

218. The Skyline Problem

A city's skyline is the outer contour of the silhouette formed by all the buildings in that city when viewed from a distance. Given the locations and heights of all the buildings, return the skyline formed by these buildings collectively.

The geometric information of each building is given in the array buildings where $\text{buildings}[i] = [\text{left}_i, \text{right}_i, \text{height}_i]$:

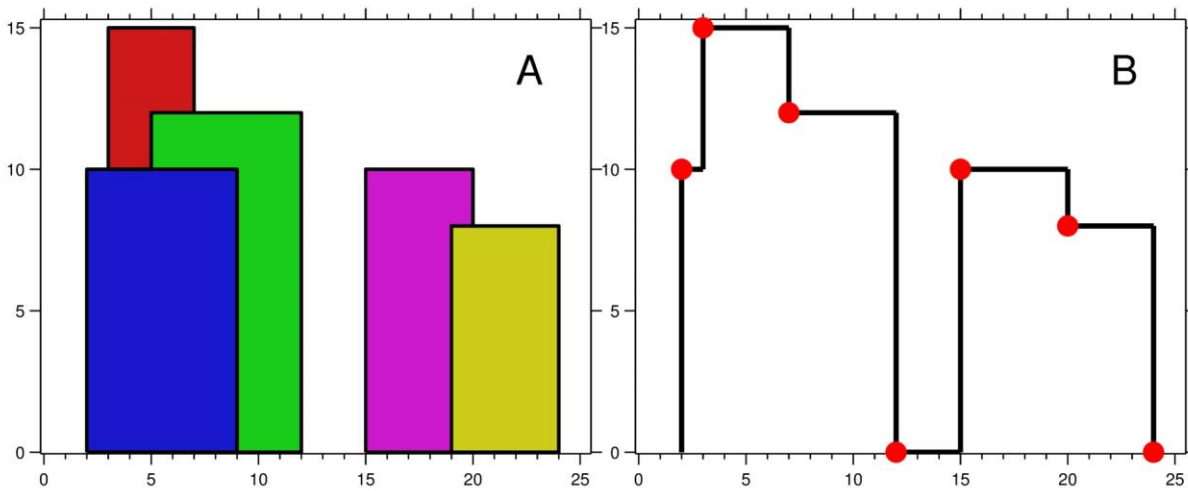
- left_i is the x coordinate of the left edge of the i th building.
- right_i is the x coordinate of the right edge of the i th building.
- height_i is the height of the i th building.

You may assume all buildings are perfect rectangles grounded on an absolutely flat surface at height 0.

The skyline should be represented as a list of "key points" sorted by their x-coordinate in the form $[[x_1, y_1], [x_2, y_2], \dots]$. Each key point is the left endpoint of some horizontal segment in the skyline except the last point in the list, which always has a y-coordinate 0 and is used to mark the skyline's termination where the rightmost building ends. Any ground between the leftmost and rightmost buildings should be part of the skyline's contour.

Note: There must be no consecutive horizontal lines of equal height in the output skyline. For instance, $[\dots, [2, 3], [4, 5], [7, 5], [11, 5], [12, 7], \dots]$ is not acceptable; the three lines of height 5 should be merged into one in the final output as such: $[\dots, [2, 3], [4, 5], [12, 7], \dots]$

Example 1:



Input: buildings = [[2,9,10],[3,7,15],[5,12,12],[15,20,10],[19,24,8]]

Output: [[2,10],[3,15],[7,12],[12,0],[15,10],[20,8],[24,0]]

Explanation:

- Figure A shows the buildings of the input.
- Figure B shows the skyline formed by those buildings. The red points in figure B represent the key points in the output list.

Example 2:

Input: buildings = [[0,2,3],[2,5,3]]

Output: [[0,3],[5,0]]

Constraints:

- $1 \leq \text{buildings.length} \leq 104$
- $0 \leq \text{lefti} < \text{righti} \leq 231 - 1$
- $1 \leq \text{heighti} \leq 231 - 1$
- `buildings` is sorted by `lefti` in non-decreasing order.