

Jan Reineke  
 Andreas Abel



Deadline: Thursday, July 11, 2013, 14:15

## Assignment 10

### Problem 1: Predictability (3+3+3 Points)

Three important properties of predictable architectures are *temporal isolation*, *timing compositionality*, and the absence of *timing anomalies*.

1. Briefly explain each of these properties.
2. Describe possible techniques to achieve these properties. Why are these techniques often not used in common architectures, i.e., what are their drawbacks?
3. Which of the properties does the PRET PTARM architecture achieve, and by which means?

### Problem 2: Scheduling (2+2+5)

1. Explain the difference between offline and online scheduling.
2. What are the advantages and disadvantages of preemptive and non-preemptive scheduling?
3. We have seen in class that EDD scheduling minimizes the maximum lateness. Does it also minimize the number of late jobs? Prove your answer!

### Problem 3: Aperiodic Scheduling (6+4+2 Points)

Assume you are given the following set of tasks:

	$a_j$	$C_j$	$d_j$	$D_j$	$X_j$	EDF					SJF					
						$s_j$	$f_j$	$R_j$	$L_j$	$E_j$	$s_j$	$f_j$	$R_j$	$L_j$	$E_j$	
$J_1$	3	5	12													
$J_2$	0	4	5													
$J_3$	2	1	4													
$J_4$	5	3	15													
$J_5$	7	2	9													

1. Determine whether the task set is schedulable under EDF and SJF, and fill out the missing entries in the table.
2. Compute the average response time, the total completion time, the maximum latency, and the number of late jobs for both scheduling algorithms.
3. Is the task set schedulable if preemption is not allowed?