CST8116 Lab Exercise 06

Order of operations, Boolean logic

# Instructions

* Solve the equations presented, simplifying them step by step following order of operations.

# Part 1 Understand the Problem

* There are three equations to solve for this lab exercise, each produces a Boolean result.

1. 42 / 3.0 + 44 >= 100 && true || 99 - (11\*9) + 45 < 42
2. x++ + y > (y = 3) || 45 - y++ <= 2
3. ! (3 + 5 > 7 && 42 == 5 || ! (3 <= 3))

* List the order of operations you will need to follow to solve each equation.
* You can copy a list from the lecture notes (See week 5).

# Part 2 Solve each equation step-by-step

* Solve each equation step by step to get an answer of true or false for each
  + For equation 2, set x = 10 and y = 5 as starting values.
* Show the steps, based on order of operations within your MS Word document submission.
* Reference Lecture Notes Week 5 “01 boolean, logic and relational operators.pptx” slide 15 for an example.

# Part 3 Write a Java program to test your answers

* Use Java coding conventions.
* Create a simple program within a method main, which outputs the result of each equation, see the example program run at the bottom of this handout as reference for outputs.
* Include your name as part of the program output.
* Take a screen shot of your program output, including your full name as part of the program output.

# Microsoft Word Document Format

See the template example (from exercise 01), suggested headings below:

* Order of Operations Reference
* Equation1 Solved Step by Step
* Equation2 Solved Step by Step
* Equation3 Solved Step by Step
* Screen Shot Java Program

Note: You are **not required** to copy and paste your Java code inside the MS Word document, however ensure that your .java source code file(s) are uploaded as part of your exercise submission.

# Submission Requirements

* You are required to upload your MS Word document, as well as your .java source code files for your submission.
* Follow any additional submission instructions specified by your lab professor.

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# Grading (6 Points)

|  |  |  |  |
| --- | --- | --- | --- |
| Criteria | Missing / Poor (0) | Below Expectations (0.5) | Meets Expectations (1) |
| Order of operations | Missing or incorrect. | Not fully correct | Correct, lists order of operations |
| Equation 1 step by step | Missing or incorrect. | Small mistakes in steps | Correct |
| Equation 2 step by step | Missing or incorrect. | Small mistakes in steps | Correct |
| Equation 3 step by step | Missing or incorrect. | Small mistakes in steps | Correct |
| Java program (.java file) conventions | Missing or incorrect. | Does not meet all of the requirements: Java coding conventions, output of equations as true/false answers. | Does meet all of the requirements: Java coding conventions, output of equations as true/false answers. |
| Java program screen shot | Missing or incorrect or student name missing from screen shot. | Screen shot shows program output as minimally true or false for each equation, student does not output their full name. | Screen shot shows program output that closely matches the sample provided, student full name appears as part of the output. |

Appendix: Sample Run of Program (Your program should produce similar output)

equation1: 42 / 3.0 + 44 >= 100 && true || 99 - (11\*9) + 45 < 42

equation1 answer: false

int x = 10

int y = 5

equation2: x++ + y > (y = 3) || 45 - y++ <= 2

equation2 answer: true

equation3: ! (3 + 5 > 7 && 42 == 5 || ! (3 <= 3))

equation3 answer: true

Program by Stanley Pieda