The following is a list of possible questions for our quiz on June 12th. Some of the questions will not be asked in the quiz. All the questions that will appear in the quiz will appear exactly as shown below (however, numeric parameters may be changed). The quiz is closed textbook, closed notes and closed neighbors. Note that the questions, which did not appear in this quiz, still may appear in the exams. You will find a solution for these questions during lectures.

- It is suggested that you bring your calculator (you can use your calculator during the quiz on June 12th).

#1: What are “registers” in processors?

#2: How are registers in processors used when a binary executable program is executed?

#3: What is “PC-SPIM”? 

#4: Why do we need “jr $31” at the end of an assembly program?

#5: What are “system calls” in “MIPS Simulator”? 

#6: What are the differences between “li $t0, 1024” and “lb $t0, (1024)” instructions? Mention at least two differences.

#7: What are the differences between “lb $t0, (1024)” and “lw $t0, (1024)” instructions? Mention at least two differences.

#8: “li $t0, (1024)” is an illegal instruction (if you try to assemble that instruction using PC-Spim simulator, that instruction will cause a syntax error). What’s wrong?

#9: What is the difference between “li $a0, 1024” and “la $a0, 1024” instructions? Assume that this computer system is a 32-bit system (i.e., all the registers are 32-bit registers and its ALU can deal with up to 32-bit inputs and outputs).

#10: “li $t1, $t0” is an illegal instruction (if you try to assemble that instruction using PC-SPIM simulator, that instruction will cause a syntax error). What’s wrong?
#11: Which of the following load instructions does (do) not access memory at all (select all that apply)?

① li (load immediate)
② la (load address)
③ lb (load byte)
④ lw (load word)
⑤ lhw (load half-word)

#12: What does “la” instruction do?

#13: What are “conditional branch instructions”?

#14: There is a logic error in the following if-else structure implemented in MIPS R3000 assembly language. (a) What is the error (describe the problem). (b) How can we fix the problem?

```
.text
.globl main
main:  
       
if_equal:        instruction A
       
end_if_else:    instruction C
       
jr $31
```

CS 312 – Computer Organization & Architecture, Quiz #2 Question List (Part II)