Real-Time Operating Systems
Written Exam

1 Question

Consider the task set $\Gamma = \{\tau_i\}$, with $\tau_1 = (6, 36)$ $\tau_2 = (3, 15)$ $\tau_3 = (2, 10)$ $\tau_4 = (6, 26)$ (assume relative deadlines equal to periods: $D_i = T_i$)

Is the task set schedulable in a POSIX compliant OS? Motivate your answer and explain how you would schedule Γ.

The task set is implemented with the POSIX API, and executed on a non real-time OS, with a worst case latency $L = 2$. Do you expect missed deadlines? Why? Motivate your answer.

2 Question

Some real-time OSs are based on the so called “dual kernel” approach: explain the advantages of such an approach (respect to the traditional general-purpose kernel structure), explaining why it is more suitable for running real-time applications.

Provide a theoretical justification for the better real-time performance provided by dual-kernel systems.

3 Question

Explain how to implement the periodic task behaviour using the POSIX API, describing some possible problems and solutions.

4 Question

Describe the advantages and disadvantages of HLP, with a small example.