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//Minimum Spanning Tree using Prim's Algorithm
#include<stdio.h>
#include<stdlib.h>
#define infinity 9999
#define MAX 20
int G[MAX][MAX],spanning[MAX][MAX],n;
int prims();
int main()
{
int i,j,total_cost;
printf("Enter no. of vertices:");
scanf("%d",&n);
printf("\nEnter the adjacency matrix:\n");
for(i=0;i<n;i++)
for(j=0;j<n;j++)
scanf("%d",&G[i][j]);
total_cost=prims();
printf("\nspanning tree matrix:\n");
for(i=0;i<n;i++)
{
printf("\n");
for(j=0;j<n;j++)
printf("%d\t",spanning[i][j]);
}
printf("\n\nTotal cost of spanning tree=%d",total_cost);
return 0;
}
int prims()
{
int cost[MAX][MAX];
int u,v,min_distance,distance[MAX],from[MAX];
```

```
int visited[MAX],no_of_edges,i,min_cost,j;
for(i=0;i<n;i++)
for(j=0;j<n;j++)
{
if(G[i][j]==0)
cost[i][j]=infinity;
else
cost[i][j]=G[i][j];
spanning[i][j]=0;
}
distance[0]=0;
visited[0]=1;
for(i=1;i<n;i++)
{
distance[i]=cost[0][i];
from[i]=0;
visited[i]=0;
}
min_cost=0;
no_of_edges=n-1;
while(no_of_edges>0)
{
min_distance=infinity;
for(i=1;i<n;i++)
if(visited[i]==0&&distance[i]<min_distance)
{
v=i;
min_distance=distance[i];
}
u=from[v];
spanning[u][v]=distance[v];
```

```
spanning[v][u]=distance[v];
no_of_edges--;
visited[v]=1;
for(i=1;i<n;i++)
if(visited[i]==0&&cost[i][v]<distance[i])
{
distance[i]=cost[i][v];
from[i]=v;
}
min_cost=min_cost+cost[u][v];
}
return(min_cost);
```

```
Enter no. of vertices:2

Enter the adjacency matrix:
3
2
5
4

spanning tree matrix:

0       2
2       0

Total cost of spanning tree=2
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Process exited after 11.76 seconds with return value 0
Press any key to continue . . .
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}
```