(1) What are the two tasks “jal” instruction performs?

1. Load the address of the next instruction to “$ra” register
2. Jump (set PC register) to the first instruction in the called subroutine

(2) The following is a sketch of subroutine calls using jal and jr instructions. What is the problem (describe symptom) in the program?

The problem is that “$s0” register, which is sued as the loop counter in the loop, “LOOP” in module main is re-initialized in module xyz, causing an infinite loop for the loop in main.
(3) In order to solve the problem talked about in #5 above, what should we do? Show what are supposed to be done in the subroutine.

(4) Show the memory hierarchy.

(5) What is “virtual memory”?

Virtual memory is a mechanism that expands memory space to be seen by processors using the hard drive capacity (some portion of the virtual memory address space to be seen by processors is mapped to hard drives).