Trees & Graphs Lecture 3

Sunday, 18 August 2024 5:57 AM

https://www.geeksforgeeks.org/problems/print-adjacency-list-1587115620/1

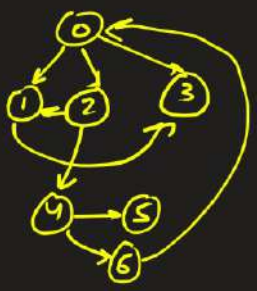
```cpp
class Solution {
  public:
    // Function to return the adjacency list for each vertex.
    vector<vector<int>> printGraph(int V, vector<pair<int,int>>edges) {
        vector<vector<int>> adjList(V);
        for(auto p: edges) {
            adjList[p.first].push_back(p.second);
            adjList[p.second].push_back(p.first);
        }
        return adjList;
    }
};
```

```python
class Solution:
    def printGraph(self, V : int, edges : List[List[int]]) -> List[List[int]]:
        adjList = [[] for _ in range(V)]
        for e in edges:
            adjList[e[0]].append(e[1])
            adjList[e[1]].append(e[0])
        return adjList
```

https://www.geeksforgeeks.org/problems/bfs-traversal-of-graph/1

$T = O(V+E)$
$S = O(V)$

```
class Solution {
  public:
    // Function to return Breadth First Traversal of given graph.
    vector<int> bfsOfGraph(int V, vector<int> adj[]) {
        queue<int> q;
        vector<int> ans;
        if(V==0)    return ans;
        q.push(0);
        bool visited[V] = {false};
        visited[0] = true;
        while(!q.empty()) {
            ans.push_back(q.front());
            q.pop();
            for(auto x: adj[ans.back()]) {
                if(!visited[x]) {
                    visited[x] = true;
                    q.push(x);
                }
            }
        }
        return ans;
    }
};
```



ans

q

0: {1, 2, 3}
1: {3}
2: {1, 4}
3: { }
4: {5, 6}
5: { }
6: {0}

	T	T	T	T	T	T	T
	R	R	R	R	R	R	R
vis	0	1	2	3	4	5	6