## Quiz7:

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**(The [result of the test case](#_Test Case:) is in the second and the third page.)**

**Program Description:**

I use a class which is written myself, to define the link list used in the program. The class’s name is link\_list and I put it together with the Quiz7.java. It is singly linked list. The structure of the link list is as follows:

Vertex3

weight

next

Vertex2

weight

next

Vertex1

weight

next

This figure of link list stands for there is path from 1 to 2, and its length is stored in the weight of the node 1. Also,there is a path from 1 to 3, and its length is stored in the weight of node 2

There will be an array of link\_list, named adjacency\_list[], to store the adjacency matrix, and every link\_list stores all the paths from one vertex. For example, adjacency\_list[x] stands for all the paths starts from vertex x. So the length of the adjacency\_list[] is the number of the vertexes in the graph.

Every link list has several nodes, every node has 3 members:

The 1st member: “vertex” stands for the vertex of the node.

The 2nd member: “weight” stands for the weight of the path between the first node’s vertex and the vertex of the next node, for example: in the link list starts with vertex 0, weight1 stands for length from 0 to 2, weight2 stands for length from 0 to 3, length n stands for length from 0 to n+1.

The 3rd member: “next” is a pointer points to the next node of the current node.

Because we need to use link list instead of two-dimension array, we defined a function to get the length of the path between two nodes by reading the array of link lists:

**int getLength(int startNode, int target, link\_list[] V).**

**Input: the index of the start vertex, the index of the end vertex, and the array of the link lists: V.**

**Output: the length of the path between the start node and the end node.**

By using this function and the link list, we can replace the two-dimension array. For example: adjacency[a][b] = getLength(a, b, adjacency\_list).

# Test Case:







