

## Design and Analysis of Algorithms – 20ISL57A

### Program 4 - Implement and analyze Kruskal's algorithm and find minimum cost spanning tree of a given connected undirected graph.

```
#include<stdio.h>

int i,j,k,a,b,u,v,n,ne=1;
int min,mincost=0,cost[9][9],parent[9];
int find(int i)
{
    while(parent[i])
        i=parent[i];
    return i;
}
int uni(int i,int j)
{
    if(i!=j)
    {
        parent[j]=i;
        return 1;
    }
    return 0;
}
int main()
{
    printf("Enter the no. of vertices:\n");
    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]);
            if(cost[i][j]==0)
                cost[i][j]=999;
        }
    }
    for(i=1;i<=n;i++)
```

```

{
    parent[i]=0;
}
printf("The edges of Minimum Cost Spanning Tree are\n");
while(ne < n)
{
    for(i=1,min=999;i<=n;i++)
    {
        for(j=1;j<=n;j++)
        {
            if(cost[i][j]<min)
            {
                min=cost[i][j];
                a=u=i;
                b=v=j;
            }
        }
    }
    u=find(u);
    v=find(v);
    if(uni(u,v))
    {
        printf("%d edge (%d,%d) = %d\n",ne++,a,b,min);
        mincost +=min;
    }
    cost[a][b]=cost[b][a]=999;
}
printf("Minimum cost = %d\n",mincost);
}

```