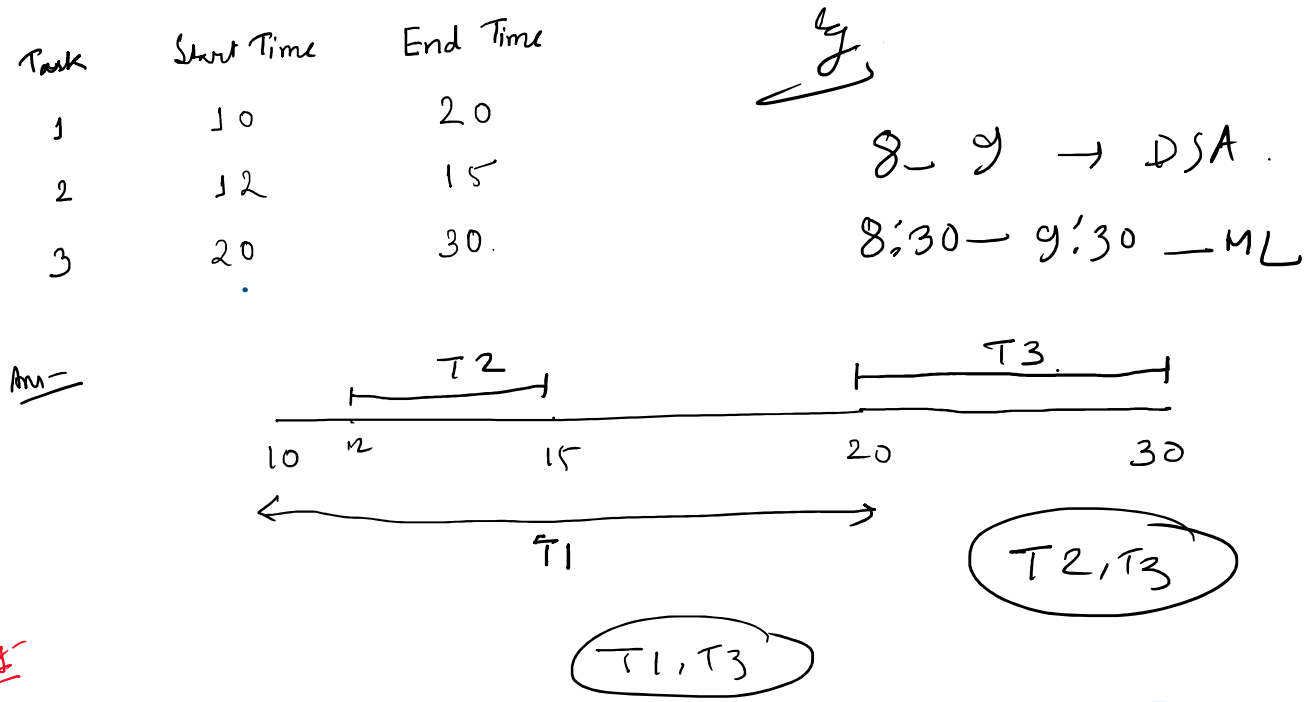
S

12 March 2025 15:25

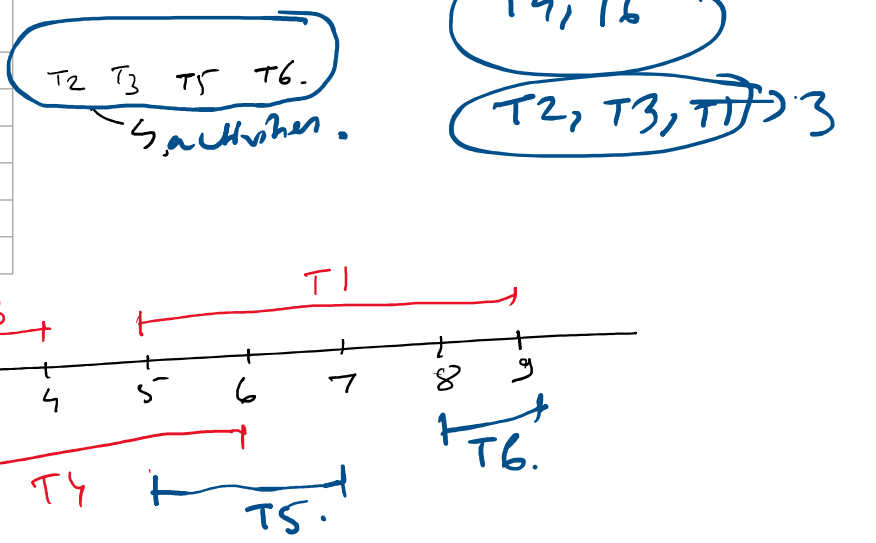
Activity selection problem / maximum disjoint interval

You are given **n** activities with their start and finish times. Select the maximum number of activities that can be performed by a single person, assuming that a person can only work on a single activity at a time.



Eg

Start Time (s)	Finish Time (f)	Task Name
5	9	T1
1	2	T2
3	4	T3
0	6	T4
5	7	T5
8	9	T6



Algorithm:

1. Sort all activities based on their finish time.
2. Choosing the first activity from the sorted list.
3. Select the next activity from the sorted list only if its `start` time is greater than or equal to the `finish` time of the previously selected activity.
4. Repeat `Step 3` for all the remaining activities in the sorted list.

Question: Maximum tasks that can be performed without any overlapping

Start Time (s)	Finish Time (f)	Task Name
5	9	T1
1	2	T2
3	4	T3

0	6	T4
5	7	T5
8	9	T6

Answer:

1. Sort all activities based on their finish time.

Start Time (s)	Finish Time (f)	Task Name
		T
1	2	T
3	4	T
0	6	T
5	7	T
5	9	T
8	9.	6

T2, T3, T5, T6

Max activity performed = 4.

TC → n log n.

previous task. End time <= next task. Start Time.

H/W

GFG Job Sequencing Problem → Greedy approach