

## Task 5

Vertices = 12 ( $n$ )

Edges = 17 ( $m$ )

In BFS & DFS, the time complexity is  $O(m+n)$  as the search was done on the adjacency list. For adjacency matrix, the complexity becomes  $O(n^2)$ .

From the output of both task 2 and task 3, it is seen that,

BFS :  $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 7 \rightarrow 11 \rightarrow 6 \rightarrow 12$

DFS :  $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 7 \rightarrow 11 \rightarrow 12$

So, it is seen that, DFS takes lesser steps to reach victory road.

For time complexity, adjacency list moves linearly with the nodes and connected edges. But for the matrix, each node is visited twice (for row and for column).

For the traversal, in BFS, all the nearest (neighbor) nodes are taken and visited, then it moves further. But in DFS it goes in one direction until it reaches the destination. So, DFS reaches victory road with less nodes visited.