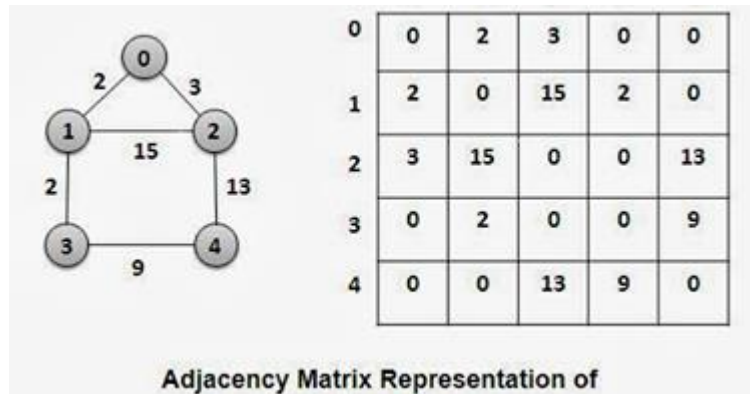


Submit your programs and a screenshot of the outputs in a single **Word/PDF** file.

1. [12] Write a program to implement **Dijkstra's single-source shortest path algorithm** and show your solution on the following graph (use the **adjacency matrix representation** as given below). The user will pick the source.



Your program must output in the following manner:

Vertex Distance from Source

1 2

... ..

and so on.

2. [18] The **Knapsack problem** is described as follows: given a set of items, each with a **weight** and a **value**, determine the items to include in a knapsack so that the total weight is less than or equal to a given limit and the total value is as large as possible.

Formulate the problem as a **dynamic programming** problem. Write a program to implement the solution to the **Knapsack problem using dynamic programming**. Show your solution for the following knapsack problem, including the **objects picked** and the **corresponding overall value** of the sack:

Item	Weight	Value
1	10	\$100
2	7	\$63
3	8	\$70
4	4	\$40
5	5	\$55
6	6	\$59

Capacity: $c = 18$