Faculty of Computer Science, IBA

Graphs

Objective

The objective of this lab is to understand the implementation of Graph data structure. Implement graph as adjacency list. Furthermore, understand its time and space complexity.

Task

1. Develop a program that investigates your friend's network. Create a graph where each vertex represent person and edge between vertices represents their friend's relationship.
   a. Create an adjacency list to represent the Graph and perform operations.

Procedure

a. **Adjacency list:** Store graph as adjacency list where one dimensional array stores vertices and for every vertex adjacency list stores a list of adjacent vertices to it.

```
class vertex{ String
    name; int age;
    Linkedlist<vertex> friendsList=new Linklist<vertex>();
    vertex(String d, int a){
        name=d;
         age=a;
 }}
Class MyGraph{
    vertex[] adjList;
int count;
MyGraph(int s){ AdjList=new
    vertex[s]; Count=0;
    }
public void AddVertex(String n, int a){ … } public void
AddEdge(String n1,String n2) {... } public void
deleteVertex(String n){ … }
public void deleteEdge(String n1,String n2){ … } public
vertex FindVertex(String n){ … }
public vertex FindVertexFriendsList(String n){ …} public
String toString(){ … }
}
```

```
class node {
    vertex v; node
    next;
node(vertex ver){ v=ver;
}}

Class Linkedlist{
  public void insert(vertex v) { … } public
  void delete(vertex v){ … } public
  boolean find(vertex v){ …
}
  public String toString() { … }

}
```