THADOMAL SHAHANI
TSEC
ENGINEERING COLLEGE

Experiment No. 3.

Aim: Implement BFS search algorithm in python.

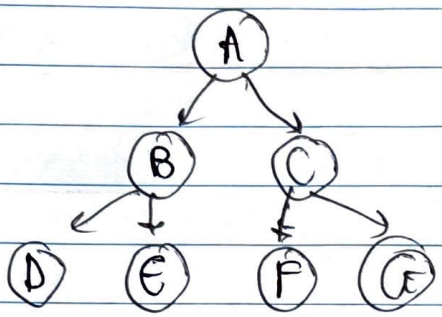
Theory:

The Breadth First Search (BFS) algorithm is used to search a graph data structure for a node that meets a set of criteria. It starts at the root of the graph & visits all nodes at the current depth level before moving on to the nodes at the next depth level. Starting from the root, all the nodes at a particular level are visited first & then the nodes of the next level are traversed till all the nodes are visited. To do this a queue is used. All the adjacent unvisited nodes of the current level are pushed into the queue & the nodes of the current level are marked visited & popped from the queue.

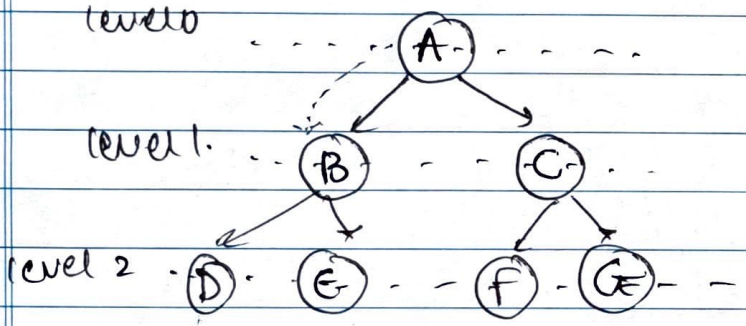
Applications of BFS:

1) Used in crawlers by search engines
2) GPS navigation systems.
3) Broadcasting
4. Peer to peer networking

Example:



Starting from root node 'A'.



Explore & traverse unvisited nodes adjacent at the same level.

∴ path starting from root node 'A' is

The time complexity of the BFS algorithm is represented in the form of $O(V+E)$, where V is the no. of nodes & E is the no. of edges the space complexity of the algorithm is $O(V)$.

20/03/24