Figure 1.

Figure 1: Reading the operand and two operators

Enter the operator: *
Enter the first operand: 12.5
Enter the second operand: 2

1. Read the operator and two operands as shown in the figure.
2. The operator can be any one of the following four characters: +, -, *, or /
3. The operands are both decimal values.

4.2 Input Validation

4.2.1 Operator Validation
When any operator other than the four mentioned above is entered, print the following error message: “Invalid operator” and exit without reading any further inputs. Refer to Figure 2.

**4.2.2 Operand Validation**

When the operator is / (division) and the second operand is zero, print the following error message: “Cannot divide by zero”. Refer to Figure 3.

**4.3 Data processing and Output**

Use the collected data to print the output as shown in Figure 4.

1. The result to be displayed is calculated as follows: Result = operand1 operation operand2. For example, when operand1 is 10.5, operand2 is 3.4, and operator is ‘-’, the result is “10.5 – 3.4 = 7.100”.
2. Check for input validation errors based on the rules mentioned above and display the appropriate error message.
3. When there are no validation errors compute the result of the operation.

**4.4 Displaying Output**

1. All decimal values displayed as part of output should be formatted to exactly 3 digits of precision. Use the DecimalFormat class from the java.text package. You can also use the printf() method from System.out to format your output instead of DecimalFormat.
2. Try to match your output exactly to what appears in Figure 4.
5 Coding standards

Make sure you follow the coding standards specified in the course website at http://web.ics.purdue.edu/~cs180/Spring2012Web/java_programming_standards.html

6 Grading

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct data types</td>
<td>15</td>
</tr>
<tr>
<td>Data Input</td>
<td>15</td>
</tr>
<tr>
<td>Input Validation</td>
<td>20</td>
</tr>
<tr>
<td>Calculations</td>
<td>20</td>
</tr>
<tr>
<td>Correct Output</td>
<td>20</td>
</tr>
<tr>
<td>Coding Standard</td>
<td>10</td>
</tr>
</tbody>
</table>

7 Turnin

Make sure you have class level comments that clearly specify your name, cs login, recitation section number, and date.

/*
 * name:
 * cs login:
 * recitation section
 * date
 */

To turn in your project, first remove all the .class files and other backup files (e.g., files with names ending in ~) from your project3 folder.

% pwd
/u/u9x/yourlogin/cs180/project3
% rm -i *.class ~

Change your current folder to your cs180 folder and only then run the turnin command.

% cd ..
% pwd
/u/u9x/yourlogin/cs180
% turnin -v -c cs180=XXX -p project3 project3

In the table below, find the recitation section in which you are enrolled. Substitute the XXX above with the corresponding value in column XXX.

<table>
<thead>
<tr>
<th>Section Day</th>
<th>Time</th>
<th>Rec. TA</th>
<th>XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>R01 F</td>
<td>11:30:00 AM</td>
<td>Gnanasekaran, Bala</td>
<td>REC1</td>
</tr>
<tr>
<td>R02 F</td>
<td>02:30:00 PM</td>
<td>Zage, John</td>
<td>REC2</td>
</tr>
<tr>
<td>R03 F</td>
<td>09:30:00 AM</td>
<td>Stephen, Julian</td>
<td>REC3</td>
</tr>
<tr>
<td>R04 F</td>
<td>08:30:00 AM</td>
<td>Sriran, Dinesh</td>
<td>REC4</td>
</tr>
<tr>
<td>Room</td>
<td>Time</td>
<td>Name, Name</td>
<td>REC</td>
</tr>
<tr>
<td>--------</td>
<td>---------------</td>
<td>-------------------</td>
<td>------</td>
</tr>
<tr>
<td>RM1 F</td>
<td>03:30:00 PM</td>
<td>Zage, John</td>
<td>REC2</td>
</tr>
<tr>
<td>RM2 F</td>
<td>10:30:00 AM</td>
<td>Stephen, Julian</td>
<td>REC3</td>
</tr>
<tr>
<td>RM3 F</td>
<td>04:30:00 PM</td>
<td>Sriram, Dinesh</td>
<td>REC4</td>
</tr>
</tbody>
</table>