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**Subject:** AI (Lab)

# Task 05

## Question No. 1

Task:  
Implement a program to perform Depth-First Search (DFS) traversal on a given graph.

Explanation:  
- The program represents a graph using a dictionary, where each key represents a node and its value is a list of connected nodes (neighbors).  
- It uses a stack-based approach to explore nodes in a depth-first manner — that is, it goes as deep as possible along one branch before backtracking.  
- A set is used to keep track of visited nodes, ensuring no node is processed more than once.  
- The traversal path is stored and displayed at the end.

Working Steps:  
1. Start from the initial node (e.g., A).  
2. Push the starting node onto the stack.  
3. Pop the top node from the stack and visit it.  
4. Add all its unvisited adjacent nodes to the stack (in reverse order to maintain correct traversal sequence).  
5. Continue this process until the stack is empty.  
6. Display the final DFS traversal path.

Example Input (Graph):  
A → [B, C]  
B → [D, E]  
C → [F]  
D → []  
E → [F]  
F → []

Output Example:  
DFS Path: ['A', 'B', 'D', 'E', 'F', 'C']