

1)

Resource Planning

You are given a list of tasks. Each task has a start week, an end week, and the number of engineers it requires. The tasks can overlap.

Propose an algorithm and an associated data structure to solve the following question:

At which time frame the highest number of engineers is required, and how many are needed at that time frame?

Example:

Task ID	Start week	End week	Number of engineers
1	1	5	4
2	11	28	2
3	3	15	3
4	22	34	1

Example Output:

Max engineers at the same time: 7

Time frame/s: [3, 4, 5] or Time frame/s: [(3, 5)]

2)

The same problem as in q.1 but with continuous datetime data.

Example:

TypeID	Start time	End time	Number of engineers
1	01/12/22 13:55	28/12/22 14:34	4
2	09/02/23 11:44	06/03/23 12:22	2
3	14/12/22 19:55	13/02/23 10:45	3
4	26/04/22 13:18	30/06/22 13:15	1

Example Output:

Max engineers at the same time: 7

Time frame/s: [('14/12/22 19:55', '28/12/22 14:34')]