Aim : To solve a problem in AI using Breadth First Search algorithm.

Title : Solve a problem in AI using Breadth First search.

Theory :

Breadth First Search

- BFS is an algorithm which is part of an uninformed search strategy.
- This algorithm works in a way where breadthwise traversal is done under the nodes.
- It starts operating by searching starting from root node there by expanding the successor node at that level.
- BFS require a considerable amount of memory space and time for its execution in the case where the required node lies at the bottom of the trace or graph.
- If required a use of FIFO (First In First out) approach i.e data structure queue.
- BFS strategy works without any domain knowledge.

Algorithm :-

S-1 : Define a queue with size equal to the total numbers of vertices in the graph

S-2 : Select any vertex as the starting point for traversal visit that vertex and insert it into the queue.

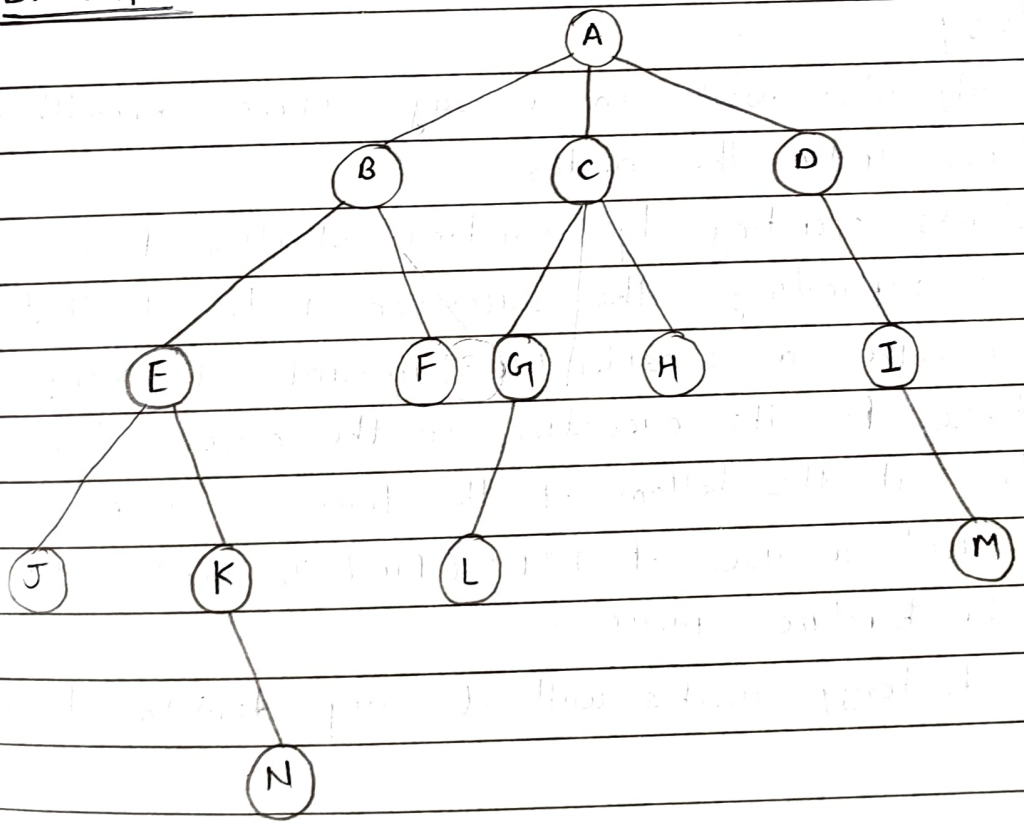
S-3 : Visit all the adjacent vertices of the vertex which is in Front of the queue which is not visited and insert them into the queue.

S-4 : When there is no new vertex to visit from the vertex at front of the queue then delete the vertex from the queue.

S-5 : Repeat step ③ and step ④ untill the queue empty.

S-6 : When the queue become empty then produce final spanning tree by removing unused edges the graph.

Example :-



A

A

B	C	D

AB

C	D	E	F

ABC

D	E	F	G	H

ABCD

F	G	H	I	J	K

ABCDE

G	H	I	J	K

ABCDEF

H	I	J	K	L

ABCDEFG

I	J	K	L

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J	K	L	M

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Advantages :-

- BFS is complete
- optimal solution is possible to obtain from BFS
- It has vast no. of application in data structure.

Disadvantages :-

- The run time may exceed when the goal node is not known.
- Code might enter into infinite loop.
- Time required is vast for bigger data.