❑ What is BFS ?????

- BFS stands for **B**readth **F**irst **S**earch.

- BFS is an algorithm for traversing or searching a tree or graph data structures.

- It uses a queue data structure for implementation.

- In BFS traversal we visit all the nodes level by level and the traversal completed when all the nodes are visited.

❑ Algorithm for BFS :

Step 1: Initialize all nodes with status=1.(ready state)
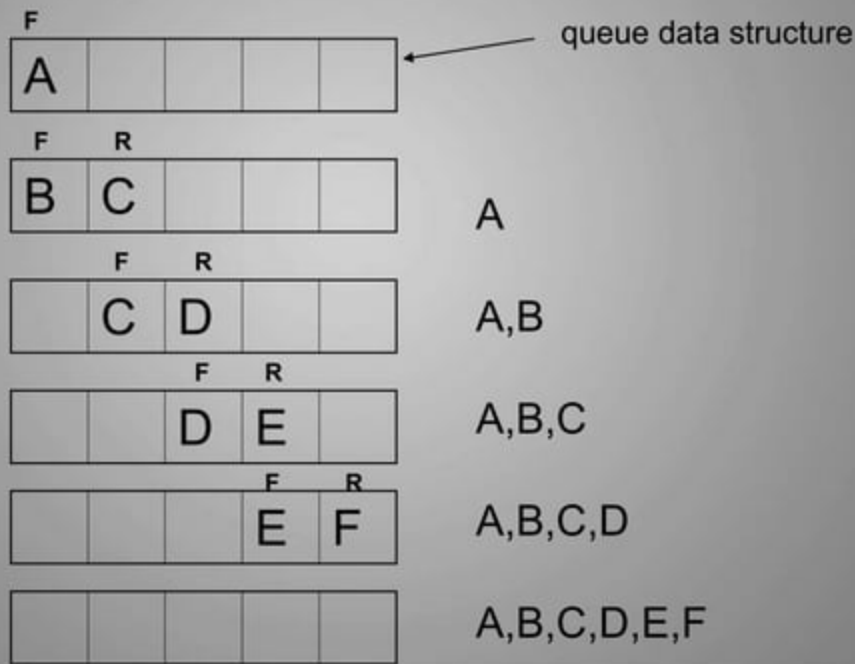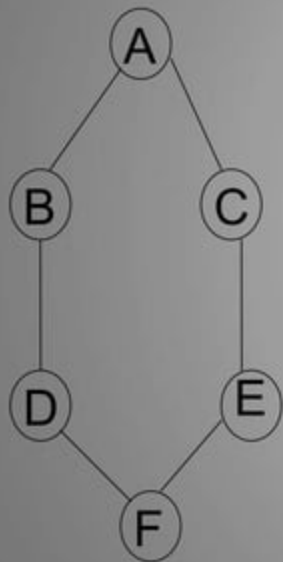
Step 2: Put starting node in a queue and change status to status=2.(waiting state)

Step 3: loop:
repeat step 4 and step 5 until queue gets empty.

Step 4: Remove front node N from queue, process them and change the status of N to status=3.(processed state)

Step 5: Add all the neighbours of N to the rear of queue and change status to status=2.(waiting status)

Working of BFC :

What is DFS ?????

- DFS stands for <u>Depth</u> <u>F</u>irst <u>S</u>earch.

- DFS is an algorithm for traversing or searching a tree or graph data structures.

- It uses a stack data structure for implementation.

- In DFS one starts at the root and explores as far as possible along each branch before backtracking.

Algorithm of DFS

[1]-- Initialize all nodes with status=1.(ready state)

[2]– Put starting node in the stack and change status to status=2(waiting state).

[3]– Loop:-

Repeat step- 4 and step- 5 until stack Get empty.

[4]– Remove top node N from stack process them and change the status of N processed state (status=3).

[5]– Add all the neighbours of N to the top of stack and change status to waiting status-2.
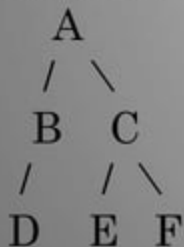
☐ Working of DFC :
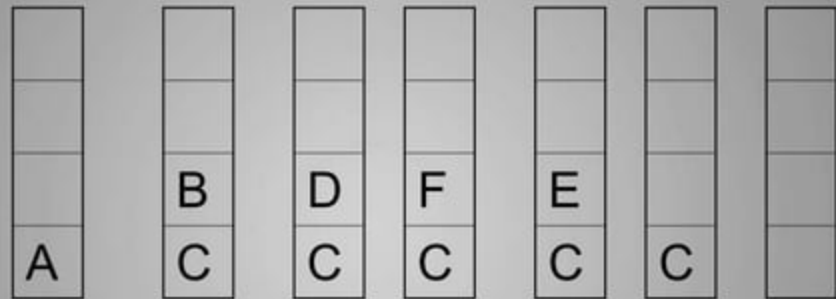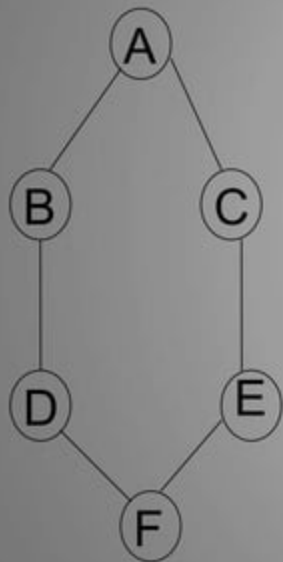
output

A	A	A	A	A	A	
	B	B	B	B	B	
		D	D	D	D	
			F	F	F	
				E	E	
					C	

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DFS V/S BFS

- DFS stands for Depth First Search.
- DFS can be done with the help of STACK i.e., LIOF.
- In DFS has higher time and space complexity, because at a time it needs to back tracing in graph for traversal.

- BFS stands for Breadth First Search.
- BFS can be done with the help of QUEUE i.e., FIOF.
- In BFS the space & time complexity is lesser as there is no need to do back tracing

DFS V/S BFS

- DFS is more faster then BFS.
- DFS requires less memory compare to BFS.
- DFS is not so useful in finding shortest path.
- Example :

```
        A
       / \
      B   C
     /   / \
    D   E   F
```

Ans : A,B,D,C,E,F

- BFS is slower than DFS.
- BFS requires more memory compare to DFS.
- BFS is useful in finding shortest path.
- Example :

```
        A
       / \
      B   C
     /   / \
    D   E   F
```

Ans : A,B,C,D,E,F