2015. Average Height of Buildings in Each Segment Premium

Medium | Topics | Companies | Hint

A perfectly straight street is represented by a number line. The street has building(s) on it and is represented by a 2D integer array `buildings`, where `buildings[i] = [start_i, end_i, height_i]`. This means that there is a building with `height_i` in the **half-closed segment** `[start_i, end_i)`.

You want to **describe** the heights of the buildings on the street with the **minimum** number of non-overlapping **segments**. The street can be represented by the 2D integer array `street` where `street[j] = [left_j, right_j, average_j]` describes a **half-closed segment** `[left_j, right_j)` of the road where the **average** heights of the buildings in the **segment** is `average_j`.

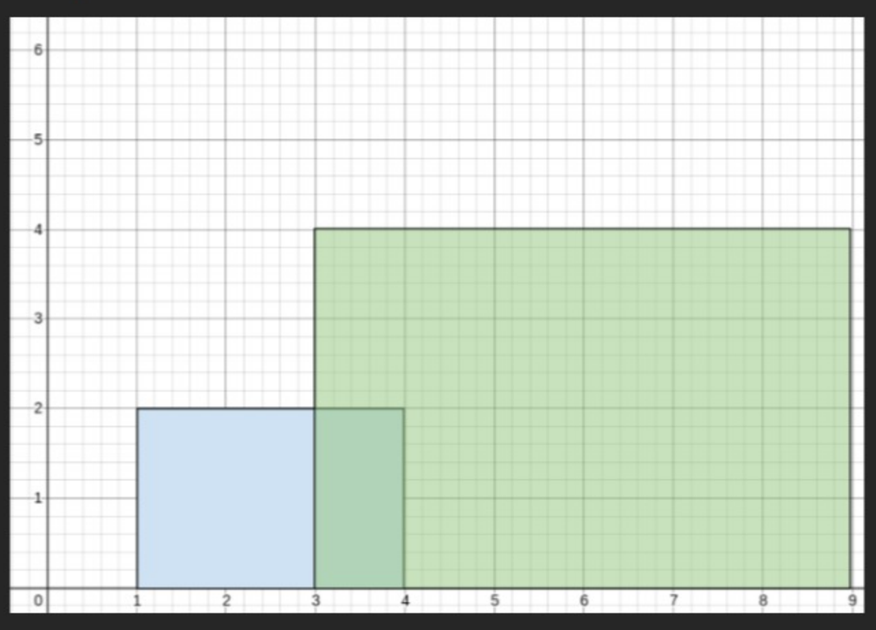
- For example, if `buildings = [[1,5,2],[3,10,4]]`, the street could be represented by `street = [[1,3,2],[3,5,3],[5,10,4]]` because:
  - From 1 to 3, there is only the first building with an average height of `2 / 1 = 2`.
  - From 3 to 5, both the first and the second building are there with an average height of `(2+4) / 2 = 3`.
  - From 5 to 10, there is only the second building with an average height of `4 / 1 = 4`.

Given `buildings`, return *the 2D integer array* `street` *as described above (**excluding** any areas of the street where there are no buldings). You may return the array in **any order**.*

The **average** of `n` elements is the **sum** of the `n` elements divided (**integer division**) by `n`.

A **half-closed segment** `[a, b)` is the section of the number line between points `a` and `b` **including** point `a` and **not including** point `b`.

Example 1:




```
Input: buildings = [[1,4,2],[3,9,4]]
Output: [[1,3,2],[3,4,3],[4,9,4]]
Explanation:
From 1 to 3, there is only the first building with an average height of 2 / 1 = 2.
From 3 to 4, both the first and the second building are there with an average height of (2+4) / 2 = 3.
From 4 to 9, there is only the second building with an average height of 4 / 1 = 4.
```

Example 2:

```
Input: buildings = [[1,3,2],[2,5,3],[2,8,3]]
Output: [[1,3,2],[3,8,3]]
Explanation:
From 1 to 2, there is only the first building with an average height of 2 / 1 = 2.
From 2 to 3, all three buildings are there with an average height of (2+3+3) / 3 = 2.
From 3 to 5, both the second and the third building are there with an average height of (3+3) / 2 = 3.
From 5 to 8, there is only the last building with an average height of 3 / 1 = 3.
The average height from 1 to 3 is the same so we can group them into one segment.
The average height from 3 to 8 is the same so we can group them into one segment.
```

Example 3:

```
Input: buildings = [[1,2,1],[5,6,1]]
Output: [[1,2,1],[5,6,1]]
Explanation:
From 1 to 2, there is only the first building with an average height of 1 / 1 = 1.
From 2 to 5, there are no buildings, so it is not included in the output.
From 5 to 6, there is only the second building with an average height of 1 / 1 = 1.
We cannot group the segments together because an empty space with no buildings seperates the segments.
```

Constraints:

- `1 <= buildings.length <= 10^5`
- `buildings[i].length == 3`
- `0 <= start_i < end_i <= 10^8`
- `1 <= height_i <= 10^5`

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

Yes No

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Topics

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Companies

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Microsoft 2

Hint 1

Try sorting the start and end points of each building.

Hint 2

The naive solution is to go through each position on the street and keep track of the sum of all the buildings at that position and the number of buildings at that position.

Hint 3

How could we optimize that solution to pass?

Hint 4

We don't need to go through every position, just the ones where a building starts or a building ends.

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