EL2450 Homework 2

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1 Rate Monotonic scheduling

Task 1: Explain what Rate Monotonic scheduling means.
Rate Monotonic scheduling means that all tasks are given a priority. At te beginning of each cycle, the task with the highest priority is run until Rate Monotonic scheduling means that all tasks are given a priority. At te beginning of each cycle, the task with the highest priority is run until completion.

Task 2: Are the three tasks schedulable?
Calculating the utilization factor U from

$$U = \sum_{i=1}^{n} \frac{C_i}{T_i} = \frac{6}{20} + \frac{6}{29} + \frac{6}{35} = 0.75 \tag{1}$$

The rules states that if U < 1 the set is schedulable.

Task 3: What are the differences in control performance between the different pendulums?
When using rate monotonic scheduling, the small and medium pendulums are asymptotically stable while the large pendulum is not. The control performance is shown in Figure 1.

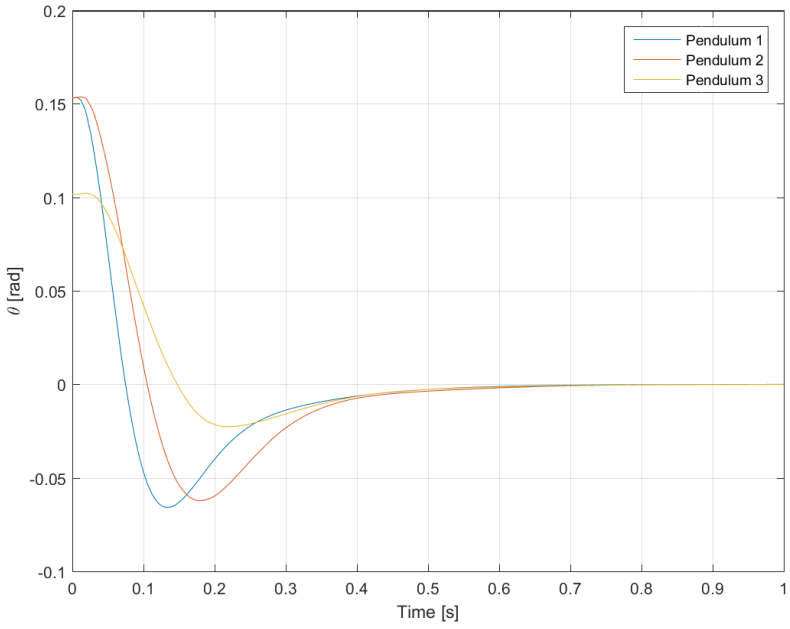

Figure 1: Performance of pendulums under rate monotonic scheduling.

Task 4: Setting the execution time for all three processes to 10ms, what are the differences with respect to control performance?

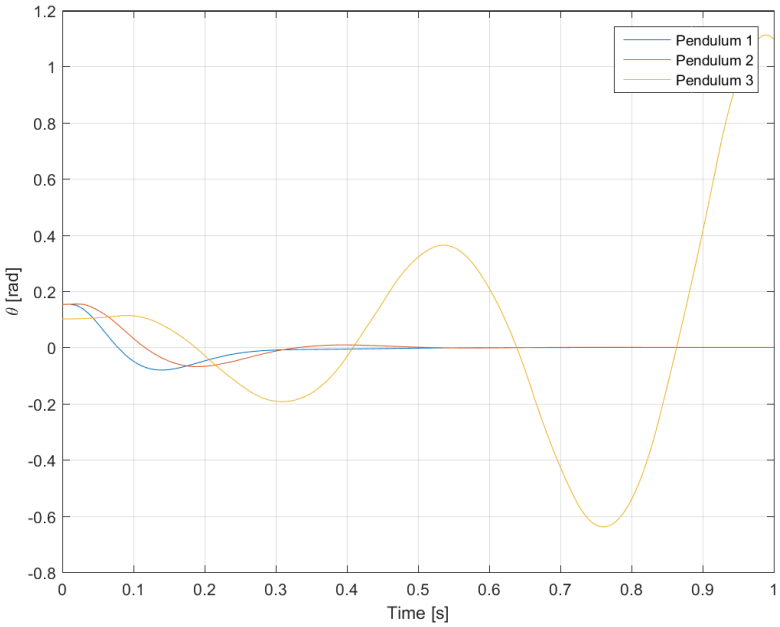

Figure 2: Performance of pendulums under rate monotonic scheduling.