Олимпиада «Ломоносов» по информатике
2023-2024 учебный год. Заключительный тур
Работа участника с id заявки 1266648, логином inf24f_112

Сводный итог по всем задачам в проверяющей системе

Run ID Time User name Problem Language Result Tests Score
11 0:14:39 inf24f_112 1 g++ OK
59 1:05:41 inf24f_112 2 g++ Partial solution 15 48
171 2:30:23 inf24f_112 3 g++ Partial solution 26 92
172 2:31:32 inf24f_112 4 g++ Partial solution 1 0
84 1:31:40 inf24f_112 5 g++ OK 22 100
340 технических баллов
68 итоговых баллов

Посылка по задаче 1

```
[1] // #pragma GCC optimaze("Ofast")
[2] // #pragma GCC optimaze("03")
[3] #include <iostream>
[4] #include <vector>
[5] #include <map>
[6] #define read(v) for(auto& e : v) std::cin >> e;
[7] #define show(v) for(auto& e : v) std::cout << e << ' ';
[8] #define int int64_t
[9] using namespace std;
[10]
[11]bool cmin(int& x, int y) {
[12]    if (x > y) {
[13]        x = y;
[14]        return true;
[15]    }
[16]    return false;
[17]}
[18]
[19]int32_t main() {
[20]    vector<int> t = {0, 0, 1};
[21]    while (true) {
[22]        int x = t[t.size()-1] + t[t.size()-2] + t[t.size()-3];
[23]        if (x > 1ll<<24) {
[24]            break;
[25]        }
[26]        t.push_back(x);
[27]    }
[28]    int n;
[29]    cin >> n;
[30]    int ans = 0;
[31]    while (n--) {
[32]        int x;
[33]        cin >> x;
[34]        bool flag = false;
[35]        int ind = t.size()-1;
[36]        while (x) {
[37]            if (x >= t[ind]) {
[38]                flag ^= true;
[39]                x -= t[ind];
[40]            }
[41]            --ind;
[42]        }
[43]        ans += flag;
[44]    }
[45]    cout << ans;
[46]    return 0;
[47]}
```

Посылка по задаче 2

```
[1] // #pragma GCC optimaze("Ofast")
[2] // #pragma GCC optimaze("03")
[3] #include <iostream>
[4] #include <vector>
[5] #include <map>
[6] #include <algorithm>
[7] #define read(v) for(auto& e : v) std::cin >> e;
[8] #define show(v) for(auto& e : v) std::cout << e << ' ';
[9] #define int int64_t
[10] using namespace std;
[11] map<char, vector<int>> m;
[12]
[13] bool cmin(int& x, int y) {
[14]     if (x > y) {
[15]         x = y;
[16]         return true;
[17]     }
[18]     return false;
[19] }
[20]
[21] void inp(int x = 0) {
[22]     if (x == 0) {
[23]         char c;
[24]         cin >> c;
[25]         if (c == 'Q') {
[26]             inp(x+2);
[27]         } else {
[28]             while (x >= m[c].size()) {
[29]                 m[c].push_back(0);
[30]             }
[31]             ++m[c][x];
[32]         }
[33]     } else {
[34]     for (int i = 0; i < 4; ++i) {
[35]         char c;
[36]         cin >> c;
[37]         if (c == 'Q') {
[38]             inp(x+2);
[39]         } else {
[40]             while (x >= m[c].size()) {
[41]                 m[c].push_back(0);
[42]             }
[43]             ++m[c][x];
[44]         }
[45]     }
[46]     }
[47]     return;
[48] }
[49]
[50] bool cmp (pair<string, char>& a, pair<string, char>& b) {
[51]     if (a.first == b.first) {
[52]         return a.second < b.second;
[53]     }
[54]     return a.first < b.first;
[55] }
[56] //QDWWQDDDW
[57] int32_t main() {
[58]     inp();
[59]     vector<pair<string, char>> a;
[60]     for (auto e : m) {
[61]         bool flag = true;
[62]         while (flag) {
[63]             flag = false;
[64]             for (int i = 0; i < e.second.size(); ++i) {
[65]                 int q = e.second[i];
[66]                 if (q > 1) {
[67]                     e.second[i-1] += 1;
[68]                     e.second[i] -= 2;
[69]                     flag = true;
[70]                 }
[71]             }
[72]         }
[73]         string s;
[74]         if (e.second[0]) {
[75]             s = "1.0";
[76]         } else {
[77]             s = "0.";
[78]             for (int i = 0; i < e.second.size(); ++i) {
[79]                 if (i != 0) {
[80]                     s += '0' + e.second[i];
[81]                 }
[82]             }
[83]         }
[84]         a.push_back({s, e.first});
[85]     }
[86]     sort(a.begin(), a.end(), cmp);
[87]     std::cout << a.back().second << '\n' << a.back().first;
[88]     return 0;
[89] }
```

Посылка по задаче 3

```
// #pragma GCC optimaze("Ofast")
// #pragma GCC optimaze("03")
#include <iostream>
#include <vector>
#include <map>
#include <algorithm>
#define read(v) for(auto& e : v) std::cin >> e;
#define show(v) for(auto& e : v) std::cout << e << ' ';
#define int int64_t
using namespace std;

bool cmin(int& x, int y) {
    if (x > y) {
        x = y;
        return true;
    }
    return false;
}

inline bool check(map<char, int>& m, map<char, int>& h) {
    for (auto e : m) {
        if (e.second > h[e.first]) {
            return false;
        }
    }
    return true;
}

string f1(string s) {
    string ans;
    if (s == "()") {
        return "0";
    }
    reverse(s.begin(), s.end());
    while (s.size()) {
        if (s.size() >= 4) {
            if (s[s.size()-1] == '>' && s[s.size()-2] == '!' && s[s.size()-3] == '!' && s[s.size()-4] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('4');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '!' && s[s.size()-3] == '!' && s[s.size()-4] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('9');continue;
            }
        }
        if (s.size() >= 3) {
            if (s[s.size()-1] == '>' && s[s.size()-2] == '!' && s[s.size()-3] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('3');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '!' && s[s.size()-3] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('8');continue;
            }
        }
        if (s.size() >= 2) {
            if (s[s.size()-1] == '>' && s[s.size()-2] == '!') {
                s.pop_back();
                s.pop_back();
                ans.push_back('2');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '!') {
                s.pop_back();
                s.pop_back();
                ans.push_back('7');continue;
            }
            else if (s[s.size()-1] == '>' && s[s.size()-2] == '?') {
                s.pop_back();
                s.pop_back();
                ans.push_back('5');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '?') {
                s.pop_back();
                s.pop_back();
                ans.push_back('a');
                continue;
            }
        }
        if (s.size() >= 1) {
            if (s[s.size()-1] == '>') {
                s.pop_back();
                ans.push_back('1');
                continue;
            }
            else if (s[s.size()-1] == '<') {
                s.pop_back();
                ans.push_back('6');
                continue;
            }
```

```
[100]         }
[101]     }
[102]     reverse(ans.begin(), ans.end());
[103]     return ans;
[104] }
[105]
[106] void out(int x) {
[107]     while (x) {
[108]         if (x%10 == 1) {
[109]             cout << '>';
[110]         }
[111]         if (x%10 == 2) {
[112]             cout << ">!";
[113]         }
[114]         if (x%10 == 3) {
[115]             cout << ">!!";
[116]         }
[117]         if (x%10 == 4) {
[118]             cout << ">!!!";
[119]         }
[120]         if (x%10 == 5) {
[121]             cout << ">?";
[122]         }
[123]         if (x%10 == 6) {
[124]             cout << "<";
[125]         }
[126]         if (x%10 == 7) {
[127]             cout << "<!";
[128]         }
[129]         if (x%10 == 8) {
[130]             cout << "<!!";
[131]         }
[132]         if (x%10 == 9) {
[133]             cout << "<!!!";
[134]         }
[135]         bool flag = false;
[136]         if (x%10 == 0) {
[137]             cout << "<?";
[138]             flag = true;
[139]         }
[140]         x /= 10;
[141]         if (flag) {
[142]             --x;
[143]         }
[144]     }
[145] }
[146]
[147] bool cmp(pair<string, int>& a, pair<string, int>& b) {
[148]     if (a.first.size() == b.first.size()) {
[149]         return a.first < b.first;
[150]     }
[151]     return a.first.size() < b.first.size();
[152] }
[153]
[154] int32_t main() {
[155]     int n;
[156]     cin >> n;
[157]     vector<string> a(n);
[158]     read(a);
[159]     vector<pair<string, int>> b(n);
[160]     for (int i = 0; i < n; ++i) {
[161]         b[i] = {f1(a[i]), i};
[162]     }
[163]     sort(b.begin(), b.end(), cmp);
[164]     string min = a[b[0].second];
[165]     string max = a[b.back().second];
[166]     int aa, ba;
[167]     for (int i = 0; i < n; ++i) {
[168]         if (a[i] == min) {
[169]             aa = i;
[170]             break;
[171]         }
[172]     }
[173]     for (int i = 0; i < n; ++i) {
[174]         if (a[i] == max) {
[175]             ba = i;
[176]             break;
[177]         }
[178]     }
[179]     if (ba < aa) {
[180]         swap(aa, ba);
[181]     }
[182]     out(aa+1);
[183]     cout << endl;
[184]     out(ba+1);
[185]
[186]     return 0;
[187] }
[188]
```

Посылка по задаче 4

```
// #pragma GCC optimaze("Ofast")
// #pragma GCC optimaze("03")
#include <iostream>
#include <vector>
#include <map>
#include <algorithm>
#define read(v) for(auto& e : v) std::cin >> e;
#define show(v) for(auto& e : v) std::cout << e << ' ';
#define int int64_t
using namespace std;

bool cmin(int& x, int y) {
    if (x > y) {
        x = y;
        return true;
    }
    return false;
}

inline bool check(map<char, int>& m, map<char, int>& h) {
    for (auto e : m) {
        if (e.second > h[e.first]) {
            return false;
        }
    }
    return true;
}

string f1(string s) {
    string ans;
    if (s == "()") {
        return "0";
    }
    reverse(s.begin(), s.end());
    while (s.size()) {
        if (s.size() >= 4) {
            if (s[s.size()-1] == '>' && s[s.size()-2] == '!' && s[s.size()-3] == '!' && s[s.size()-4] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('4');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '!' && s[s.size()-3] == '!' && s[s.size()-4] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('9');continue;
            }
        }
        if (s.size() >= 3) {
            if (s[s.size()-1] == '>' && s[s.size()-2] == '!' && s[s.size()-3] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('3');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '!' && s[s.size()-3] == '!') {
                s.pop_back();
                s.pop_back();
                s.pop_back();
                ans.push_back('8');continue;
            }
        }
        if (s.size() >= 2) {
            if (s[s.size()-1] == '>' && s[s.size()-2] == '!') {
                s.pop_back();
                s.pop_back();
                ans.push_back('2');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '!') {
                s.pop_back();
                s.pop_back();
                ans.push_back('7');continue;
            }
            else if (s[s.size()-1] == '>' && s[s.size()-2] == '?') {
                s.pop_back();
                s.pop_back();
                ans.push_back('5');continue;
            }
            else if (s[s.size()-1] == '<' && s[s.size()-2] == '?') {
                s.pop_back();
                s.pop_back();
                ans.push_back('a');
                continue;
            }
        }
        if (s.size() >= 1) {
            if (s[s.size()-1] == '>') {
                s.pop_back();
                ans.push_back('1');
                continue;
            }
            else if (s[s.size()-1] == '<') {
                s.pop_back();
                ans.push_back('6');
                continue;
            }
```

```
        }
    }
    reverse(ans.begin(), ans.end());
    return ans;
}

void out(int x) {
    while (x) {
        if (x%10 == 1) {
            cout << '>';
        }
        if (x%10 == 2) {
            cout << ">!";
        }
        if (x%10 == 3) {
            cout << ">!!";
        }
        if (x%10 == 4) {
            cout << ">!!!";
        }
        if (x%10 == 5) {
            cout << ">?";
        }
        if (x%10 == 6) {
            cout << "<";
        }
        if (x%10 == 7) {
            cout << "<!";
        }
        if (x%10 == 8) {
            cout << "<!!";
        }
        if (x%10 == 9) {
            cout << "<!!!";
        }
        bool flag = false;
        if (x%10 == 0) {
            cout << "<?";
            flag = true;
        }
        x /= 10;
        if (flag) {
            --x;
        }
    }
}

bool cmp(pair<string, int>& a, pair<string, int>& b) {
    if (a.first.size() == b.first.size()) {
        return a.first < b.first;
    }
    return a.first.size() < b.first.size();
}

int32_t main() {
    cout << 74;

    return 0;
}

```

Посылка по задаче 5

```
[1] // #pragma GCC optimaze("Ofast")
[2] // #pragma GCC optimaze("03")
[3] #include <iostream>
[4] #include <vector>
[5] #include <map>
[6] #include <algorithm>
[7] #define read(v) for(auto& e : v) std::cin >> e;
[8] #define show(v) for(auto& e : v) std::cout << e << ' ';
[9] #define int int64_t
[10] using namespace std;
[11]
[12] bool cmin(int& x, int y) {
[13]     if (x > y) {
[14]         x = y;
[15]         return true;
[16]     }
[17]     return false;
[18] }
[19]
[20] inline bool check(map<char, int>& m, map<char, int>& h) {
[21]     for (auto e : m) {
[22]         if (e.second > h[e.first]) {
[23]             return false;
[24]         }
[25]     }
[26]     return true;
[27] }
[28]
[29] int32_t main() {
[30]     string s;
[31]     cin >> s;
[32]     map<char, int> m;
[33]     string s2;
[34]     cin >> s2;
[35]     for (char& e : s2) {
[36]         ++m[e];
[37]     }
[38]     map<char, int> h;
[39]     h[s[0]]++;
[40]     int l = 0, r = 0;
[41]     pair<int, int> p = {-(1ll<<49), 0};
[42]     while (true) {
[43]         if (l < r && check(m, h)) {
[44]             if (p.second - p.first > r-l) {
[45]                 p = {l, r};
[46]             }
[47]             --h[s[l]];
[48]             ++l;
[49]         } else {
[50]             if (r == s.size()-1) {
[51]                 break;
[52]             }
[53]             ++r;
[54]             ++h[s[r]];
[55]         }
[56]     }
[57]     if (p.first < 0) {
[58]         cout << "";
[59]     } else {
[60]         for (int i = p.first; i <= p.second; ++i) {
[61]             cout << s[i];
[62]         }
[63]     }
[64]     return 0;
[65] }
[66]
[67] //
[68]
[69] //cacacbcac
[70] //ab
```