

CSCI-21 Lab #7 -- Stack exercises – due 4/13/16

Please work in groups of two on these exercises.

Exercise 1

Write a program that prompts the user for a string. Read the string into a buffer. Using the stack, reverse the string in the buffer. Print the resulting string.

To reverse the string, push a NUL character ('0') onto the stack. Then set a pointer to the base of the string buffer and scan the string until you find the NUL at the end, pushing each character as you go. Do not push the NUL. After you read the terminating NUL, reset your pointer to the base of the string buffer, then pop characters from the stack and copy them into the buffer until you pop the NUL byte.

Exercise 2

Write a program that prompts the user for a string. Read the string into a buffer. Push a NUL onto the stack. Then scan the string from right to left starting with the right-most character (this is the one just before the NUL terminator). Push each non-vowel character onto the stack. Skip over vowels. For this exercise, a vowel is one of 'a', 'e', 'i', 'o' or 'u'. You may assume all lower-case letters in the string.

Now pop the stack character by character back into the buffer. Put characters back into the buffer from left to right. Stop popping, and end the string with a NUL byte you pushed first. The buffer will now contain the string, in the correct order, without vowels.

Print out the final string.

Exercise 3

Modify the program from exercise 2 to allow upper case letters (as well as lower case) and to deal with 'y' (or 'Y'). For this exercise only, 'y' is a vowel if and only if it is at the end of the word, e.g. in "yellow" 'y' is a consonant, but in "Quincy" 'y' is a vowel. (This ignores words like the name "Smyth", where 'y' is a vowel.)

Exercise 4

The letter 'w' is a vowel if it is between two consonants; for example, in the word "crwth", 'w' is a vowel. A crwth is a musical instrument similar to a small harp or a lyre. Modify the program from exercise 3 to consider 'w' as a possible vowel. You may ignore the possibility that a 'w' could be preceded by or followed by a 'y'.