LAB 5

Minimum Spanning Tree

1.Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal’s algorithm.

#include <stdio.h>

int cost[10][10], n, t[10][2], sum;

void kruskal(int cost[10][10], int n);

int find(int parent[10], int i);

int main()

{

int i, j;

printf("Enter the number of vertices: ");

scanf("%d", &n);

printf("Enter the cost adjacency matrix:\n");

for (i = 0; i < n; i++)

{

for (j = 0; j < n; j++)

{

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

}

}

kruskal(cost, n);

printf("Edges of the minimal spanning tree:\n");

for (i = 0; i < n - 1; i++)

{

printf("(%d, %d) ", t[i][0], t[i][1]);

}

printf("\nSum of minimal spanning tree: %d\n", sum);

return 0;

}

void kruskal(int cost[10][10], int n)

{

int min, u, v, count, k;

int parent[10];

k = 0;

sum = 0;

for (int i = 0; i < n; i++)

{

parent[i] = i;

}

count = 0;

while (count < n - 1)

{

min = 999;

u = -1;

v = -1;

for (int i = 0; i < n; i++)

{

for (int j = 0; j < n; j++)

{

if (find(parent, i) != find(parent, j) && cost[i][j] < min)

{

min = cost[i][j];

u = i;

v = j;

}

}

}

int root\_u = find(parent, u);

int root\_v = find(parent, v);

if (root\_u != root\_v)

{

parent[root\_u] = root\_v;

t[k][0] = u;

t[k][1] = v;

sum += min;

k++;

count++;

}

}

}

int find(int parent[10], int i)

{

while (parent[i] != i)

{

i = parent[i];

}

return i;

}

**OUTPUT-**

