CS619 Advanced Data Structures and Algorithms Laboratory
Autumn 2024
Assignment 3
Maximum marks: 10

Objective

The objective of this assignment is to implement the bounded search tree based fixed-parameter tractable algorithm for Vertex Cover, discussed in the class.

Task

Implement the bounded search tree based fixed-parameter tractable algorithm for Vertex Cover, discussed in the class. Your program should take two inputs - the first one is a file containing the description of a graph (see below) and the second is an integer, which is the parameter in the instance. Your program should output “No” if the input is a no-instance and should output “Yes” along with a vertex cover of size at most the parameter, if the instance is a yes-instance.

Input

You are given with many test input files each of them containing details of a graph. The first line of description of a graph contains two integers - the number of vertices n and the number of edges m respectively separated by a white space. Each of the next m lines gives an edge in the graph. The numbering of vertices is from 0 to n-1. Blank lines should be ignored.

Evaluation

The maximum marks for this assignment is 10. Showing the correct output gives you 2 marks. The remaining 8 marks are for your understanding of the algorithm/program which will be evaluated by the instructor through a viva. A plagiarism test will be conducted after the deadline and if found guilty a “-10” mark will be awarded to the corresponding students and may be forwarded to the disciplinary action committee in grave cases.

Submission

Your program must be submitted through moodle on or before 10th September. You have to submit the same code that you show to the instructor. You have been added to the lab course in moodle already. If you are not able to locate it in moodle, please contact your TA: Mr. Sridhatta.