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Question 4:

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Question 4.

	$T_1$	$T_2$	$T_3$	$T_4$
$a_i$	0	0	7	4
$c_i$	5	4	1	10
$D_i$	6	14	10	18

$T_3 \rightarrow T_2$ ;  $T_1 \rightarrow T_4$

1) With EDF algorithm, we need to find producing schedule for this task set, we have to:

$T_3 \rightarrow T_2$ ;  $T_1 \rightarrow T_4$

$\Rightarrow \begin{cases} r_1^* = a_1 = 0 \\ r_3^* = a_3 = 7 \end{cases} \Rightarrow \begin{cases} s_1^* = \max(a_1, r_1^* + c_1) = 5 \\ s_3^* = \max(a_3, r_3^* + c_3) = 8 \end{cases}$

$\Rightarrow$  New deadline:  $\begin{cases} d_2^* = d_2 = 14 \\ d_4^* = d_4 = 18 \end{cases}$

$\Rightarrow \begin{cases} d_1^* = \min(d_1, d_1^* - c_1) = 6 \\ d_3^* = \min(d_3, d_3^* - c_3) = 10 \end{cases}$

	$T_1$	$T_2$	$T_3$	$T_4$
$r_i^*$	0	5	0	5
$c_i$	5	4	1	10
$D_i$	6	14	10	18

Question 2:

④ The general real-time scheduling problem is:

There are more always more tasks than processors and multiple tasks run concurrently on uniprocessor system. Therefore, the aim of real-time scheduling is to create a series of jobs that fulfill strict timing restrictions at run-time.

$\rightarrow$  Problem: Assign processors from set of processor and resources from set of resources to a task (in set of tasks) under given constraints.

### ③ Real-time scheduling must satisfy

Timing constraints: Constraints on execution time, is the time that must meet in order to achieve the desired behavior

Precedence constraints: Tasks can have precedence constraints. A task has to be executed after another task's task is completed.

Resource constraints: any software structure that can be used by the process to advance its execution.

### ④ Static vs dynamic

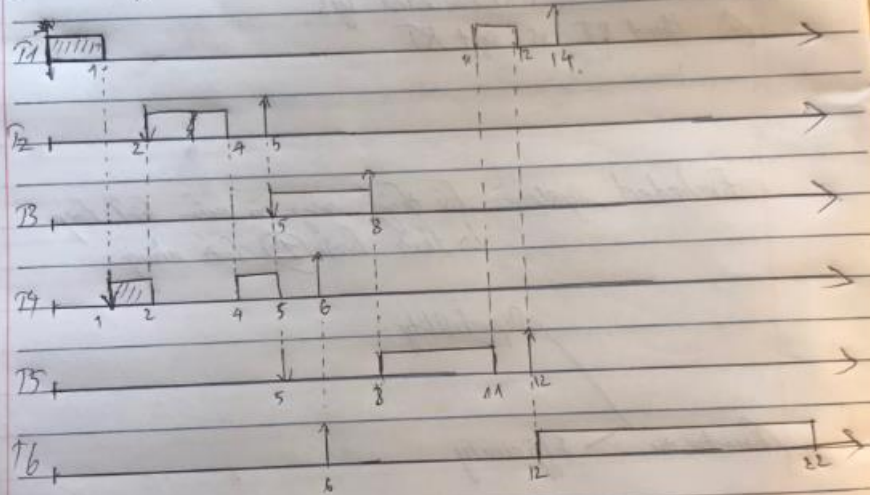
Static Scheduling is a technology that allows us to control the order/way that in which threads/processes execute in our code (at compile time). Dynamic Scheduling is the mechanism through which operating systems schedule threads depending on any scheduling algorithms provided at OS level.

Question 3:

Question 3:

	T1	T2	T3	T4	T5	T6
$q_i$	0	2	3	1	5	6
$t_i$	2	2	3	2	3	<del>4</del> 10
$D_i$	14	5	8	6	12	20

- ① The algorithm help minimize  $L_{max}$  of this task set is the EDF algorithm.
- ② The pm schedule for this task set is:



⇒

We have:

$$L_1 = 12 - 14 = -2$$

$$L_2 = 4 - 5 = -1$$

$$L_3 = 8 - 8 = 0$$

$$L_4 = 5 - 6 = -1$$

$$L_5 = 11 - 12 = -1$$

$$L_6 = 22 - 20 = 2$$

$$\Rightarrow L_{max} = 2$$

KLONG