Lecture

Topics:

- Introduction to scheduling theory: Independent processes

Readings

For the scheduling part, the note by Burns and Wellings [BW] found in the Week 06 module will be used as basic material.

This week, sections 11.1–11.7 + 11.11.1 in [BW] will be covered. Next week sections 11.8–11.16 will be discussed.

Exercises

You are expected to do these exercises as a preparation for the exam, but you may prefer to work on the assignment at the labs and do the exercises at home.

Exercise 1: Response time calculations

Consider the following set of tasks to be scheduled by fixed priorities ($D = T$):

Task	T	C
a	20	3
b	9	2
c	40	4
d	13	5

Question 1.1: Calculate the total processor load/utilization. Would the task set be schedulable according to the utilization-based check?

Question 1.2: How should the tasks be prioritized according to the Rate Monotonic Assignment principle?

Question 1.3: Calculuate the response times of each task manually using the iterative approach shown at the lecture.

Question 1.4: A sporadic (alarm-)task e should be added to the task set. The task has a computation time of 2 and a minimum arrival time of 100.

What is the best obtainable response time that can be obtained for e?

Exercise 2: RMA vs. EDF

Try to device a (small) set of tasks that are not schedulable by fixed priority scheduling (e.g. using RMA) but can be scheduled by Earliest Deadline First (EDF).

You should try to find a set with a lower total load than the 98.3% shown in the example from the lectures.