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1  #include<iostream>
2  using namespace std;
3
4  //-----无向图的邻接多重表
5  #define MAX_VERTEX_NUM 20
6  #define VisitIf bool
7  #define InfoType int
8  #define VerTexType char
9  #define INFINITY 16 //INT_MAX
10
11 typedef enum{ERROR,OK}Status; //枚举型，函数状态变量
12
13 typedef struct EBox{
14     VisitIf mark; //访问标记
15     int ivex, jvex; //该边依附的两个顶点的位置
16     struct EBox *ilink, *jlink; //分别指向依附这两个顶点的下一条边
17     InfoType *info; //该边信息指针
18 }EBox; //边的结构
19 typedef struct VexBox{
20     VerTexType data; //顶点信息
21     EBox *firstedge; //指向第一条依附该顶点的边
22 }VexBox; //顶点结构
23 typedef struct{
24     VexBox adjmulist[MAX_VERTEX_NUM];
25     int vexnum, arcnum;
26 }AMLGraph; //邻接多重表
27
28 //若c中存在顶点u，则返回u在c中的位置，若没找到则返回INFINITY
29 int LocateVex(AMLGraph G, VerTexType u){
30     int i=0;
31     for(i=0; i<G.vexnum; i++){
32         if(G.adjmulist[i].data==u)
33             break;
34     }
35     if(i<G.vexnum)
36         return i;
37     else
38         return INFINITY;
39 }
40
41 Status CreateUDG(AMLGraph &G){
42     char IncInfo; //0/1用来表示弧边是否含有辅助信息
43     cout << "Please input: vexnum(no more than 20) arcnum(no more than vexnum*vexnum)
44     IncInfo(default 0)" << endl;
45     cin >> G.vexnum >> G.arcnum >> IncInfo; //IncInfo=0表示弧边不含辅助信息
46     cout << "构造顶点向量" << endl;
47     for(int i=0; i<G.vexnum; i++){ //构造并初始化顶点向量
48         cin >> G.adjmulist[i].data;
49         G.adjmulist[i].firstedge = NULL;
50     }
51
52     EBox *p;
53     char v1,v2; //顶点
54     int v1_int, v2_int;
55     cout << "以'起点 终点'的方式依次输入每一条边(例如: ab\t起点: a, 终点: b): " << endl;
56     for(int k=0; k<G.arcnum; ++k){ //构造邻接矩阵
57         cin >> v1 >> v2;
58         //定位v1,v2在c中的位置
59         v1_int = LocateVex(G, v1);
60         v2_int = LocateVex(G, v2);
61
62         p = new EBox;
63         //对边赋值{mark, ivex, jvex, ilink, jlink, info}
64         *p = {false, v1_int, v2_int, G.adjmulist[v1_int].firstedge,
65             G.adjmulist[v2_int].firstedge, NULL};
66         G.adjmulist[v1_int].firstedge = p;
67         G.adjmulist[v2_int].firstedge = p;
68         // if(IncInfo)
69         //     input(*G.arcs[i][j].info);
70         //若弧边上有辅助信息，则输入
71     }
72     return OK;
73 }
74
75 int main(){
76     AMLGraph G;
77     CreateUDG(G);
78
79     for(int i=0; i<G.vexnum; i++){
80         cout << G.adjmulist[i].data << "\t";
81     }
82     cout << endl;
83
84     EBox *p;
85     for(int i=0; i<G.vexnum; i++){

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83         cout << G.adjmulist[i].data << " | ";
84         p = G.adjmulist[i].firstedge;
85         while(p){
86             cout << G.adjmulist[p->ivex].data << "_" << G.adjmulist[p->jvex].data << " ";
87             p=p->ilink;
88         }
89         cout << endl;
90     }
91
92     return 0;
93 }
94
```