```
#include<stdio.h>
void dij(int, int [20][20], int [20], int [20], int);
void main() {
   int i, j, n, visited[20], source, cost[20][20], d[20];
   printf("Enter no. of vertices: ");
   scanf("%d", &n);
   printf("Enter the cost adjacency matrix\n");
   for (i = 1; i <= n; i++) {
      for (j = 1; j <= n; j++)
      { scanf("%d", &cost[i][j]);
      }
   }
   printf("\nEnter the source node: ");
   scanf("%d", &source);
   dij(source, cost, visited, d, n); for (i
   = 1; i <= n; i++) {
      if (i != source)
         printf("\nShortest path from %d to %d is %d", source, i, d[i]);
   }
}
void dij(int source, int cost[20][20], int visited[20], int d[20], int n)
{ int i, j, min, u, w;
   for (i = 1; i <= n; i++) {
      visited[i] = 0;
      d[i] = cost[source][i];
   }
   visited[source] = 1;
   d[source] = 0;
   for (j = 2; j <= n; j++)
   { min = 999;
      for (i = 1; i <= n; i++)
      { if (!visited[i]) {
            if (d[i] < min)
            { min = d[i];
               u = i;
```

```
            }
          }
        }
        visited[u] = 1;
        for (w = 1; w <= n; w++) {
          if (cost[u][w] != 999 && visited[w] == 0)
          { if (d[w] > cost[u][w] + d[u])
                d[w] = cost[u][w] + d[u];}}}}
```

**Output:**

```
Enter no. of vertices: 6
Enter the cost adjacency matrix
999  3   999   999  6   5
3   999   1   999  999  4
999 1   999   6   999   4
999 999 6   999   8    5
6   999  999   8   999  2
5   4    4   5    2   999

Enter the source node: 1

Shortest path from 1 to 2 is 3
Shortest path from 1 to 3 is 4
Shortest path from 1 to 4 is 10
Shortest path from 1 to 5 is 6
Shortest path from 1 to 6 is 5
```

**Outcomes:** Oncompletion ofthis Program, the students are able to :

- Solve Dijkstra's sorting and searching techniques to find shortest paths.
- Develop a program that can be solved to Dijkstra's algorithm design techniques.

**Viva questions**

1. How do you represent the graph?
2. Application of Dijkstras Algorithm.
3. Difference between Floyds and Dijkstras algorithm.
4. Dijkstras algorithm can be solved by using which type algorithm method.