#### 最小费用最大流（MCMF）

#include "Headers.cpp"   
template <typename T>   
struct MCMF // 费用流(Dinic)zkw板子   
{ // Based on Dinic (zkw)   
   
 typedef long long LL;   
 T INF;   
 int N = 1e5 + 5; // 最大点meta参数，要按需改   
#define \_N 100006   
 std::bitset<\_N> vis; // 要一起改   
 T \*Dis;   
 int s, t; // 源点，汇点需要外部写入   
 int \*Cur; // 当前弧优化用   
 T maxflow, mincost; // 放最终答案   
   
 struct EdgeContent   
 {   
 int to;   
 T flow;   
 T cost;   
 int dualEdge;   
 EdgeContent(int a, T b, T c, int d) : to(a), flow(b), cost(c), dualEdge(d) {}   
 };   
   
 std::vector<EdgeContent> \*E;   
   
 MCMF(int n)   
 {   
 N = n;   
 E = new std::vector<EdgeContent>[n + 1];   
 Dis = new T[n + 1];   
 Cur = new int[n + 1];   
 maxflow = mincost = 0;   
 memset(&INF, 0x3f, sizeof(INF));   
 }   
   
 void add(int u, int v, T f, T w) // 加一条u到v流为f单位费为w的边   
 {   
 E[u].emplace\_back(v, f, w, E[v].size());   
 E[v].emplace\_back(u, 0, -w, E[u].size() - 1);   
 }   
   
 bool SPFA()   
 {   
 std::queue<int> Q;   
 Q.emplace(s);   
 memset(Dis, INF, sizeof(T) \* (N + 1));   
 Dis[s] = 0;   
 int k;   
 while (!Q.empty())   
 {   
 k = Q.front();   
 Q.pop();   
 vis.reset(k);   
 for (auto [to, f, w, rev] : E[k])   
 {   
 if (f and Dis[k] + w < Dis[to])   
 {   
 Dis[to] = Dis[k] + w;   
 if (!vis.test(to))   
 {   
 Q.emplace(to);   
 vis.set(to);   
 }   
 }   
 }   
 }   
 return Dis[t] != INF;   
 }   
 T DFS(int k, T flow)   
 {   
 if (k == t)   
 {   
 maxflow += flow;   
 return flow;   
 }   
 T sum = 0;   
 vis.set(k);   
 for (auto i = Cur[k]; i < E[k].size(); i++)   
 {   
 auto &[to, f, w, rev] = E[k][i];   
 if (!vis.test(to) and f and Dis[to] == Dis[k] + w)   
 {   
 Cur[k] = i;   
 T p = DFS(to, std::min(flow - sum, f));   
 sum += p;   
 f -= p;   
 E[to][rev].flow += p;   
 mincost += p \* w;   
 if (sum == flow)   
 break;   
 }   
 }   
 vis.reset(k);   
 return sum;   
 }   
   
 void Dinic() // 入口   
 {   
 while (SPFA())   
 {   
 memset(Cur, 0, sizeof(int) \* (N + 1));   
 DFS(s, INF);   
 }   
 }   
};