COE 301 / ICS 233 – Computer Organization

MIPS Programming Assignment 1, Term 172

Due date: Tuesday 27/02/2018 at 11:59 PM

Write and test a MIPS assembly language program to **count each letter, each even digit, and each odd digit** in a text file. The program should do the following:

a) Open a text file **"input.txt"** and read all characters into an array. Limit the length of the array to 10000 characters. The maximum number of characters to be read should be 10000 characters. MARS provides the system calls for opening and reading a text file. If the file does not exist then the program should display an error message and terminates.

b) Traverse the array character by character. Count all letters and digits while ignoring the other characters. You should use an **array of 26 integer counters** for the 26 letters in the alphabet, and **two integer counters**; one counter to count the **even** digits in the file, and the other counter to count the **odd** digits in the file. Do not distinguish between capital and lowercase letter; both should be counted as the same letter.

c) Display the count of each letter as well as the even-digit count, the odd-digit counts, and the total digit count. A sample run is shown below:

```
Letter Count
A      67
B      18
C      23
.
.
Z      5

Even-digit count = 25
Odd-digit count = 14
Total digit count = 39
```

Submission Guidelines:

All submissions should be done through Blackboard. Submit the source code of the program. Make sure that your program is well written and documented. The program will be graded according to its correctness and documentation. It is your responsibility to make sure that the program works. A program that does not assemble or run will receive zero on correctness. **Copying programming assignment is not allowed. This is individual work. Detected copies will get zero grades. This includes the one who wrote the program and the one who copied it.**

Grading Scheme:

Opening and reading text file: "input.txt"	**[1 point]**
Displaying an error message when the file does not exist	**[1 point]**
Counting letters into an array of 26 counters and displaying them	**[5 points]**
Counting and displaying even digits, odd digits, and total digits	**[2 point]**
Program readability and comments	**[1 point]**
Total	**[10 points]**