Олимпиада «Ломоносов» по информатике
2024-2025 учебный год. Заключительный этап
Работа участника с id заявки 1433571, логином inf25f_331

Сводный итог по всем задачам в проверяющей системе

RunID	Time	Username	Prob	Lang	Result	Tests	Score
178	2:39:23	inf25f_331	5	clang++	Partial solution	1	0
123	1:57:02	inf25f_331	3	clang++	OK	23	100
72	1:10:40	inf25f_331	2	clang++	OK	28	100
21	0:37:11	inf25f_331	1	clang++	Partial solution	9	20
N/A	N/A	inf25f_331	4	N/A	N/A	0	0

220 технических баллов
63 итоговых балла

Посылка по задаче 1

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <set>
[4] using namespace std;
[5] using ll = long long;
[6] using lod = long double;
[7]
[8] int main() {
[9]     vector<ll> dist(10001, 1e18);
[10]    vector<ll> p(10001, -1);
[11]    ll start, end;
[12]    cin >> start >> end;
[13]    if (start == end) {
[14]        cout << 0;
[15]        return 0;
[16]    }
[17]    dist[start] = 0;
[18]    set<pair<ll, ll>> q;
[19]    q.emplace(0, start);
[20]    while (!q.empty()) {
[21]        auto [d, v] = *q.begin();
[22]        q.erase(q.begin());
[23]        if (v * 2 < 10001 and d + 1 < dist[v * 2]) {
[24]            q.erase({dist[v * 2], v * 2});
[25]            dist[v * 2] = d + 1;
[26]            p[v * 2] = v;
[27]            q.insert({dist[v * 2], v * 2});
[28]        }
[29]        if (v % 2 == 0 and v / 2 > 0 and d + 1 < dist[v / 2]) {
[30]            q.erase({dist[v / 2], v / 2});
[31]            dist[v / 2] = d + 1;
[32]            p[v / 2] = v;
[33]            q.insert({dist[v / 2], v / 2});
[34]        }
[35]        if (v % 2 == 1 and 3 * v + 1 < 10001 and d + 1 < dist[3 * v + 1]) {
[36]            q.erase({dist[v * 3 + 1], v * 3 + 1});
[37]            dist[v * 3 + 1] = d + 1;
[38]            p[v * 3 + 1] = v;
[39]            q.insert({dist[v * 3 + 1], v * 3 + 1});
[40]        }
[41]        if ((v / 3) % 2 == 1 and v % 3 == 1 and v / 3 > 0 and d + 1 < dist[v / 3]) {
[42]            q.erase({dist[v / 3], v / 3});
[43]            dist[v / 3] = d + 1;
[44]            p[v / 3] = v;
[45]            q.insert({dist[v / 3], v / 3});
[46]        }
[47]    }
[48]    if (dist[end] == 1e18) cout << -1;
[49]    else {
[50]        cout << dist[end] << '\n';
[51]        vector<ll> st;
[52]        ll cur = end;
[53]        while (p[cur] != start) {
[54]            st.push_back(p[cur]);
[55]            cur = p[cur];
[56]        }
[57]        while (!st.empty()) {
[58]            cout << st.back() << ' ';
[59]            st.pop_back();
[60]        }
[61]    }
[62] }
```

Посылка по задаче 2

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <set>
[4] using namespace std;
[5] using ll = long long;
[6] using lod = long double;
[7]
[8] ll f(const string& s) {
[9]     ll res = 0;
[10]    ll cur = 0;
[11]    while (cur < s.size()) {
[12]        char c1 = s[cur];
[13]        char c2 = s[cur + 1];
[14]        if (c2 == '^') {
[15]            if ('a' <= c1 and c1 <= 'z') res = res * 52 + 78 + (c1 - 'a');
[16]            else res = res * 52 + 52 + (c1 - 'A');
[17]            cur += 2;
[18]        } else if (c2 == '~') {
[19]            if ('a' <= c1 and c1 <= 'z') res = res * 52 + 130 + (c1 - 'a');
[20]            else res = res * 52 + 104 + (c1 - 'A');
[21]            cur += 2;
[22]        } else if (c2 == '_') {
[23]            if ('a' <= c1 and c1 <= 'z') res = res * 52 + 182 + (c1 - 'a');
[24]            else res = res * 52 + 156 + (c1 - 'A');
[25]            cur += 2;
[26]        } else {
[27]            if ('a' <= c1 and c1 <= 'z') res = res * 52 + 26 + (c1 - 'a');
[28]            else res = res * 52 + 0 + (c1 - 'A');
[29]            cur += 1;
[30]        }
[31]    }
[32]    return res;
[33]}
[34]
[35]int main() {
[36]    int n;
[37]    cin >> n;
[38]    vector<ll> v(n);
[39]    for (int i = 0; i < n; ++i) {
[40]        string s;
[41]        cin >> s;
[42]        v[i] = f(s);
[43]    }
[44]    ll p1 = -1, p2 = -1;
[45]    for (int i = 1; i < n; ++i) {
[46]        if (v[i] > v[i - 1]) {
[47]            if (p1 == -1) p1 = i;
[48]            else p2 = i;
[49]        }
[50]    }
[51]    for (int i = 0; i < n - 1; ++i) {
[52]        for (int j = i + 1; j < n; ++j) {
[53]            swap(v[i], v[j]);
[54]            bool flg = true;
[55]            for (int i = 1; i < n; ++i) {
[56]                if (v[i] > v[i - 1]) {
[57]                    flg = false;
[58]                    break;
[59]                }
[60]            }
[61]            if (flg) {
[62]                cout << i + 1 << ' ' << j + 1;
[63]                return 0;
[64]            }
[65]            swap(v[i], v[j]);
[66]        }
[67]    }
[68]}
```

Посылка по задаче 3

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <set>
[4] #include <algorithm>
[5] #include <numeric>
[6] using namespace std;
[7] using ll = long long;
[8] using ld = long double;
[9]
[10] ll n, t, m;
[11] vector<vector<ll>> d(11, vector<ll>(11));
[12] vector<ll> p(11);
[13] vector<ll> perm;
[14] ll mx;
[15] vector<ll> res = {1};
[16] vector<ll> used(11);
[17]
[18] void f(ll e) {
[19]     if (e == 0) {
[20]         perm.push_back(1);
[21]         ll ans = 0, ti = 0;
[22]         for (int i = 1; i < perm.size(); ++i) {
[23]             ans += p[perm[i]];
[24]             ti += d[perm[i - 1]][perm[i]];
[25]         }
[26]         perm.pop_back();
[27]         if (ti <= t and ans > mx) {
[28]             mx = ans;
[29]             res = perm;
[30]         } else if (ti <= t and ans == mx and perm.size() < res.size()) {
[31]             res = perm;
[32]         }
[33]         return;
[34]     }
[35]     for (ll i = 2; i <= n; ++i) {
[36]         if (used[i]) continue;
[37]         used[i] = 1;
[38]         perm.push_back(i);
[39]         f(e - 1);
[40]         perm.pop_back();
[41]         used[i] = 0;
[42]     }
[43] }
[44]
[45] int main() {
[46]     cin >> n >> t >> m;
[47]     for (int i = 1; i <= n; ++i) cin >> p[i];
[48]     mx = p[1];
[49]     for (int i = 1; i <= n; ++i) {
[50]         for (int j = 1; j <= n; ++j)
[51]             cin >> d[i][j];
[52]     }
[53]     for (int k = 0; k < m; ++k) {
[54]         ll a, b, ds;
[55]         cin >> a >> b >> ds;
[56]         d[a][b] = min(d[a][b], ds);
[57]         d[b][a] = min(d[b][a], ds);
[58]     }
[59]     for (int k = 1; k <= n; ++k) {
[60]         for (int i = 1; i <= n; ++i)
[61]             for (int j = 1; j <= n; ++j)
[62]                 d[i][j] = min(d[i][j], d[i][k] + d[k][j]);
[63]     }
[64]     perm.push_back(1);
[65]     used[1] = 1;
[66]     for (ll l = 1; l < n; ++l) {
[67]         f(l);
[68]     }
[69]     sort(res.begin(), res.end());
[70]     cout << res.size() << '\n';
[71]     for (ll i : res) cout << i << ' ';
[72] }
```

Посылка по задаче 4

Посылок по задаче 4 не было отправлено.

Посылка по задаче 5

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <set>
[4] #include <algorithm>
[5] #include <numeric>
[6] #include <bitset>
[7] using namespace std;
[8] using ll = long long;
[9] using ld = long double;
[10]
[11]vector<pair<int, int>> g[1000000];
[12]bitset<800> b[1000000];
[13]
[14]void dfs(int v) {
[15]    for (auto [u, pos] : g[v]) {
[16]        b[u] = b[v];
[17]        b[u][pos] = true;
[18]        dfs(u);
[19]    }
[20]}
[21]
[22]int main() {
[23]    int m, n, k;
[24]    cin >> m >> n >> k;
[25]    for (int i = 0; i < n - 1; ++i) {
[26]        int s, d, b;
[27]        cin >> s >> d >> b;
[28]        g[s - 1].emplace_back(d - 1, b);
[29]    }
[30]    dfs(0);
[31]    while (k--) {
[32]        int p, q;
[33]        cin >> p >> q;
[34]        --p, --q;
[35]        int prev = -1;
[36]        int res = 0;
[37]        for (int i = 0; i < m; ++i) {
[38]            if (b[p][i] or b[q][i]) prev = i;
[39]            else res = max(res, i - prev);
[40]        }
[41]        cout << res << '\n';
[42]    }
[43]}
```