LAB-13

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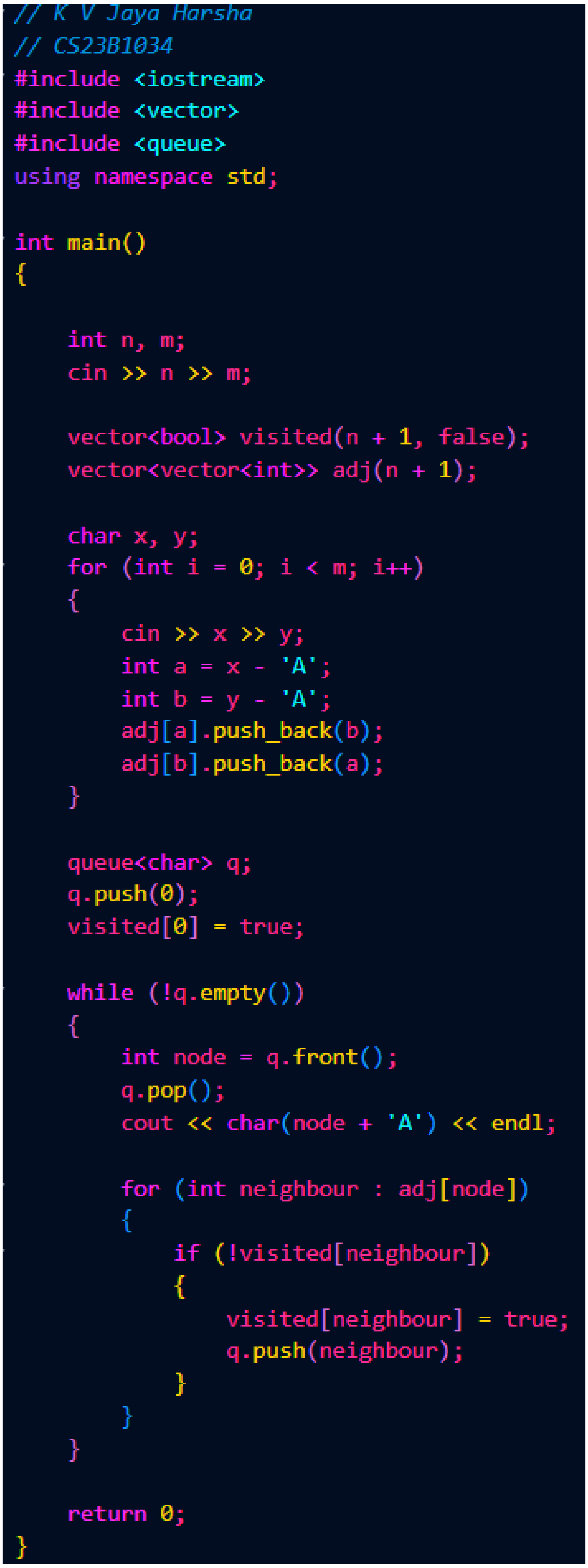
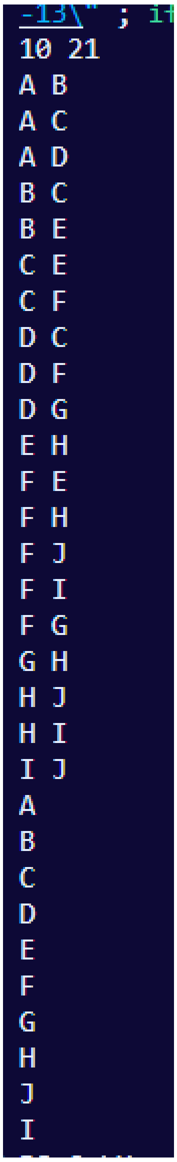
Roll no: CS23B1034 Date: 30-10-2024

Q1. BFS (in cpp)



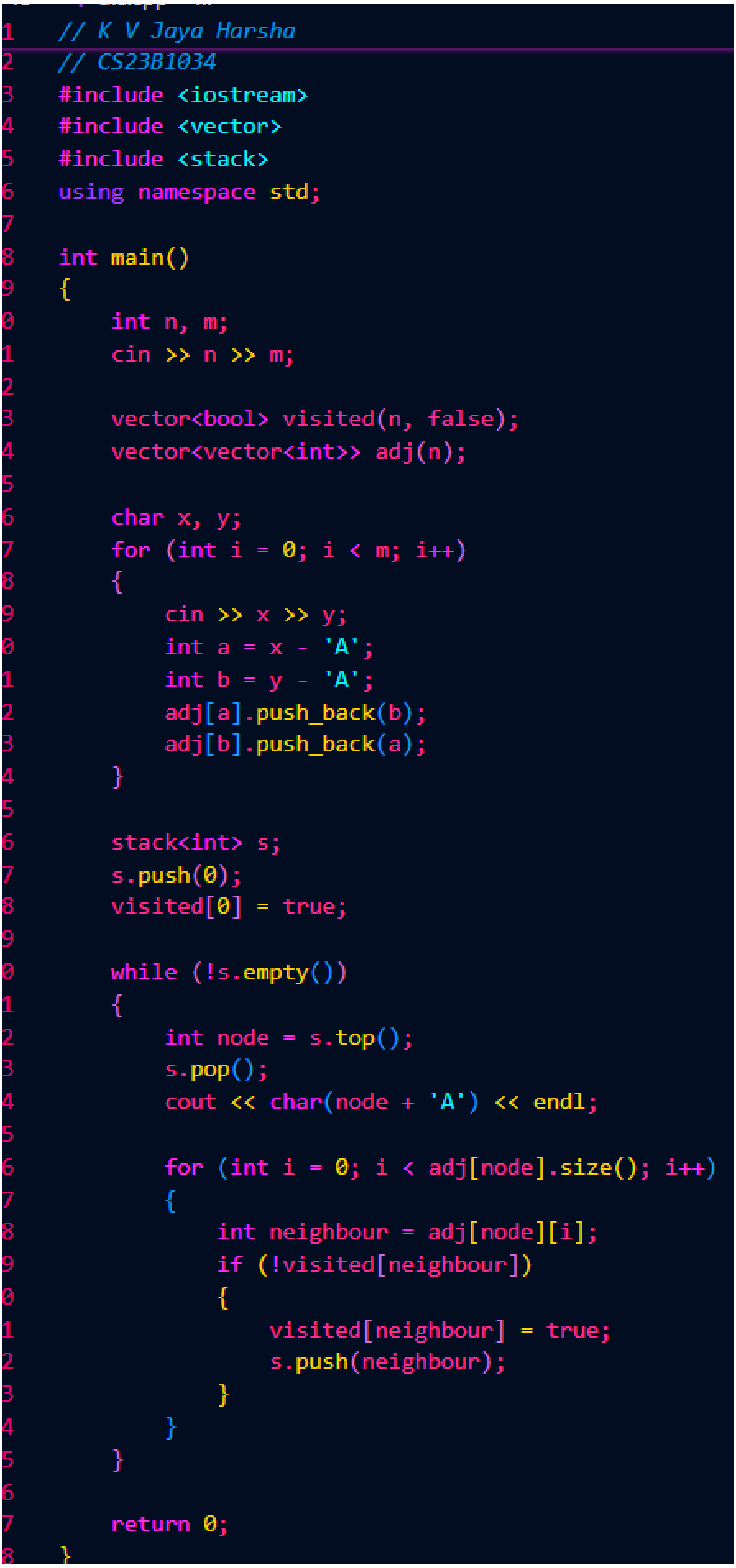
```cpp
// K V Jaya Harsha
// CS23B1034
#include <iostream>
#include <vector>
#include <queue>
using namespace std;

int main()
{

    int n, m;
    cin >> n >> m;

    vector<bool> visited(n + 1, false);
    vector<vector<int>> adj(n + 1);

    char x, y;
    for (int i = 0; i < m; i++)
    {
        cin >> x >> y;
        int a = x - 'A';
        int b = y - 'A';
        adj[a].push_back(b);
        adj[b].push_back(a);
    }

    queue<char> q;
    q.push(0);
    visited[0] = true;

    while (!q.empty())
    {
        int node = q.front();
        q.pop();
        cout << char(node + 'A') << endl;

        for (int neighbour : adj[node])
        {
            if (!visited[neighbour])
            {
                visited[neighbour] = true;
                q.push(neighbour);
            }
        }
    }

    return 0;
}
```

Output (q1)



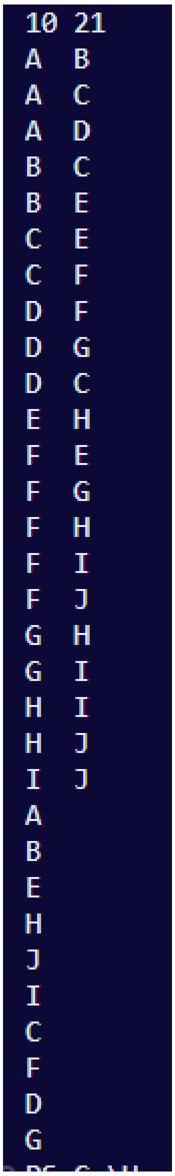
```
-13\" ; if
10 21
A B
A C
A D
B C
B E
C E
C F
D C
D F
D G
E H
F E
F H
F J
F I
F G
G H
H J
H I
I J
A
B
C
D
E
F
G
H
J
I
```

Q2. DFS (in cpp)



```cpp
// K V Jaya Harsha
// CS23B1034
#include <iostream>
#include <vector>
#include <stack>
using namespace std;

int main()
{
    int n, m;
    cin >> n >> m;

    vector<bool> visited(n, false);
    vector<vector<int>> adj(n);

    char x, y;
    for (int i = 0; i < m; i++)
    {
        cin >> x >> y;
        int a = x - 'A';
        int b = y - 'A';
        adj[a].push_back(b);
        adj[b].push_back(a);
    }

    stack<int> s;
    s.push(0);
    visited[0] = true;

    while (!s.empty())
    {
        int node = s.top();
        s.pop();
        cout << char(node + 'A') << endl;

        for (int i = 0; i < adj[node].size(); i++)
        {
            int neighbour = adj[node][i];
            if (!visited[neighbour])
            {
                visited[neighbour] = true;
                s.push(neighbour);
            }
        }
    }

    return 0;
}
```

Output (q2)



```
10 21
A  B
A  C
A  D
B  C
B  E
C  E
C  F
D  F
D  G
D  C
E  H
F  E
F  G
F  H
F  I
F  J
G  H
G  I
H  I
H  J
I  J
A
B
E
H
J
I
C
F
D
G
PS C:\U
```