

```

1  #include "MGraph.h"
2
3  //辅助数组结构
4  typedef struct{
5      VertexType adjvex;
6      VRType lowcost;
7  }Closededge;
8
9  //定义辅助数组的全局变量
10 Closededge closedge[MAX_VERTEX_NUM];
11
12 //求出当前顶点集中权值最小的边
13 int minimum(int num){
14     int i;
15     VRType minp=0;
16     for(i=0; i<num; i++){
17         if(closedge[i].lowcost != 0){
18             minp=i;
19             break;
20         }
21
22     for(i=0; i<num; i++){
23         if(closedge[i].lowcost<closedge[minp].lowcost && closedge[i].lowcost!=0)
24             minp = i;
25
26     return minp;
27 }
28
29 //用prim算法构造输出G的最小生成树
30 void MiniSpanTree_PRIM(MGraph G, VertexType u){
31     int k=LocateVex(G,u);
32
33     //初始化辅助数组
34     for(int i=0; i<G.vexnum; i++)
35         if(i!=k)
36             closedge[i] = {u, G.arcs[k][i].adj}; //({adjvex, lowcost})
37     closedge[k].lowcost = 0; //初始U = {u}
38
39     for(int i=1; i<G.vexnum; i++){ //选择其余G.vexnum-1个顶点
40         k=minimum(G.vexnum);
41         //输出生成树的边
42         cout << closedge[k].adjvex << "___" << G.vexs[k] << "\t" ;
43
44         closedge[k].lowcost = 0; //第k顶点并入U集
45         for(int j=0; j<G.vexnum; j++){
46             if(G.arcs[k][j].adj < closedge[j].lowcost) //新顶点并入U后重新选择最小边
47                 closedge[j] = {G.vexs[k], G.arcs[k][j].adj};
48         }
49         cout << endl;
50     }
51
52 int main(){
53     MGraph G;
54     CreateGraph(G);
55     PrintAdjMatrix(G);
56     MiniSpanTree_PRIM(G, 1);
57     return 0;
58 }
59

```