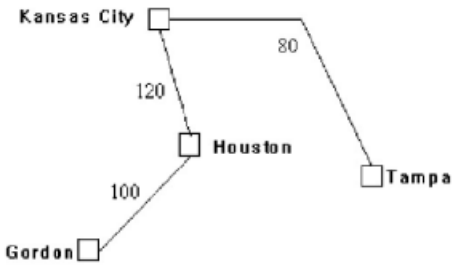
AI

LAB-10

QUESTION:

Write a program to solve traveling salesman problem for the given graph.



CODE:

```
import java.util.*;
import java.io.*;
class SalesMan
{
static int findHamiltonianCycle(int[][] distance, boolean[] visitCity, int
currPos, int
cities, int count, int cost, int hamiltonianCycle)
{
if (count == cities && distance[currPos][0] > 0)
{
hamiltonianCycle = Math.min(hamiltonianCycle, cost + distance[currPos][0]);
return hamiltonianCycle;
}
for (int i = 0; i < cities; i++)
{
if (visitCity[i] == false && distance[currPos][i] > 0)
{
visitCity[i] = true;
hamiltonianCycle = findHamiltonianCycle(distance, visitCity, i, cities, count + 1,
cost + distance[currPos][i], hamiltonianCycle);
```

```
visitCity[i] = false;
}
}
return hamiltonianCycle;
}
public static void main(String[] args)
{
int cities;
Scanner sc = new Scanner(System.in);
System.out.println("Enter total number of cities "); cities = sc.nextInt();
int distance[][] = new int[cities][cities]; for( int i = 0; i < cities; i++){
for( int j = 0; j < cities; j++){
System.out.println("Distance from city"+ (i+1) +" to city"+ (j+1) +": ");
distance[i][j] = sc.nextInt();
}
}
boolean[] visitCity = new boolean[cities]; visitCity[0] = true;
int hamiltonianCycle = Integer.MAX_VALUE;
hamiltonianCycle = findHamiltonianCycle(distance, visitCity, 0, cities, 1, 0,
hamiltonianCycle);
System.out.println(hamiltonianCycle);
}
}
```

OUTPUT:

```
C:\Users\MAJJIGA JASWANTH\Desktop\java>javac SalesMan.java

C:\Users\MAJJIGA JASWANTH\Desktop\java>java SalesMan
Enter total number of cities
4
Distance from city1 to city1:
0
Distance from city1 to city2:
80
Distance from city1 to city3:
200
Distance from city1 to city4:
300
Distance from city2 to city1:
80
Distance from city2 to city2:
0
Distance from city2 to city3:
120
Distance from city2 to city4:
220
Distance from city3 to city1:
200
Distance from city3 to city2:
120
Distance from city3 to city3:
0
Distance from city3 to city4:
100
Distance from city4 to city1:
300
Distance from city4 to city2:
220
Distance from city4 to city3:
100
Distance from city4 to city4:
0
600
```