Find minimum cost spanning tree of a given undirected graph using prims algorithm

```
#include <limits.h>
#include <stdbool.h>
#include <stdio.h>
#define V 10
int minKey(int key[], bool mstSet[], int n)
{
        int min = INT_MAX, min_index;
        for (int v = 0; v < n; v++)
                if (mstSet[v] == false && key[v] < min)
                         min = key[v], min_index = v;
        return min_index;
}
int printMST(int parent[], int graph[V][V], int n)
{
  int weight = 0;
        printf("Edge \tWeight\n");
        for (int i = 1; i < n; i++)
                printf("%d - %d \t%d \n", parent[i], i,
                         graph[i][parent[i]]);
  for(int i=1;i<n;i++){
    weight += graph[i][parent[i]];
  }
```

```
printf("\nWeight is %d \n",weight);
}
void prims(int graph[V][V],int n)
{
        int parent[V];
        int key[V];
        bool mstSet[V];
        for (int i = 0; i < n; i++)
                key[i] = INT_MAX, mstSet[i] = false;
        key[0] = 0;
        parent[0] = -1;
        for (int count = 0; count < n - 1; count++) {
                int u = minKey(key, mstSet, n);
                mstSet[u] = true;
                for (int v = 0; v < n; v++)
                         if (graph[u][v] && mstSet[v] == false
                                 && graph[u][v] < key[v])
                                 parent[v] = u, key[v] = graph[u][v];
        }
```

```
printMST(parent, graph, n);
}

int main()
{
    int graph[V][V],n;
    printf("Enter the number of nodes\n");
    scanf("%d",&n);
    printf("Enter the weight matrix\n");
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++)
            scanf("%d",&graph[i][j]);
    }

    prims(graph,n);
    return 0;
}</pre>
```

```
C:\Users\lenovo\Desktop\ADA\prims.exe
```

```
Enter the number of nodes
Enter the weight matrix
0 3 99 99 6 5
3 0 1 99 99 4
99 1 0 6 99 4
99 99 6 0 8 5
6 99 99 8 0 2
5 4 4 5 2 0
Edge
       Weight
0 - 1
      5
      2
  - 4
  - 5
Weight is 15
Process returned 0 (0x0) execution time : 38.175 s
Press any key to continue.
```

Find MST of a given undirected graph using krushkals algorithm.

```
#include<stdio.h>
#include <stdbool.h>
#define INT_MAX 99
#define V 5
int n;
int parent[V];
int find(int i)
{
    while (parent[i] != i)
        i = parent[i];
    return i;
}
```

```
{
  int a = find(i);
  int b = find(j);
  parent[a] = b;
}
void kruskalMST(int cost[][V])
{
  int mincost = 0;
  for (int i = 0; i < V; i++)
     parent[i] = i;
  int edge_count = 0;
  while (edge_count < V - 1) {
    int min = INT_MAX, a = -1, b = -1;
    for (int i = 0; i < V; i++) {
       for (int j = 0; j < V; j++) {
         if (find(i) != find(j) && cost[i][j] < min) {
            min = cost[i][j];
            a = i;
            b = j;
         }
       }
     }
     union1(a, b);
    printf("Edge %d:(%d, %d) cost:%d n",
         edge_count++, a, b, min);
```

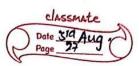
```
mincost += min;
  }
  printf("\n Minimum weight= %d \n", mincost);
}
int main()
{
  int cost[V][V];
  printf("Enter the number of nodes\n");
  scanf("%d",&n);
  printf("Enter the weight matrix\n");
  for(int i=0;i< n;i++){
    for(int j=0;j<n;j++)
      scanf("%d",&cost[i][j]);
  }
  kruskalMST(cost);
  return 0;
}
```

C:\Users\lenovo\Desktop\ADA\krushkals.exe

```
Enter the number of nodes
5
Enter the weight matrix
0 5 99 6 99
5 0 1 3 99
99 1 0 4 6
6 3 4 0 2
99 99 6 2 0
Edge 0:(1, 2) cost:1
Edge 1:(3, 4) cost:2
Edge 2:(1, 3) cost:3
Edge 3:(0, 1) cost:5

Minimum weight= 11

Process returned 0 (0x0) execution time : 30.129 s
Press any key to continue.
```



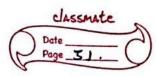
	4
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	graph using prim's algorithm.
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	0
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	Post ("Y.d", \$0); (am > Cm xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
	for li=1; iz =n; i++) : (or)(=) = dial
	dor [1:1; 12 =n; 1++) ([a] [3] +20) = dia1
	3 = 17
	for (j=1; j'<=n;j++) ; m=V
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	void primstil mou
[66]	int s, min, m, K, u, V;
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	for (s=1; s2n; s+t)	mark water prince place
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	while (3>0)	it min
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	for (m= 2; m = n; m+	(tolignital)
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	\$ 1.71.00 100 910A	
	fost[kxm]2min)	" (a & "b. \") fan 2
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	V=m;	a) 5 (d)
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et	[3][1]=V;	1 99 199 4
	t+; ************************************	0, 6, 99 4
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	m = Sum + min; "arm	5, 4, 4, 5, 2, 0
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3	19 19	112 2 0 - 4
		weight = 15 = 1 100
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	Date Page 29
	Find MCST of a given undirected graph using krushkals.
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1	V = parent [V]; [contact the contact the c
	1 - tind (v) parent):
	return v;
	3
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	parent (1)= r.
	else ridaudi
	parent [1°) = j; CVJCUJD+ cous = cous
	g
	void Kruskal (int n, intatios (100) = EVI (11)
	\$
	int count, k, min, sum, i, ig t10, u, v, parent[10].
	count=0;
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	Sum=0; (rri: 1-0);0:11:0;
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	min =999;
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           Count++
          CVJCUJA+ muz=muz;
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         if ( countries = p=1) mus, aim, s, tanos tai
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          for 11:0; (Cn-1; 1+1)
          Print + (">d /d /p", tciscos, tcisis)
                                   Toline ( conol) - p - 1
         frint + ("cost of spanning tree = 1.d \n", sam);
                                           i cee : nim
         else
         print + 1"Spanning tree doesn't exist 10");
        int main()
                    11 (057770 Se aim 5 (130) 20) 11
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	Print + 1" enter the adjacency matrin (0");
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	g (ratorslai)
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	return 0; [u.a.]. [. [. [. [. [.]]] tail
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