

CSD211:Computer Organization and Architecture

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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: String Comparison Procedure

Problem: Write a MIPS program that compares two strings lexicographically (like the `strcmp` function in C). The program should return 0 if the strings are equal, a negative value if the first string is less than the second, and a positive value if the first string is greater than the second.

Requirements:

- Implement the string comparison in a procedure.
- Use procedures to read the input strings.
- Use a procedure to print the comparison result.

Q2: Matrix Multiplication

Problem: Write a MIPS program that multiplies two matrices and stores the result in a third matrix. The matrices should be of compatible sizes for multiplication. The program should use procedures to handle matrix multiplication, input, and output.

Requirements:

- Use a procedure to perform matrix multiplication.
- Use procedures to read the matrices and store the results.
- Use a procedure to print the resulting matrix.

Q3: Counting Characters in a String

Problem: Write a MIPS program that counts the occurrences of each character in a given string. The program should return an array where each index represents a character (e.g., 0 for 'a', 1 for 'b', etc.), and the value at that index represents the count.

Requirements:

- Use a procedure to count the occurrences of each character.
- Use a procedure to read the input string.
- Use a procedure to print the character counts.

Q4: Fibonacci Sequence Generator

Problem: Write a MIPS program that generates the first n numbers in the Fibonacci sequence. The value of n should be provided by the user. Implement the Fibonacci sequence generation in a recursive procedure.

Requirements:

- Use a recursive procedure to generate the Fibonacci sequence.
- Use a procedure to read the value of n .
- Use a procedure to print the Fibonacci sequence.