Lets look at an algorithm to implement depth-first-traversal on a graph represented by an adjacency matrix (the sparce matrix, or has-table approach works in similar fashion).  Here is our graph rooted at 1 and its adjacency matrix.

Diagram

Description automatically generatedText

Description automatically generated with low confidence

**Depth-First-Traversal**

Alg.: DFS(startNode)  
// NOTE: The traversal process can be done first (preorder) or last(postorder)  
    traverse(startNode) // do whatever you need to at the node;  
    for adjacentNode in column 1..12  // if cyclic, we would need to be careful here  
        if matrix[startNode][adjacentNode] == 1 then  
            DFS(adjacentNode) // traverse everything from this node  
// done

As you can see, we visit and traverse in the order 1, 2, 5, 9, 10, 6, 3, 4, 7, 11, 12, 8.