## CSCI 3328 Object Oriented Programming in C# Fall 2012 Assignment #8

Instructor: Dr. Xiang Lian Due Date: See the course Web page

In a conventional arithmetic expression, the operator is between the operands (2 + 3); this is called infix notation. Computers prefer postfix notation in which the operator is written to the right of its operands. A compiler would have to convert the infix to a postfix. Consider the following problems:

Infix	Postfix
(6.2+3) * 5 - 8 / 4	6.2 3 + 5 * 8 4 / -
(3+4) * 5	34+5*
3 + 4 * 5	3 4 5 * +

Write a program to

Accept a Postfix problem as a string (a number could be real or integer).

Parse the string to find the operands and opcodes

Opcodes allowed are: +, - , \* , /,  $\setminus$ , %

Using a stack data structure (that you create) do the calculation. Implement stack either as a class or a module.

Display all activities in a dialog box.

Display the result in a label box.

## **Explanation:**

We evaluate the expression by scanning from left to right. Consider the problem 62/5+. Look for the first operator beginning from left. The division operator is applied to the immediate previous operands. The divisor would be the later one, in this case 2. Now the problem has been reduced to 35 +. Continue processing until the end of the problem statement.

Here are some problems with results.

postfix expression	result	
		* this description and the samples are
4 5 7 2 + - *	-16	taken from Nell Dale's Book.
34+2*7/	2	
57+62-*	48	

Please submit:

1. Program listing, and

2. The screen captures (as given in the Appendix)

Please submit all files in a compressed \*.zip file.

• Your program should begin with a comment section that would include the following:

PROGRAMMERS NAME:_		
STUDENT ID:		
CLASS:	ASSIGNMENT #:	
DATE DUE:	DATE TURNED IN:	

 Upload the \*.zip file you created to the Blackboard. The subject of the submission must include the following information: [CSCI 3328] [Assignment #] [Your Name Here] [Your Student ID Here]

## **Appendix: Examples of Screen Captures**

2	Form1	
0	2 2 2 + - Calculate Answer	enc
	Pushed: 2 Pushed: 2 Stack Operations	
	Another Problem	pef
	Stop	
	2	
	Pushed: 2	
	ОК	

🛃 Form1			
2 2 2 + - Calcula Postfix problem (see example)	Answer		
Pushed: 2 Pushed: 2 Pushed: 2	Stack Operations		
	Another Problem		
	Stop		
	2		
Pushed: 2			

🛃 Form1	
2 2 2 + - Calcu Postfix problem (see example)	late Answer
Pushed: 2 Pushed: 2 Pushed: 2 Performing Operation +	Stack Operations
	Another Problem
	Stop
	2 2 2
OpCode found, will pop two nur	nbers from the Stack and peform Operation!
	ОК

222+-	Calculate Answer
Postrix problem (see example) Pushed: 2 Pushed: 2 Performing Operation + Popped: 2	Stack Operations Another Problem Stop
	2
	Popped: 2 OK

2 2 2 + - Postfix problem (see example)	Calculate	
Pushed: 2 Pushed: 2 Performing Operation + Popped: 2 Popped: 2 Pushed: 4	Stack Operations           Another Proble           Stop	*m
	2 Pushed: 4 OK	

2 2 2 + - Postfix problem (see example)	Calculate
Pushed: 2 Pushed: 2 Pushed: 2 Performing Operation + Popped: 2 Popped: 2 Pushed: 4 Performing Operation -	Stack Operations Another Problem
	Stop
	4 2
OpCode found, will pop	• two numbers from the Stack and peform Operation!
	ОК

🖳 Form1	
2 2 2 + - Postfix problem (see example) Pushed: 2 Pushed: 2 Pushed: 2 Performing Operation + Ponped: 2	Calculate -2 Answer Stack Operations
Popped: 2 Pushed: 4 Performing Operation - Popped: 4 Popped: 2 Pushed: -2 Popped: Answer!	Another Problem Stop
	-2

Another Program run showing just the last screen:

🖳 Form1			
6.2 3 + 5 * 8 4 / -	Calculate	44	Answer
Pushed: 6.2 Pushed: 3 Performing Operation + Popped: 3		Stack Ope	erations
Popped: 6.2 Pushed: 9.2 Pushed: 5 Performing Operation * Popped: 5 Popped: 9 2			Another Problem
Pushed: 46 Pushed: 8 Pushed: 4 Performing Operation / Popped: 4	Ξ		Stop
Popped: 8 Pushed: 2 Performing Operation - Popped: 2 Popped: 46 Pushed: 44		44	