Design and implement C/C++ Program to find Minimum Cost Spanning Tree of a given connected undirected graph using Kruskal's algorithm.

#include<stdio.h>

#define INF 999

#define MAX 100

int p[MAX], c[MAX][MAX], t[MAX][2];

int find(int v)

{

while (p[v])

v = p[v];

return v;

}

void union1(int i, int j)

{

p[j] = i;

}

void kruskal(int n)

{

int i, j, k, u, v, min, res1, res2, sum = 0;

for (k = 1; k < n; k++)

{

min = INF;

for (i = 1; i < n - 1; i++)

{

for (j = 1; j <= n; j++)

{

if (i == j) continue;

if (c[i][j] < min)

{

u = find(i);

v = find(j);

if (u != v)

{

res1 = i;

res2 = j;

min = c[i][j];

}

}

}

}

union1(res1, find(res2));

t[k][1] = res1;

t[k][2] = res2;

sum = sum + min;

}

printf("\nCost of spanning tree is=%d", sum);

printf("\nEdgesof spanning tree are:\n");

for (i = 1; i < n; i++)

printf("%d -> %d\n", t[i][1], t[i][2]);

}

int main()

{

int i, j, n;

printf("\nEnter the n value:");

scanf("%d", & n);

for (i = 1; i <= n; i++)

p[i] = 0;

printf("\nEnter the graph data:\n");

for (i = 1; i <= n; i++)

for (j = 1; j <= n; j++)

scanf("%d", & c[i][j]);

kruskal(n);

return 0;

}

**OUTPUT**

Enter the n value:5

Enter the graph data:

1 3 4 6 2

1 7 6 9 3

5 2 8 99 45

1 44 66 33 6

12 4 3 2 0

Cost of spanning tree is=11

Edgesof spanning tree are:

2 -> 1

1 -> 5

3 -> 2

1 -> 4

Design and implement C/C++ Program to find Minimum Cost Spanning Tree of a given connected undirected graph using Prim's algorithm.

#include<stdio.h>

#define INF 999

int prim(int c[10][10],int n,int s)

{

int v[10],i,j,sum=0,ver[10],d[10],min,u;

for(i=1; i<=n; i++)

{

ver[i]=s;

d[i]=c[s][i];

v[i]=0;

}

v[s]=1;

for(i=1; i<=n-1; i++)

{

min=INF;

for(j=1; j<=n; j++)

if(v[j]==0 && d[j]<min)

{

min=d[j];

u=j;

}

v[u]=1;

sum=sum+d[u];

printf("\n%d -> %d sum=%d",ver[u],u,sum);

for(j=1; j<=n; j++)

if(v[j]==0 && c[u][j]<d[j])

{

d[j]=c[u][j];

ver[j]=u;

}

}

return sum;

}

void main()

{

int c[10][10],i,j,res,s,n;

printf("\nEnter n value:");

scanf("%d",&n);

printf("\nEnter the graph data:\n");

for(i=1; i<=n; i++)

for(j=1; j<=n; j++)

scanf("%d",&c[i][j]);

printf("\nEnter the souce node:");

scanf("%d",&s);

res=prim(c,n,s);

printf("\nCost=%d",res);

}

**OUTPUT**

Enter n value:4

Enter the graph data:

4 5 2 1

7 5 9 2

1 7 6 9

0 2 8 5

Enter the souce node:4

4 -> 1 sum=0

4 -> 2 sum=2

1 -> 3 sum=4

Cost=4