

## 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 the 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 the 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

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

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

**Task 3: What are the differences in control performance between the different pendulums?**

All pendulums are asymptotically stable and have similar control performance. The performance is shown in Figure 1.

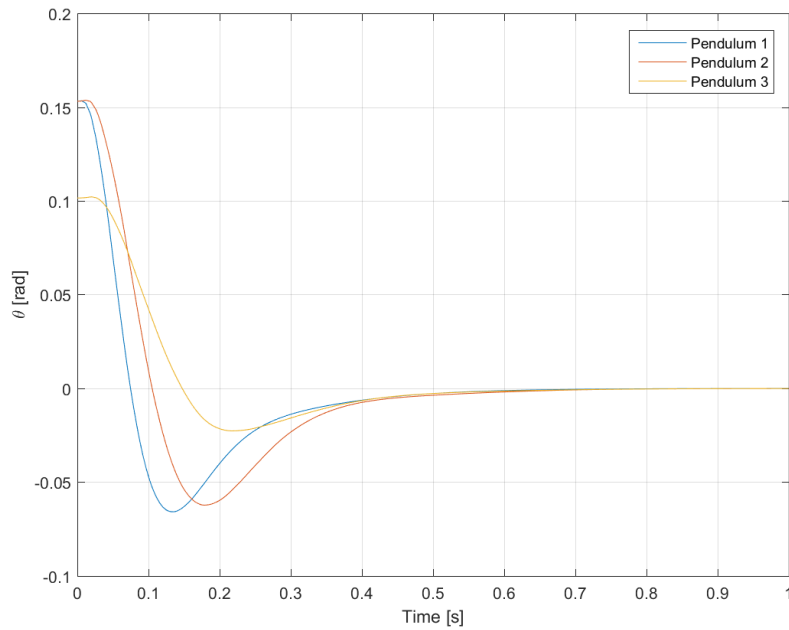


Figure 1: Performance of pendulums under rate monotonic scheduling.

**Task 4: Compare against the schedule in the model. Does it match?**

As can be seen below in Figure 2, the schedules match. The tasks are schedulable as stated in q2.

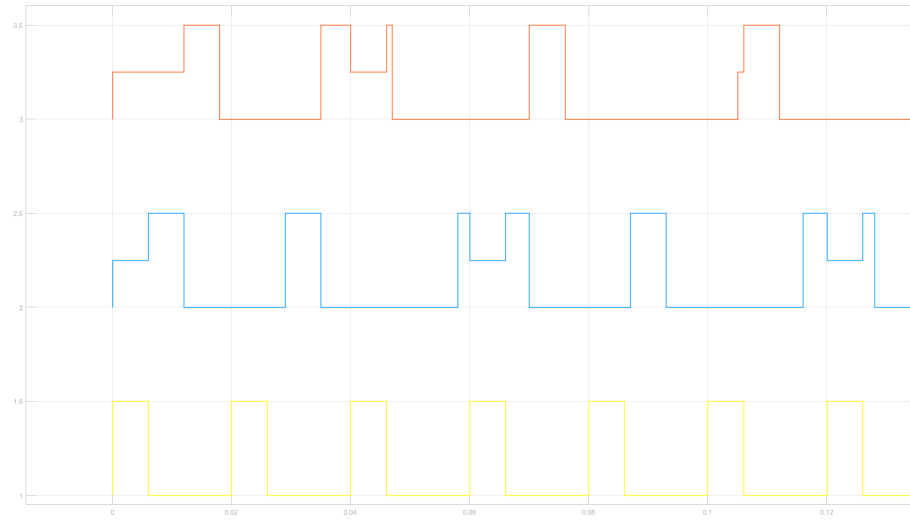


Figure 2: Schedule for pendulums when computation time of all is 6 ms. Yellow is small pendulum, blue is medium and red is big.