

Олимпиада «Ломоносов» по информатике  
2025-2026 учебный год. Заключительный этап  
Работа участника с id заявки 1623400, логином inf26f\_127

Сводный итог по всем задачам в проверяющей системе

Run ID	Time	User name	Problem	Language	Result	Tests	Score
1167	3:48:53	inf26f_127	6	g++	Partial solution	3	10
972	3:22:07	inf26f_127	3	g++	OK	23	100
623	2:23:57	inf26f_127	7	py3	Partial solution	3	20
274	1:10:58	inf26f_127	5	g++	OK	103	100
196	0:57:24	inf26f_127	4	g++	OK	103	100
122	0:42:41	inf26f_127	2	g++	OK	53	100
54	0:29:51	inf26f_127	1	g++	OK	23	100

530 (пятьсот тридцать) технических баллов  
76 (семьдесят шесть) итоговых баллов



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## Посылка по задаче 1

```
[1] #include <iostream>
[2] #include <vector>
[3]
[4] using namespace std;
[5]
[6] template<class T>
[7] ostream& operator<< (ostream& out, vector<T> v) {
[8]     for(T it : v) {
[9]         out << it << ' ';
[10]    }
[11]    out << '\n';
[12]    return out;
[13] }
[14] #define ll long long
[15] const int MAX = 100'005;
[16]
[17] char tr(int x) {
[18]     if(x < 26) {
[19]         return 'A' + x;
[20]     } else {
[21]         return 'a' + x - 26;
[22]     }
[23] }
[24] int tod(char ch) {
[25]     if(ch == 'I') {
[26]         return 1;
[27]     } else if(ch == 'V') {
[28]         return 5;
[29]     } else if(ch == 'X') {
[30]         return 10;
[31]     } else {
[32]         return 50;
[33]     }
[34] }
[35] string f(string s) {
[36]     string res = "";
[37]     int x = 0;
[38]     int cnt = 0;
[39]     int pr = -1;
[40]     int c;
[41]     for(char ch : s) {
[42]         if(ch == '.') {
[43]             x += cnt * pr;
[44]             res.push_back(tr(x));
[45]             x = 0;
[46]             cnt = 0;
[47]             pr = -1;
[48]         } else if(ch == 'N') {
[49]
[50]         } else {
[51]             c = tod(ch);
[52]             if(pr == c || pr == -1) {
[53]                 cnt++;
[54]                 pr = c;
[55]             } else {
[56]                 if(pr > c) {
[57]                     x += cnt * pr;
[58]                 } else {
[59]                     x -= cnt * pr;
[60]                 }
[61]                 cnt = 1;
[62]                 pr = c;
[63]             }
[64]         }
[65]     }
[66]     x += cnt * pr;
[67]     res.push_back(tr(x));
[68]     return res;
[69] }
[70] int main() {
[71]     int k;
[72]     string s, mn, mx;
[73]
[74]     cin >> k >> s;
[75]     mn = f(s);
```

```
[76]     mx = mn;
[77]     while(--k) {
[78]         cin >> s;
[79]         s = f(s);
[80]         if(s.size() < mn.size() || (s.size() == mn.size() && s < mn)) {
[81]             mn = s;
[82]         }
[83]         if(s.size() > mx.size() || (s.size() == mx.size() && s > mx)) {
[84]             mx = s;
[85]         }
[86]     }
[87]     cout << mn << '\n' << mx;
[88] }
```

## Посылка по задаче 2

```
[1] #include <iostream>
[2] #include <vector>
[3]
[4] using namespace std;
[5]
[6] template<class T>
[7] ostream& operator<< (ostream& out, vector<T> v) {
[8]     for(T it : v) {
[9]         out << it << ' ';
[10]    }
[11]    out << '\n';
[12]    return out;
[13] }
[14] #define ll long long
[15] const int MAX = 160'005;
[16] int cnt[MAX];
[17]
[18] bool check(int x, int b) {
[19]     ll p = 1;
[20]     while(x > 0) {
[21]         x -= p;
[22]         p *= b;
[23]     }
[24]     return (x == 0);
[25] }
[26] int main() {
[27]     int n;
[28]     cin >> n;
[29]
[30]     int x;
[31]     bool tf;
[32]     for(int it = 0; it < n; it++) {
[33]         cin >> x;
[34]         tf = true;
[35]         for(int i = 2; i * i <= x; i++) {
[36]             if(x % i == 0) {
[37]                 tf = false;
[38]                 break;
[39]             }
[40]         }
[41]         if(tf) {
[42]             int b = 2;
[43]             while(1 + b + b * b <= x) {
[44]                 if(check(x, b)) {
[45]                     cnt[x]++;
[46]                     break;
[47]                 }
[48]                 b++;
[49]             }
[50]         }
[51]     }
[52]     int res = 0;
[53]     for(int i = MAX - 1; i >= 0; i--) {
[54]         if(cnt[i] > cnt[res]) {
[55]             res = i;
[56]         }
[57]     }
[58]     cout << res;
[59] }
```

### Посылка по задаче 3

```
[1] #include <iostream>
[2] #include <vector>
[3]
[4] using namespace std;
[5]
[6] template<class T>
[7] ostream& operator<< (ostream& out, vector<T> v) {
[8]     for(T it : v) {
[9]         out << it << ' ';
[10]    }
[11]    out << '\n';
[12]    return out;
[13] }
[14] #define ll long long
[15] ll n;
[16] ll f(ll i, ll j) {
[17]     ll m = (n + 1) / 2;
[18]     if(i >= j) {
[19]         if(i <= n + 1 - j) {
[20]             ll res = 0;
[21]             for(int x = 0; x < j - 1; x++) {
[22]                 res += (n - 2 * x) * 4 - 4;
[23]             }
[24]             return res + i - j;
[25]         } else {
[26]             ll res = 0;
[27]             int x;
[28]             for(x = 0; x < (n - i); x++) {
[29]                 res += (n - 2 * x) * 4 - 4;
[30]             }
[31]             res += (n - 2 * x) - 2;
[32]             return res + j - (n - i);
[33]         }
[34]     } else {
[35]         if(i >= n + 1 - j) {
[36]             ll res = 0;
[37]             int x;
[38]             for(x = 0; x < n - j; x++) {
[39]                 res += (n - 2 * x) * 4 - 4;
[40]             }
[41]             res += 2 * (n - 2 * x - 1);
[42]             return res + (n - i) - (n - j);
[43]         } else {
[44]             ll res = 0;
[45]             int x;
[46]             for(x = 0; x < i - 1; x++) {
[47]                 res += (n - 2 * x) * 4 - 4;
[48]             }
[49]             res += 3 * (n - 2 * x - 1);
[50]             return res + (n - j) - i + 1;
[51]         }
[52]     }
[53] }
[54] int main() {
[55]     ll i, j;
[56]     cin >> n >> i >> j;
[57]
[58]     swap(i, j);
[59]     cout << f(i, j);
[60] }
```

#### Посылка по задаче 4

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <algorithm>
[4]
[5] using namespace std;
[6]
[7] template<class T>
[8] ostream& operator<< (ostream& out, vector<T> v) {
[9]     for(T it : v) {
[10]         out << it << ' ';
[11]     }
[12]     out << '\n';
[13]     return out;
[14] }
[15] int main() {
[16]     int n;
[17]     cin >> n;
[18]
[19]     vector<int> a(n);
[20]     for(int i = 0; i < n; i++) {
[21]         cin >> a[i];
[22]     }
[23]     reverse(a.begin(), a.end());
[24]     vector<int> v(n + 1, 1e9 + 5);
[25]     for(int i = 0; i < n; i++) {
[26]         int it = upper_bound(v.begin(), v.end(), a[i]) - v.begin();
[27]         v[it] = a[i];
[28]     }
[29]     int i = 0;
[30]     while(v[i] != 1e9 + 5) {
[31]         i++;
[32]     }
[33]     cout << n - i;
[34] }
```

## Посылка по задаче 5

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <algorithm>
[4]
[5] using namespace std;
[6]
[7] template<class T>
[8] ostream& operator<< (ostream& out, vector<T> v) {
[9]     for(T it : v) {
[10]         out << it;
[11]     }
[12]     out << '\n';
[13]     return out;
[14] }
[15] #define ll long long
[16] struct pv {
[17]     ll x, y, h;
[18] };
[19] istream& operator>> (istream& in, pv& p) {
[20]     return in >> p.x >> p.y >> p.h;
[21] }
[22] ostream& operator<< (ostream& out, pv& p) {
[23]     return out << p.x << ' ' << p.y << ' ' << p.h << '\n';
[24] }
[25] int main() {
[26]     int n;
[27]     cin >> n;
[28]
[29]     vector<pv> a(n);
[30]     for(int i = 0; i < n; i++) {
[31]         cin >> a[i];
[32]     }
[33]     sort(a.begin(), a.end(), [](pv a, pv b) { return a.x > b.x || (a.x == b.x && a.y > b.y); });
[34]     vector<int> dp(n, 1);
[35]     for(int i = 0; i < n; i++) {
[36]         for(int j = 0; j < i; j++) {
[37]             if(a[i].x < a[j].x && a[i].y < a[j].y && a[i].h > a[j].h && dp[i] < dp[j] + 1) {
[38]                 dp[i] = dp[j] + 1;
[39]             }
[40]         }
[41]     }
[42]     int res = 0;
[43]     for(int i = 0; i < n; i++) {
[44]         if(res < dp[i]) {
[45]             res = dp[i];
[46]         }
[47]     }
[48]     cout << res;
[49] }
```

## Посылка по задаче 6

```
[1] #include <iostream>
[2] #include <vector>
[3]
[4] using namespace std;
[5]
[6] template<class T>
[7] ostream& operator<< (ostream& out, vector<T> v) {
[8]     for(T it : v) {
[9]         out << it << ' ';
[10]    }
[11]    out << '\n';
[12]    return out;
[13] }
[14] #define ll long long
[15]
[16] int main() {
[17]     int n1, n2, n3, n4, r, c;
[18]     cin >> n1 >> n2 >> n3 >> n4 >> r >> c;
[19]
[20]     if(n1 + n2 + n3 + n4 <= 1) {
[21]         cout << 1;
[22]     } else {
[23]         cout << 3;
[24]     }
[25] }
```

## Посылка по задаче 7

```
[1] from math import sin, cos, pi, sqrt
[2]
[3] s = input()
[4] mp = {}
[5] while(s[0] != '-' or s[1] != '-'):
[6]     name, sa, sb, r = s.split(' ')
[7]     r = float(r)
[8]
[9]     mn = False
[10]    if(sa[0] == '-'):
[11]        mn = True
[12]    sa = sa[:-1].split('°')
[13]    a = abs(float(sa[0]))
[14]    sa = sa[1].split('')
[15]
[16]    a += float(sa[0]) / 60.0 + float(sa[1]) / 3600.0
[17]    if(mn):
[18]        a = -a
[19]
[20]    mn = False
[21]    if(sb[0] == '-'):
[22]        mn = True
[23]    sb = sb[:-1].split('h')
[24]    b = abs(float(sb[0])) * 15
[25]    sb = sb[1].split('m')
[26]
[27]    b += float(sb[0]) * 15 / 60.0 + float(sb[1]) * 15 / 3600.0
[28]    if(mn):
[29]        b = -b
[30]
[31]    s = input()
[32]
[33]    b = b / 180 * pi
[34]    a = a / 180 * pi
[35]
[36]    a, b = b, a
[37]    x = r * sin(b)
[38]    y = r * cos(b) * sin(a)
[39]    z = r * cos(b) * cos(a)
[40]    mp[name] = [x, y, z]
[41]
[42] s = input()
[43] mpe = {}
[44] while(s):
[45]     name, sa, sb, r = s.split(' ')
[46]     r = float(r)
[47]
[48]     mn = False
[49]     if(sa[0] == '-'):
[50]         mn = True
[51]     sa = sa[:-1].split('°')
[52]     a = abs(float(sa[0]))
[53]     sa = sa[1].split('')
[54]
[55]     a += float(sa[0]) / 60.0 + float(sa[1]) / 3600.0
[56]     if(mn):
[57]         a = -a
[58]
[59]
[60]     mn = False
[61]     if(sb[0] == '-'):
[62]         mn = True
[63]     sb = sb[:-1].split('h')
[64]     b = abs(float(sb[0])) * 15
[65]     sb = sb[1].split('m')
[66]
[67]     b += float(sb[0]) * 15 / 60.0 + float(sb[1]) * 15 / 3600.0
[68]     if(mn):
[69]         b = -b
[70]
[71]     b = b / 180 * pi
[72]     a = a / 180 * pi
[73]     a, b = b, a
[74]
```

```
[75] x = r * sin(b)
[76] y = r * cos(b) * sin(a)
[77] z = r * cos(b) * cos(a)
[78] mpe[name] = [x, y, z]
[79]
[80] if(not (s == input())):
[81]     break
[82]
[83] res = -1
[84] for name in mpe:
[85]     if(name in mp):
[86]         x, y, z = mpe[name]
[87]         dx, dy, dz = mp[name]
[88]         dx -= x
[89]         dy -= y
[90]         dz -= z
[91]         res = max(res, sqrt(dx * dx + dy * dy + dz * dz))
[92]
[93] print(res)
```