

S.P.P.U. External Practical Viva Questions and Answers

Name: HK

Viva Questions and Answers (DFS Traversal of Graph)

1. What is the objective of your project?

Answer:

The objective is to perform Depth-First Search (DFS) traversal of a graph using a stack, with parallel initialization using OpenMP.

2. What is DFS (Depth-First Search)?

Answer:

DFS is a graph traversal method that explores as far along each branch as possible before backtracking.

3. How is the graph represented in your code?

Answer:

The graph is represented using an adjacency list implemented as an array of vectors (`vector<int> graph[MAX]`).

4. How is DFS implemented?

Answer:

- Using a stack to store nodes.
- Visit a node, mark it visited, and push its unvisited neighbors onto the stack.

- Continue until the stack is empty.

5. Why do you use a stack for DFS?

Answer:

A stack ensures that the most recently discovered node is explored first, which is the main behavior of DFS (LIFO - Last In, First Out).

6. How is OpenMP used in your code?

Answer:

OpenMP is used to parallelize the initialization of the visited array, speeding up setting all values to false.

7. What inputs are taken from the user?

Answer:

- Number of nodes n .
- Number of edges m .
- Start node for DFS traversal.
- The pairs of edges representing the graph.

8. What is the time complexity of DFS traversal?

Answer:

$O(V + E)$, where V = number of vertices and E = number of edges.

9. Why is it important to check if a node is visited?

Answer:

To avoid visiting the same node multiple times, which could lead to infinite loops or incorrect traversal.

10. How can DFS be extended further?

Answer:

- To detect cycles in graphs.
- To find connected components.
- To perform topological sorting for directed acyclic graphs.

Best of Luck, HK!