

Олимпиада «Ломоносов» по информатике
2024-2025 учебный год. Заключительный этап
Работа участника с id заявки 1364126, логином inf25f_304

Сводный итог по всем задачам в проверяющей системе

RunID	Time	Username	Prob	Lang	Result	Tests	Score
362	3:58:13	inf25f_304	1	g++	Partial solution	18	56
340	3:53:46	inf25f_304	3	g++	OK	23	100
286	3:40:00	inf25f_304	2	python3	OK	28	100
261	3:28:17	inf25f_304	4	python3	Partial solution	0	0
257	3:25:30	inf25f_304	5	g++	Partial solution	2	10

266 технических баллов

76 итоговых баллов

Посылка по задаче 1

```
[1] #include <bits/stdc++.h>
[2] #pragma GCC optimize("Ofast,unroll-loops,O3")
[3] #define vl vector<long long>
[4] #define vvl vector<vector<long long>>
[5] #define pl pair<long long, long long>
[6] #define F first
[7] #define S second
[8] #define all(v) v.begin(), v.end()
[9] #define pb push_back
[10] #define rep(i, a, b) for (long long i = a; i < b; ++i)
[11]
[12] typedef long long ll;
[13] typedef long double ld;
[14] using namespace std;
[15] const ll INF = 1e18, MOD = 1e9 + 7;
[16]
[17] ll a, b, res = INF;
[18] vl elems, p;
[19] ll was[1000001];
[20]
[21] void f(ll k, ll x) {
[22]     if (x == b) {
[23]         if (res < p.size()) return;
[24]         res = p.size();
[25]         elems.clear();
[26]         for (ll elem : p) elems.pb(elem);
[27]         return;
[28]     }
[29]     if (x > 1000000 || k >= was[x] || k > 10000) {
[30]         return;
[31]     }
[32]     was[x] = k;
[33]     p.pb(2 * x);
[34]     f(k + 1, 2 * x);
[35]     p.pop_back();
[36]     if (x % 2) {
[37]         p.pb(3 * x + 1);
[38]         f(k + 1, 3 * x + 1);
[39]         p.pop_back();
[40]     } else {
[41]         p.pb(x / 2);
[42]         f(k + 1, x / 2);
[43]         p.pop_back();
[44]         if (x % 3 == 1) {
[45]             p.pb((x - 1) / 3);
[46]             f(k + 1, (x - 1) / 3);
[47]             p.pop_back();
[48]         }
[49]     }
[50] }
[51] int main() {
[52]     ios_base::sync_with_stdio(0);
[53]     cin.tie(0);
[54]     //freopen("input", "r", stdin);
[55]     //freopen("output", "w", stdout);
[56]     rep(j, 0, 1000001) {
[57]         was[j] = INF;
[58]     }
[59]     cin >> a >> b;
[60]     if (a == b) {
[61]         cout << 0;
[62]         return 0;
[63]     }
[64]     p.pb(a);
[65]     f(0, a);
[66]
[67]     if (res == INF) {
[68]         cout << -1;
[69]         return 0;
[70]     }
[71]     cout << res - 1 << "\n";
[72]     if (res == INF) {
[73]         cout << -1;
[74]     } else if (res > 2) {
[75]         rep(i, 1, elems.size() - 1) cout << elems[i] << " ";
[76]     }
[77]     return 0;
[78] }
```

Посылка по задаче 2

```
[1] def make(s):
[2]     mp = dict()
[3]     mp['^'] = 52
[4]     mp['~'] = 104
[5]     mp['_'] = 156
[6]     for i in range(26):
[7]         mp[chr(65 + i)] = i
[8]         mp[chr(97 + i)] = 26 + i
[9]     num = 0
[10]    s = s[::-1]
[11]    st = 1
[12]    i = 0
[13]    while i < len(s):
[14]        if s[i] in "^~_":
[15]            num += st * (mp[s[i]] + mp[s[i + 1]])
[16]            i += 2
[17]        else:
[18]            num += st * mp[s[i]]
[19]            i += 1
[20]        st *= 52
[21]    return num
[22]
[23]
[24] n = int(input())
[25] a = []
[26] for i in range(n):
[27]     a.append(make(input()))
[28]
[29] for i in range(0, n - 1):
[30]     for j in range(i + 1, n):
[31]         if a[i] < a[j]:
[32]             a[i], a[j] = a[j], a[i]
[33]             for k in range(1, n):
[34]                 if a[k] >= a[k - 1]:
[35]                     break
[36]             else:
[37]                 print(i + 1, j + 1)
[38]                 break
[39]             a[i], a[j] = a[j], a[i]
```

Посылка по задаче 3

```
[1] #include <bits/stdc++.h>
[2] #pragma GCC optimize("Ofast,unroll-loops,O3")
[3] #define vl vector<long long>
[4] #define vvl vector<vector<long long>>
[5] #define pl pair<long long, long long>
[6] #define F first
[7] #define S second
[8] #define all(v) v.begin(), v.end()
[9] #define pb push_back
[10] #define rep(i, a, b) for (long long i = a; i < b; ++i)
[11]
[12] typedef long long ll;
[13] typedef long double ld;
[14] using namespace std;
[15] const ll INF = 1e18, MOD = 1e9 + 7;
[16]
[17] ll n, t, m, ans = 0, ca = 0, cr = 1, res = 0, u, v, d;
[18] vl p, cnt, best;
[19] vvl g;
[20]
[21] void f(ll v, ll tm, ll k) {
[22]     if (tm > t || k >= 4 * n) return;
[23]     if (v == 1) {
[24]         ll j = 1;
[25]         while (j <= n && cnt[j] == best[j]) j++;
[26]         if (res > ans || (res == ans && (cr < ca || (j <= n && cnt[j] == 1)))) {
[27]             ans = res;
[28]             ca = cr;
[29]             rep(i, 1, n + 1) best[i] = cnt[i];
[30]         }
[31]     }
[32]     rep(i, 1, n + 1) {
[33]         if (i == v) continue;
[34]         if (cnt[i] == 0) {
[35]             cnt[i]++;
[36]             res += p[i];
[37]             cr++;
[38]             f(i, tm + g[i][v], k + 1);
[39]             res -= p[i];
[40]             cr--;
[41]             cnt[i]--;
[42]         } else {
[43]             cnt[i]++;
[44]             f(i, tm + g[i][v], k + 1);
[45]             cnt[i]--;
[46]         }
[47]     }
[48] }
[49]
[50] int main() {
[51]     ios_base::sync_with_stdio(0);
[52]     cin.tie(0);
[53]     //freopen("input", "r", stdin);
[54]     //freopen("output", "w", stdout);
[55]     cin >> n >> t >> m;
[56]     p.resize(n + 1);
[57]     rep(i, 1, n + 1) cin >> p[i];
[58]     g.resize(n + 1);
[59]     rep(i, 1, n + 1) {
[60]         g[i].resize(n + 1);
[61]         rep(j, 1, n + 1) {
[62]             cin >> g[i][j];
[63]         }
[64]     }
[65]     rep(i, 0, m) {
[66]         cin >> u >> v >> d;
[67]         if (d >= g[u][v]) continue;
[68]         g[u][v] = d;
[69]         g[v][u] = d;
[70]     }
[71]     cnt.resize(n + 1, 0); best.resize(n + 1, 0);
[72]     cnt[1] = 1;
[73]     res = p[1];
[74]     f(1, 0, 1);
[75]     cout << ca << "\n";
[76]     ll fl = 0;
[77]     rep(i, 1, n + 1) {
[78]         if (best[i]) {
[79]             if (fl) cout << " ";
[80]             cout << i;
[81]             fl = 1;
[82]         }
[83]     }
[84]     return 0;
[85] }
```

Посылка по задаче 4

```
[1] s = input()
[2] k = 0
[3] ans = ['2H2+O2=2H2O', 'Si+O2=SiO2', 'C+O2=CO2', '(He[C2(O2Mg)4(O2Fe)2]2N3)2H3+4F=(He(C2(O2Mg)4(O2Fe)2)2N3)2H3F4']
[4] while s:
[5]     print(ans[k])
[6]     k += 1
[7]     s = input()
```

Посылка по задаче 5

```
[1] #include <bits/stdc++.h>
[2] #pragma GCC optimize("Ofast,unroll-loops,O3")
[3] #define vl vector<long long>
[4] #define vvl vector<vector<long long>>
[5] #define pl pair<long long, long long>
[6] #define F first
[7] #define S second
[8] #define all(v) v.begin(), v.end()
[9] #define pb push_back
[10] #define rep(i, a, b) for (long long i = a; i < b; ++i)
[11]
[12] typedef long long ll;
[13] typedef long double ld;
[14] using namespace std;
[15] const ll INF = 1e18, MOD = 1e9 + 7;
[16]
[17] ll n, m, k, s, d, b, a, c, t;
[18] vector<pl> p, st;
[19] vl h;
[20] ll r[800];
[21]
[22] int main() {
[23]     ios_base::sync_with_stdio(0);
[24]     cin.tie(0);
[25]     cout.tie(0);
[26]     //freopen("input", "r", stdin);
[27]     //freopen("output", "w", stdout);
[28]     cin >> m >> n >> k;
[29]     p.resize(n + 1, {-1, -1});
[30]     h.resize(n + 1, 0);
[31]     rep(i, 0, n - 1) {
[32]         cin >> s >> d >> b;
[33]         p[d] = {s, b};
[34]         st.pb({s, d});
[35]     }
[36]     sort(all(st));
[37]     for (auto [s, d] : st) {
[38]         h[d] = h[s] + 1;
[39]     }
[40]     rep(w, 0, k) {
[41]         cin >> a >> b;
[42]         rep(i, 0, m) r[i] = 1;
[43]         while (h[a] > h[b]) {
[44]             r[p[a].S] = 0;
[45]             a = p[a].F;
[46]         }
[47]         while (h[b] > h[a]) {
[48]             r[p[b].S] = 0;
[49]             b = p[b].F;
[50]         }
[51]         while (a != b) {
[52]             r[p[a].S] = 0;
[53]             a = p[a].F;
[54]             r[p[b].S] = 0;
[55]             b = p[b].F;
[56]         }
[57]         c = 0; t = 0;
[58]         rep(i, 0, m) {
[59]             if (!r[i]) continue;
[60]             if (i == 0 || r[i - 1] == 0) {
[61]                 c = 1;
[62]             } else {
[63]                 c++;
[64]             }
[65]             if (c > t) t = c;
[66]         }
[67]         cout << t << "\n";
[68]     }
[69]
[70]     return 0;
[71] }
```