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//Write a program to find Minimum-Cost Spanning Trees (Prim’s & Kruskal’s algorithm).

//Prim’s Algorithm

#include<iostream>

#include<algorithm>

#include<conio.h>

using namespace std;

class Prims

{

public:

    void Cost();

};

void Prims::Cost()

{

    int a, b, u, n, v, i, j, ne = 1;

    int visited[10] = { 0 }, m, mincost = 0, cost[10][10];

    cout << "Enter the number of nodes:";

    cin >> n;

    cout << "Enter adjacency matrix:\n";

    for (i = 1; i <= n; i++)

        for (j = 1; j <= n; j++)

        {

            cin >> cost[i][j];

            if (cost[i][j] == 0)

                cost[i][j] = 999;

        }

    visited[1] = 1;

    cout << "\n";

    while (ne < n)

    {

        for (i = 1, m = 999; i <= n; i++)

            for (j = 1; j <= n; j++)

                if (cost[i][j] < m)

                        if (visited[i] == 0)

                            continue;

                else

                {

                    m = cost[i][j];

                    a = u = i;

                    b = v = j;

                }

        if (visited[u] == 0 || visited[v] == 0)

        {

            cout << "\n" << ne++ << "edge";

            cout << "(" << a << "," << b << "" << ")" << "=";

            cout << m;

            mincost = mincost += m;

            visited[b] = 1;

        }

        cost[a][b] = cost[b][a] = 999;

    }

    cout << "\n minimum cost=" << mincost;

}

int main()

{

    Prims p;

    p.Cost();

    return 0;

}

Output:

Enter the number of nodes:4

Enter adjacency matrix:

0 4 3 0

0 0 9 6

0 0 0 8

0 0 0 0

1edge(1,3)=3

2edge(1,2)=4

3edge(2,4)=6

minimum cost=13