2534. Time Taken to Cross the Door Premium

Hard Topics Companies Hint

There are `n` persons numbered from `0` to `n - 1` and a door. Each person can enter or exit through the door once, taking one second.

You are given a **non-decreasing** integer array `arrival` of size `n`, where `arrival[i]` is the arrival time of the i^{th} person at the door. You are also given an array `state` of size `n`, where `state[i]` is `0` if person `i` wants to enter through the door or `1` if they want to exit through the door.

If two or more persons want to use the door at the **same** time, they follow the following rules:

- If the door was **not** used in the previous second, then the person who wants to **exit** goes first.
- If the door was used in the previous second for **entering**, the person who wants to enter goes first.
- If the door was used in the previous second for **exiting**, the person who wants to **exit** goes first.
- If multiple persons want to go in the same direction, the person with the **smallest** index goes first.

Return *an array* `answer` *of size* `n` *where* `answer[i]` *is the second at which the* i^{th} *person crosses the door.*

Note that:

- Only one person can cross the door at each second.
- A person may arrive at the door and wait without entering or exiting to follow the mentioned rules.

Example 1:

```
Input: arrival = [0,1,1,2,4], state = [0,1,0,0,1]
Output: [0,3,1,2,4]
Explanation: At each second we have the following:
- At t = 0: Person 0 is the only one who wants to enter, so they just enter through the door.
- At t = 1: Person 1 wants to exit, and person 2 wants to enter. Since the door was used the previous second for entering, person 2 enters.
- At t = 2: Person 1 still wants to exit, and person 3 wants to enter. Since the door was used the previous second for entering, person 3 enters.
- At t = 3: Person 1 is the only one who wants to exit, so they just exit through the door.
- At t = 4: Person 4 is the only one who wants to exit, so they just exit through the door.
```

Example 2:

```
Input: arrival = [0,0,0], state = [1,0,1]
Output: [0,2,1]
Explanation: At each second we have the following:
- At t = 0: Person 1 wants to enter while persons 0 and 2 want to exit. Since the door was not used in the previous second, the persons who want to exit get to go first.
Since person 0 has a smaller index, they exit first.
- At t = 1: Person 1 wants to enter, and person 2 wants to exit. Since the door was used in the previous second for exiting, person 2 exits.
- At t = 2: Person 1 is the only one who wants to enter, so they just enter through the door.
```

Constraints:

- `n == arrival.length == state.length`
- `1 <= n <= 10^5`
- `0 <= arrival[i] <= n`
- `arrival` is sorted in **non-decreasing** order.
- `state[i]` is either `0` or `1`.

Seen this question in a real interview before? 1/5

Yes No

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Topics

Array Queue Simulation

Companies

0 - 3 months

Google 7

0 - 6 months

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6 months ago

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Hint 1

Use a queue to store the people who want to enter or exit and their corresponding times.

Hint 2

Simulate the process described in the statement and apply the 4 rules to the people crossing the door.

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