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CS 3340.002
November 3, 2017

Report for Pgm4

Problem Statement

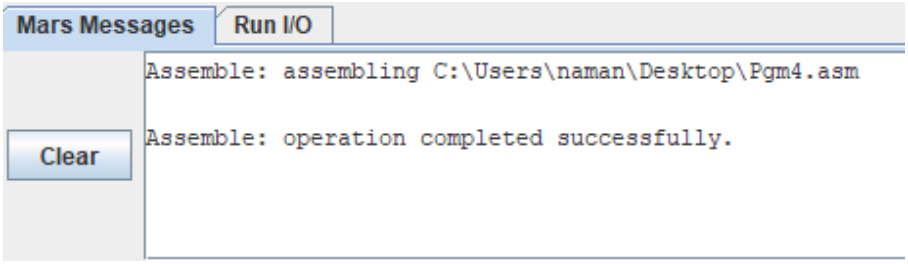
The purpose of this assignment is to read a file from a filename inputted by the user and then output the frequencies of the digits 0-9, similar to data in histograms. The file must be readable by a scanner, meaning it must have text source in it. The output must display the count for each digit in an easily understandable format. Furthermore, the supplied file "input.txt" may be used as a sample file, but the program must work for all valid files.

Approach to Solution

The printing of the digit frequencies in the specified file should be done utilizing the MIPS assembly language with the Mars IDE. Knowledge of the working with expression evaluation, system calls, reading from files, initializing and instantiating arrays, reading the length of strings, evaluating ASCII codes, and basic structure of loops will be required. A computer running the Java Virtual Machine (JVM) will be needed along with access to the computer's registers for storage. Additionally, tools inside the IDE such as the assembling and running of the current program are essential.

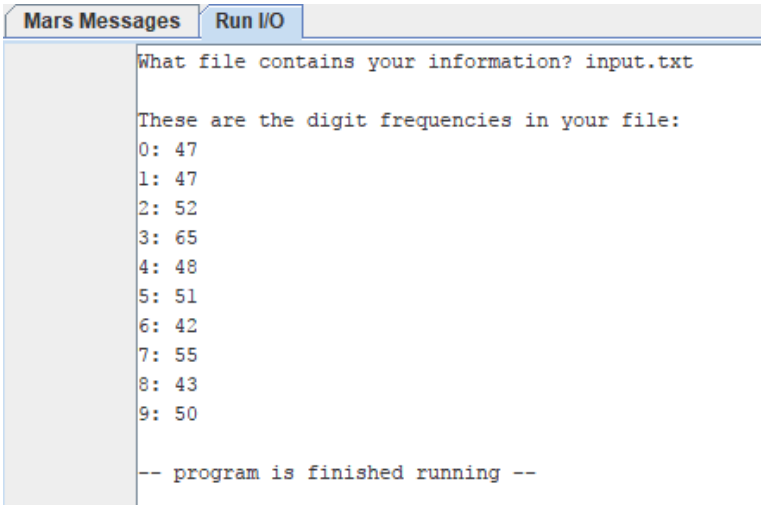
Solution Description

When the Mars IDE has been launched and Pgm4.asm has been opened, it is important to build (or "assemble") the program before running it. To do so, click the wrench and screwdriver button found in the tool icon layout. After clicking it, the program should successfully assemble, and there should be a success message from the "Mars Messages" tab at the bottom of the screen.



The message given after the Pgm4.asm has been successfully assembled with no errors.

Once the program has successfully compiled, it is now time to run it. At the top of the screen, click the green play button in the tools to the right of the assemble button pressed earlier. The user will be prompted to enter the name of a file in the "Run I/O" tab. If the filename is valid and found in the same directory as the executable MARS launcher, the "Run I/O" tab should display all the digits from 0 through 9 with the count of the number of times they appeared in the file next to them, each on separate lines as shown in the screencap below. If the filename is invalid, the program is susceptible to not terminate and get stuck in an infinite loop. Therefore, it is important that the inputted filename is the name of a valid file.



The "histogram" or frequencies of each digit generated after the program is given a valid file to read from user input.