



PROBLEM SESSION 2: Instructions Sequencing.

Problem 1

Instruction Set

| Instruction | Description |
|----------------|--|
| LOAD R, [A] | Load value from memory address A into register R |
| STORE R, [A] | Store value in register R into memory address A |
| ADD R1, R2, R3 | $R1 = R2 + R3$ |
| SUB R1, R2, R3 | $R1 = R2 - R3$ |
| MOV R1, R2 | Copy R2 into R1 |

Assume:

- All instructions take 1 cycle unless stated otherwise
- Registers are initially set to 0 unless specified.

Given the following initial value: R1 = 5, R2 = 10, R3 = 0, and MEM[100] = 20 with the following instruction Sequence.

1. LOAD R3, [100]
2. ADD R1, R3, R2
3. SUB R2, R1, R3
4. STORE R2, [104]

Fill in the value of each register and memory location.

| Ri/LOC | R1 | R2 | R3 | [100] | [104] |
|---------|----|----|----|-------|-------|
| Initial | 5 | 10 | 0 | 20 | x |
| Inst 1. | | | | | |
| Inst 2. | | | | | |
| Inst 3. | | | | | |
| Inst 4. | | | | | |

Problem 2

1. Write a program to calculate the 44th Fibonacci number without using any special library in C language
2. Convert your C code into ARM assembly.
3. Create a report that contains the following:
 - Brief explanation of how your code calculate 44th Fibonacci number.
 - maps the C instruction to the assembly instruction.
 - Include the **command(s)/steps used** to convert C into ARM assembly.

Submission

Submit the C, assembly source code, and Report containing answers to both problems into LEB2.

Hint: Check out this website: <https://godbolt.org/>. It may help you understand more about assembly language.

This is the problem session for the group of 2-3 students.