



**МОСКОВСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
имени М.В. ЛОМОНОСОВА**

ОЛИМПИАДНАЯ РАБОТА

Наименование олимпиады школьников: **«Ломоносов»**

Профиль олимпиады: **Информатика**

ФИО участника олимпиады: **Черных Елена Артемовна**

Класс: **8 класс**

Технический балл: **76**

Дата проведения: **17 марта 2022 г.**

Результаты проверки:

Оценка участника строится в 2 этапа:

1. оценка за задание - рассчитывается путем запуска тестов и определения правильности работы программы на тестах, до 100 баллов по каждой задаче;
2. нормализация оценки - полученная сумма делится на 2.9.

Оценки за задания:

№	1	2	3	4	5
Оценка	92	72	55	0	0

Задание 1. Попытка 1.

```
def c_z(s):  
    i = 0  
    while s[i] == '0' and i < len(s) - 1:  
        i += 1  
    return s[i:]  
  
k = int(input())  
ans = "  
ans_i = -1  
for i in range(1, int(input()) + 1):  
    s = input()  
    if s[-k + 1:] == '0' * min(k - 1, len(s)):  
        ans_i = i  
        ans = c_z(s)  
  
if ans_i > 0:  
    print(ans)  
    print(ans_i)  
else:  
    print(-1)
```

Задание 2. Попытка 1.

```
def char2num(c):
```

```
    if '0' <= c <= '9':
```

```
        return int(c)
```

```
    else:
```

```
        return 10 + ord(c.lower()) - ord('a')
```

```
def check_char(c):
```

```
    return '0' <= c <= '9' or 'A' <= c <= 'Z'
```

```
def cut_zeros(s):
```

```
    i = 0
```

```
    while i < (len(s) - 1) and s[i] == '0':
```

```
        i += 1
```

```
    return s[i:]
```

```
def check(s):
```

```
    for i in range (len(s), 0, -1):
```

```
        if char2num(s[-i]) > i:
```

```
            return False
```

```
    return True
```

```
n = int(input())
```

```
s = sorted([c for c in input() if check_char(c)], key=char2num, reverse=True)
```

```
used = [0] * len(s)
```

```
ans = [""] * 35
for i in range (len(ans)):
    j = 0
    while j < len(s) and not (char2num(s[j]) <= 35 - i - 1 and not used[j]):
        j += 1
    if (j < len(s) and char2num(s[j]) <= 35 - i - 1 and not used[j]):
        ans[i] = s[j]
        used[j] = 1

ans = ".join(ans)

if check(ans):
    print(cut_zeros(ans))
else:
    print(-1)
```

Задание 3. Попытка 1.

```
// Problem C

#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

signed main() {
#ifdef LOCAL
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif

    cin.tie(nullptr);
    ios_base::sync_with_stdio(false);

    int x; cin >> x;

    string tmp; cin >> tmp;

    vector<vector<int>> face(2 * x, vector<int> (2));
    vector<vector<int>> back(2 * x, vector<int> (2));

    int elem;

    int i = 0;

    cin.ignore(1);

    while (isdigit(cin.peek())) {
```

```

    cin >> elem;
    face[i].push_back(elem);
    cin >> elem;
    face[i].push_back(elem);
    i++;
    cin.ignore(1);
}
cin >> tmp;
int i1 = 0;
cin.ignore(1);
while (isdigit(cin.peek())) {
    cin >> elem;
    back[i1].push_back(elem);
    cin >> elem;
    back[i1].push_back(elem);
    i1++;
    cin.ignore(1);
}
cin >> tmp;

i--; i1--;
bool flag = true;
for (int j = 0; j < min(i , i1); ++j) {
    cerr << face[j][3] << " " << back[j][2] << "\n";
    if (face[j][3] != back[j][2]) {

```

```
        flag = false;
        break;
    }
}
if (max(i, i1) - min(i, i1) > 1) {
    flag = false;
} else {
    if (i > i1) {
        if (face[i][2] != back[i1][3]) {
            flag = false;
        }
    } else if (i1 > i) {
        if (face[i][3] != back[i1][3]) {
            flag = false;
        }
    }
}

if (flag) {
    cout << "YES";
} else {
    cout << "NO";
}
return 0;
}
```


Задание 3. Попытка 2.

```
// Problem C

#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

signed main() {
#ifdef LOCAL
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif

    cin.tie(nullptr);
    ios_base::sync_with_stdio(false);

    int x; cin >> x;

    string tmp; cin >> tmp;

    vector<vector<int>> face(2 * x, vector<int> (2));
    vector<vector<int>> back(2 * x, vector<int> (2));

    int elem;

    int i = 0;

    cin.ignore(1);

    while (isdigit(cin.peek())) {
```

```
    cin >> elem;
    face[i].push_back(elem);
    cin >> elem;
    face[i].push_back(elem);
    i++;
    cin.ignore(1);
}
cin >> tmp;
int i1 = 0;
cin.ignore(1);
while (isdigit(cin.peek())) {
    cin >> elem;
    back[i1].push_back(elem);
    cin >> elem;
    back[i1].push_back(elem);
    i1++;
    cin.ignore(1);
}
cin >> tmp;

i--; i1--;
bool flag = true;
for (int j = 0; j < min(i, i1); ++j) {
    if (face[j][3] != back[j][2]) {
        flag = false;
```

```
        break;
    }
}
if (max(i, i1) - min(i, i1) > 1) {
    flag = false;
} else {
    if (i > i1) {
        if (face[i][2] != back[i1][3]) {
            flag = false;
        }
    } else if (i1 > i) {
        if (face[i][3] != back[i1][3]) {
            flag = false;
        }
    }
}

if (flag) {
    cout << "YES";
} else {
    cout << "NO";
}
return 0;
}
```

Задание 3. Попытка 3.

```
// Problem C

#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

signed main() {
#ifdef LOCAL
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif

    cin.tie(nullptr);
    ios_base::sync_with_stdio(false);

    int x; cin >> x;

    string tmp; cin >> tmp;

    vector<vector<int>> face(2 * x, vector<int> (2));
    vector<vector<int>> back(2 * x, vector<int> (2));

    int elem;

    int i = 0;

    cin.ignore(1);

    while (isdigit(cin.peek())) {
```

```
    cin >> elem;
    face[i].push_back(elem);
    cin >> elem;
    face[i].push_back(elem);
    i++;
    cin.ignore(1);
}
cin >> tmp;
int i1 = 0;
cin.ignore(1);
while (isdigit(cin.peek())) {
    cin >> elem;
    back[i1].push_back(elem);
    cin >> elem;
    back[i1].push_back(elem);
    i1++;
    cin.ignore(1);
}
cin >> tmp;

i--; i1--;
bool flag = true;
for (int j = 0; j < min(i, i1); ++j) {
    if (face[j][3] != back[j][2]) {
        flag = false;
```

```
        break;
    }
}
if (max(i, i1) - min(i, i1) > 1) {
    flag = false;
} else {
    if (i > i1) {
        if (face[i][2] != back[i1][3]) {
            flag = false;
        }
    } else if (i1 > i) {
        if (face[i][3] != back[i1][3]) {
            flag = false;
        }
    }
}

if (flag) {
    cout << "YES";
} else {
    cout << "NO";
}
return 0;
}
```


Задание 3. Попытка 4.

```
// Problem C

#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

signed main() {
#ifdef LOCAL
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif

    cin.tie(nullptr);
    ios_base::sync_with_stdio(false);

    int x; cin >> x;

    string tmp; cin >> tmp;

    vector<vector<int>> face(2 * x, vector<int> (2));
    vector<vector<int>> back(2 * x, vector<int> (2));

    int elem;

    int i = 0;

    cin.ignore(1);

    while (isdigit(cin.peek())) {
```

```
    cin >> elem;
    face[i].push_back(elem);
    cin >> elem;
    face[i].push_back(elem);
    i++;
    cin.ignore(1);
}
cin >> tmp;
int i1 = 0;
cin.ignore(1);
while (isdigit(cin.peek())) {
    cin >> elem;
    back[i1].push_back(elem);
    cin >> elem;
    back[i1].push_back(elem);
    i1++;
    cin.ignore(1);
}
cin >> tmp;

bool flag = true;
for (int j = 0; j < min(i, i1); ++j) {
    if (face[j][3] != back[j][2]) {
        flag = false;
        break;
    }
}
```

```
    }  
}  
  
i--; i1--;  
if (max(i, i1) - min(i, i1) > 1) {  
    flag = false;  
} else {  
    if (i > i1) {  
        if (face[i][2] != back[i1][3]) {  
            flag = false;  
        }  
    } else if (i1 > i) {  
        if (face[i][3] != back[i1][3]) {  
            flag = false;  
        }  
    }  
}  
  
if (flag) {  
    cout << "YES";  
} else {  
    cout << "NO";  
}  
return 0;  
}
```


Задание 3. Попытка 5.

```
// Problem C

#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

signed main() {
#ifdef LOCAL
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif

    cin.tie(nullptr);
    ios_base::sync_with_stdio(false);

    int x; cin >> x;

    string tmp; cin >> tmp;

    vector<vector<int>> face(2 * x, vector<int> (2));
    vector<vector<int>> back(2 * x, vector<int> (2));

    int elem;

    int i = 0;

    cin.ignore(1);

    while (isdigit(cin.peek())) {
```

```
    cin >> elem;
    face[i][0] = elem;
    cin >> elem;
    face[i][1] = elem;
    i++;
    cin.ignore(1);
}
cin >> tmp;
int i1 = 0;
cin.ignore(1);
while (isdigit(cin.peek())) {
    cin >> elem;
    back[i1][0] = elem;
    cin >> elem;
    back[i1][1] = elem;
    i1++;
    cin.ignore(1);
}
cin >> tmp;

bool flag = true;
for (int j = 0; j < min(i, i1); ++j) {
    if (face[j][1] != back[j][0]) {
        flag = false;
        break;
    }
}
```

```
    }  
}  
  
i--; i1--;  
if (max(i, i1) - min(i, i1) > 1) {  
    flag = false;  
} else {  
    if (i > i1) {  
        if (face[i][0] != back[i1][1]) {  
            flag = false;  
        }  
    } else if (i1 > i) {  
        if (face[i][1] != back[i1][0]) {  
            flag = false;  
        }  
    }  
}  
  
if (flag) {  
    cout << "YES";  
} else {  
    cout << "NO";  
}  
return 0;  
}
```


Задание 3. Попытка 6.

```
// Problem C

#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

signed main() {
#ifdef LOCAL
    // freopen("input.txt", "r", stdin);
    // freopen("output.txt", "w", stdout);
#endif
    // cin.tie(nullptr);
    // ios_base::sync_with_stdio(false);

    int x; cin >> x;

    string tmp; cin >> tmp;

    vector<vector<int>> face(2 * x, vector<int> (2));
    vector<vector<int>> back(2 * x, vector<int> (2));

    int i = 0;

    cin >> tmp;

    while (tmp != "BACK") {
        int x1 = stoi(tmp);
```

```
int x2;

face[i][0] = x1;

cin >> x2;

face[i][1] = x2;

i++;

cin >> tmp;

}

int i1 = 0;

cin >> tmp;

while (tmp != "END") {

    int x1 = stoi(tmp);

    int x2;

    back[i1][0] = x1;

    cin >> x2;

    back[i1][1] = x2;

    i1++;

    cin >> tmp;

}

bool flag = true;

for (int j = 0; j < min(i, i1); ++j) {

    if (face[j][1] != back[j][0]) {

        flag = false;

        break;

    }

}
```

```
}

i--; i1--;
if (max(i, i1) - min(i, i1) > 1) {
    flag = false;
} else {
    if (i > i1) {
        if (face[i][0] != back[i1][1]) {
            flag = false;
        }
    } else if (i1 > i) {
        if (face[i][1] != back[i1][0]) {
            flag = false;
        }
    }
}

if (flag) {
    cout << "YES";
} else {
    cout << "NO";
}

return 0;
}
```


Задание 5. Попытка 1.

```
// Problem E
```

```
#include <iostream>
```

```
#include <vector>
```

```
#include <algorithm>
```

```
using namespace std;
```

```
signed main() {
```

```
#ifdef LOCAL
```

```
    freopen("input.txt", "r", stdin);
```

```
    freopen("output.txt", "w", stdout);
```

```
#endif
```

```
    cin.tie(nullptr);
```

```
    ios_base::sync_with_stdio(false);
```

```
    int a1, b1, a2, b2; cin >> a1 >> b1 >> a2 >> b2;
```

```
    int x = max(a1, a2) - min(a1, a2);
```

```
    int y = max(b1, b2) - min(b1, b2);
```

```
    if (y > x) {
```

```
        cout << 1 + 2 * x + y - x;
```

```
    return 0;
```

```
}
```


Задание 5. Попытка 2.

// Problem E

```
#include <iostream>
```

```
#include <vector>
```

```
#include <algorithm>
```

```
using namespace std;
```

```
signed main() {
```

```
    int a1, b1, a2, b2; cin >> a1 >> b1 >> a2 >> b2;
```

```
    int x = max(a1, a2) - min(a1, a2);
```

```
    int y = max(b1, b2) - min(b1, b2);
```

```
    if (y > x) {
```

```
        cout << 1 + 2 * x + y - x; }
```

```
    return 0;
```

```
}
```