**CARLETON UNIVERSITY**
**School of Computer Science**

COMP 2003 Computer Organization

Fall 2005

Assignment 3

**Due date: November 7, 5 PM** (MUST be submitted through the Raven system)
Paper assignments will NOT be accepted.

Note: For your convenience, the marking scheme for this assignment is included.

Write a stand-alone assembly language program that reads a character string as input and outputs the number of lower-case letters and the digit characters (outputs a separate count for each) in the input string. You must read the input string using the **`GetStr`** I/O routine. Do NOT read the input string as a sequence of characters using **`GetCh`**. Your program should be able to read strings of size 70 (excluding the NULL).

Here is an example input and output (this is how your program's interaction should look like):

```
Please enter a string (< 71 characters):
COMP 2003 Computer Organization
Your string has 18 lower-case letters and 4 digits.
Do you want to enter another string? (Y/N)
Y
Please enter a string (< 71 characters):
....
....
```

After processing an input string (i.e., after displaying the two counts), your program should query the user whether he/she wants to enter another string. If the answer is 'yes' (you can use Y/N for 'yes' or 'no'), read and process another string. The program terminates only when the user answers 'no' (i.e., N) to the query.

Note: Make sure to submit enough evidence that indicates that you have tested your program thoroughly. In particular, identify the border cases and use them to test your program. You may find the ASCII table in Appendix B useful to come up with some of the border case scenarios.

You should submit the following three parts:

(1) Your source code
(2) *Test plan and test data output:* For each test case, provide the objective (why you are doing that particular test) and the rationale for selecting the test input. **Zero marks will be given to this part if your assignment provides testing information without this information (i.e., objective and rationale).** In particular, identify the border cases and test them.
(3) Output of your program for the following strings:
    - **`COMP 2003A`**
    - **`Computer Science`**

Marking scheme for this assignment (25 marks):

| | |
|---|---|
| Correctness of the program: | 12 marks (if your programs works correctly and your documentation convinces the TA – don't expect marks if you just submit a print out of the source code) |
| Structure and comments: | 4 marks (spacing, indentation, comments, variable names etc.) |
| Good, clean, and efficient solution: | 4 marks (weird or convoluted solutions will be heavily penalized) |
| Test plans & test data output: | 4 marks (zero marks if no objective or rationale as mentioned above) |
| Output with the class test data: | 1 mark |