(1) Computer Networks Lab.

Batch - 3

Program - 9.

Rutazet Ritik Rout
1BM18CS151
10/12/20.

```
import java.util.*;
public class Dijkstra{
    public static void main(String[] args){
        System.out.println("Enter no. of vertices");
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        int arr[][] = new int[n][n];
        System.out.println("Enter adjacent matrix");
        for(int i=0; i<n; i++){
            for(int j=0; j<n; j++){
                arr[i][j] = sc.nextInt();
                if(arr[i][j]==0)
                    arr[i][j]=999;
            }
        }
        System.out.println("Enter source vertex");
        int start = sc.nextInt();
        dijkstra(n, arr, start);
    }

    public static void dijkstra(int n, int arr[][], int start){
        int visited[] = new int[n];
        int parent[] = new int[n];
        int distance[] = new int[n];
        int count=0;
        distance[start] = 0;
        for(int i=0; i<n; i++){
            visited[i]=0;
            parent[i] = start;
            if(i!=start)
                distance[i]= arr[start][i];
        }
        parent[start] = -1;
        visited[start] = 1;
```

Rutazet

(2)

```
while (count < n-1){
    int min = 999, index = 0; i;
    for (i=0; i<n; i++){
        if (visited[i] != 1 && distance[i] < min){
            min = distance[i];
            index = i;
        }
    }
visited[index] = 1;
 for (int j=0; j<n; j++){
    if (visited[j] != 1 && arr[index][j] != 999 && (
        distance[index] + arr[index][j] < distance[j])){
            distance[j] = distance[index] + arr[index][j];
            parent[j] = index;
        }
    }
    count++
}

System.out.println("Distance & path from source src");
for (int i=0; i<n; i++){
    System.out.println(i + ":" + distance[i] + "  " + start + "→");
    printPath(parent, i);
    System.out.println("\n");
}
}

Public Static void printPath(int parent[], int j){
    if (parent[j] == -1)
        return;
    printPath(parent, parent[j]);
    System.out.println(j + "→");
}
}
```

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