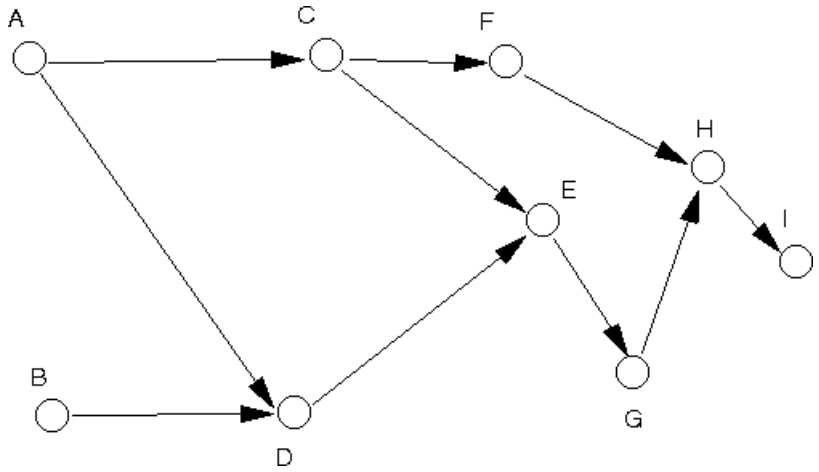
WIA1002/WIB1002 Data Structure
Tutorial: Graph

1. Write an adjacency matrix and an adjacency list for the following graph.



Adjacency Matrix

	A	B	C	D	E	F	G	H	I
A	0	0	1	1	0	0	0	0	0
B	0	0	0	1	0	0	0	0	0
C	0	0	0	0	1	1	0	0	0
D	0	0	0	0	1	0	0	0	0
E	0	0	0	0	0	0	1	0	0
F	0	0	0	0	0	0	0	1	0
G	0	0	0	0	0	0	0	1	0
H	0	0	0	0	0	0	0	0	1
I	0	0	0	0	0	0	0	0	0

Adjacency List

A C D

B D

C E F

D E

E G

F H

G H

H I

I

2. Represent the graph in question 1 using a 2 dimensional array. You use the adjacency matrix or the adjacency list for this purpose?

   Adjacency matrix.

```
int[][] matrix = {
                    {0, 0, 1, 1, 0, 0, 0, 0, 0},
                    {0, 0, 0, 1, 0, 0, 0, 0, 0},
                    {0, 0, 0, 0, 1, 1, 0, 0, 0},
                    {0, 0, 0, 0, 1, 0, 0, 0, 0},
                    {0, 0, 0, 0, 0, 0, 1, 0, 0},
                    {0, 0, 0, 0, 0, 0, 0, 1, 0},
                    {0, 0, 0, 0, 0, 0, 0, 1, 0},
                    {0, 0, 0, 0, 0, 0, 0, 0, 1},
                    {0, 0, 0, 0, 0, 0, 0, 0, 0}
                  };
```

3. Write code to create the graph using linked-list representation. You use the adjacency matrix or the adjacency list for this purpose?

   Adjacency list.

```
String[] vertices = {"A", "B", "C", "D", "E", "F", "G", "H", "I"};

for (String vertex : vertices) {
   graph.addVertex(vertex);
}

graph.addEdge("A", "C", 1);
graph.addEdge("A", "D", 1);
graph.addEdge("B", "D", 1);
graph.addEdge("C", "E", 1);
graph.addEdge("C", "F", 1);
graph.addEdge("D", "E", 1);
graph.addEdge("E", "G", 1);
graph.addEdge("F", "H", 1);
graph.addEdge("G", "H", 1);
graph.addEdge("H", "I", 1);
```