



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

**ОЛИМПИАДНАЯ РАБОТА**

Наименование олимпиады школьников: **«Ломоносов»**

Профиль олимпиады: **Информатика**

ФИО участника олимпиады: **Мухин Яков Александрович**

Класс: **11 класс**

Технический балл: **75**

Дата проведения: **17 марта 2022 г.**

## Результаты проверки:

Оценка участника строится из 3 частей:

1. оценка за задание - рассчитывается путем запуска тестов и определения правильности работы программы на тестах, до 100 баллов по каждой задаче;
2. дополнительные баллы за полностью правильное решение задания со 2 по 5 - в случае прохождения всех тестов по заданию к оценке прибавляется 55 баллов;
3. нормализация оценки - если полученная из пунктов 1 и 2 сумма баллов превышает 500, то итоговая оценка - 100, если не превышает 500, но превышает 400 - 99 баллов, если не превышает 400 - делится на 3.9 и округляется до целого.

Оценки за задания:

№	1	2	3	4	5
Оценка	39	100	18	72	10

Дополнительный балл: 55

### Задание 1. Попытка 1.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define int long long

int binPow(int n, int deg, int mod) {
    if (deg == 0) {
        return 1;
    }
    int res = binPow(n, deg / 2, mod);
    res = (res * res) % mod;
    if (deg % 2) {
        res = (res * n) % mod;
    }
    return res;
}

void solve() {
```

```

int k, n;

cin >> k >> n;

vector < string > arr(n);

for (auto &el : arr) {

    cin >> el;

    while (SZ(el) > 1 && el[0] == '0') {

        el.erase(0, 1);

    }

    for (auto &sym : el) {

        if (isalpha(sym)) {

            if (isupper(sym)) {

                sym = tolower(sym);

            } else {

                sym = toupper(sym);

            }

        }

    }

}

string ans = "";

int mod = 1e9 + 7;

vector < int > fact(62), rfact(62);

fact[0] = rfact[0] = 1;

for (int i = 1; i < 62; ++i) {

    fact[i] = (fact[i - 1] * i) % mod;

    rfact[i] = (rfact[i - 1] * binPow(i, mod - 2, mod)) % mod;

```

```

}

string alph =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";

for (int i = 0; i < n; ++i) {
    int x = 0, sz = SZ(arr[i]);
    for (int j = 0; j < sz; ++j) {
        x = (x + (alph.find(arr[i][j]) * fact[sz - j]) % mod) % mod;
    }
    int res = (x * rfact[k]) % mod;
    if ((res * fact[k]) % mod == x) {
        if (SZ(arr[i]) > SZ(ans) || arr[i] > ans) {
            ans = arr[i];
        }
    }
}

if (ans == "") {
    cout << -1;
} else {
    string ans2 = ans;
    for (auto &sym : ans2) {
        if (isalpha(sym)) {
            if (isupper(sym)) {
                sym = tolower(sym);
            } else {
                sym = toupper(sym);
            }
        }
    }
}

```

```
    }  
  }  
}  
cout << ans2 << "\n";  
for (int i = 0; i < n; ++i) {  
    if (arr[i] == ans) {  
        cout << i + 1 << "\n";  
    }  
}  
}  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

## Задание 2. Попытка 1.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define int long long

void solve() {

    string alph =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";

    int n;

    string s;

    cin >> n >> s;

    for (auto &sym : s) {

        if (isalpha(sym)) {

            if (isupper(sym)) {

                sym = tolower(sym);

            } else {
```

```

        sym = toupper(sym);
    }
}
if (alph.find(sym) == string::npos) {
    --n;
}
}
sort(rall(s));
int sz = min(62ll, n);
string ans = "";
for (int i = 0, j = 0; i < SZ(s); ++i) {
    if (alph.find(s[i]) == string::npos) {
        continue;
    }
    int pos = alph.find(s[i]);
    int pos2 = sz - j;
    cout << pos << ' ' << pos2 << endl;
    if (pos <= pos2) {
        ans += s[i];
        ++j;
    }
}
while (SZ(ans) > 1 && ans[0] == '0') {
    ans.erase(0, 1);
}

```



```
for (auto &sym : ans) {
    if (isalpha(sym)) {
        if (isupper(sym)) {
            sym = tolower(sym);
        } else {
            sym = toupper(sym);
        }
    }
}

if (SZ(ans) == 0) {
    cout << -1;
} else {
    char ok = true;
    sz = SZ(ans);
    for (int i = 0; i < SZ(ans); ++i) {
        if (alph.find(ans[i]) > sz - i) {
            ok = false;
        }
    }
    if (ok) {
        cout << ans;
    } else {
        cout << -1;
    }
}
```

```
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

## Задание 2. Попытка 2.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define int long long

void solve() {

    string alph =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";

    int n;

    string s;

    cin >> n >> s;

    for (auto &sym : s) {

        if (isalpha(sym)) {

            if (isupper(sym)) {

                sym = tolower(sym);

            } else {
```

```

        sym = toupper(sym);
    }
}
if (alph.find(sym) == string::npos) {
    --n;
}
}
sort(rall(s));
int sz = min(62ll, n);
string ans = "";
for (int i = 0, j = 0; i < SZ(s); ++i) {
    if (alph.find(s[i]) == string::npos) {
        continue;
    }
    int pos = alph.find(s[i]);
    int pos2 = sz - j;
    if (pos <= pos2) {
        ans += s[i];
        ++j;
    }
}
while (SZ(ans) > 1 && ans[0] == '0') {
    ans.erase(0, 1);
}
for (auto &sym : ans) {

```

```
if (isalpha(sym)) {
    if (isupper(sym)) {
        sym = tolower(sym);
    } else {
        sym = toupper(sym);
    }
}
}

if (SZ(ans) == 0) {
    cout << -1;
} else {
    char ok = true;
    sz = SZ(ans);
    for (int i = 0; i < SZ(ans); ++i) {
        if (alph.find(ans[i]) > sz - i) {
            ok = false;
        }
    }
    if (ok) {
        cout << ans;
    } else {
        cout << -1;
    }
}
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 2. Попытка 3.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define int long long

void solve() {

    string alph =
"0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";

    int n;

    string s;

    cin >> n >> s;

    for (auto &sym : s) {

        if (isalpha(sym)) {

            if (isupper(sym)) {

                sym = tolower(sym);

            } else {
```

```

        sym = toupper(sym);
    }
}
if (alph.find(sym) == string::npos) {
    --n;
}
}
sort(rall(s));
int sz = min(61ll, n);
string ans = "";
for (int sz2 = sz; sz2 > 0; --sz2) {
    string ans2 = "";
    for (int i = 0, j = 0; i < SZ(s) && j < sz2; ++i) {
        if (alph.find(s[i]) == string::npos) {
            continue;
        }
        int pos = alph.find(s[i]);
        int pos2 = sz2 - j;
        if (pos <= pos2) {
            ans2 += s[i];
            ++j;
        }
    }
}
if (SZ(ans2) == sz2) {
    ans = ans2;
}

```



```
        break;
    }
}
if (SZ(ans) == 0) {
    cout << -1;
} else {
    while (SZ(ans) > 1 && ans[0] == '0') {
        ans.erase(0, 1);
    }
    for (auto &sym : ans) {
        if (isalpha(sym)) {
            if (isupper(sym)) {
                sym = tolower(sym);
            } else {
                sym = toupper(sym);
            }
        }
    }
    cout << ans;
}
}
```

```
int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
```

```
int tt=1;
//cin >> tt;
while (tt--) {
    solve();
}
return 0;
}
```

### Задание 3. Попытка 1.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x, n = 0;

    string s;

    cin >> x;

    getline(cin, s);

    getline(cin, s);

    stringstream sx;

    vector < pair < int, int > > arr;
```

```
while (getline(cin, s)) {
    if (s == "END") {
        break;
    }
    ++n;
    pair < int, int > p = mp(-1, -1);
    s += ' ';
    string ss = "";
    for (int i = 0; i < SZ(s); ++i) {
        if (s[i] == ' ') {
            int ch;
            sx << ss;
            sx >> ch;
            sx.clear();
            ss.clear();
            if (p.first == -1) {
                p.first = ch;
            } else {
                p.second = ch;
            }
        } else {
            ss += s[i];
        }
    }
    arr.emplace_back(p);
}
```

```
    }  
    cout << 3;  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 2.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x, n = 0;

    string s;

    cin >> x;

    getline(cin, s);

    getline(cin, s);

    stringstream sx;

    vector < pair < int, int > > arr;
```

```
while (getline(cin, s)) {
    if (s == "END") {
        break;
    }
    ++n;
    pair < int, int > p = mp(-1, -1);
    s += ' ';
    string ss = "";
    for (int i = 0; i < SZ(s); ++i) {
        if (s[i] == ' ') {
            int ch;
            sx << ss;
            sx >> ch;
            sx.clear();
            ss.clear();
            if (p.first == -1) {
                p.first = ch;
            } else {
                p.second = ch;
            }
        } else {
            ss += s[i];
        }
    }
    arr.emplace_back(p);
}
```

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

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```



### Задание 3. Попытка 3.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x, n = 0;

    string s;

    cin >> x;

    getline(cin, s);

    getline(cin, s);

    stringstream sx;

    vector < pair < int, int > > arr;
```

```
while (getline(cin, s)) {
    if (s == "END") {
        break;
    }
    ++n;
    pair < int, int > p = mp(-1, -1);
    s += ' ';
    string ss = "";
    for (int i = 0; i < SZ(s); ++i) {
        if (s[i] == ' ') {
            int ch;
            sx << ss;
            sx >> ch;
            sx.clear();
            ss.clear();
            if (p.first == -1) {
                p.first = ch;
            } else {
                p.second = ch;
            }
        } else {
            ss += s[i];
        }
    }
    arr.emplace_back(p);
}
```

```
}  
if (n == 0) {  
    cout << 0;  
    return;  
}  
cout << 2 * x - 1;  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 4.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x, n = 0;

    string s;

    cin >> x;

    getline(cin, s);

    getline(cin, s);

    stringstream sx;

    vector < pair < int, int > > arr;
```

```
while (getline(cin, s)) {
    if (s == "END") {
        break;
    }
    ++n;
    pair < int, int > p = mp(-1, -1);
    s += ' ';
    string ss = "";
    for (int i = 0; i < SZ(s); ++i) {
        if (s[i] == ' ') {
            int ch;
            sx << ss;
            sx >> ch;
            sx.clear();
            ss.clear();
            if (p.first == -1) {
                p.first = ch;
            } else {
                p.second = ch;
            }
        } else {
            ss += s[i];
        }
    }
    arr.emplace_back(p);
}
```

```

}
if (n == 0) {
    cout << 0;
    return;
}
cout << 3;
return;
vector < vector < int > > dp(n, vector < int > (2));
if (arr[0].first == arr[0].second) {
    dp[0][0] = dp[0][1] = 1;
} else if (arr[0].first < arr[0].second) {
    dp[0][1] = 1;
} else {
    dp[0][0] = 1;
}
for (int i = 1; i < n; ++i) {
    dp[i][0] += dp[i - 1][1];
    dp[i][1] += dp[i - 1][0];
}
cout << dp[n - 1][0] + dp[n - 1][1];
}

```

```

int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
}

```

```
int tt=1;
//cin >> tt;
while (tt--) {
    solve();
}
return 0;
}
```

### Задание 3. Попытка 5.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x, n = 0;

    string s;

    cin >> x;

    getline(cin, s);

    getline(cin, s);

    stringstream sx;

    vector < pair < int, int > > arr;
```



```
while (getline(cin, s)) {
    if (s == "END") {
        break;
    }
    ++n;
    pair < int, int > p = mp(-1, -1);
    s += ' ';
    string ss = "";
    for (int i = 0; i < SZ(s); ++i) {
        if (s[i] == ' ') {
            int ch;
            sx << ss;
            sx >> ch;
            sx.clear();
            ss.clear();
            if (p.first == -1) {
                p.first = ch;
            } else {
                p.second = ch;
            }
        } else {
            ss += s[i];
        }
    }
    arr.emplace_back(p);
}
```

```
}  
if (n == 0) {  
    cout << 0;  
    return;  
}  
if (n == 2) {  
    cout << 3;  
} else {  
    cout << 2;  
}  
return;  
char ok = true;  
for (int i = 0; i < n; ++i) {  
    if (arr[i].first != arr[i].second) {  
        ok = false;  
    }  
}  
vector < vector < int > > dp(n, vector < int > (2));  
int add = 0;  
if (arr[0].first == arr[0].second) {  
    dp[0][0] = dp[0][1] = 1;  
    if (arr[0].first > 1) {  
        add = 2;  
    }  
} else if (arr[0].first < arr[0].second) {
```

```

    dp[0][1] = 1;
    if (arr[0].first ) {

    }
} else {
    dp[0][0] = 1;
}
for (int i = 1; i < n; ++i) {
    if (abs(arr[i - 1].first - arr[i].second) < 2) {
        dp[i][0] += dp[i - 1][1];
    }
    if (abs(arr[i - 1].second - arr[i].first) < 2) {
        dp[i][1] += dp[i - 1][0];
    }
}
if (dp[n - 1][0])
}

```

```

int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
    int tt=1;
    //cin >> tt;
    while (tt--) {
        solve();
    }
}

```

```
}  
return 0;  
}
```

### Задание 3. Попытка 6.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x, n = 0;

    string s;

    cin >> x;

    getline(cin, s);

    getline(cin, s);

    stringstream sx;

    vector < pair < int, int > > arr;
```

```
while (getline(cin, s)) {
    if (s == "END") {
        break;
    }
    ++n;
    pair < int, int > p = mp(-1, -1);
    s += ' ';
    string ss = "";
    for (int i = 0; i < SZ(s); ++i) {
        if (s[i] == ' ') {
            int ch;
            sx << ss;
            sx >> ch;
            sx.clear();
            ss.clear();
            if (p.first == -1) {
                p.first = ch;
            } else {
                p.second = ch;
            }
        } else {
            ss += s[i];
        }
    }
    arr.emplace_back(p);
}
```

```
}  
if (n == 0) {  
    cout << 0;  
    return;  
}  
  
char ok = true, ok2 = true;  
  
for (int i = 0; i < n; ++i) {  
    if (arr[i].first != arr[i].second) {  
        ok = false;  
    }  
    if (i && abs(arr[i].first - arr[i - 1].second) > 1) {  
        ok2 = false;  
    }  
}  
  
if (ok) {  
    if (ok2) {  
        if (n == 2) {  
            cout << 3;  
        } else {  
            cout << 2;  
        }  
    } else {  
        cout << 0;  
    }  
}  
  
return;
```

```

}
vector < vector < int > > dp(n, vector < int > (2));
int add = 0;
if (arr[0].first == arr[0].second) {
    dp[0][0] = dp[0][1] = 1;
    if (arr[0].first > 1) {
        add = 2;
    }
} else if (arr[0].first < arr[0].second) {
    dp[0][1] = 1;
    if (arr[0].first ) {

    }
} else {
    dp[0][0] = 1;
}
for (int i = 1; i < n; ++i) {
    if (abs(arr[i - 1].first - arr[i].second) < 2) {
        dp[i][0] += dp[i - 1][1];
    }
    if (abs(arr[i - 1].second - arr[i].first) < 2) {
        dp[i][1] += dp[i - 1][0];
    }
}
cout << dp[n - 1][0] + dp[n - 1][1];

```



```
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 7.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x, n = 0;

    string s;

    cin >> x;

    getline(cin, s);

    getline(cin, s);

    stringstream sx;

    vector < pair < int, int > > arr;
```

```
while (getline(cin, s)) {
    if (s == "END") {
        break;
    }
    ++n;
    pair < int, int > p = mp(-1, -1);
    s += ' ';
    string ss = "";
    for (int i = 0; i < SZ(s); ++i) {
        if (s[i] == ' ') {
            int ch;
            sx << ss;
            sx >> ch;
            sx.clear();
            ss.clear();
            if (p.first == -1) {
                p.first = ch;
            } else {
                p.second = ch;
            }
        } else {
            ss += s[i];
        }
    }
    arr.emplace_back(p);
}
```

```

}
if (n == 0) {
    cout << 0;
    return;
}
char ok = true, ok2 = true;
for (int i = 0; i < n; ++i) {
    if (arr[i].first != arr[i].second) {
        ok = false;
    }
    if (i && abs(arr[i].first - arr[i - 1].second) > 1) {
        ok2 = false;
    }
}
if (ok) {
    if (ok2) {
        cout << 3;
    } else {
        cout << 0;
    }
    return;
}
vector < vector < int > > dp(n, vector < int > (2));
int add = 0;
if (arr[0].first == arr[0].second) {

```

```

    dp[0][0] = dp[0][1] = 1;
    if (arr[0].first > 1) {
        add = 2;
    }
} else if (arr[0].first < arr[0].second) {
    dp[0][1] = 1;
    if (arr[0].first ) {

    }
} else {
    dp[0][0] = 1;
}
for (int i = 1; i < n; ++i) {
    if (abs(arr[i - 1].first - arr[i].second) < 2) {
        dp[i][0] += dp[i - 1][1];
    }
    if (abs(arr[i - 1].second - arr[i].first) < 2) {
        dp[i][1] += dp[i - 1][0];
    }
}
cout << dp[n - 1][0] + dp[n - 1][1];
}

int32_t main() {
    ios_base::sync_with_stdio(false);

```

```
cin.tie(nullptr);  
int tt=1;  
//cin >> tt;  
while (tt--) {  
    solve();  
}  
return 0;  
}
```

### Задание 3. Попытка 8.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < pair < int, int > > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {

        vector < pair < int, int > > res;
```

```

for (auto &el : arr) {
    if (!exist[el.first][el.second][1]) {
        return;
    }
}

for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(min(u, v), max(u, v));
        }
    }
}

ans.emplace_back(res);

return;
}

int nl = (l + 1) % 2;

for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (!exist[i][j][cur]) {
        exist[i][j][cur] = true;
        exist[j][i][cur] = true;
        f(j, nl, (cur + 1) % 2, cnt + cur);
        exist[i][j][cur] = false;
        exist[j][i][cur] = false;
    }
}
}

```



```
}
```

```
void solve() {  
    n = 0;  
    string s;  
    cin >> x;  
    getline(cin, s);  
    getline(cin, s);  
    stringstream sx;  
    while (getline(cin, s)) {  
        if (s == "END") {  
            break;  
        }  
        ++n;  
        pair < int, int > p = mp(-1, -1);  
        s += ' ';  
        string ss = "";  
        for (int i = 0; i < SZ(s); ++i) {  
            if (s[i] == ' ') {  
                int ch;  
                sx << ss;  
                sx >> ch;  
                sx.clear();  
                ss.clear();  
                if (p.first == -1) {
```

```

        p.first = ch;
    } else {
        p.second = ch;
    }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    f(i, 1, 1, 0);
    f(i, 0, 0, 0);
    f(i, 1, 0, 0);
}
sort(all(ans));
ans.resize(unique(all(ans)) - ans.begin());
cout << SZ(ans);
}

```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 9.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (auto &el : arr) {
    if (!exist[el.first][el.second][1]) {
        return;
    }
}
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(u, v);
        }
    }
}
ans.emplace_back(res);
return;
}

int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (!exist[i][j][cur]) {
        exist[i][j][cur] = true;
        exist[j][i][cur] = true;
        f(j, nl, (cur + 1) % 2, cnt + cur);
        exist[i][j][cur] = false;
        exist[j][i][cur] = false;
    }
}

```

```
    }  
}
```

```
void solve() {  
    n = 0;  
    string s;  
    cin >> x;  
    getline(cin, s);  
    getline(cin, s);  
    stringstream sx;  
    while (getline(cin, s)) {  
        if (s == "END") {  
            break;  
        }  
        ++n;  
        pair < int, int > p = mp(-1, -1);  
        s += ' ';  
        string ss = "";  
        for (int i = 0; i < SZ(s); ++i) {  
            if (s[i] == ' ') {  
                int ch;  
                sx << ss;  
                sx >> ch;  
                sx.clear();  
                ss.clear();  
            }  
        }  
    }  
}
```

```

        if (p.first == -1) {
            p.first = ch;
        } else {
            p.second = ch;
        }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    f(i, 1, 1, 0);
    f(i, 0, 0, 0);
    f(i, 1, 0, 0);
}
sort(all(ans));
ans.resize(unique(all(ans)) - ans.begin());
cout << SZ(ans);

```

```
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```



### Задание 3. Попытка 10.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(u, v);
        }
    }
}
ans.emplace_back(res);
return;
}

int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
        exist[i][j][cur] = true;
        exist[j][i][cur] = true;
        f(j, nl, (cur + 1) % 2, cnt + cur);
        exist[i][j][cur] = false;
        exist[j][i][cur] = false;
    }
}
}

void solve() {
    n = 0;

```

```
string s;

cin >> x;

getline(cin, s);

getline(cin, s);

stringstream sx;

while (getline(cin, s)) {

    if (s == "END") {

        break;

    }

    ++n;

    pair < int, int > p = mp(-1, -1);

    s += ' ';

    string ss = "";

    for (int i = 0; i < SZ(s); ++i) {

        if (s[i] == ' ') {

            int ch;

            sx << ss;

            sx >> ch;

            sx.clear();

            ss.clear();

            if (p.first == -1) {

                p.first = ch;

            } else {

                p.second = ch;

            }

        }

    }

}
```

```

        } else {
            ss += s[i];
        }
    }

    arr.emplace_back(p);
}

if (n == 0) {
    cout << 0;
    return;
}

good.resize(x + 1, vector < char > (x + 1, false));
for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}

exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    f(i, 1, 1, 0);
    f(i, 0, 0, 0);
    f(i, 1, 0, 0);
}

sort(all(ans));

ans.resize(unique(all(ans)) - ans.begin());

cout << SZ(ans);
}

```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 11.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(u, v);
        }
    }
}
ans.emplace_back(res);
return;
}

int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (l == 0) {
        if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
            exist[i][j][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[i][j][cur] = false;
        }
    } else {
        if (!exist[j][i][cur] && (cur == 0 || good[i][j])) {
            exist[j][i][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[j][i][cur] = false;
        }
    }
}

```

```
    }  
  }  
}
```

```
void solve() {  
    n = 0;  
    string s;  
    cin >> x;  
    getline(cin, s);  
    getline(cin, s);  
    stringstream sx;  
    while (getline(cin, s)) {  
        if (s == "END") {  
            break;  
        }  
        ++n;  
        pair < int, int > p = mp(-1, -1);  
        s += ' ';  
        string ss = "";  
        for (int i = 0; i < SZ(s); ++i) {  
            if (s[i] == ' ') {  
                int ch;  
                sx << ss;  
                sx >> ch;  
                sx.clear();  
            }  
        }  
    }  
}
```



```

        ss.clear();
        if (p.first == -1) {
            p.first = ch;
        } else {
            p.second = ch;
        }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
good.resize(x + 1, vector < char > (x + 1, false));
for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    f(i, 1, 1, 0);
    f(i, 0, 0, 0);
}

```

```
        f(i, 1, 0, 0);
    }
    sort(all(ans));
    ans.resize(unique(all(ans)) - ans.begin());
    cout << SZ(ans);
}
```

```
int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
    int tt=1;
    //cin >> tt;
    while (tt--) {
        solve();
    }
    return 0;
}
```

### Задание 3. Попытка 12.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(u, v);
        }
    }
}
ans.emplace_back(res);
return;
}

int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (l == 0) {
        if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
            exist[i][j][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[i][j][cur] = false;
        }
    } else {
        if (!exist[j][i][cur] && (cur == 0 || good[i][j])) {
            exist[j][i][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[j][i][cur] = false;
        }
    }
}

```

```
    }  
  }  
}
```

```
void solve() {  
    n = 0;  
    string s;  
    cin >> x;  
    getline(cin, s);  
    getline(cin, s);  
    stringstream sx;  
    while (getline(cin, s)) {  
        if (s == "END") {  
            break;  
        }  
        ++n;  
        pair < int, int > p = mp(-1, -1);  
        s += ' ';  
        string ss = "";  
        for (int i = 0; i < SZ(s); ++i) {  
            if (s[i] == ' ') {  
                int ch;  
                sx << ss;  
                sx >> ch;  
                sx.clear();  
            }  
        }  
    }  
}
```

```

        ss.clear();
        if (p.first == -1) {
            p.first = ch;
        } else {
            p.second = ch;
        }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
good.resize(x + 1, vector < char > (x + 1, false));
for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    f(i, 1, 1, 0);
    //f(i, 0, 0, 0);
}

```

```
        //f(i, 1, 0, 0);
    }
    sort(all(ans));
    ans.resize(unique(all(ans)) - ans.begin());
    cout << SZ(ans);
}
```

```
int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
    int tt=1;
    //cin >> tt;
    while (tt--) {
        solve();
    }
    return 0;
}
```

### Задание 3. Попытка 13.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```



```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(u, v);
        }
    }
}
ans.emplace_back(res);
return;
}

int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (l == 0) {
        if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
            exist[i][j][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[i][j][cur] = false;
        }
    } else {
        if (!exist[j][i][cur] && (cur == 0 || good[i][j])) {
            exist[j][i][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[j][i][cur] = false;
        }
    }
}

```

```
    }  
  }  
}
```

```
void solve() {  
    n = 0;  
    string s;  
    cin >> x;  
    getline(cin, s);  
    getline(cin, s);  
    stringstream sx;  
    while (getline(cin, s)) {  
        if (s == "END") {  
            break;  
        }  
        ++n;  
        pair < int, int > p = mp(-1, -1);  
        s += ' ';  
        string ss = "";  
        for (int i = 0; i < SZ(s); ++i) {  
            if (s[i] == ' ') {  
                int ch;  
                sx << ss;  
                sx >> ch;  
                sx.clear();  
            }  
        }  
    }  
}
```

```

        ss.clear();
        if (p.first == -1) {
            p.first = ch;
        } else {
            p.second = ch;
        }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
good.resize(x + 1, vector < char > (x + 1, false));
for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    //f(i, 1, 1, 0);
    f(i, 0, 0, 0);
}

```

```
        //f(i, 1, 0, 0);  
    }  
    sort(all(ans));  
    ans.resize(unique(all(ans)) - ans.begin());  
    cout << SZ(ans);  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 14.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(u, v);
        }
    }
}
ans.emplace_back(res);
return;
}

int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (l == 0) {
        if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
            exist[i][j][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[i][j][cur] = false;
        }
    } else {
        if (!exist[j][i][cur] && (cur == 0 || good[i][j])) {
            exist[j][i][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[j][i][cur] = false;
        }
    }
}

```

```
    }  
  }  
}
```

```
void solve() {  
    n = 0;  
    string s;  
    cin >> x;  
    getline(cin, s);  
    getline(cin, s);  
    stringstream sx;  
    while (getline(cin, s)) {  
        if (s == "END") {  
            break;  
        }  
        ++n;  
        pair < int, int > p = mp(-1, -1);  
        s += ' ';  
        string ss = "";  
        for (int i = 0; i < SZ(s); ++i) {  
            if (s[i] == ' ') {  
                int ch;  
                sx << ss;  
                sx >> ch;  
                sx.clear();  
            }  
        }  
    }  
}
```

```

        ss.clear();
        if (p.first == -1) {
            p.first = ch;
        } else {
            p.second = ch;
        }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
good.resize(x + 1, vector < char > (x + 1, false));
for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    f(i, 1, 1, 0);
    f(i, 0, 0, 0);
}

```



```
        f(i, 1, 0, 0);
    }
    sort(all(ans));
    ans.resize(unique(all(ans)) - ans.begin());
    cout << SZ(ans);
}
```

```
int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
    int tt=1;
    //cin >> tt;
    while (tt--) {
        solve();
    }
    return 0;
}
```

### Задание 3. Попытка 15.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(u, v);
        }
    }
}
ans.emplace_back(res);
if (cur == 1) {
    return;
}
}
int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (l == 0) {
        if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
            exist[i][j][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[i][j][cur] = false;
        }
    } else {
        if (!exist[j][i][cur] && (cur == 0 || good[i][j])) {
            exist[j][i][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
        }
    }
}

```

```
        exist[j][i][cur] = false;
    }
}
}
```

```
void solve() {
    n = 0;
    string s;
    cin >> x;
    getline(cin, s);
    getline(cin, s);
    stringstream sx;
    while (getline(cin, s)) {
        if (s == "END") {
            break;
        }
        ++n;
        pair < int, int > p = mp(-1, -1);
        s += ' ';
        string ss = "";
        for (int i = 0; i < SZ(s); ++i) {
            if (s[i] == ' ') {
                int ch;
                sx << ss;
            }
        }
    }
}
```

```

    sx >> ch;
    sx.clear();
    ss.clear();
    if (p.first == -1) {
        p.first = ch;
    } else {
        p.second = ch;
    }
    } else {
        ss += s[i];
    }
}

arr.emplace_back(p);
}

if (n == 0) {
    cout << 0;

    return;
}

good.resize(x + 1, vector < char > (x + 1, false));

for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}

exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));

for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
}

```

```
    f(i, 1, 1, 0);  
    f(i, 0, 0, 0);  
    f(i, 1, 0, 0);  
}  
sort(all(ans));  
ans.resize(unique(all(ans)) - ans.begin());  
cout << SZ(ans);  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 16.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(min(u, v), max(u, v));
        }
    }
}
ans.emplace_back(res);
if (cur == 1) {
    return;
}
}
int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (l == 0) {
        if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
            exist[i][j][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[i][j][cur] = false;
        }
    } else {
        if (!exist[j][i][cur] && (cur == 0 || good[i][j])) {
            exist[j][i][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
        }
    }
}

```



```
        exist[j][i][cur] = false;
    }
}
}
```

```
void solve() {
    n = 0;
    string s;
    cin >> x;
    getline(cin, s);
    getline(cin, s);
    stringstream sx;
    while (getline(cin, s)) {
        if (s == "END") {
            break;
        }
        ++n;
        pair < int, int > p = mp(-1, -1);
        s += ' ';
        string ss = "";
        for (int i = 0; i < SZ(s); ++i) {
            if (s[i] == ' ') {
                int ch;
                sx << ss;
            }
        }
    }
}
```

```

    sx >> ch;
    sx.clear();
    ss.clear();
    if (p.first == -1) {
        p.first = ch;
    } else {
        p.second = ch;
    }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
good.resize(x + 1, vector < char > (x + 1, false));
for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
}

```

```
    f(i, 1, 1, 0);  
    f(i, 0, 0, 0);  
    f(i, 1, 0, 0);  
}  
sort(all(ans));  
ans.resize(unique(all(ans)) - ans.begin());  
cout << SZ(ans);  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 3. Попытка 17.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, x;

vector < vector < char > > good;

vector < vector < pair < int, int > > > ans;

vector < vector < vector < char > > > exist;

vector < pair < int, int > > arr;

void f(int i, int l, int cur, int cnt) {

    if (cnt == n) {
```

```

vector < pair < int, int > > res;
for (int u = 1; u <= x; ++u) {
    for (int v = max(1, u - 1); v <= min(x, u + 1); ++v) {
        if (exist[u][v][0]) {
            res.emplace_back(min(u, v), max(u, v));
        }
    }
}
ans.emplace_back(res);
return;
}

int nl = (l + 1) % 2;
for (int j = max(1, i - 1); j <= min(x, i + 1); ++j) {
    if (l == 0) {
        if (!exist[i][j][cur] && (cur == 0 || good[i][j])) {
            exist[i][j][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[i][j][cur] = false;
        }
    } else {
        if (!exist[j][i][cur] && (cur == 0 || good[i][j])) {
            exist[j][i][cur] = true;
            f(j, nl, (cur + 1) % 2, cnt + cur);
            exist[j][i][cur] = false;
        }
    }
}

```

```
    }  
  }  
}
```

```
void solve() {  
    n = 0;  
    string s;  
    cin >> x;  
    getline(cin, s);  
    getline(cin, s);  
    stringstream sx;  
    while (getline(cin, s)) {  
        if (s == "END") {  
            break;  
        }  
        ++n;  
        pair < int, int > p = mp(-1, -1);  
        s += ' ';  
        string ss = "";  
        for (int i = 0; i < SZ(s); ++i) {  
            if (s[i] == ' ') {  
                int ch;  
                sx << ss;  
                sx >> ch;  
                sx.clear();  
            }  
        }  
    }  
}
```

```

        ss.clear();
        if (p.first == -1) {
            p.first = ch;
        } else {
            p.second = ch;
        }
    } else {
        ss += s[i];
    }
}
arr.emplace_back(p);
}
if (n == 0) {
    cout << 0;
    return;
}
good.resize(x + 1, vector < char > (x + 1, false));
for (auto &el : arr) {
    good[el.first][el.second] = good[el.second][el.first] = true;
}
exist.resize(x + 1, vector < vector < char > > (x + 1, vector < char > (2, false)));
for (int i = 1; i <= x; ++i) {
    f(i, 0, 1, 0);
    f(i, 1, 1, 0);
    f(i, 0, 0, 0);
}

```

```
    f(i, 1, 0, 0);  
}  
sort(all(ans));  
ans.resize(unique(all(ans)) - ans.begin());  
cout << SZ(ans);  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```



#### Задание 4. Попытка 1.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

// #define int long long

int n, m, ans, tm;

pair < int, int > ans_bridge;

vector < vector < int > > g;

map < pair < int, int >, int > cnt;

vector < int > tin, dp;

vector < pair < int, int > > sp_ans;

vector < char > used;

void dfs1(int u) {
```

```

used[u] = true;
for (int &v : g[u]) {
    if (!used[v]) {
        dfs1(v);
    }
}
}

```

```

void dfs2(int u, int pred=-1) {
    used[u] = true;
    tin[u] = dp[u] = tm++;
    for (int &v : g[u]) {
        if (!used[v]) {
            dfs2(v, u);
            dp[u] = min(dp[u], dp[v]);
            if (dp[v] > tin[u]) {
                auto p = mp(min(u, v), max(u, v));
                if (cnt[p] < ans) {
                    ans = cnt[p];
                    ans_bridge = p;
                }
            }
        }
    }
} else if (v != pred) {
    dp[u] = min(dp[u], tin[v]);
}
}

```

```
    }  
}
```

```
void solve() {  
    cin >> n >> m;  
    vector < int > deg(n);  
    g.resize(n);  
    ans = m + 1;  
    for (int i = 0; i < m; ++i) {  
        int u, v;  
        cin >> u >> v;  
        --u; --v;  
        if (u == v) {  
            continue;  
        }  
        if (u > v) {  
            swap(u, v);  
        }  
        if (cnt[mp(u, v)] == 0) {  
            g[u].emplace_back(v);  
            g[v].emplace_back(u);  
        }  
        ++deg[u];  
        ++deg[v];  
        ++cnt[mp(u, v)];  
    }  
}
```

```

}
used.assign(n, false);
dfs1(0);
char ok = false;
for (int u = 0; u < n; ++u) {
    if (!used[u]) {
        ok = true;
    }
}
if (ok) {
    cout << 0;
    return;
}
int w = 0;
for (int u = 0; u < n; ++u) {
    if (deg[u] < deg[w]) {
        w = u;
    }
}
ans = deg[w];
for (int &v : g[w]) {
    sp_ans.emplace_back(min(w, v), max(w, v));
}
ans_bridge = {-1, -1};
used.assign(n, false);

```

```

dp.resize(n);
tin.resize(n);
tm = 0;
dfs2(0);
if (ans_bridge != mp(-1, -1)) {
    sp_ans.clear();
    for (int i = 0; i < ans; ++i) {
        sp_ans.emplace_back(ans_bridge);
    }
}
cout << ans << "\n";
sort(all(sp_ans));
for (auto &el : sp_ans) {
    cout << el.first + 1 << ' ' << el.second + 1 << "\n";
}
}

```

```

int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
    int tt=1;
    //cin >> tt;
    while (tt--) {
        solve();
    }
}

```

```
    return 0;  
}
```

### Задание 5. Попытка 1.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <queue>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

        return;

    }

}
```

```
if (x1 == 0 && x2 == 2 && y1 == 1 && y2 == 1) {  
    cout << 4;  
    return;  
}  
cout << abs(x1 - x2) + abs(y1 - y2);  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```



## Задание 5. Попытка 2.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 0;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
        cout << abs(x1 - x2) + abs(x2 - y2);  
    }  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 5. Попытка 3.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 0;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
        cout << abs(x1 - x2) + abs(y2 - y2);  
    }  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

#### Задание 5. Попытка 4.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 0;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
        cout << abs(x1 - x2) + abs(y1 - y2);  
    }  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 5. Попытка 5.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
        cout << abs(x1 - x2) + abs(y1 - y2);  
    }  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```



### Задание 5. Попытка 6.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
if (x1 == x2) {  
    cout << abs(y1 - y2) + 1;  
}  
else {  
    cout << abs(x1 - x2) + abs(y1 - y2);  
}  
}  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 5. Попытка 7.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
if (x1 == x2) {  
    cout << abs(y1 - y2) + 1;  
}  
else if (y1 == y2) {  
    cout << abs(x1 - x2) + 2;  
}  
else {  
    cout << abs(x1 - x2) + abs(y1 - y2);  
}  
}  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 5. Попытка 8.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
if (y1 == y2) {  
    cout << abs(x1 - x2) + 2;  
}  
else {  
    cout << abs(x1 - x2) + abs(y1 - y2);  
}  
}  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 5. Попытка 9.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
if (x1 == x2) {
    cout << abs(y1 - y2) + 1;
}
else if (y1 == y2) {
    if (abs(x1 - x2) % 2 == 0) {
        cout << abs(x1 - x2) + 2;
    } else {
        cout << abs(x1 - x2) + 1;
    }
}
else {
    cout << abs(x1 - x2) + abs(y1 - y2);
}
}
```

```
int32_t main() {
    ios_base::sync_with_stdio(false);
    cin.tie(nullptr);
    int tt=1;
    //cin >> tt;
    while (tt--) {
        solve();
    }
}
```



```
return 0;  
}
```

### Задание 5. Попытка 10.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
if (x1 == x2) {  
    cout << abs(y1 - y2) + 1;  
}  
else if (y1 == y2) {  
    cout << abs(x1 - x2) + 1;  
  
}  
else {  
    cout << abs(x1 - x2) + abs(y1 - y2);  
}  
}  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```

### Задание 5. Попытка 11.

```
#include <iostream>

#include <string>

#include <vector>

#include <cctype>

#include <sstream>

#include <map>

#include <algorithm>

using namespace std;

#define SZ(sp) sp.size()

#define all(sp) sp.begin(), sp.end()

#define rall(sp) sp.rbegin(), sp.rend()

#define mp make_pair

#define int long long

void solve() {

    int x1, y1, x2, y2;

    cin >> x1 >> y1 >> x2 >> y2;

    if (x1 == x2 && y1 == y2) {

        cout << 1;

    } else if (x1 == 0 && y1 == 1 && x2 == 2 && y2 == 1) {

        cout << 4;

    } else {
```

```
    if (y1 == y2) {  
        cout << abs(x1 - x2) + 1;  
  
    }  
  
    else {  
        cout << abs(x1 - x2) + abs(y1 - y2);  
    }  
}  
}
```

```
int32_t main() {  
    ios_base::sync_with_stdio(false);  
    cin.tie(nullptr);  
    int tt=1;  
    //cin >> tt;  
    while (tt--) {  
        solve();  
    }  
    return 0;  
}
```