ABAIAJ

12 March 2025 15:25

Activity selection problem / maximum disjoint interval

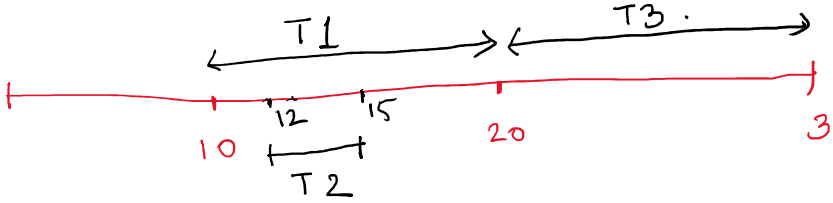
You are given **n** activities with their start and finish times. Select the maximum number of activities that can be performed by a single person, assuming that a person can only work on a single activity at a time. (No overlapping between 2 tasks)

Task	Start Time	End Time
1	10	20
2	12	15
3	20	30

8 – 9 → DSA.

8:30 – 9:30 → ML

Ans –



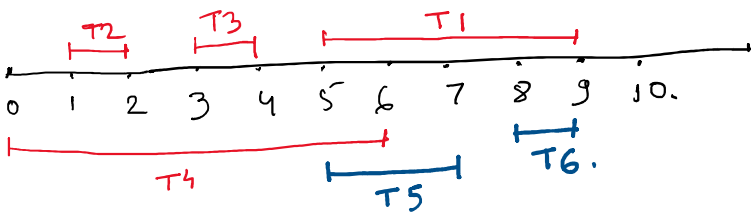
T1, T3

T2, T3

previous task . end time <= next task . start 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



T4, T6 → 2

T2, T3, T1 → 3

T2, T3, T5, T6 → 4.

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

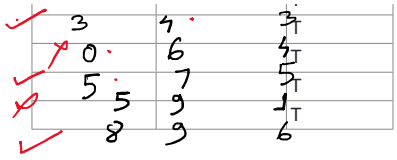
Answer:

1. Sort all activities based on their finish time.

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

T2, T3, T5, T6.

Max activity = 4.



Max activity = 4.

TC → O(n log n)

H/W Job sequencing Problem (Greedy Technique)

GFG.