2IMN20 - Real-Time Systems

Scheduling 101 - Quiz

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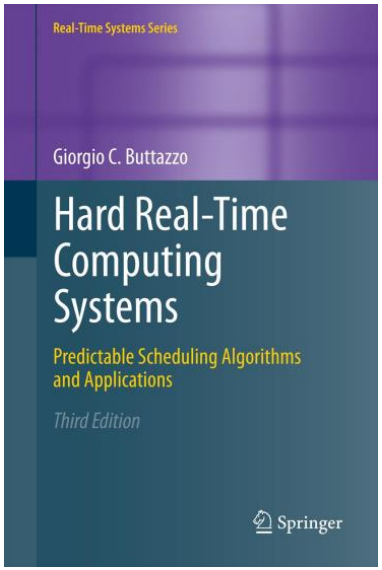
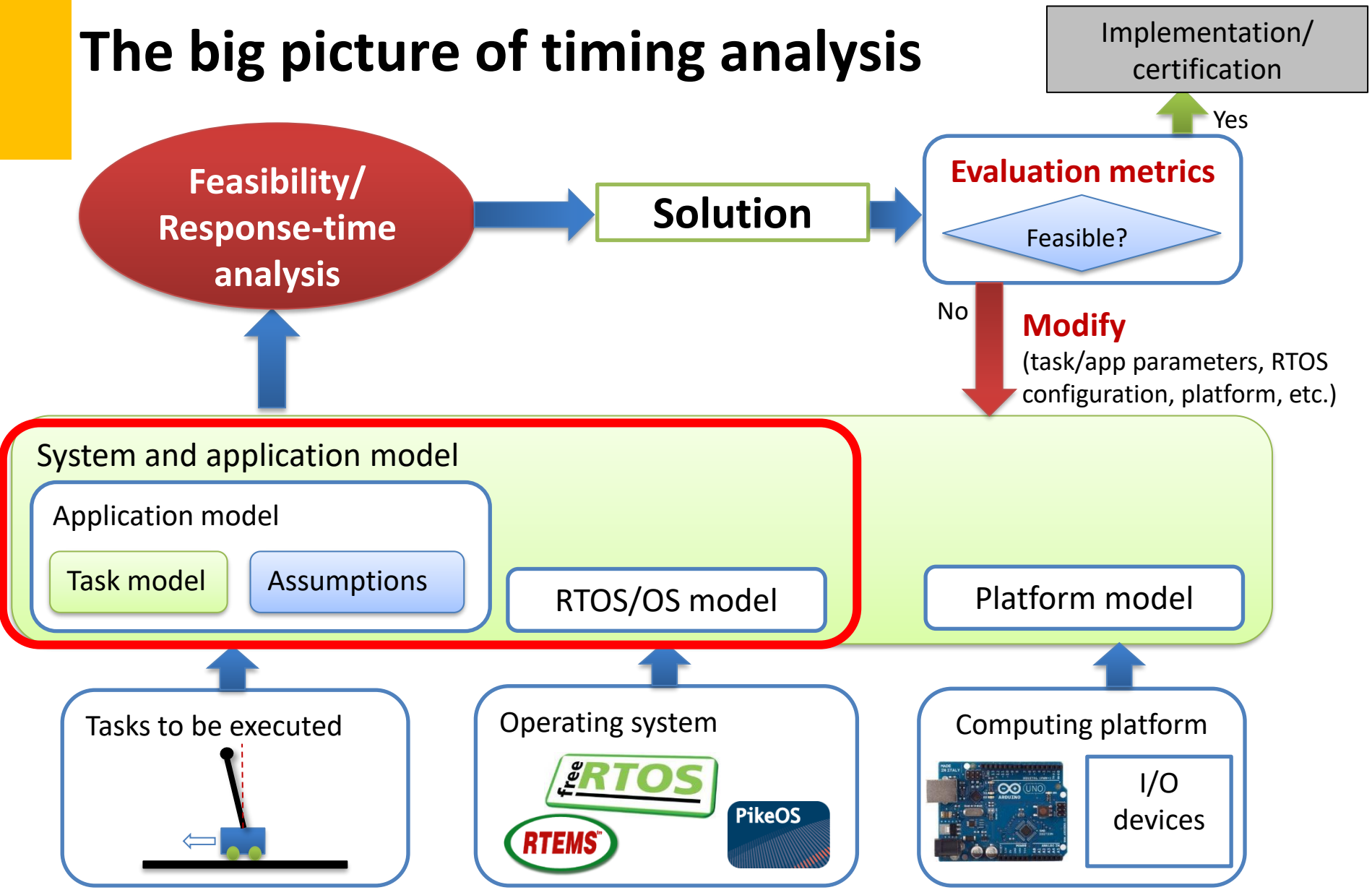
Buttazzo's book, chapters 2 and small part of 3



Disclaimer:
Most slides were provided by Dr. Mitra Nasri

The big picture of timing analysis



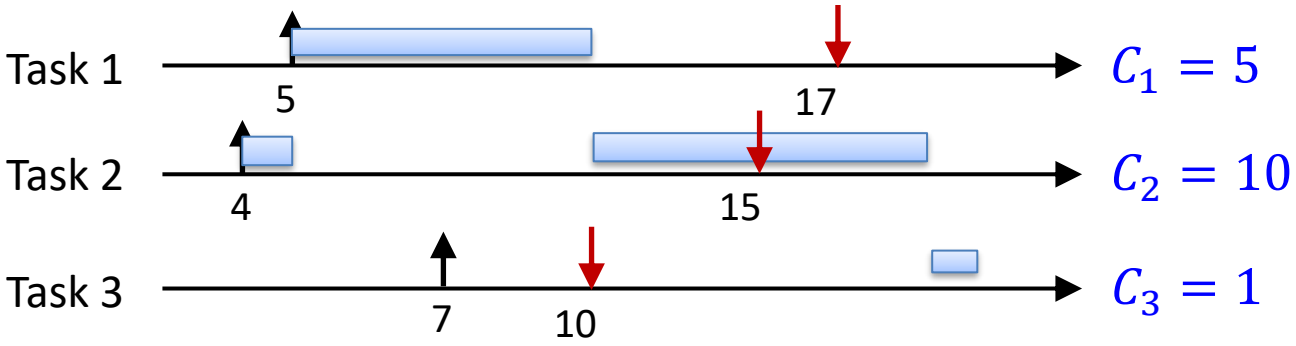
Ready for a quick test?

Character: Luffy
Anime: One Piece


QUIZ TIME

Quiz

- What are the priorities used by the FP algorithm?



($P_i > P_j$ means Task i has a higher priority than task j)

1: $P_2 > P_1 > P_3$

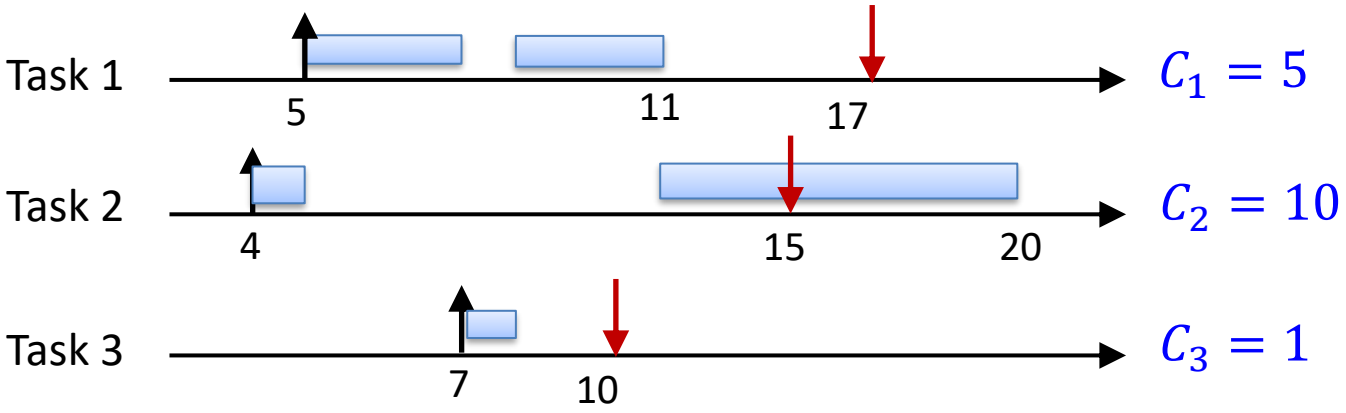
2: $P_2 > P_3 > P_1$

3: $P_1 > P_2 > P_3$

4: $P_3 > P_2 > P_1$

Quiz

- Which scheduling algorithm is used?



1: FIFO

3: EDF

2: FP with priorities: $P_1 > P_2 > P_3$

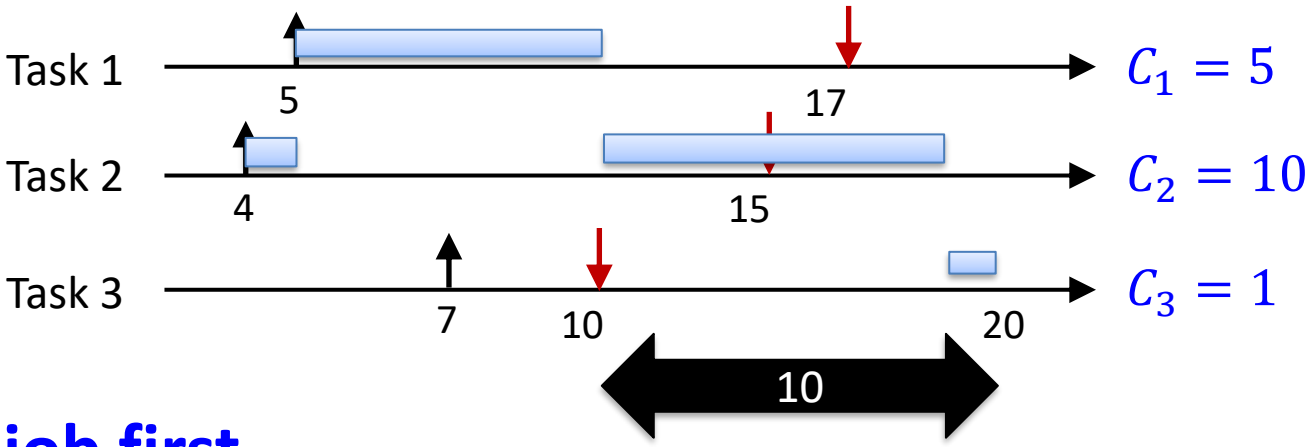
4: shortest job first

Quiz

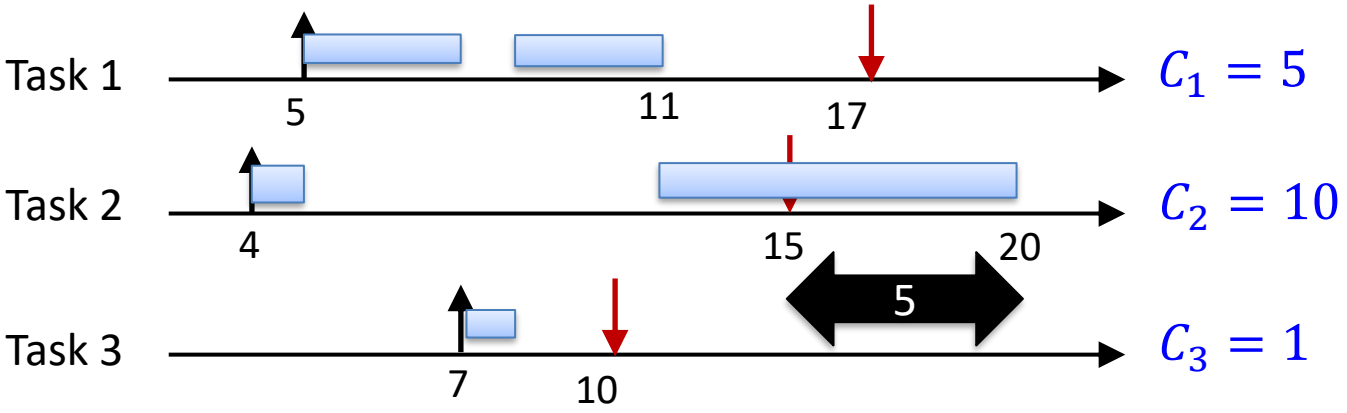
- Which schedule has a shorter **maximum lateness**?

1: FP

P1>P2>P3

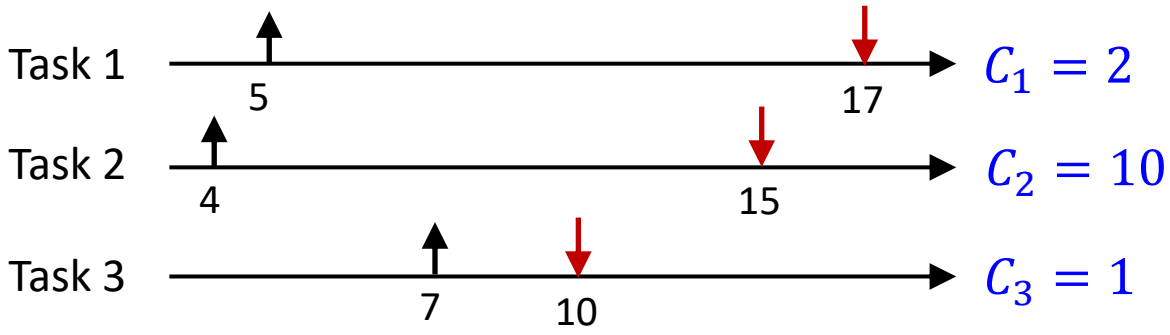


2: shortest job first



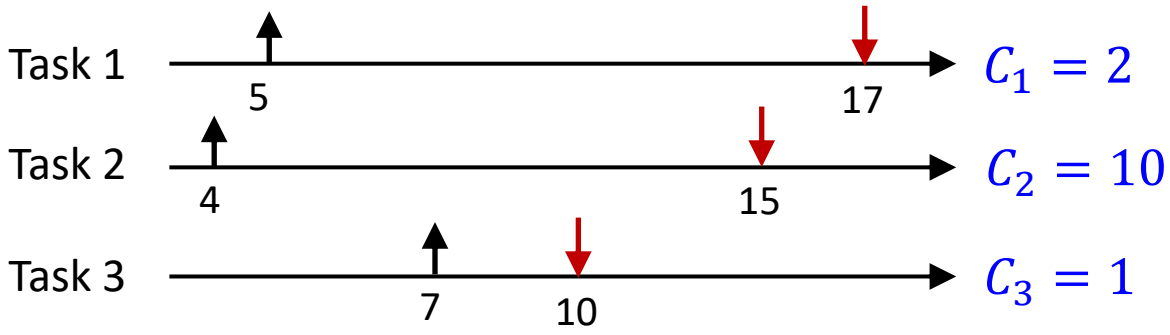
Quiz

Question: In any *arbitrary feasible schedule of this task set*, which task(s) might be executing at time 14? Why? (think *carefully*)



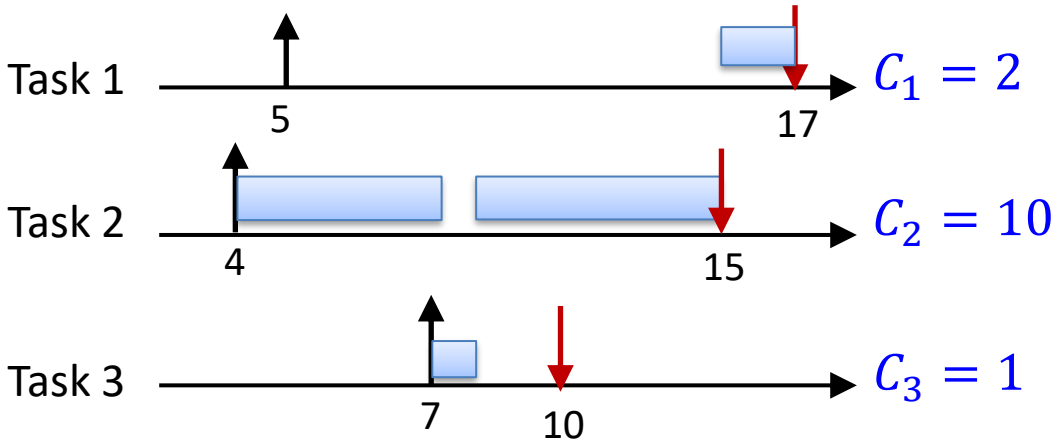
Quiz

Question: In any *arbitrary* *feasible schedule* *of this task set*, which task(s) might be executing at time 14? Why? (think *carefully*)



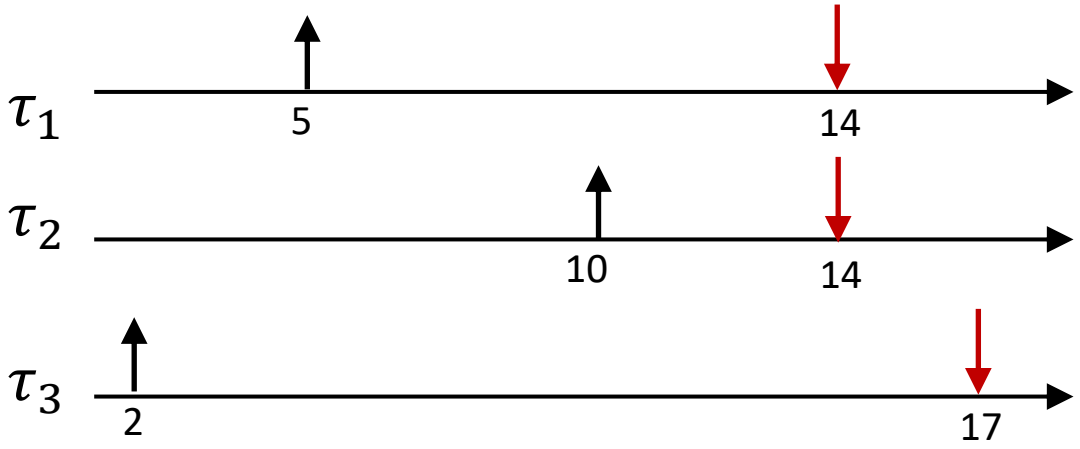
Only Task 2

The slack of Task 2 is 1 time unit. Task 3, however, needs that slack within the execution window of Task 2, otherwise it will not meet its deadline. Hence, Task 2 must be the only one else that executes throughout [4, 15] apart from Task 3.



Quiz

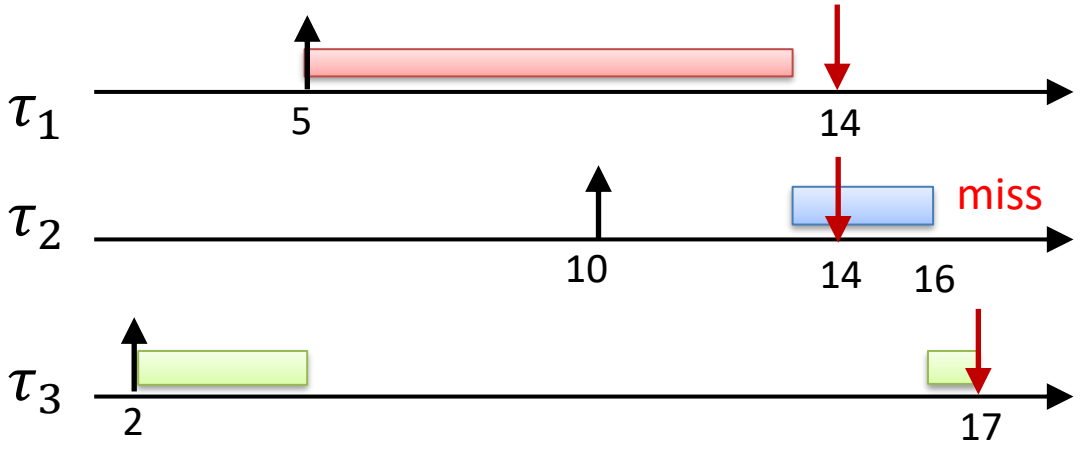
Is this task set feasible?



τ_i	C_i	$r_{i,1}$	$d_{i,1}$
τ_1	8	5	14
τ_2	3	10	14
τ_3	4	2	17

Quiz

Is this task set feasible?



τ_i	C_i	$r_{i,1}$	$d_{i,1}$
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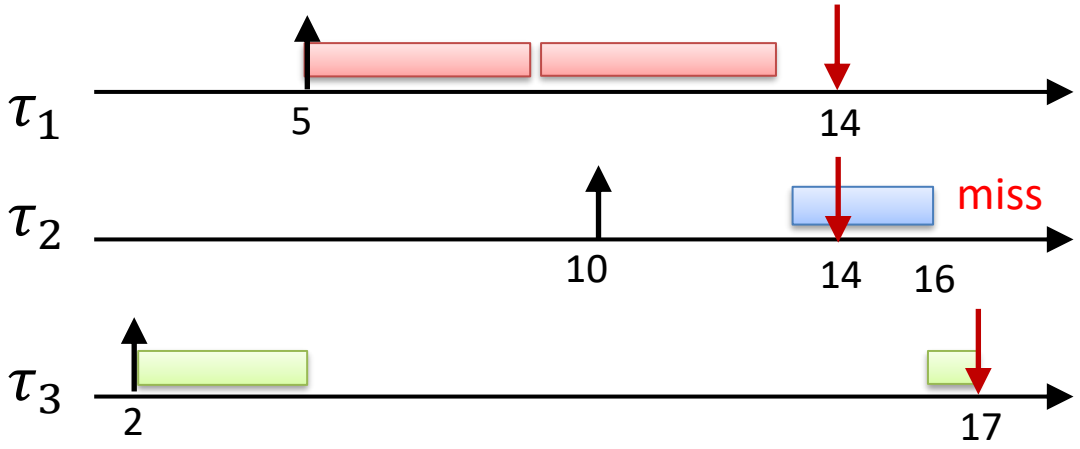
No, because whatever you do, you cannot find a solution without a deadline miss. Try!

In general, this claim always requires a proof!

Proof: both the job of τ_1 and τ_2 must execute in the interval [5,14). However, $C_1 + C_2 = 11 > 14 - 5 = 9$.

Therefore, the execution of τ_1 and τ_2 does not fit in [5,14).

Quiz



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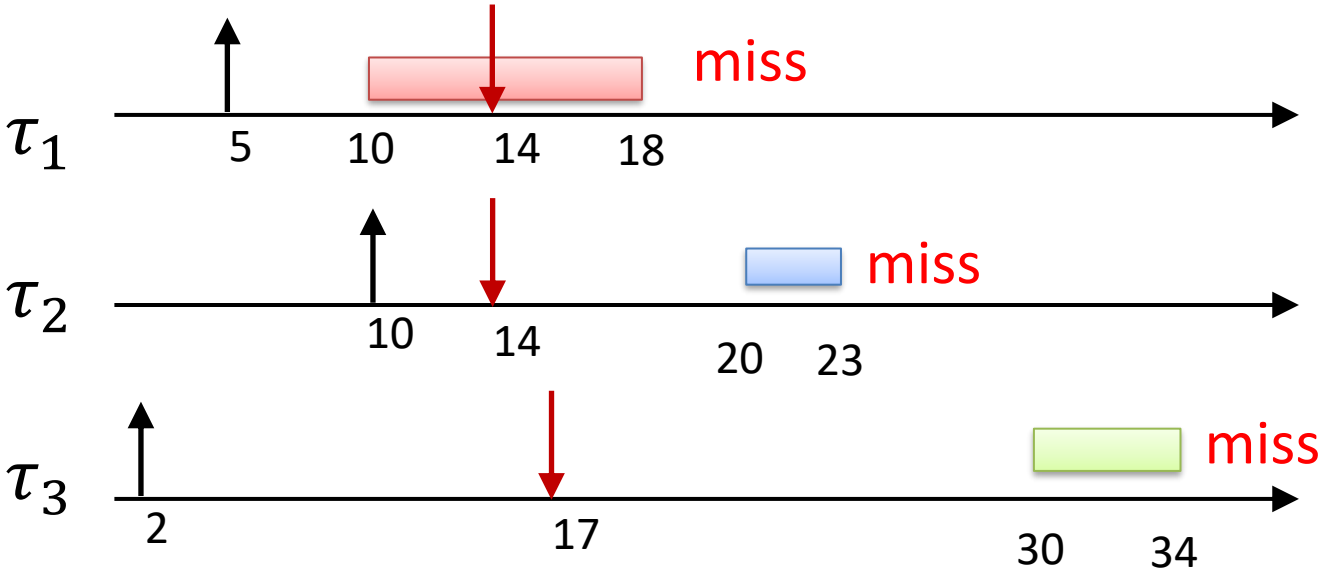
What would be the **maximum number of deadline misses** that this job set may have for "**any imaginable**" scheduling algorithm?

3

How?

My "**just-invented-scheduling-policy-for-fun**" (JISPFF)

schedules each job τ_i at time $i \times 10$



It is easy to mess up!

Never underestimate the power of a BAD scheduling algorithm!

https://www.thecatniptimes.com/learn/cat-care-tips/cleaning-hacks-for-cat-owners/#iLightbox[gallery15488]/0