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Lab_06

COSC 3020

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```
for (var i = rootNode; i < adjMatrix.length; i++)
        {

            nodesVisited[i]=false; //sets the number of nodes as not visited
        }
        depthFirstHelper(rootNode, nodesVisited, adjMatrix)
```

This section of code iterates over the number of vertices flagging them as not visited(false) and calls a helper function that will perform the depth first search. This section of code is $\Theta(|V|)$ or linear in the number of vertices.

```
function depthFirstHelper(rootNode, nodesVisited, adjMatrix)
{
    nodesVisited[rootNode] = true;
    console.log(rootNode);
    for(var k=0; k < adjMatrix.length; k++)
    {
        if(((adjMatrix[rootNode][k])==1) && (nodesVisited[k]==false))
        {
            depthFirstHelper(k, nodesVisited, adjMatrix) //recursively iterates t
hrough edges of the current node
        }
    }
}
```

This section of code iterates of the edges of the root nodes which is linear in the number of vertices[2]. $\Theta(|V^2|)$. In addition, it iterates over the vertices adjacent to the current root node, which is linear in the number of vertices. $\Theta(|V|)$. Overall, depth first search of an adjacency matrix has a worst case Big-θ of $\Theta(|V^2|)$.