Randomized Minimum Cut

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Given an undirected and unweighted graph, find the smallest cut (smallest number of edges that disconnects the graph into two components).

Step-by-Step Algorithm

1. **Initialize the Graph:** The code reads the number of vertices () and edges () and stores the edges in a list .
2. **Pick a Random Edge:** While there are more than 2 vertices remaining in the graph, the algorithm randomly selects an edge from the current edge list.
3. **Contract the Edge:** The algorithm "merges" vertex into vertex .
    - It iterates through all existing edges.
    - Any edge connected to is redirected to .
    - Effectively, and become a single "super-vertex."
4. **Remove Self-Loops:** After merging, any edges that now start and end at the same vertex (e.g.,) are removed. These are "self-loops" and do not contribute to a cut between different sets of vertices.
5. **Repeat until Two Vertices Remain:** Steps 2 through 4 repeat until only two "super-vertices" are left.
6. **Return the Result:** The number of edges remaining between these last two vertices represents a candidate for the **Minimum Cut**.