

```

1  /// Prim's Algorithm(MST):
2  #define mx 100
3  vector<int>adj[mx]; int cost[mx][mx]; queue<int>Q; bool vis[mx];
4  struct edge{
5      int u,v,w;
6      edge(int x, int y, int c){
7          u=x;v=y;w=c;
8      }
9      bool operator < (const edge& p) const{
10         return p.w < w;
11     }
12 };
13
14 int primsMST(int node, int src){
15     priority_queue<edge>pq;
16     int Mincost=0;
17
18     for(int i=0; i<adj[src].size(); i++){
19         int v = adj[src][i];
20         pq.push(edge(src,v,cost[src][v]));
21     }
22
23     for(int j=1; j<=node-1; j++){
24         label:
25         edge d(0,0,0);
26         d = pq.top();
27         pq.pop();
28         if(vis[d.u]==true&&vis[d.v]==true){ //create cycle
29             pq.pop();
30             goto label;
31         }
32         vis[d.u]=true; vis[d.v]=true;
33         Q.push(d.u); Q.push(d.v);
34         Mincost+=d.w;
35         int u = d.v;
36         for(int i=0; i<adj[u].size(); i++){
37             int v = adj[u][i];
38             if(vis[v]==false){
39                 pq.push(edge(u,v,cost[u][v]));
40             }
41         }
42     }
43     return Mincost;
44 }
45 int main(){
46     int node,edge,u,v,w,mincst;
47     cin >> node >> edge;
48
49     for(int i=0; i<edge; i++){
50         cin >> u >> v >> w; // bidirectional graph
51         adj[u].push_back(v); adj[v].push_back(u);
52         cost[u][v]=w; cost[v][u]=w;
53     }
54
55     mincst=primsMST(node, 1);
56
57     cout <<endl<<"Minimum Spanning Tree:"<<endl<<endl;
58     cout <<" Edges "<<" Weight"<<endl;
59
60     for(int i=1; i<=node-1; i++){
61         u=Q.front(); Q.pop();
62         v=Q.front(); Q.pop();
63         w=cost[u][v];
64         printf("%2d %2d %3d\n\n",u,v,w);
65     }
66     cout <<endl<<"Total Minimum Cost: "<<mincst<<endl;
67     return 0;
68 }

```