1135. Connecting Cities With Minimum Cost Premium

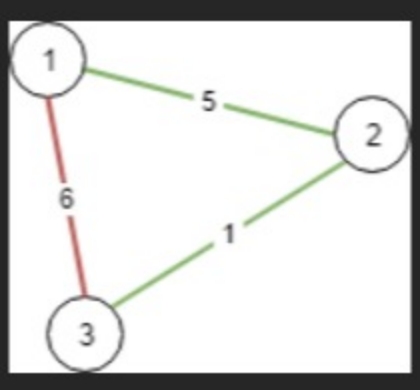
Medium | Topics | Companies | Hint

There are `n` cities labeled from `1` to `n`. You are given the integer `n` and an array `connections` where `connections[i] = [x_i, y_i, cost_i]` indicates that the cost of connecting city `x_i` and city `y_i` (bidirectional connection) is `cost_i`.

Return *the minimum **cost** to connect all the `n` cities such that there is at least one path between each pair of cities.* If it is impossible to connect all the `n` cities, return `-1`,

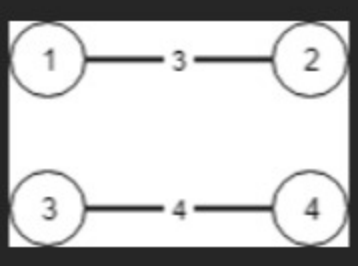
The **cost** is the sum of the connections' costs used.

Example 1:




```
Input: n = 3, connections = [[1,2,5],[1,3,6],[2,3,1]]
Output: 6
Explanation: Choosing any 2 edges will connect all cities so we choose the minimum 2.
```

Example 2:




```
Input: n = 4, connections = [[1,2,3],[3,4,4]]
Output: -1
Explanation: There is no way to connect all cities even if all edges are used.
```

Constraints:

- `1 <= n <= 10^4`
- `1 <= connections.length <= 10^4`
- `connections[i].length == 3`
- `1 <= x_i, y_i <= n`
- `x_i != y_i`
- `0 <= cost_i <= 10^5`

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

Yes No

Accepted 77.6K | Submissions 124.6K | Acceptance Rate 62.2%

Topics

Union Find | Graph | Heap (Priority Queue) | Minimum Spanning Tree

Companies

0 - 6 months

Amazon 3

Hint 1

What if we model the cities as a graph?

Hint 2

Build a graph of cities and find the minimum spanning tree.

Hint 3

You can use a variation of the Kruskal's algorithm for that.

Hint 4

Sort the edges by their cost and use a union-find data structure.

Hint 5

How to check all cities are connected?

Hint 6

At the beginning we have n connected components, each time we connect two components the number of connected components is reduced by one. At the end we should end with only a single component otherwise return -1.

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