Lecture #11 – blackboard scribble

Policy	Priority
RM	$\sim 1/T_i$
DM	$\sim 1/D_i$
WM	$\sim C_i/T_i$
SM	$\sim 1/(T_i - C_i)$

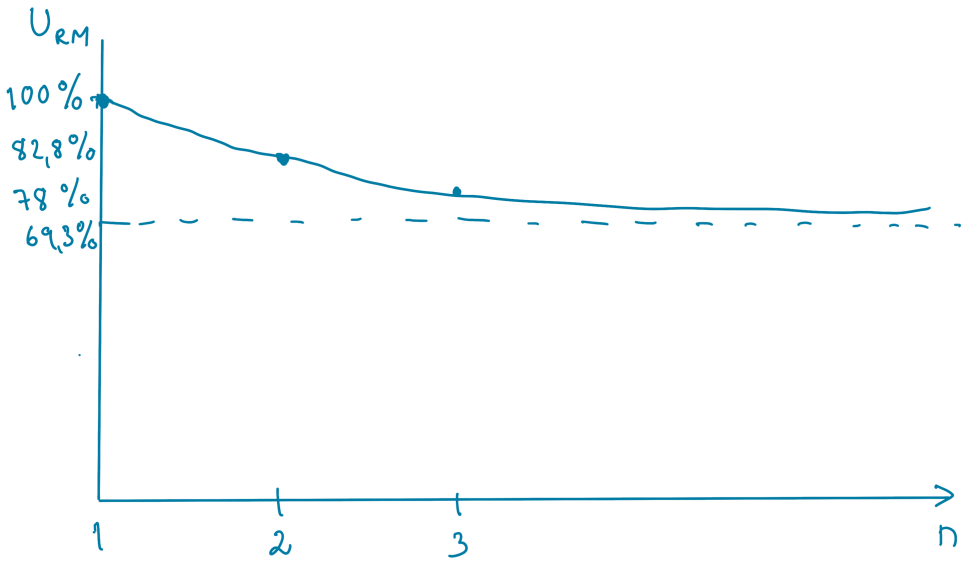
Policy	Priority
EDF	$\sim \frac{1}{\text{abs. deadline}}$
LLF	$\sim \frac{1}{\text{abs. deadline} - \text{remain. exec. time}}$

When $n \to \infty$

$$U_{RM} = n\left(\underbrace{2^{1/n} - 1}_{\to 0}\right)$$

$n \to \infty$, $2^{1/n} - 1 \to 1$

$$\lim_{n \to \infty} n\left(2^{1/n} - 1\right) = \ln 2$$



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Task	C_i	O_i	T_i
τ_1	1	0	3
τ_2	1	0	4
τ_3	1	0	5

a) The utilization U of the system is

$$U = \sum_{i=1}^{3} \frac{C_i}{T_i} = \frac{1}{3} + \frac{1}{4} + \frac{1}{5} \approx 0{,}783$$

b) The utilization bounds U_{RM} and U_{EDF} are:

$U_{RM} = n\left(2^{1/n} - 1\right) = 3\left(2^{1/3} - 1\right) \approx 0{,}780$ $\quad U > U_{RM}$ The test fails!

$U_{EDF} = 1$ $\quad U < U_{EDF}$ The test succeeds!

c) For EDF: Since $U < U_{EDF}$ the task set is schedulable

For RM: Since $U > U_{RM}$ and the test is only sufficient, we cannot yet determine if the task set is schedulable or not.

(So, how do we do that?)

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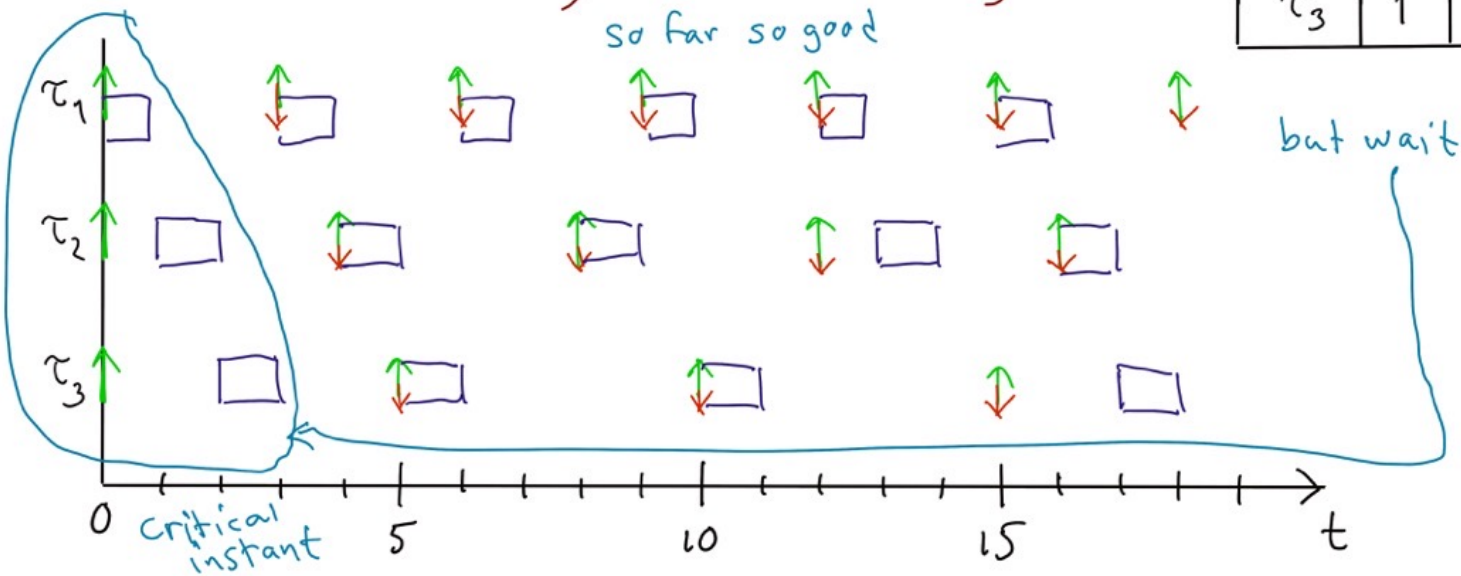
we learned that hyper period analysis can always be used.

How long is the hyper period? LCM{3,4,5} = 60

Simulate RM scheduling to check feasibility:

Task	C_i	O_i	T_i	
τ_1	1	0	3	H
τ_2	1	0	4	M
τ_3	1	0	5	L



Lin and Layland said that if the task set is schedulable at the critical instant (i.e. at t=0), then the task set is also schedulable in all other cases. Hence, it is enough to show that the first instance of each task meets its deadline!