

CSD211:Computer Organization and Architecture

Dr. Sheel Sindhu Manohar TAs:

Aaradhy Sharma & Raj Rajeshwar Singh Bisen

Instructions

- 1) Use only a MARS simulator for MIPS32 programming in the lab.
- 2) Programs given for Brainstorming can be submitted later, but other programs you need to code in the lab only.
- 3) Save your programs in a separate folder with .asm extension and delete it from the system after making final submission and before leaving the lab.
- 4) Show the working programs to the TAs available before submitting your word file at blackboard.

Q1:Create a MIPS assembly program that reads a text file and counts the number of characters in it. The program should then write the count to a new file.

Hints: - Use syscall with appropriate service numbers for file operations. - Remember to open the file in read mode, read character by character, and close it when done. - Use a register to keep track of the character count.

Q2:Develop a MIPS program that reads a text file, counts the number of vowels (a, e, i, o, u, both lowercase and uppercase), and writes the count to a new file.

Q3:Develop a MIPS program that reads a text file line by line, reverses each line, and writes the reversed lines to a new file.

Q4: Implement a basic text file compression program using run-length encoding. The program should read from one file, compress the data, and write the compressed data to another file.

Hints: - Run-length encoding compresses data by replacing sequences of identical data elements with a single data value and count. - You'll need to keep track of the current character and its count. - Consider how to handle the case when a character count exceeds 255 (if using byte-sized counts). - Think about how to represent the compressed data in the output file.