

# DESIGN AND ANALYSIS OF ALGORITHMS – 2CS503

## Practical 5

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### 1. Prims Algorithm

**Code:**

```
#include <limits.h>
```

```
#include <stdbool.h>
```

```
#include <stdio.h>
```

```
#define V 7
```

```
int minKey(int key[], bool mstSet[])
```

```
{
```

```
int min = INT_MAX, min_index;
```

```
for (int v = 0; v < V; 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])
```

```
{
```

```
printf("Edge \tWeight\n");
```

```
for (int i = 1; i < V; i++)
```

```
printf("%d - %d \t%d \n", parent[i], i, graph[i][parent[i]]);
```

```
}
```

```
void primMST(int graph[V][V])
```

```
{
```

```
int parent[V];
```

```
int key[V];
```

```
bool mstSet[V];
```

```
for (int i = 0; i < V; i++)
```

```
key[i] = INT_MAX, mstSet[i] = false;
```

```
key[0] = 0;
```

```
parent[0] = -1;
```

```
for (int count = 0; count < V - 1; count++) {
```

```
int u = minKey(key, mstSet);
```

```
mstSet[u] = true;
```

```
for (int v = 0; v < V; v++)
```

```
{
```

```
if (graph[u][v] && mstSet[v] == false && graph[u][v] < key[v])
```

```
{
```

```
parent[v] = u, key[v] = graph[u][v];
```

```
}
```

```
}
```

```
}
```

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

}
int main()
{
int graph[V][V] = {
{0,4,2,0,0,0,0},
{4,0,0,2,5,0,0},
{2,0,0,0,0,3,0},
{0,2,0,0,0,0,0},
{0,5,0,0,0,0,6},
{0,0,3,0,0,0,4},
{0,0,0,0,6,4,0}
};
// Print the solution
primMST(graph);
return 0;
}

## OUTPUT:

Edge	Weight
0 - 1	4
0 - 2	2
1 - 3	2
1 - 4	5
2 - 5	3
5 - 6	4