

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;
using ll = long long;
#define print(x) cout << #x << ":_ " << x << endl;
#define print_arr(x) cout << #x << ":_ "; for(auto& y: x) cout << y << '_ ' ; cout << endl;

int main(){
    int n;
    cin >> n;
    multiset<pair<ll, ll>> hah;
    for (int i = 0; i < n; ++i){
        pair<ll, ll> x;
        cin >> x.second >> x.first;
        while(x.second % 10 == 0){
            x.first++;
            x.second /= 10;
        }
        hah.insert(x);
    }
    int i = 1;
    int g = 1;
    while(g && hah.size() > 1){
        auto [cur_b, cur_val] = *(hah.begin());
        hah.erase(hah.begin());
        g = 0;
        while(!hah.empty() && (*(hah.begin())).first == cur_b){
            cur_val += (*(hah.begin())).second;
            hah.erase(hah.begin());
            g = 1;
        }
        while(cur_val % 10 == 0){
            cur_val /= 10;
            cur_b++;
        }
        hah.insert({cur_b, cur_val});
    }
    auto [cur_b, cur_val] = *(hah.begin());
    cout << cur_b << '\n';
}
```

Task B ()

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

using namespace std;
using ll = long long;
#define print(x) cout << #x << ":_" << x << endl;
#define print_arr(x) cout << #x << ":_" ; for(auto& y: x) cout << y << ' '; cout << endl;
const ll mod = 998244353;

void solve(){
    int n;
    cin >> n;
    vector<int> k(n);
    int sum = 0;
    for (auto& x: k) {
        cin >> x;
        sum += x;
    }
    string s;
    cout << "Flip_and_wait" << endl;
    for (int i = n; i >= 1; --i){
        int cur = 0;
        while(k[i - 1]){
            cin >> s;
            cur += (s.size() - 3) / 2;
            if (cur >= i){
                k[i - 1]--;
                sum--;
                if (sum)
                    cout << "Flip_and_wait" << endl;
                cur = 0;
            }
            else{
                cout << "Wait" << endl;
            }
        }
    }
    cout << "Stop" << endl;
}

int main(){
    int t = 1;
    // cin >> t;
    while(t--){
        solve();
    }
}
```

Task C ()

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

using namespace std;
using ll = long long;
#define print(x) cout << #x << ":_" << x << endl;
#define print_arr(x) cout << #x << ":_" ; for(auto& y: x) cout << y << ' '; cout << endl;

void solve(){
    string s;
    cin >> s;
    int cnt0 = 0, cnt1 = 0;
    for (auto& x: s){
        if (x == '1')
            cnt1++;
        else if (x == '0')
            cnt0++;
    }
    string ans = "";
    if (cnt0 + cnt1 == s.size()){
        if (cnt1 == s.size()){
            for (int i = 0; i < s.size() / 2; ++i){
                ans += '?';
            }
            for (int i = s.size() / 2; i < s.size(); ++i){
                ans += '1';
            }
        }
        else if (cnt0 == s.size()){
            for (int i = 0; i < s.size(); ++i){
                ans += '?';
            }
        }
        else if (cnt1 != cnt0){
            for (auto& x: s){
                if (x == '0' + (cnt0 > cnt1))
                    ans += x;
                else
                    ans += '?';
            }
        }
        else{
            for (auto& x: s){
                if (x != s[0]){
                    ans += '?';
                }
                else{
                    ans += x;
                }
            }
        }
    }
    else{
        if (cnt0 + cnt1 == 0){
            for (auto& x: s)
                ans += '0';
        }
        else if (s.size() - cnt1 == s.size() / 2 && s[0] == '?'){
            for (auto& x: s)
                ans += '1';
        }
        else{
            for (auto& x: s){
                if (x != '?')
                    ans += x;
                else
                    ans += '0' + (cnt0 != 0);
            }
        }
    }
    cout << ans << endl;
}
```

```
int main(){
    int t;
    cin >> t;
    while(t--){
        solve();
    }
}
```

Task D ()

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

using namespace std;
using ll = long long;
#define print(x) cout << #x << ":_ " << x << endl;
#define print_arr(x) cout << #x << ":_ "; for(auto& y: x) cout << y << '_'; cout << endl;
const ll mod = 998244353;
const ll llllllllllllllllllll = 1;
long long n;
ll bin_pow(ll a, ll pow){
    if (pow == 0) return 1;
    if (pow % 2 == 0){
        ll res = bin_pow(a, pow / 2);
        return (res * res) % mod;
    }
    return (bin_pow(a, pow - 1) * a) % mod;
}

ll rev(ll a){
    return bin_pow(a, mod - 2);
}

ll diff(ll a, ll b){
    return (a * rev(b)) % mod;
}

void solve(){
    cin >> n;
    n++;
    ll f_ans = 0;
    f_ans += n / mod + n / (mod * mod);
    cout << f_ans << '_';
    ll cf;
    if ((n / mod) % 2 == 0)
        cf = 1;
    else
        cf = -1;
    ll hahahah = n / mod;
    if (hahahah >= mod){
        cf *= -1;
        hahahah -= mod;
    }
    ll res = 1;
    ll to = n % mod;
    if (to > mod - to){
        for (ll i = to + 1; i < mod; ++i){
            res = (res * i) % mod;
        }
        res = diff((mod - 1), res);
    }
    else{
        for (ll i = 1; i <= to; ++i){
            res = (res * i) % mod;
        }
    }
    to = hahahah;
    ll res1 = 1;
    if (to > mod - to){
        for (ll i = to + 1; i < mod; ++i){
            res1 = (res1 * i) % mod;
        }
        res1 = diff((mod - 1), res1);
    }
    else{
        for (int i = 1; i <= to; ++i){
            res1 = (res1 * i) % mod;
        }
    }
    res = (res * res1) % mod;
    if (cf == -1){
        res = mod - res;
    }
}
```

```
        cout << res << '\n';
    }

    int main(){
        int t = 1;
        // cin >> t;
        while(t--){
            solve();
        }
    }
}
```

Task E ()

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

using namespace std;
using ll = long long;
#define print(x) cout << #x << ":_" << x << endl;
#define print_arr(x) cout << #x << ":_"; for(auto& y: x) cout << y << '_'; cout << endl;
const ll mod = 998244353;

void solve(){
    int n;
    cin >> n;
    vector<int> v(n);
    for (auto& x: v) cin >> x;
    int q;
    cin >> q;
    for (int i = 0; i < q; ++i){
        int a, b, d;
        cin >> a >> b >> d;
        ll res = 0;
        for (int j = a; j < b; ++j){
            res += (d + v[j] - 1) / v[j];
        }
        cout << res << '\n';
    }
}

int main(){
    int t = 1;
    // cin >> t;
    while(t--){
        solve();
    }
}
```

Task F ()