CS314 Operating System
Spring 2024
Exercise Questions on January 16, 2024

EXERCISE #1

In multitasking OS, each OS performs "context switching" to switch from a program to another in multitasking. What must a multitasking OS perform in context switching?

EXERCISE #2

Are the following statements true or false?

    (a) A multitasking OS is a time-sharing OS.

    (b) A time-sharing OS is a multitasking OS.

EXERCISE #3

Which of the following types of operating need short-term process scheduling? Select all that apply. For those you do NOT select, explain why it (they) do not need short-term scheduling?

    (a) Pre-OS
    (b) Batch system
    (c) Multi-tasking
    (d) Time sharing

EXERCISE #4

How do operating systems make sure that user processes will not be able to directly access hardware resources without going through an operating system? Mention one hardware mechanism and one software mechanism operating systems use to achieve the goal.

Hardware:

Software:

EXERCISE #5

What is the difference between the kernel mode and the user mode?

EXERCISE #6

Which of the following instructions should be allowed only the kernel mode of a processor (select all that apply)?

    (a) Disable all interrupts

    (b) Read the time-of-day clock (in the real-time clock in a computer system)

    (c) Set the time-of-day clock (in the real-time clock in a computer system)

    (d) Assign additional memory space to programs running in the user mode of a processor

EXERCISE #7

A portable application program (in the source code level) is one that can be ported from one operating system (e.g., Windows) to another (e.g., UNIX) without any modification. Explain why it is impossible to build an application program that is completely portable.

EXERCISE #8

Consider whether operating systems should include application programs that are very popularly used (e.g., web browsers and e-mail clients) as a part of the operating systems. Argue both pros and cons for this design. Then, conclude which choice (should be included a part of an operating system or should not be included a part of an operating system) you believe we should take.