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) \( \sum_{i=1}^{n} U_i \leq n^{(2^m - 1)} \)

QUESTION #6
Which of the following deadline(s) does RMS guarantee (select all that apply)?

(a) Determinism

(b) Responsiveness

(c) Response Time (Completion Time)