



**EASTERN MEDITERRANEAN UNIVERSITY
COMPUTER ENGINEERING DEPARTMENT**

AING216 Basic Search Strategies

LAB I

Graph Search & Maze Solving

Algorithms: Depth First Search (DFS)

Language: Python

Lab Objectives

By the end of this lab, students will be able to:

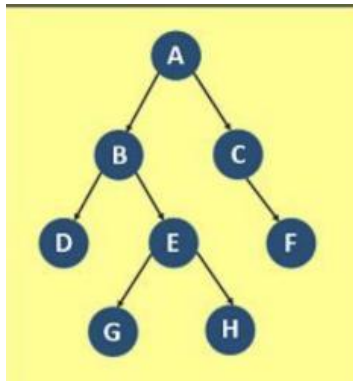
- Understand graph and maze representations
- Implement DFS
- Apply search algorithms to real problems

PART A: Graph Search Using DFS

Question 1: Graph Representation

Create a graph using an **adjacency list** representation in Python.

Use the following graph:



Task:

- Represent the graph using a dictionary
- Print the adjacency list

Question 2: Recursive DFS Traversal

Write a Python program to perform **recursive Depth First Search** starting from node “A”.

Tasks:

- Implement DFS using recursion
- Display the order of traversal

PART B: Maze Solving Using DFS

Question 3: Maze Representation

Represent the following maze using a 2D list:

S	1	1	0	1	1	0
0	0	0	0	0	0	0
0	1	0	0	1	0	1
0	1	0	1	1	0	1
0	0	0	0	0	0	E
1	1	1	0	0	1	1

Legend:

- S → Start
- E → Exit
- 0 → Open path
- 1 → Wall

Question 4: Maze Solving Using DFS (Recursive)

Write a Python program to solve the maze using **recursive DFS**.

Tasks:

- Start from S
- Move in four directions
- Print the path from S to E
- Use backtracking

Lab Submission Guidelines

- Python source code (.py)
- Output screenshots
- Brief explanation (1–2 pages)
- Proper comments in code