ICS 233 – Spring 2010
Computer Architecture and Assembly Language
Programming Assignment 2

Write and test a MIPS assembly language program to count the letters in a text file and sort them according to their frequency. The program should do the following:

- Open a text file and read all characters into an array. The maximum number of characters to be read should be limited to the size of the array, which should be 100,000 characters. MARS provides the system calls for opening a file and reading from a file.
- Traverse the array character by character. Count the uppercase letters, the lowercase letters, the decimal digits, and the number of words. A word should begin with a letter and can contain only letters (uppercase or lowercase). The end of a word is detected if the next character is not a letter. Four counters are needed. Display the values of these four counters.

Your program should be well divided into procedures. A sample run is shown below:

```
Enter input text filename: input.txt

Uppercase Letters = 120
Lowercase Letters = 975
Decimal Digits = 84
Words = 136
```

Submission Guidelines:

All submissions will be done through WebCT.

Submit the source code of the program. Make sure that your program is well documented.

Grading Policy:

The grade will be divided according to the following components:

- Correctness of code: program works properly and produces correct results
- Design and Coding: program is well designed and divided into procedures
- Documentation of code: program is well documented

Late Policy:

The programming assignment should be submitted on the due date by midnight. Late submissions are accepted, but will be penalized for a maximum of 3 late days. Assignments submitted after 3 late days will not be accepted.