ROLL: 2207053, 2207054, 2207055

Introduction to Random Minimum Cut Algorithm (Karger's algorithm for Minimum Cut)

Problem Definition:
Let G = (V, E) be a connected undirected graph.
A cut divides V into two non-empty disjoint sets.
The cut size is the number of edges crossing between the two sets.
The minimum cut problem finds the cut with the smallest number of such edges.

Solution Algorithm:
- The graph is taken as input from the console.
- A disjoint set (union–find) data structure is used to manage vertex contraction.
- In each iteration, a random edge is selected and its endpoint nodes are merged if they belong to different subsets.
- This merging process simulates the contraction of vertices according to Karger's algorithm.
- The algorithm continues contracting vertices until only two super-nodes remain.
- After contraction, the program counts the number of edges crossing between the two remaining subsets.
- To handle the randomized nature, the algorithm is executed multiple times in a loop.
- The minimum cut value obtained across all runs is the final result.