

# Олимпиада СПбГУ по информатике 2021/22 учебного года

A	B	C	D	E	F	Sum
100	100	100	80	58	0	438

## Task A ()

```
#include <bits/stdc++.h>

using namespace std;

#define int long long
#define all(v) v.begin(), v.end()
#define edilya adilichka
#define fori(i, n) for(int i = 0; i < n; i++)

int inf = 2e18;
int mod = 1e9 + 7;
int maxn = 2e5 + 1;

signed main() {
    cout.tie(nullptr), cin.tie(nullptr), ios_base::sync_with_stdio(false);
    cout.precision(20);
    // freopen("cakes.in", "r", stdin);
    // freopen("cakes.out", "w", stdout);
    #ifdef PUTIN
        freopen("input.txt", "r", stdin);
        freopen("output.txt", "w", stdout);
    #endif
    int q;
    cin >> q;
    map<int, int> rz;
    while(q--){
        int a, b;
        cin >> a >> b;
        while(a != 0){
            rz[++b] += a % 10;
            a /= 10;
        }
    }
    pair<int, int> mn = *rz.begin();
    int ans = mn.first - 1;
    while(mn.second % 10 == 0){
        rz[mn.first + 1] += mn.second / 10;
        mn = {mn.first + 1, rz[mn.first + 1]};
        ans++;
    }
    cout << ans;
}
```

## Task B ()

```
#include <bits/stdc++.h>

using namespace std;

#define int long long
#define all(v) v.begin(), v.end()
#define edilya adilichka
#define fori(i, n) for(int i = 0; i < n; i++)

int inf = 2e18;
int mod = 1e9 + 7;
int maxn = 2e5 + 1;

int get_ans(int p = 0) {
    if (p == 0) cout << "Flip_and_wait\n";
    else cout << "Wait\n";
    cout.flush();
    string s;
    cin >> s;
    int cnt = 0;
    fori(i, s.size()) {
        if (s[i] == 'e') cnt++;
    }
    return cnt / 2;
}

signed main() {
    cout.tie(nullptr), cin.tie(nullptr), ios_base::sync_with_stdio(false);
    cout.precision(20);
    // freopen("cakes.in", "r", stdin);
    // freopen("cakes.out", "w", stdout);
#ifdef PUTIN
    // freopen("input.txt", "r", stdin);
    // freopen("output.txt", "w", stdout);
#endif
    int n;
    cin >> n;
    vector<int> a(n);
    fori(i, n) {
        cin >> a[i];
    }
    int id = n - 1;
    while (id >= 0 && a[id] == 0) id--;
    int cnt = 0;
    while (id >= 0) {
        cnt += get_ans();
        while (cnt < id + 1) cnt += get_ans(1);
        a[id]--;
        cnt = 0;
        while (id >= 0 && a[id] == 0) {
            id--;
        }
    }
    cout << "Stop";
}
```

## Task C ()

```
#include <bits/stdc++.h>

using namespace std;

#define int long long
#define all(v) v.begin(), v.end()
#define edilya adilichka
#define fori(i, n) for(int i = 0; i < n; i++)

int inf = 2e18;
int mod = 1e9 + 7;
int maxn = 2e5 + 1;

signed main() {
    cout.tie(nullptr), cin.tie(nullptr), ios_base::sync_with_stdio(false);
    cout.precision(20);
    // freopen("cakes.in", "r", stdin);
    // freopen("cakes.out", "w", stdout);
    #ifdef PUTIN
        freopen("input.txt", "r", stdin);
        freopen("output.txt", "w", stdout);
    #endif
    int q;
    cin >> q;
    while (q--) {
        string s;
        cin >> s;
        map<char, int> cnt;
        int n = s.size();
        fori(i, n) cnt[s[i]]++;
        string ans;
        if (cnt['?'] == 0) {
            if (cnt['0'] >= cnt['1']) {
                if (cnt['0'] == n) {
                    fori(i, n / 2) ans += '?';
                    fori(i, n / 2 + n % 2) ans += '0';
                } else {
                    fori(i, n) {
                        if (s[i] == '0') ans += '?';
                        else ans += '1';
                    }
                }
            } else {
                fori(i, n) {
                    if (s[i] == '1') ans += '?';
                    else ans += '0';
                }
            }
        } else {
            if (cnt['?'] == n) {
                fori(i, n) ans += '1';
            } else {
                if (cnt['?'] > cnt['1'] && cnt['1'] != 0) {
                    fori(i, n) {
                        if (s[i] == '?') ans += '0';
                        else ans += '1';
                    }
                } else if (cnt['?'] > cnt['0'] && cnt['0'] != 0) {
                    fori(i, n) {
                        if (s[i] != '0') ans += '1';
                        else ans += '0';
                    }
                } else {
                    fori(i, n) {
                        if (s[i] != '1') ans += '0';
                        else ans += '1';
                    }
                }
            }
        }
        cout << ans << "\n";
    }
}
```



## Task D ()

```
#include <bits/stdc++.h>

using namespace std;

#define int long long
#define all(v) v.begin(), v.end()
#define edilya adilichka
#define fori(i, n) for(int i = 0; i < n; i++)

int inf = 2e18;
int mod = 998244353;
int maxn = 2e5 + 1;
int k = 1e8;
int get_ans(int p = 0) {
    if (p == 0) cout << "Flip_and_wait\n";
    else cout << "Wait\n";
    cout.flush();
    string s;
    cin >> s;
    int cnt = 0;
    fori(i, s.size()) {
        if (s[i] == 'e') cnt++;
    }
    return cnt / 2;
}

signed main() {
    cout.tie(nullptr), cin.tie(nullptr), ios_base::sync_with_stdio(false);
    cout.precision(20);
    // freopen("cakes.in", "r", stdin);
    // freopen("cakes.out", "w", stdout);
#ifdef PUTIN
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif
    vector<int> lol = {808258749, 117153405, 761699708, 573994984, 62402409, 511621808, 242726978,
        887890124,
        875880304};

    int n;
    cin >> n;
    ++n;
    int c = k;
    int id = -1;
    while (c < n) {
        c += k;
        id++;
    }
    int ans = 1;
    if (id != -1) ans = lol[id];
    for (int i = max(1LL, k * (id + 1) + 1); i <= n; i++) {
        ans *= i;
        ans %= mod;
    }
    cout << "0_" << ans;
}
```

## Task E ()

```
#include <bits/stdc++.h>

using namespace std;

#define int long long
#define all(v) v.begin(), v.end()
#define edilya adilychka
#define fori(i, n) for(int i = 0; i < n; i++)

int inf = 2e18;
int mod = 1e9 + 7;
int maxn = 2e5 + 1;

signed main() {
    cout.tie(nullptr), cin.tie(nullptr), ios_base::sync_with_stdio(false);
    cout.precision(20);
    // freopen("cakes.in", "r", stdin);
    // freopen("cakes.out", "w", stdout);
    #ifdef PUTIN
        freopen("input.txt", "r", stdin);
        freopen("output.txt", "w", stdout);
    #endif
    int n, q;
    cin >> n;
    vector<int> a(n);
    fori(i, n) cin >> a[i];
    cin >> q;
    while (q--) {
        int x, y, d;
        cin >> x >> y >> d;
        int ans = 0;
        for (int i = x; i < y; i++) {
            ans += d / a[i];
            if (d % a[i] != 0) ans++;
        }
        cout << ans << "\n";
    }
}
```

## Task F ()

```
#include <bits/stdc++.h>

using namespace std;

#define int long long
#define all(v) v.begin(), v.end()
#define edilya adilichka
#define fori(i, n) for(int i = 0; i < n; i++)

int mod = 998244353;
int maxn = 2e5 + 1;
int to = 1e4, pl = 1e4;
int inf = 2e18;

signed main() {
    cout.tie(nullptr), cin.tie(nullptr), ios_base::sync_with_stdio(false);
    cout.precision(20);
    // freopen("cakes.in", "r", stdin);
    // freopen("cakes.out", "w", stdout);
#ifdef PUTIN
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif
    int n;
    cin >> n;
    vector<pair<int, int>> a(n);
    vector<int> t(to * 2);
    t[to] = 1;
    fori(i, n) {
        cin >> a[i].first >> a[i].second;
        t[-a[i].first + to + 1]--;
        t[-a[i].second + to]++;
    }
    int ans = 1, now = 0;
    fori(i, to * 2) {
        now += t[i];
        ans = max(ans, now);
    }
    cout << ans;
}
```