Problem 3547: Maximum Sum of Edge Values in a Graph

Problem Information

Difficulty: Hard
Acceptance Rate: 34.90%
Paid Only: No
Tags: Math, Greedy, Graph

Problem Description

You are given an **undirected connected** graph of `n` nodes, numbered from `0` to `n - 1`. Each node is connected to **at most** 2 other nodes.

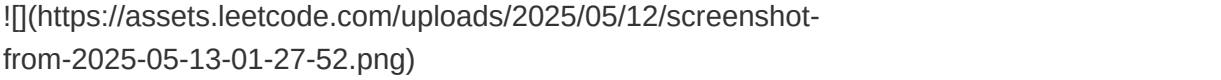
The graph consists of `m` edges, represented by a 2D array `edges`, where `edges[i] = [ai, bi]` indicates that there is an edge between nodes `ai` and `bi`.

You have to assign a **unique** value from `1` to `n` to each node. The value of an edge will be the **product** of the values assigned to the two nodes it connects.

Your score is the sum of the values of all edges in the graph.

Return the **maximum** score you can achieve.

Example 1:



Input: n = 4, edges = [[0,1],[1,2],[2,3]]

Output: 23

Explanation:

The diagram above illustrates an optimal assignment of values to nodes. The sum of the values of the edges is: `(1 * 3) + (3 * 4) + (4 * 2) = 23`.

Example 2:

Input: n = 6, edges = [[0,3],[4,5],[2,0],[1,3],[2,4],[1,5]]

Output: 82

Explanation:

The diagram above illustrates an optimal assignment of values to nodes. The sum of the values of the edges is: `(1 * 2) + (2 * 4) + (4 * 6) + (6 * 5) + (5 * 3) + (3 * 1) = 82`.

Constraints:

* `1 <= n <= 5 * 104` * `m == edges.length` * `1 <= m <= n` * `edges[i].length == 2` * `0 <= ai, bi < n` * `ai != bi` * There are no repeated edges. * The graph is connected. * Each node is connected to at most 2 other nodes.

Code Snippets

C++:

```
class Solution {
public:
long long maxScore(int n, vector<vector<int>>& edges) {

}
};
```

Java:

```
class Solution {
public long maxScore(int n, int[][] edges) {

}
}
```

Python3:

```
class Solution:
def maxScore(self, n: int, edges: List[List[int]]) -> int:
```