Lab Report 04

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# Problem

State the given problem clearly in one’s own words. Copy and pasting from the assignment will result in an overall 0 for the entire lab report.

We need to create a method that takes in integer values and operators the user enters, put them into a stack, and have the method solve the equations given. The method must be able to find two numbers, then a operator right after the second number. The program must solve the equation and pop the value back into the stack. This process should repeat until there is only one numeric value left in the stack. That value is then returned.

# Solution

Explain how the program solves the problem. This description must be detailed and high-level without using the direct implementation – do not just copy and paste the programming solution’s code. You may think of this as explaining how the software works to another non-computer entity, like a human. It should cover the finer points of the lab while justifying implementation decisions. While pseudocode may be used it must be accompanied by said clear and understandable description. Flow Charts and graphics are strongly encouraged, and in some cases required.

1. The String variable is inputted
2. A for loop is created based on the length of the String
   1. Checks the current character and determines what the do with it through a switch statement
      1. If the value is a number, it adds it to the stack
      2. If the value is an operator, it checks that there are at least two numbers already in the stack
         1. If yes, it does the operation
            1. Returns 0 incase of a divide by 0 error
         2. If no, it returns 0
      3. If the value is neither of those two things, it returns 0
3. After the loop is completed, a final check is done to make sure there is only one value left in the stack
   1. If this is true, that value is returned
   2. If this is false, it returns 0

# Implementation Problems Encountered

Enumerate the issues that arose from creating this solution. Include major syntax, run-time, and logical errors with their respective solutions. If you did not have any problems then you may put, “No problems encountered”, but if the solution is not correct then this section will receive no points.

One of my biggest troubles for this lab was understanding what the question was asking. The concept of a Reverse Polish Calculator is difficult to grasp upon a first look. I also had lots of trouble trying to convert the String into integers in a stack. However, once I got that part down, the actual calculations were easy.

# Lab Report Questions

1. Draw the resulting stack after the following commands are run. Clearly indicate the head of the Stack.
   1. Push 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 //current stack: 10,9,8,7,6,5,4,3,2,1
   2. Pop Twice //current stack: 8,7,6,5,4,3,2,1
   3. Push 11, 12, 13, 14, 15 //current stack: 15,14,13,12,11,8,7,6,5,4,3,2,1
   4. Pop 3 times //current stack: 12,11,8,7,6,5,4,3,2,1

//Final stack: 12,11,8,7,6,5,4,3,2,1

1. Redo Question 1 but with a Queue. In other words, what is the results after the following commands are run. Clearly indicate the head of the Queue
   1. Enqueue 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 //current queue: 1,2,3,4,5,6,7,8,9,10
   2. Dequeue Twice //current queue: 3,4,5,6,7,8,9,10
   3. Enqueue 11, 12, 13, 14, 15 //current queue: 3,4,5,6,7,8,9,10,11,12,13,14,15
   4. Dequeue 3 times //current queue: 6,7,8,9,10,11,12,13,14,15

//Final queue: 6,7,8,9,10,11,12,13,14,15