COE 301: Computer Organization

MIPS Programming Assignment 1, Term 221

Counting Letters, Digits, Special Characters and Lines in a Text File

Write and test a MIPS assembly language program to **count each letter, digit, special character, and number of lines** in a text file. The program should do the following:

a) Open a text file **"input.txt"** and read all characters into an array in memory. Limit the length of the array to 10000 characters. The maximum number of characters to be read should be 10000 characters. The actual number of characters depends on the file length. 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 **uppercase letters, lowercase letters**, **digits**, and all **other special characters**. In addition, count the **lines** (A line ends with a '\n' character). A single-letter line should not be counted.

c) Display the **total count** of **letters (uppercase/lowercase)**, **digits**, **special characters**, and **lines**.

If file **"input.txt"** does not exist in the same folder then output the following error message:

```
Error: input.txt does NOT exist.
```

If file **"input.txt"** exists then output the following after counting all letters (uppercase/lowercase), digits, etc.

```
Uppercase Letters = 2782, Lowercase Letters = 2692
Digits  = 1042
Special Characters  = 3267
Lines   = 107
```

Submission Guidelines:

This assignment can be solved individually or in groups of two students only. No group should have more than two students. **At the beginning of your program, write the names of the students who worked on the program.** If this program was solved individually then write your name only. The rest of the code should be well written and well document.

All submissions should be done through Blackboard. Submit the source code of the program. **If the assignment was solved by two students, then it is sufficient for one student to submit the assignment. The other student can write a note on Blackboard indicating his partner.**

Grading Scheme:

Opening and reading text file: "input.txt"	**10 points**
Displaying an error message when the file does not exist	**10 points**
Counting uppercase letters (10 points), counting lowercase letters (10 points), digits (10 points), special characters (20 points), lines (20 points), and displaying them	**70 points**
Program readability and comments	**10 points**
Total	**100 points**