East West University

Department of Computer Science and Engineering

Course: CSE246 Algorithm Topic: Graph Theory (DFS) Lab: 08

1. DFS: You are given an unweighted and undirected graph as input. Your task is to perform a Depth-First Search (DFS) traversal of the graph, starting from the given vertex, and output the order in which the vertices are visited.

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| Sample input | Sample output |
| 4  4  1 0  0 2  1 2  3 2  Starting node: 0 | O, 2, 1, 3 |

1. Edge classification: You are given an unweighted and undirected graph as input. Your task is to classify every edge of the graph as tree, back, forward, and cross edge depending on their type using DFS algorithms.

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| Sample input | Sample output |
| 4  4  1 0  0 2  1 2  3 2 | O->1: tree edge  1->2: tree edge  2->3: tree edge  2->0: back edge |

1. Topological sort: You are given a directed acyclic graph (DAG) as input. Your task is to perform a topological sort of the vertices in the graph and output the order in which the vertices should be processed.

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| Sample input | Sample output |
| 4  4  1 0  0 2  1 2  3 2 | 1, 2, 0, 3 |

1. Articulation points: You are given an undirected graph as input. Your task is to find all the articulation points in the graph.

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| Sample input | Sample output |
| 4  4  1 0  0 2  1 2  3 2 | 2 |