Backend Architect (Max Test Duration 145 Minutes)

Question 1

A start-up owner is looking to meet new investors to get some funds for the company. Each investor has a tight schedule that the owner has to respect. Given the schedules of the days investors are available, determine how many meetings the owner can schedule. Note that the owner can only have one meeting per day.

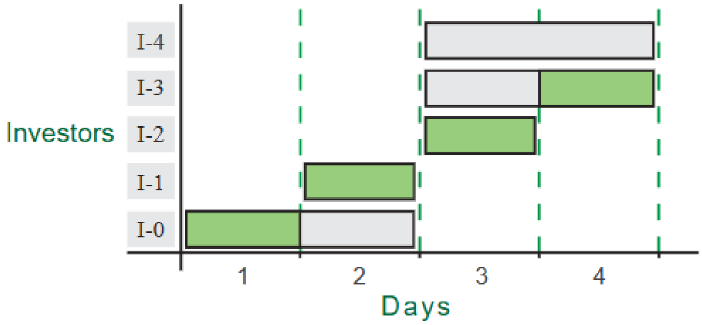
The schedules consist of two integer arrays: *firstDay,* and *lastDay,* aligned by index. Each element in the array *firstDay* represents the first day an investor is available, and each element in *lastDay* represents the last day an investor is available, both inclusive.

Example:

firstDay = [1,2,3,3,3]

lastDay= [2,2,3,4,4]

- There are 5 investors [I-0, I-1, I-2, I-3, I-4]
- The investor I-0 is available from day 1 to day 2 inclusive [1, 2]
- The investor I-1 is available in day 2 only [2, 2]. The investor I-2 is available in day 3 only [3, 3]
- The investors I-3 and I-4 are available from day 3 to day 4 only [3, 4]
- The owner can only meet 4 investors out of 5 : I-0 in day 1, I-1 in day 2, I-2 in day 3 and I-3 in day 4. The graphic below shows the scheduled meetings in green and blocked days are in gray.



Function Description

Complete the function *countMeetings* in the editor below.

countMeetings has the following parameters:

int firstDay[n]: *firstDay[i]* is the first day the i^{-th} investor is available to meet.

int lastDay[n]: *lastDay[i]* is the last day the i^{th} investor is available to meet.

Returns:

int: the maximum number of meetings possible

Constraints

- $1 \le n \le 10^5$
- $1 \le firstDay[i], lastDay[i] \le 10^5$ (where $0 \le i < n$)
- $firstDay[i] \le lastDay[i]$ (where $0 \le i < n$)

Question 2

Given arrays of words and phrases, first, group all the anagrams. Determine the number of phrases that can be generated by replacing any word with its anagrams.

Example

words = ['desserts', 'stressed', 'bats', 'stabs', 'are', 'not']

phrases = ['bats are not stressed']

Here *desserts* and *stressed* are anagrams. Since *stabs* has one more *s than bats*, the two are not anagrams.

The two sentences that can be generated are:

- bats are not stressed
- bats are not desserts

Return 2.

Function Description

Complete the *substitutions* function in the editor below.

substitutions has the following parameters:

string words[n]: an array of strings

string phrases[m]: an array of strings

Returns

int[m]: the number of phrases that can be generated from each phrase in *phrases*

Constraints

- $0 < n \le 10^5$
- *1 ≤ length of each word ≤ 20*
- $1 \le m \le 1000$
- *3 ≤ words in phrases[i] ≤ 20*
- All words in *phrases[i]* are also in *words[]*.