

6267. Add Edges to Make Degrees of All Nodes Even

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There is an **undirected** graph consisting of n nodes numbered from 1 to n . You are given the integer n and a **2D** array `edges` where `edges[i] = [ai, bi]` indicates that there is an edge between nodes a_i and b_i . The graph can be disconnected.

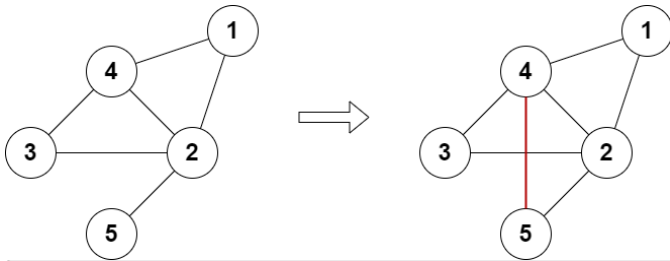
You can add **at most** two additional edges (possibly none) to this graph so that there are no repeated edges and no self-loops.

Return `true` if it is possible to make the degree of each node in the graph even, otherwise return `false`.

The degree of a node is the number of edges connected to it.

User Accepted:	0
User Tried:	0
Total Accepted:	0
Total Submissions:	0
Difficulty:	Hard

Example 1:

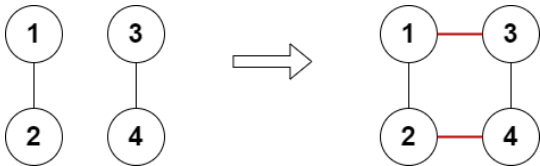


Input: $n = 5$, `edges = [[1,2],[2,3],[3,4],[4,2],[1,4],[2,5]]`

Output: `true`

Explanation: The above diagram shows a valid way of adding an edge. Every node in the resulting graph is connected to an even number of edges.

Example 2:

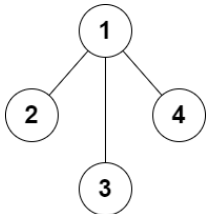


Input: $n = 4$, `edges = [[1,2],[3,4]]`

Output: `true`

Explanation: The above diagram shows a valid way of adding two edges.

Example 3:



Input: $n = 4$, `edges = [[1,2],[1,3],[1,4]]`

Output: `false`

Explanation: It is not possible to obtain a valid graph with adding at most 2 edges.

Constraints:

- $3 \leq n \leq 10^5$
- $2 \leq \text{edges.length} \leq 10^5$
- $\text{edges}[i].\text{length} == 2$
- $1 \leq a_i, b_i \leq n$
- $a_i \neq b_i$
- There are no repeated edges.

JavaScript



```

1  const initializeGraphSet = (n) => { let g = []; for (let i = 0; i < n; i++) { g.push(new Set()); } return g; };
2  const packUG_Set = (g, edges) => { for (const [u, v] of edges) { g[u - 1].add(v - 1); g[v - 1].add(u - 1); } };
3
4  const isPossible = (n, edges) => {
5      let g = initializeGraphSet(n);
6      packUG_Set(g, edges);
7      return canAddAtMost2EdgesMakeALLNodesDegreeEven(g);
8  };
9
10 const canAddAtMost2EdgesMakeALLNodesDegreeEven = (g) => {
11     let oddNodes = [];
12     for (let i = 0; i < g.length; i++) {
13         let deg = g[i].size;
14         if (deg % 2 == 1) {
15             oddNodes.push(i);
16         }
17     }
18     if (oddNodes.length == 0) {
19         return true;
20     } else if (oddNodes.length == 2) {
21         let [a, b] = oddNodes;
22         for (let k = 0; k < g.length; k++) {
23             if (!g[a].has(k) && !g[b].has(k)) return true;
24         }
25         return false;
26     } else if (oddNodes.length == 4) {
27         let [a, b, c, d] = oddNodes;
28         if (!g[a].has(b) && !g[c].has(d)) return true;
29         if (!g[a].has(c) && !g[b].has(d)) return true;
30         if (!g[a].has(d) && !g[c].has(b)) return true;
31         return false;
32     } else {
33         return false;
34     }
35 }

```

☐ Custom Testcase

Use Example Testcases

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