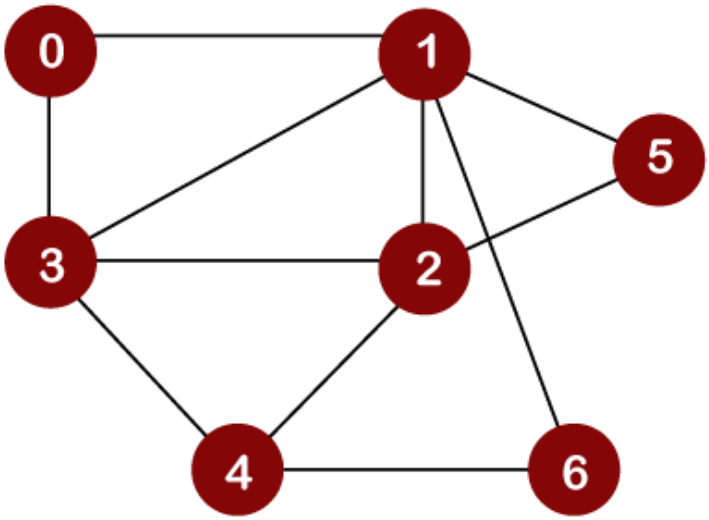
American International University – Bangladesh

CSC 2211: Algorithms Final Lab Performance

1. There is an undirected graph below and graph data in ***graph.txt*** file. Represent the graph using adjacency list(C++ code is given to you).



Graph Data:

Two integers in first line: n m, where n= number of vertices, m= number of edges
Two integers from second line to last: u v, where vertex u has edge with vertex v; m times (number of edges).

```
7 11
0 1
0 3
1 3
2 3
4 3
1 2
4 2
4 6
1 6
2 5
1 5
```

2. Write a method/function which will find degree of each vertices.
3. The following code is written in procedual way in c++. Write a Graph class which have the 3 properties: number of vertex, nunber of edges and List(pointer to list) and few methods: graph contructor(dynamic list initialize), addEdges, printGraph, DFS and BFS. Create graph object in main method and test different methods.[Use OOP]

```
#include<bits/stdc++.h>
using namespace std;

vector<int> * graph(int v){
    return new vector<int>[v];
}
void addEdge(vector<int> *g, int u,int v ){
    g[u].push_back(v);
    g[v].push_back(u);
}

void printGraph(vector<int>*g,int v){
 for(int i=0;i<v;i++){
            cout<<i<<"->";
        for(int j=0;j<g[i].size();j++){
            cout<<g[i][j]<<" ";
        }
        cout<<endl;
    }
}

int main(){

int vertex;
int edge;

    ifstream in("graph.txt");
```

```
    in>>vertex>>edge;
    vector<int> *g = graph(vertex);

    int u1,v1;

    for(int i=0;i<edge;i++){
        in>>u1>>v1;
        addEdge(g,u1,v1);
    }
    printGraph(g,vertex);
}
```