

# Homework 16

(42 points)

1. Given the task set shown below, can we guarantee schedulability at the given criticality levels with the Static Mixed Criticality (SMC) approach? Show your work for each task. (12 points)

Priority	Criticality	$T$	$C_{HI}$	$C_{LO}$
1	LO	8	5	2
2	HI	20	4	3
3	HI	25	6	5
4	HI	30	2	2
5	LO	38	10	6

2. Given the task set shown below, can we guarantee schedulability at the given criticality levels with the Static Mixed Criticality (SMC) approach? Assume that Level A is the highest and Level C is the lowest. Show your work for each task. (12 points)

Priority	Criticality	$T$	$C_A$	$C_B$	$C_C$
1	B	7	4	2	1
2	C	10	5	3	2
3	A	28	7	2	2
4	B	16	12	4	3

## “Cache Sharing and Isolation Tradeoffs in Multicore Mixed-Criticality Systems”

3. What are the primary contributions of this paper? (2 points)
4. What are the three cache partitioning approaches mentioned in Sec. 1? Describe each approach briefly. (6 points)
5. How many certification levels are considered for cache partitioning? (2 points)

## “Real-Time Scalability of Nested Spin Locks”

6. What are the primary contributions of this paper? (2 points)
7. Show an example of a nesting level of four. (2 points)
8. What approaches can be applied when looking at nesting of three or more levels? What restrictions (if any) are there on systems in which these approaches can be applied? (4 points)

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## Feedback

1. How much time did you spend completing this assignment (ignoring interruptions)?
2. How much time did you spend doing the assigned reading (ignoring interruptions)?
3. Any other feedback?