Algorithm Analysis Lab Report

Title: Introduction to Randomized Minimum Cut Algorithm

Date: 18/12/2025

Section: A

Roll: 2207044, 2207045, 2207046

Course no: CSE 2202

Objectives:

- To learn and implement Randomized Minimum Cut Algorithm.

Algorithm Overview:

Given an undirected graph with V vertices and E edges the target is to divide the graph into two disjoint sets by cutting or removing edges such that the number of the edges cut is the minimum among all possible combinations. The algorithm works in the following way

i) Pick a random edge.
ii) Contract the edge to make a super node using the two nodes of the edge.
iii) Remove any kind of self-loop.
iv) Go to step 1 or repeat until there are 2 nodes left in the graph.
v) The number of remaining edges in the remaining graph is the minimum cut cost or the result.

Implementation Overview:

The algorithm is implemented in the following way.

1) Graph input is taken as edge list.
2) A map “done” is used to track the edges that are done processing.
3) An integer “f” taken to count super-node number.
4) A loop to iterate edges which takes the first edge and changes it’s node to the current super-node number and an inner loop for updating all the remaining edges with the super-node. At each iteration of the outer loop the node is updated as a processed node in the map.
5) The loop breaks when there are only two nodes remaining.
6) Finally the number of undone edges is the result.