* Assignment No. 5*

* **Title:** Program for creating adjancey matrix and adjancey list using weighted graph.

* Objective:

To study and implement the weighted graph. Using adjanceey matrix and adjancecy list.

* **Problem Statement:**

There is flights paths between cities. If there is a flight between city and The cost of the edge can edge between cities The cost of the edge can be the time and that flights takes to reach city B from A. or the amount of fuel used for the journey. Represent this as a graph.

* Outcome:

* **Input:**

i) city
ii) time.

* **output**

i) Display source and destination path of the city.

ii) Display the time or fuel required to reach source city to desination city.

- Hardware requirement: 8GB RAM, dual core processor

- Software requirement: on fedora os gedit.

Theory-:

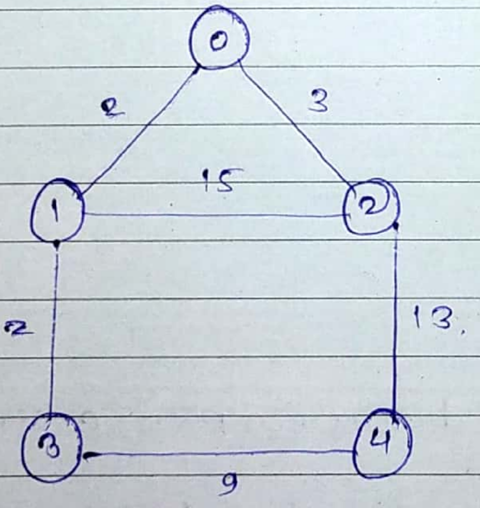
* Weighted Graph-:

A Weighted graph is a graph. is a graph. in which edges are assigned some values . most of the physical situations are shown using weighted graph . An edges may represent a highway link. between two cities . The weight will denote the distance between two connected cities highway weighted of an edge is also called as it cost

i) for weighted graph , the matrix adj[][] represented as

ii) If there is an edge betn vertices then Adj[i][j]. weighted of the curve edge (1,j) either Adj[i][j] =0.

Ex-:



$$\begin{array}{c|ccccc} & 0 & 1 & 2 & 3 & 4 \\ \hline 0 & 0 & 2 & 3 & 0 & 0 \\ 1 & 2 & 0 & 15 & 2 & 0 \\ 2 & 3 & 15 & 0 & 0 & 13 \\ 3 & 0 & 2 & 0 & 0 & 9 \\ 4 & 0 & 0 & 13 & 9 & 0. \end{array}$$

fig. A weighted graph & its adjancecy Matrix.

iii) Adjanceey matrix representation of graph is very simple to implement.

iv) Memory requirement : Adjanceey Matrix representation of a graph coastes lots of Memory space.

Such Matrix are found to the Very Space. Above representation requires space for n^2 elements.

presence of an edges between two Verties vi and vj can be checked is constant.

```
if (adj [i][j] == 1).
        edges is present betn Vertices i & j
else
    is absent betn Vertices i and j.
```

Ex-: for weighted graph using adjancey matrix and adjancecy list.

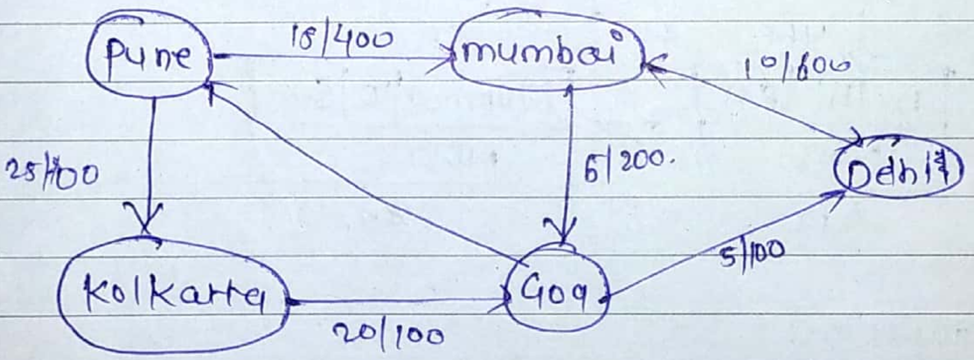
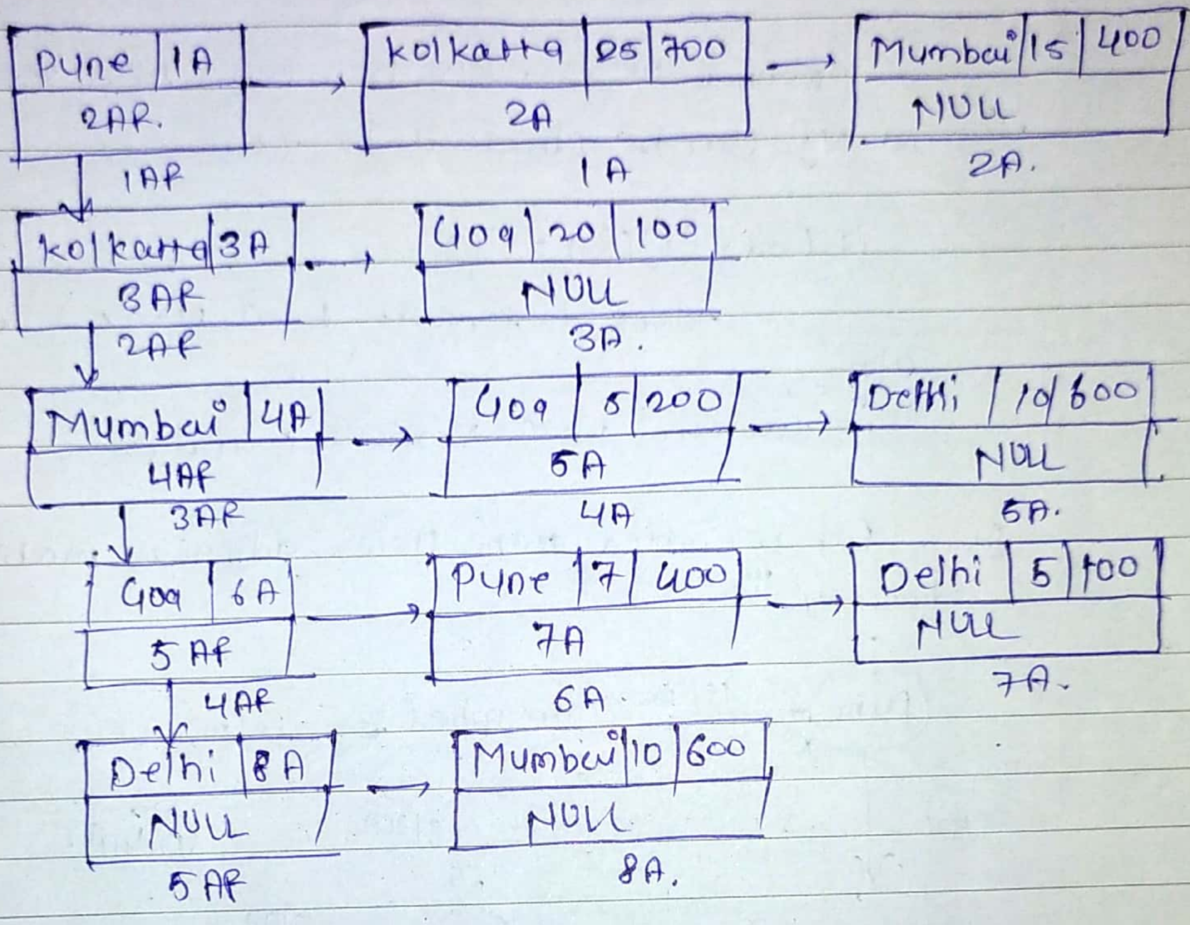


fig. weighted graph (directed).

Adjancecy matrix.:

	Pune	Mumbai	kolkatta.	Goa	Dehili
pune	0	25	15	0	0
kolkatta	0	0	0	20	0
mumbai	0	0	0	5	10
Goa	7	0	6	0	5
Delhi	0	0	10	0	0.

* Adjancecy list -:



* Algorithm:

① start

② Declare structure & class

③ Take data member and function member as per our need.

④ Enter city

⑤ Show Message is there edge between A to B if present then allows or fuel to that source and destination

⑥ Repeat step ④ until user not enter .n

⑦ display

⑧ Stop.

* Flowchart :-

Start

Delcare class & structure.

Create a suitable node structure
and tree name of the city in it
until all the vertices are
cover.

Enter source city & cost of them
to destination in node
structure & three fields.

Make all the destination element
adjacent to source vertex.
(with its cost)

Display adjancy list
representation.

Stop.

*Conclusion :

Hence we studies & implement the program for creating adjancency matrix and adjancency list using weighted graph.