

# Graph Representation

Adjacency Lists

```
public static void main(String argv []) {  
  
    Graph g = new Graph();  
    g.addVertex("CS1");  
    g.addVertex("DiscStruct");  
    g.addVertex("DataStruct");  
    g.addEdge("CS1", "DiscStruct");  
    g.addEdge("DiscStruct", "DataStruct");  
    g.addEdge("CS1", "DataStruct");  
    g.printGraph();  
}
```

```
class Vertex {  
  
    String name;  
    LinkedList<Edge> inList ;  
    LinkedList<Edge> outList;  
  
    public Vertex(String s) {  
        name = s;  
        inList = new LinkedList<Edge>();  
        outList = new LinkedList<Edge>();  
    }  
}
```

```
class Edge {  
    Vertex vert;  
  
    public Edge(Vertex v) {  
        vert = v;  
    }  
}
```

```
public class Graph {
```

```
    Hashtable<String,Vertex> h;
```

```
    public Graph() {  
        h = new Hashtable<String, Vertex>();  
    }
```

```
public void addVertex(String s) {  
    Vertex v = new Vertex(s);  
    h.put(s,v);  
}
```

```
public void addEdge(String s1, String s2) {  
    Vertex u = h.get(s1);  
    Vertex v = h.get(s2);  
    if ( (u != null) && (v !=null) )  
    {  
        u.outList.add(new Edge(v));  
        v.inList.add(new Edge(u));  
    }  
}
```

```
public void printGraph() {  
    Collection<Vertex> vertexList = h.values();  
  
    for(Vertex v: vertexList) {  
        System.out.print(v.name + " :");  
        for(Edge e: v.outList)  
            System.out.print(" " + e.vert.name);  
        System.out.println(" ");  
    }  
}
```