CS 314 Operating Systems
Spring 2024
Quiz #2 on January 18, 2024 (SUGGESTED SOLUTIONS)

Your Last Three Digits: _____

(please do NOT write all of your student ID or your name)

Grade: _____

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(1) What are the four main OS functional components CS314 (Spring 2024) covers?

- Process management (= allocating CPU resource)

- Memory management

- I/O resource management

- User management

(2) What is "extended machine"? This question does <u>not</u> ask how we can use extended machine. A definition of "extended machine" is needed.

"An <u>imaginary computer</u> (as a hardware computer) <u>that can be manipulated directly by high-level user commands</u> by abstraction offered by an operating system"

Note: any similar solution is acceptable (as long as the underlined concepts are (well) described).

(3) What is "context switching"?

The act of <u>switching a processor from a program (or "a process") to another</u>.

(4) What problem in "batch system" do "multi-programming (multitasking) OSes" fix and how?

What: Multitasking OSes improve (fix) <u>the low processor utilization</u> expected for batch systems.

How: <u>When a currently-running process can not use (utilize) a processor</u> when it waits for a user input (or for inputs from I/O devices), <u>the processor will be context-switched to another process</u> that needs a processor. Thus a processor is used more.

(5) What problem in "multi-programming (multitasking) OSes" do "multitasking timesharing OSes" fix and how?

Multitasking OSes are not interactive, while time-sharing OSes are <u>interactive</u>.