ECE 0302 Homework 2

Problem1 : Meeting Room Scheduling

Description:

You are given a list of n meetings, each represented as a pair of integers $[start, end]$, indicating the start and end time of a meeting. Your goal is to attend as many non-overlapping meetings as possible.

Two meetings $[s_1, e_1]$ and $[s_2, e_2]$ are non-overlapping if $e_1 \leq s_2$ or $e_2 \leq s_1$.

Input:

- A list of meeting intervals: `vector<pair<int, int>> meetings`

Output: An integer: the maximum number of non-overlapping meetings.

Example:

```
Input:  [[1,3], [2,4], [3,5], [5,6]]
Output: 3

Explanation:
We can attend meetings [1,3], [3,5], and [5,6].
```

Problem2: Sort Array Elements by Frequency

Description:

You are given an integer array `nums`. Sort the elements of the array according to the following rules:

- Elements with a lower frequency come first.
- If two elements have the same frequency, the one with the **higher value** comes first.

Input:

- A vector of integers `nums`

Output: A reordered vector of integers following the above rules.

Example:

```
Input:  [4, 4, 1, 1, 2, 3, 3, 3]
Output: [2, 4, 4, 1, 1, 3, 3, 3]

Explanation:
Frequencies are:
1 → 2 times
2 → 1 time
3 → 3 times
4 → 2 times

Sorted by frequency (ascending), then value (descending):
→ 2, 4, 4, 1, 1, 3, 3, 3
```

Problem3: Minimum Number of Items to Reach Target Sum

Description:

You are given a list of positive integers representing item values in a store and an integer target sum T. Your task is to choose the **minimum number of items** such that their total value is greater than or equal to T. Each item can be used at most once.

Input:

- A vector `items` of n integers

Output: Minimum number of items needed to reach or exceed T, or -1 if it is not possible.

Example:

```
Input:
items = [1, 3, 5, 10]
T = 12

Output: 2

Explanation:
Choose 10 and 5 → sum = 15 is bigger than 12 (minimum 2 items)
```