

CS314 Operating System

Spring 2024

Exercise Questions on April 11, 2024

QUESTION #1

- (a) To make “determinism (start time)” easier to meet, what should be done? Mention at least two.
- (b) What is the possible side effect of putting high weight on “meeting determinism”?

QUESTION #2

Which of the following real-time process scheduling algorithms can be used for (a) hard real-time systems and (b) soft-real-time systems?

- (a) Static Table-Driven Scheduling algorithms
- (b) Rate Monotonic Scheduling (RMS) algorithm
- (c) Dynamic Planning-Based Scheduling algorithms
- (d) Dynamic Best-Effort Scheduling algorithms

QUESTION #3

Does the static table-driven scheduling with the following properties guarantee responsiveness?

- Completion (response) time deadlines
- Earliest deadline first
- Preemptive
- No priority (equal priority for every process)

QUESTION #4

For static table-driven scheduling for real-time processes, how long the scheduler should “simulate” timing of the real-time tasks to conclude that they are “feasible” (what is the condition that guarantees “feasibility” of the submitted real-time tasks)?

Assume that the real-time tasks are all “periodic” (i.e., the arrival time and the execution time are constant and they repeat).

QUESTION #5

Which of the following two conditions is “necessary condition”, “sufficient condition”, or “necessary satisfactory condition”?

(a) $\sum_{i=1}^n U_i \leq 1.0$

(b) $\sum_{i=1}^n U_i \leq n(2^{1/n} - 1)$

QUESTION #6

Which of the following deadline(s) does RMS guarantee (select all that apply)?

- (a) Determinism
- (b) Responsiveness
- (c) Response Time (Completion Time)