

CS 311 HW Assignment 1 (Due by 9am on Feb 6th)

Stack Implementation (20 points)

Write a **stack** application program to evaluate post-fix expressions.

The user will enter a post-fix expression of the form

34+ which means $3+4$

345+* which means $3*(4+5)$

722+- which means $7-(2+2)$

as a string. Operators are +, -, and *. Single digit numbers only. No blanks.

Please note that the expression could be wrong.

e.g.

3+ too few operands (i.e. cannot pop operand)

345 incomplete expression (i.e. more than the result at the end)

Your program will display the evaluated result (a number) or an error message describing what is wrong (the algorithm is in Notes-1, so use it as given).

- You may assume that no expression will be longer than 12 characters.
- Since each element of the string is a character, you will need to convert it to an integer to perform arithmetic operations.

Required Test Cases (MUST TEST IN THIS ORDER):

1. 34+ which means $3+4$
2. 345+* which means $3*(4+5)$
3. 722+- which means $7-(2+2)$
4. 34+56++ which means $(3+4)+(5+6)$
5. 12+34*45+-+ which means $(1+2) + ((3*4) - (4+5))$
6. 1234567891234 expression too long
7. + too few operands
8. 3+ too few operands
9. 3# invalid element
10. 2345+ incomplete expression

NOTE: Do you think I have listed all possible cases? Always ask yourself if there are other cases you should test to make sure your program is bug free.

Submission

SUBMIT THESE 3 FILES IN A **ZIP FILE** TO COUGAR COURSES:

Always make sure the files you submit can be compiled on empress.csusm.edu.

- stack.h -- class declaration (header file)
- stack.cpp -- class definition (source file)
- main.cpp -- application (main file)

Note: Compress all the above files in a zip file, name it with your name, and submit the zip file on Cougar Course. For example, my first name is Xin and my last name is Ye, then I will name the zip file as XinYe.zip.

Grading

1. On Cougar Course, submit all the files in a zip file with your name. Otherwise, we will not grade it.
2. Your code should be compiled on Cougar Course. If there is a compilation error, you will get 0 points.
3. If your code fails in 1 test case, we will deduct 10% of the total points.
4. If your code fails in 2 test cases, we will deduct 20% of the total points.
5. If your code fails in 3 test cases, we will deduct 40% of the total points.
6. If your code fails in more than 3 test cases, we will deduct 90% of the total points.
7. The comments in your code count for 10% of the total points.
8. Additionally, we will deduct 5 points for each day after the due date.