**Department of Computing Sciences**

**SUNY Brockport**

**CSC 219 (Programming in C)**

**Lab Exercise 4**

This lab is concerned with the manipulation of character strings.

Write a C program that does the following:

1. Prompts the used to enter input. The input consists of any number of characters from the standard input (keyboard). The input is processed until the user enters the character z (lower case).
2. Counts the number of whitespace characters (tab, enter, space), the number of digits, the number of lower case letters (not counting z) and the number of upper case letters in the input. Any other type of character is not counted, but will be used in part 3.
3. Prints out the user input exactly as it was typed in, but with all lower case letters changed to upper case and all upper case letters changed to lower case.

*Sample input/output:*

Enter any input from the keyboard. To end input z

*(The user enters the characters below until the ‘z’character)*

11Sd‘tab’‘newline’

W34^‘newline’

z

*(This is what the program outputs to the user – from below to the string ‘Goodbye’)*

11sD‘tab’‘newline’

w34^‘newline’

The number of whitespace characters is: 3

The number of digits is: 4

The number of lowercase characters is: 1

The number of uppercase characters is 2

Goodbye

**NOTE 1:** The number of whitespace characters is 3 because of the characters: ‘tab’, ‘newline’ and ‘newline’ in the two strings the user typed. The ‘newline’ character is entered by hitting the ENTER key, of course.

**NOTE 2:** You may want to use the C functions getchar() and putchar() to write this program – that could be the best way. Look at the material on slides 31 – 33 of the class notes (which we already discussed in class) to get this done.

**NOTE 3:** You can use a large character array – of (say) 999 elements to store the *character sequence you need to print out* – as you read characters in.