Олимпиада «Ломоносов» по информатике
2024-2025 учебный год. Заключительный этап
Работа участника с id заявки 1437816, логином inf25f_314

Сводный итог по всем задачам в проверяющей системе

RunID Time Username Prob Lang Result Tests Score
345 3:55:05 inf25f_314 4 g++ Partial solution 0 0
136 2:02:31 inf25f_314 1 g++ Partial solution 27 92
56 1:01:16 inf25f_314 2 python3 Partial solution 24 84
N/A N/A inf25f_314 3 N/A N/A 0 0
N/A N/A inf25f_314 5 N/A N/A 0 0

176 технических баллов
50 итоговых балла

Посылка по задаче 1

```
[1]  #include <bits/stdc++.h>
[2]  using namespace std;
[3]
[4]  using ll = long long;
[5]  using ull = unsigned long long;
[6]  using vll = vector<ll>;
[7]  using pll = pair<ll, ll>;
[8]  using vpll = vector<pll>;
[9]
[10] #define mod 1'000'000'007
[11] #define inf 1'000'000'000'000'000'000
[12] //
[13] //vector<vector<bool>> graph(10001, vector<bool>(10001, false));
[14] //
[15] //inline ll func(ll a) {
[16] //    if (a % 2 == 0) {
[17] //        a /= 2;
[18] //    } else {
[19] //        a *= 3;
[20] //        a += 1;
[21] //    }
[22] //    return a;
[23] //}
[24] //
[25] //inline pll rfunc(const ll& a) {
[26] //    pll res = {0, 0};
[27] //    if ((a - 1) % 3 == 0) {
[28] //        res.first = (a - 1) / 3;
[29] //    }
[30] //    res.second = 2 * a;
[31] //    return res;
[32] //}
[33] //
[34] //inline void bfs(ll from) {
[35] //    queue<int> q;
[36] //    q.push(from);
[37] //    vector<int> parent(10001);
[38] //
[39] //    parent[from] = -1;
[40] //
[41] //}
[42]
[43]
[44] ll kollatz(const ll& a) {
[45]     if (a % 2 == 0) {
[46]         return a / 2;
[47]     }
[48]     return 3 * a + 1;
[49] }
[50]
[51]
[52] struct Element {
[53]     ll self{};
[54]     ll foccur{};
[55] };
[56]
[57] bool operator<(const Element& a, const Element& b) {
[58]     if (a.self != b.self) {
[59]         return a.self < b.self;
[60]     }
[61]     return a.foccur < b.foccur;
[62] }
[63]
[64] inline void solve() {
[65]     ll from, to;
[66]     cin >> from >> to;
[67]     if (from == to) {
[68]         cout << 0 << endl;
[69]         return;
[70]     }
```

```
[71]      if (from == kollatz(to) || to == kollatz(from)) {
[72]          cout << 1 << endl;
[73]          return;
[74]      }
[75]
[76]      vector<ll> f, t;
[77]      f.push_back(from);
[78]      t.push_back(to);
[79]      while (f.back() != 1) {
[80]          f.push_back(kollatz(f.back()));
[81]      }
[82]      f.push_back(4);
[83]      f.push_back(2);
[84]      while (t.back() != 1) {
[85]          t.push_back(kollatz(t.back()));
[86]      }
[87]      t.push_back(4);
[88]      t.push_back(2);
[89]
[90]  //    set<Element> fs, ts; // = {f.begin(), f.end()}, ts = {t.begin(), t.end()};
[91]
[92]      ll gcd = 1;
[93]      ll cnt = f.size() + t.size();
[94]      for (ll i = 0; i < t.size(); ++i) {
[95]          for (ll j = 0; j < f.size(); ++j) {
[96]              if (t[i] == f[j] && i + j < cnt) {
[97]                  cnt = i + j;
[98]                  gcd = t[i];
[99]              }
[100]         }
[101]     }
[102]
[103]     vll ans;
[104]     for (ll i = 1; f[i] != gcd; ++i) ans.push_back(f[i]);
[105]     vll s;
[106]     for (ll j = 1; t[j] != gcd; ++j) s.push_back(t[j]);
[107]     reverse(s.begin(), s.end());
[108]
[109]     cout << cnt << endl;
[110]     for (auto & i : ans) cout << i << " ";
[111]     if (gcd == to) {
[112]         return;
[113]     }
[114]     cout << gcd << " ";
[115]     for (auto & i : s) cout << i << " ";
[116] }
[117]
[118] int main() {
[119]     cin.tie(nullptr);
[120]     cout.tie(nullptr);
[121]     ios_base::sync_with_stdio(false);
[122]
[123]     ull t = 1;
[124] //    cin >> t;
[125]     while (t--) solve();
[126]     return 0;
[127] }
```

Посылка по задаче 2

```
[1] import sys
[2] import math
[3] import itertools
[4]
[5] def convert(s):
[6]     res = int()
[7]     i = 0
[8]     arr = []
[9]     while i < len(s):
[10]        if ord('a') <= ord(s[i]) <= ord('z'):
[11]            if i + 1 < len(s):
[12]                if s[i + 1] == '_' or s[i + 1] == '^' or s[i + 1] == '~':
[13]                    arr.append(s[i] + s[i + 1])
[14]                    i += 1
[15]                else:
[16]                    arr.append(s[i])
[17]            else:
[18]                arr.append(s[i])
[19]        elif ord('A') <= ord(s[i]) <= ord('Z'):
[20]            if i + 1 < len(s):
[21]                if s[i + 1] == '_' or s[i + 1] == '^' or s[i + 1] == '~':
[22]                    arr.append(s[i] + s[i + 1])
[23]                    i += 1
[24]                else:
[25]                    arr.append(s[i])
[26]            else:
[27]                arr.append(s[i])
[28]        i += 1
[29]
[30]    for i in range(len(arr)):
[31]        now = int(0)
[32]        if len(arr[i]) == 1:
[33]            if arr[i][0].lower() == arr[i][0]:
[34]                now = 26 + ord(arr[i][0]) - ord('a')
[35]            else:
[36]                now = ord(arr[i][0]) - ord('A')
[37]        else:
[38]            c = 0
[39]            if arr[i][1] == '^':
[40]                c = 52
[41]            elif arr[i][1] == '~':
[42]                c = 104
[43]            else:
[44]                c = 156
[45]
[46]            if arr[i][0].lower() == arr[i][0]:
[47]                now = c + 26 + ord(arr[i][0]) - ord('a')
[48]            else:
[49]                now = c + ord(arr[i][0]) - ord('A')
[50]        res += now * (52 ** (len(arr) - i - 1))
[51]
[52]    return res
[53]
[54] def solve():
[55]    n = int(input())
[56]    a = [0] * n
[57]    for i in range(n):
[58]        a[i] = convert(input())
[59]
[60]    for i in range(n):
[61]        for j in range(i + 1, n):
[62]            a[i], a[j] = a[j], a[i]
[63]            if a == sorted(a)[::-1]:
[64]                print(i + 1, j + 1)
[65]                return
[66]
[67]            a[i], a[j] = a[j], a[i]
[68]
[69]    return
[70]
[71] def main() -> int:
[72]    t = int(1)
[73]    # t = int(input())
[74]
[75]    for i in range(t):
[76]        solve()
[77]
[78]    return 0
[79]
[80] if __name__ == "__main__":
[81]    sys.exit(main())
```

Посылка по задаче 3

Посылок по задаче 3 не было отправлено.

Посылка по задаче 4

```
[1]  #include <bits/stdc++.h>
[2]  using namespace std;
[3]
[4]  typedef std::string Atom;
[5]  bool small(const char& a) {
[6]      return 'a' <= a && a <= 'z';
[7]  }
[8]
[9]  bool big(const char& a) {
[10]     return 'A' <= a && a <= 'Z';
[11] }
[12]
[13] bool num(const char& a) {
[14]     return '0' <= a && a <= '9';
[15] }
[16]
[17] class Molecula {
[18] public:
[19]     Molecula() = default;
[20]     Molecula(const std::string&, const int&);
[21]     explicit Molecula(const std::string&);
[22]     bool operator==(const Molecula&) const;
[23]     bool operator<(const Molecula&) const;
[24]     Molecula& operator+=(const Molecula&);
[25]     Molecula operator+(Molecula) const;
[26]
[27]     int operator[](const Atom&) const;
[28]     map<Atom, int> difference(const Molecula&); // returns elements wh
[29]
[30]     int pos;
[31] private:
[32]     std::string seq;
[33]     std::map<Atom, int> amount;
[34] };
[35]
[36] Molecula::Molecula(const std::string& a, const int& pos): Molecula(a){
[37]     this->pos = pos;
[38] };
[39]
[40] Molecula Molecula::operator+(Molecula other) const {
[41]     other += *this;
[42]     return other;
[43] }
[44]
[45] int Molecula::operator[](const Atom& at) const {
[46]     return amount.at(at);
[47] }
[48] map<Atom, int> Molecula::difference(const Molecula& other) {
[49]     map<Atom, int> res;
[50]     for (auto & [at, am] : other.amount) {
[51]         if (!this->amount.count(at)) {
[52]             res[at] = am;
[53]         }
[54]     }
[55]     return res;
[56] }
[57]
[58] Molecula::Molecula(const std::string& a) {
[59]     int i = 0;
[60]     int k = 0;
[61]     for (; num(a[i]); ++i) {
[62]         k *= 10;
[63]         k += a[i] - '0';
[64]     }
[65]
[66]     stack<std::map<Atom, int>> lcl; // locale amount
[67]     lcl.push({});
[68]     Atom nw;
[69]     int nm = 0;
[70]     for (; i < a.size(); ++i) {
[71]         if (big(a[i])) {
[72]             lcl.top()[nw] = nm;
[73]             nm = 0;
[74]             nw.clear();
[75]         } else if (small(a[i])) {
[76]
[77]         } else if (num(a[i])) {
[78]             nm *= 10;
[79]             nm += a[i] - '0';
[80]         } else if (a[i] == '(' || a[i] == '[') {
[81]             lcl.push({});
[82]         } else if (a[i] == ']' || a[i] == ')') {
[83]             nm = 0;
[84]             ++i;
```

```
[85]             for (; num(a[i]); ++i) {
[86]                 nm *= 10;
[87]                 nm += a[i] - '0';
[88]             }
[89]             auto e = lcl.top();
[90]             lcl.pop();
[91]             for (auto & [at, m] : e) {
[92]                 lcl.top()[at] += m * nm;
[93]             }
[94]             nm = 0;
[95]         }
[96]     }
[97]     for (auto & [at, m] : lcl.top()) {
[98]         m *= k;
[99]     }
[100]    amount = lcl.top();
[101]}
[102]
[103]bool Molecula::operator==(const Molecula& other) const {
[104]    return this->amount == other.amount;
[105]}
[106]
[107]
[108]Molecula& Molecula::operator+=(const Molecula& other) {
[109]    for (auto & [at, am] : other.amount) {
[110]        this->amount[at] += am;
[111]    }
[112]    return *this;
[113]}
[114]
[115]bool in(const Atom& a, const Molecula& m) {
[116]    return m[a] >= 0;
[117]}
[118]
[119]bool Molecula::operator<(const Molecula& other) const {
[120]    return this->seq < other.seq;
[121]}
[122]
[123]int main() {
[124]    string formula;
[125]    while (cin >> formula) {
[126]        int pos = 0;
[127]        set<Molecula> left, right;
[128]        int i = 0;
[129]        string nw;
[130]        for (; formula[i] != '='; ++i) {
[131]            if (formula[i] == '+') {
[132]                left.insert(Molecula(nw, ++pos));
[133]                nw.clear();
[134]            } else {
[135]                nw += formula[i];
[136]            }
[137]        }
[138]        left.insert(Molecula(nw, ++pos));
[139]        pos = 0;
[140]        nw.clear();
[141]        for (; i < formula.size(); ++i) {
[142]            if (formula[i] == '+') {
[143]                right.insert(Molecula(nw, ++pos));
[144]                nw.clear();
[145]            } else {
[146]                nw += formula[i];
[147]            }
[148]        }
[149]        right.insert(Molecula(nw, ++pos));
[150]        Molecula leftSum, rightSum;
[151]        for (auto & m : left) {
[152]            leftSum += m;
[153]        }
[154]        for (auto & m : right) {
[155]            rightSum += m;
[156]        }
[157]
[158]        auto diffL = leftSum.difference(rightSum);
[159]        auto diffR = rightSum.difference(leftSum);
[160]
[161]
[162]     }
[163]}
```

Посылка по задаче 5

Посылок по задаче 5 не было отправлено.