Олимпиада СПбГУ по информатике 2022/23 учебного года

A	B	C	D	E	F	Sum
100	100	100	60	28	65	453

Task A ()

```
// clang-format off
#include <iostream>
#include <cstdio>
#include <cstdlib>
#include <cmath>
#include <algorithm>
#include <vector>
#include <map>
#include <set>
#include <bitset>
#include <queue>
#include <stack>
#include <sstream>
#include <cstring>
#include <numeric>
#include <ctime>
#include <cassert>
#include <random>
#include <deque>
#include <valarray>
#include <map>
#include <unordered_map>
#include <set>
#include <unordered_set>
#include <deque>
#include <functional>
#include <list>

using namespace std;

#define DEBUG

#define re return
#define fi first
#define se second
#define mp make_pair
#define pb emplace_back
#define all(x) x.begin(), x.end()
#define mfor(i, start, end) for (int i = (start); i < (end); i++)
#define rep(i, n) for (int i = 0; i < (n); i++)
#define rrep(i, n) for (int i = (n) - 1; i >= 0; i--)
#define fill(x, y) memset(x, y, sizeof(x))
#define sqr(x) ((x)*(x))
#define unq(x) (x.resize(unique(all(x)) - x.begin()))
#define ba back()
#define popcount __builtin_popcountll
#define fastIO() {ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);}
#define readArr(arr, n) {for (int i = 0; i < n; i++) cin >> arr[i];}
#define nl '\n'
#define uset unordered_set
#define umap unordered_map

#ifdef DEBUG

#define deb(x) cout << #x << "=" << x << ' '
#define debnl(x) cout << #x << "=" << x << endl
```

```
#define name(x) cout << #x << ' ';
#define print(v) {cout << #v << endl; for (auto x : v) cout << x << ' '; cout << endl;}
#define printnl(v) {cout << #v << endl; for (auto x : v) cout << x << endl;}
#define print1(v) {cout << #v << endl; for (auto x : v) cout << x + 1 << ' '; cout << endl;}
#define print2d(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y << ' ';
    cout << endl; }}
#define print2d1(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y + 1 << ' '
    ; cout << endl; }}
#define printpair(v) { cout << #v << endl; for (auto x : v) cout << '(' << x.first << ',' << x.
    second << ')' << ' '; cout << endl; };
#define print2dpair(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << '(' << y.
    first << ',' << y.second << ')' << ' '; cout << endl; }}

#else


#define deb(x)
#define debnl(x)
#define name(x)
#define print(v)
#define printnl(v)
#define print1(v)
#define print2d(v)
#define print2d1(v)
#define printpair(v)
#define print2dpair(v)


#endif // DEBUG

typedef vector<int> vi;
typedef vector<vi> vvi;
typedef vector<vvi> vvvi;
typedef pair<int, int> ii;
typedef vector<ii> vii;
typedef vector<vii> vvii;
typedef vector<vvii> vvvii;
typedef long long ll;
typedef unsigned long long ull;
typedef vector<char> vc;
typedef vector<vc> vvc;
typedef pair<ll, ll> pll;
typedef vector<ll> vll;
typedef vector<vll> vvll;
typedef vector<vvll> vvvll;
typedef vector<pll> vpll;
typedef vector<vpll> vvpll;
typedef vector<vvpll> vvvpll;
typedef long double LD;
typedef double D;
typedef pair<D, D> pdd;
typedef pair<LD, LD> pldd;

template<class T1, class T2> ostream& operator << (ostream &o, pair<T1, T2> x) {re o << '(' << x.
    fi << ", " << x.se << ')';}
template<class T1, class T2> istream& operator >> (istream &o, pair<T1, T2> &x) {re o >> x.fi >> x
    .se;}
template<class T1, class T2> pair<T1, T2> operator + (pair<T1, T2> a, pair<T1, T2> b) {a.fi += b.
    fi; a.se += b.se; re a;}
template<class T1, class T2> pair<T1, T2> operator - (pair<T1, T2> a, pair<T1, T2> b) {a.fi -= b.
    fi; a.se -= b.se; re a;}
template<class T1, class T2> void operator += (pair<T1, T2> &a, pair<T1, T2> b) {a.fi += b.fi; a.
    se += b.se;}
template<class T1, class T2> void operator -= (pair<T1, T2> &a, pair<T1, T2> b) {a.fi -= b.fi; a.
    se -= b.se;}
template<class T> vector<T> operator + (vector<T> a, vector<T> b) { a.insert(a.end(), b.begin(), b
    .end()); re a; }
template<class T> void operator += (vector<T> &a, vector<T> b) { a.insert(a.end(), b.begin(), b.
    end()); }

mt19937 rnd(12);

const int INF = 1e9 + 1;
const ll mod = 1e9 + 7;
```

```
void solve();

signed main() {
        fastIO();
        //freopen("file.in", "r", stdin);
        //freopen("file.out", "w", stdout);
        int T = 1;
        //      cin >> T;
        while (T--) {
                //              cout << "Case #" << tt + 1 << ": ";
                solve();
        }
}


/* ================ actual code starts here ================ */

int fac(int n){
    int res= 1;
    for (int i = 1; i <= n; i++) res *= i;
    return res;
}

void solve() {
    int n = 6;
    vi true_inds(n);
    for (int i = 0; i < n; i++) cin >> true_inds[i];
    vi perm(n);
    iota(all(perm), 1);

    for (int p = 0; p < fac(n); p++){
        vi inds(n), s;
        bool flag = true;
        for (int i = 0; i < n; i++){
            s.push_back(perm[i]);
            sort(all(s));
            inds[i] = lower_bound(all(s), perm[i]) - s.begin() + 1;
            if (true_inds[i] != inds[i]){
                flag = false;
                break;
            }
        }
//        print(perm);
//        print(true_inds);
//        print(inds);

        if (flag){
            for (int i = 0; i < n; i++){
                cout << perm[i] << ' ';
            }
            return;
        }

        next_permutation(all(perm));
    }
}
```

Task B ()

```
// clang-format off
#include <iostream>
#include <cstdio>
#include <cstdlib>
#include <cmath>
#include <algorithm>
#include <vector>
#include <map>
#include <set>
#include <bitset>
#include <queue>
#include <stack>
#include <sstream>
#include <cstring>
#include <numeric>
#include <ctime>
#include <cassert>
#include <random>
#include <deque>
#include <valarray>
#include <map>
#include <unordered_map>
#include <set>
#include <unordered_set>
#include <deque>
#include <functional>
#include <list>

using namespace std;

#define DEBUG

#define re return
#define fi first
#define se second
#define mp make_pair
#define pb emplace_back
#define all(x) x.begin(), x.end()
#define mfor(i, start, end) for (int i = (start); i < (end); i++)
#define rep(i, n) for (int i = 0; i < (n); i++)
#define rrep(i, n) for (int i = (n) - 1; i >= 0; i--)
#define fill(x, y) memset(x, y, sizeof(x))
#define sqr(x) ((x)*(x))
#define unq(x) (x.resize(unique(all(x)) - x.begin()))
#define ba back()
#define popcount __builtin_popcountll
#define fastIO() {ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);}
#define readArr(arr, n) {for (int i = 0; i < n; i++) cin >> arr[i];}
#define nl '\n'
#define uset unordered_set
#define umap unordered_map

#ifdef DEBUG

#define deb(x) cout << #x << "=" << x << ' '
#define debnl(x) cout << #x << "=" << x << endl
#define name(x) cout << #x << ' ';
#define print(v) {cout << #v << endl; for (auto x : v) cout << x << ' '; cout << endl;}
#define printnl(v) {cout << #v << endl; for (auto x : v) cout << x << endl;}
#define print1(v) {cout << #v << endl; for (auto x : v) cout << x + 1 << ' '; cout << endl;}
#define print2d(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y << ' ';
    cout << endl; }}
#define print2d1(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y + 1 << ' '
    ; cout << endl; }}
#define printpair(v) { cout << #v << endl; for (auto x : v) cout << '(' << x.first << ',' << x.
    second << ')' << ' '; cout << endl; };
#define print2dpair(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << '(' << y.
    first << ',' << y.second << ')' << ' '; cout << endl; }}

#else
```

```
#define deb(x)
#define debnl(x)
#define name(x)
#define print(v)
#define printnl(v)
#define print1(v)
#define print2d(v)
#define print2d1(v)
#define printpair(v)
#define print2dpair(v)


#endif // DEBUG

typedef vector<int> vi;
typedef vector<vi> vvi;
typedef vector<vvi> vvvi;
typedef pair<int, int> ii;
typedef vector<ii> vii;
typedef vector<vii> vvii;
typedef vector<vvii> vvvii;
typedef long long ll;
typedef unsigned long long ull;
typedef vector<char> vc;
typedef vector<vc> vvc;
typedef pair<ll, ll> pll;
typedef vector<ll> vll;
typedef vector<vll> vvll;
typedef vector<vvll> vvvll;
typedef vector<pll> vpll;
typedef vector<vpll> vvpll;
typedef vector<vvpll> vvvpll;
typedef long double LD;
typedef double D;
typedef pair<D, D> pdd;
typedef pair<LD, LD> pldd;

template<class T1, class T2> ostream& operator << (ostream &o, pair<T1, T2> x) {re o << '(' << x.
    fi << ",␣" << x.se << ')';}
template<class T1, class T2> istream& operator >> (istream &o, pair<T1, T2> &x) {re o >> x.fi >> x
    .se;}
template<class T1, class T2> pair<T1, T2> operator + (pair<T1, T2> a, pair<T1, T2> b) {a.fi += b.
    fi; a.se += b.se; re a;}
template<class T1, class T2> pair<T1, T2> operator - (pair<T1, T2> a, pair<T1, T2> b) {a.fi -= b.
    fi; a.se -= b.se; re a;}
template<class T1, class T2> void operator += (pair<T1, T2> &a, pair<T1, T2> b) {a.fi += b.fi; a.
    se += b.se;}
template<class T1, class T2> void operator -= (pair<T1, T2> &a, pair<T1, T2> b) {a.fi -= b.fi; a.
    se -= b.se;}
template<class T> vector<T> operator + (vector<T> a, vector<T> b) { a.insert(a.end(), b.begin(), b
    .end()); re a; }
template<class T> void operator += (vector<T> &a, vector<T> b) { a.insert(a.end(), b.begin(), b.
    end()); }

mt19937 rnd(12);

const int INF = 1e9 + 1;
const ll mod = 1e9 + 7;
const int W = 1e6;

void solve1();
void solve2();

signed main() {
        fastIO();
        //freopen("file.in", "r", stdin);
        //freopen("file.out", "w", stdout);

        int T = 1;
        string role;

        cin >> role;
        while (T--) {
                //              cout << "Case #" << tt + 1 << ": ";
```

```
        if (role == "first") solve1();
        else solve2();
    }
}


/* ================ actual code starts here ================ */

void solve1(){
    int n;
    cin >> n;
    vi a(n);
    readArr(a, n);
    int s = accumulate(all(a), 0);
    int r = s % n;
    cout << s / n + r * W << nl;
}

void solve2() {
    int n;
    cin >> n;
    vi b(n);
    readArr(b, n);
    int r = b[0] / W;
    int full = 0;
    for (int i = 0; i < n; i++){
        full += b[i] - r * W;
    }

    cout << full + r << nl;
}
```

Task C ()

```
// clang-format off
#include <iostream>
#include <cstdio>
#include <cstdlib>
#include <cmath>
#include <algorithm>
#include <vector>
#include <map>
#include <set>
#include <bitset>
#include <queue>
#include <stack>
#include <sstream>
#include <cstring>
#include <numeric>
#include <ctime>
#include <cassert>
#include <random>
#include <deque>
#include <valarray>
#include <map>
#include <unordered_map>
#include <set>
#include <unordered_set>
#include <deque>
#include <functional>
#include <list>

using namespace std;

//#define DEBUG

#define re return
#define fi first
#define se second
#define mp make_pair
#define pb emplace_back
#define all(x) x.begin(), x.end()
#define mfor(i, start, end) for (int i = (start); i < (end); i++)
#define rep(i, n) for (int i = 0; i < (n); i++)
#define rrep(i, n) for (int i = (n) - 1; i >= 0; i--)
#define fill(x, y) memset(x, y, sizeof(x))
#define sqr(x) ((x)*(x))
#define unq(x) (x.resize(unique(all(x)) - x.begin()))
#define ba back()
#define popcount __builtin_popcountll
#define fastIO() {ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);}
#define readArr(arr, n) {for (int i = 0; i < n; i++) cin >> arr[i];}
#define nl '\n'
#define uset unordered_set
#define umap unordered_map

#ifdef DEBUG

#define deb(x) cout << #x << "=" << x << ' '
#define debnl(x) cout << #x << "=" << x << endl
#define name(x) cout << #x << ' ';
#define print(v) {cout << #v << endl; for (auto x : v) cout << x << ' '; cout << endl;}
#define printnl(v) {cout << #v << endl; for (auto x : v) cout << x << endl;}
#define print1(v) {cout << #v << endl; for (auto x : v) cout << x + 1 << ' '; cout << endl;}
#define print2d(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y << ' ';
    cout << endl; }}
#define print2d1(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y + 1 << ' '
    ; cout << endl; }}
#define printpair(v) { cout << #v << endl; for (auto x : v) cout << '(' << x.first << ',' << x.
    second << ')' << ' '; cout << endl; };
#define print2dpair(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << '(' << y.
    first << ',' << y.second << ')' << ' '; cout << endl; }}

#else
```

```
#define deb(x)
#define debnl(x)
#define name(x)
#define print(v)
#define printnl(v)
#define print1(v)
#define print2d(v)
#define print2d1(v)
#define printpair(v)
#define print2dpair(v)


#endif // DEBUG

typedef vector<int> vi;
typedef vector<vi> vvi;
typedef vector<vvi> vvvi;
typedef pair<int, int> ii;
typedef vector<ii> vii;
typedef vector<vii> vvii;
typedef vector<vvii> vvvii;
typedef long long ll;
typedef unsigned long long ull;
typedef vector<char> vc;
typedef vector<vc> vvc;
typedef pair<ll, ll> pll;
typedef vector<ll> vll;
typedef vector<vll> vvll;
typedef vector<vvll> vvvll;
typedef vector<pll> vpll;
typedef vector<vpll> vvpll;
typedef vector<vvpll> vvvpll;
typedef long double LD;
typedef double D;
typedef pair<D, D> pdd;
typedef pair<LD, LD> pldd;

template<class T1, class T2> ostream& operator << (ostream& o, pair<T1, T2> x) { re o << '(' << x.
    fi << ",␣" << x.se << ')'; }
template<class T1, class T2> istream& operator >> (istream& o, pair<T1, T2>& x) { re o >> x.fi >>
    x.se; }
template<class T1, class T2> pair<T1, T2> operator + (pair<T1, T2> a, pair<T1, T2> b) { a.fi += b.
    fi; a.se += b.se; re a; }
template<class T1, class T2> pair<T1, T2> operator - (pair<T1, T2> a, pair<T1, T2> b) { a.fi -= b.
    fi; a.se -= b.se; re a; }
template<class T1, class T2> void operator += (pair<T1, T2>& a, pair<T1, T2> b) { a.fi += b.fi; a.
    se += b.se; }
template<class T1, class T2> void operator -= (pair<T1, T2>& a, pair<T1, T2> b) { a.fi -= b.fi; a.
    se -= b.se; }
template<class T> vector<T> operator + (vector<T> a, vector<T> b) { a.insert(a.end(), b.begin(), b
    .end()); re a; }
template<class T> void operator += (vector<T>& a, vector<T> b) { a.insert(a.end(), b.begin(), b.
    end()); }

mt19937 rnd(12);

const int INF = 1e9 + 1;
const ll mod = 1e9 + 7;
const int N = 3;

void solve();

signed main() {
    fastIO();
    //freopen("file.in", "r", stdin);
    //freopen("file.out", "w", stdout);
    int T = 1;
    //  cin >> T;
    while (T--) {
        //              cout << "Case #" << tt + 1 << ": ";
        solve();
    }
}
```

```
/* ================ actual code starts here ================ */

int a[N], b[N], used[N];

vi bs;
vii ans;

int it = 0;

void global_check() {
    int i = bs[0], j = bs[1], k = bs[2];
    it++;

    for (auto t : { j, k }) {
        if (b[i] == b[j] + b[k] && a[j] == a[k]) {
            ans.push_back({ a[i] - a[t], b[i] });
        }
        if (b[i] < b[j] + b[k] && a[j] + a[k] <= a[i]) {
            ans.push_back({ a[t], b[i] - b[t] });
        }

        if (b[i] == b[j] && b[i] == b[k]) {
            ans.push_back({ a[i] - (a[j] + a[k]), b[i] });
        }

        if (a[i] == a[j] + a[k] && b[j] == b[k]) {
            ans.push_back({ a[i], b[i] - b[t] });
        }

        if (a[i] < a[j] + a[k] && b[j] + b[k] <= b[i]) {
            ans.push_back({ a[i] - a[t], b[t] });
        }

        if (a[i] == a[j] && a[i] == a[k]) {
            ans.push_back({ a[i], b[i] - (b[j] + b[k]) });
        }


    }
    deb(i); deb(j); debnl(k);
    print(ans);


}

void gen(int i) {
    if (i == N) {
        global_check();
        return;
    }

    for (int j = 0; j < N; j++) {
        if (used[j]) continue;
        if (i > 0 && (a[j] > a[bs[0]] || b[j] > b[bs[0]])) continue;

        if (i == 0) {
            ans.push_back({ a[j], b[j] });
        }
        if (i == 1 && a[j] == a[bs[0]]) {
            ans.push_back({ a[j], b[bs[0]] - b[j] });
        }
        if (i == 1 && b[j] == b[bs[0]]) {
            ans.push_back({ a[bs[0]] - a[j] , b[j] });
        }


        for (int p = 0; p < 2; p++) {
            used[j] = 1;
            bs.push_back(j);
            gen(i + 1);
            bs.pop_back();
            used[j] = 0;
            swap(a[j], b[j]);
```

```
        }



    }
}

void solve() {
    for (int i = 0; i < N; i++) {
        cin >> a[i] >> b[i];
        if (a[i] > b[i]) swap(a[i], b[i]);
    }

    gen(0);

    for (auto& p : ans) {
        if (p.first > p.second) swap(p.first , p.second);
    }

    sort(all(ans));
    unq(ans);

    for (auto p : ans) {
        if (p.first > 0) cout << p.first << ' ' << p.second << nl;
    }
}
```

Task D ()

```
// clang-format off
#include <iostream>
#include <cstdio>
#include <cstdlib>
#include <cmath>
#include <algorithm>
#include <vector>
#include <map>
#include <set>
#include <bitset>
#include <queue>
#include <stack>
#include <sstream>
#include <cstring>
#include <numeric>
#include <ctime>
#include <cassert>
#include <random>
#include <deque>
#include <valarray>
#include <map>
#include <unordered_map>
#include <set>
#include <unordered_set>
#include <deque>
#include <functional>
#include <list>

using namespace std;

#define DEBUG

#define re return
#define fi first
#define se second
#define mp make_pair
#define pb emplace_back
#define all(x) x.begin(), x.end()
#define mfor(i, start, end) for (int i = (start); i < (end); i++)
#define rep(i, n) for (int i = 0; i < (n); i++)
#define rrep(i, n) for (int i = (n) - 1; i >= 0; i--)
#define fill(x, y) memset(x, y, sizeof(x))
#define sqr(x) ((x)*(x))
#define unq(x) (x.resize(unique(all(x)) - x.begin()))
#define ba back()
#define popcount __builtin_popcountll
#define fastIO() {ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);}
#define readArr(arr, n) {for (int i = 0; i < n; i++) cin >> arr[i];}
#define nl '\n'
#define uset unordered_set
#define umap unordered_map

#ifdef DEBUG

#define deb(x) cout << #x << "=" << x << ' '
#define debnl(x) cout << #x << "=" << x << endl
#define name(x) cout << #x << ' ';
#define print(v) {cout << #v << endl; for (auto x : v) cout << x << ' '; cout << endl;}
#define printnl(v) {cout << #v << endl; for (auto x : v) cout << x << endl;}
#define print1(v) {cout << #v << endl; for (auto x : v) cout << x + 1 << ' '; cout << endl;}
#define print2d(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y << ' ';
    cout << endl; }}
#define print2d1(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y + 1 << ' '
    ; cout << endl; }}
#define printpair(v) { cout << #v << endl; for (auto x : v) cout << '(' << x.first << ',' << x.
    second << ')' << ' '; cout << endl; };
#define print2dpair(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << '(' << y.
    first << ',' << y.second << ')' << ' '; cout << endl; }}

#else
```

```
#define deb(x)
#define debnl(x)
#define name(x)
#define print(v)
#define printnl(v)
#define print1(v)
#define print2d(v)
#define print2d1(v)
#define printpair(v)
#define print2dpair(v)


#endif // DEBUG

typedef vector<int> vi;
typedef vector<vi> vvi;
typedef vector<vvi> vvvi;
typedef pair<int, int> ii;
typedef vector<ii> vii;
typedef vector<vii> vvii;
typedef vector<vvii> vvvii;
typedef long long ll;
typedef unsigned long long ull;
typedef vector<char> vc;
typedef vector<vc> vvc;
typedef pair<ll, ll> pll;
typedef vector<ll> vll;
typedef vector<vll> vvll;
typedef vector<vvll> vvvll;
typedef vector<pll> vpll;
typedef vector<vpll> vvpll;
typedef vector<vvpll> vvvpll;
typedef long double LD;
typedef double D;
typedef pair<D, D> pdd;
typedef pair<LD, LD> pldd;

template<class T1, class T2> ostream& operator << (ostream& o, pair<T1, T2> x) { re o << '(' << x.
    fi << ",␣" << x.se << ')'; }
template<class T1, class T2> istream& operator >> (istream& o, pair<T1, T2>& x) { re o >> x.fi >>
    x.se; }
template<class T1, class T2> pair<T1, T2> operator + (pair<T1, T2> a, pair<T1, T2> b) { a.fi += b.
    fi; a.se += b.se; re a; }
template<class T1, class T2> pair<T1, T2> operator - (pair<T1, T2> a, pair<T1, T2> b) { a.fi -= b.
    fi; a.se -= b.se; re a; }
template<class T1, class T2> void operator += (pair<T1, T2>& a, pair<T1, T2> b) { a.fi += b.fi; a.
    se += b.se; }
template<class T1, class T2> void operator -= (pair<T1, T2>& a, pair<T1, T2> b) { a.fi -= b.fi; a.
    se -= b.se; }
template<class T> vector<T> operator + (vector<T> a, vector<T> b) { a.insert(a.end(), b.begin(), b
    .end()); re a; }
template<class T> void operator += (vector<T>& a, vector<T> b) { a.insert(a.end(), b.begin(), b.
    end()); }

mt19937 rnd(12);

const int INF = 1e9 + 1;
const ll mod = 1e9 + 7;
const int C = 52;

void solve();

signed main() {
    fastIO();
    //freopen("file.in", "r", stdin);
    //freopen("file.out", "w", stdout);
    int T = 1;
    //  cin >> T;
    while (T--) {
        //              cout << "Case #" << tt + 1 << ": ";
        solve();
    }
}
```

```
/* ================ actual code starts here ================ */

int nim[2][C];

void precalc() {
    for (int i = 0; i < C; i++) nim[0][i] = i;

}

void solve() {
    int n;
    cin >> n;
    vi a(n), org_a;
    for (int i = 0; i < n; i++) {
        cin >> a[i];
    }




    org_a = a;
    vi rebooted(n);

    bool playing = true;

    while (playing) {
        bool lost = true;

        for (int i = 0; i < n; i++) lost &= (a[i] == 0 && rebooted[i]);

        if (lost) {
            cout << "-1 -1" << endl;
            playing = false;
            return;
        }


        int x = 0;
        for (int i = 0; i < n; i++) {
            x ^= (a[i] + (!rebooted[i] && a[i] == org_a[i]));
        }

        /*if (x == 0) {
            cout << "-1 -1" << endl;
            playing = false;
            return;
        }*/

        bool done = false;

        if (x == 0) {
            cout << "-1 -1" << endl;
            return;
        }
        else {
            for (int i = 0; i < n && !done; i++) {
                if (!rebooted[i]) {
                    if ((x ^ (a[i] + (a[i] == org_a[i])) ^ org_a[i]) == 0) {
                        a[i] = org_a[i];
                        rebooted[i] = 1;
                        done = true;
                        cout << i + 1 << ' ' << 0 << endl;
                    }
                }
                for (int j = 1; j <= a[i] && !done; j++) {
                    if ((x ^ (a[i] + (!rebooted[i] && a[i] == org_a[i])) ^ (a[i] - j)) == 0) {
                        a[i] -= j;
                        done = true;
                        cout << i + 1 << ' ' << j << endl;
                    }
                }
            }
```

```
        }

        int v, k;

        cin >> v >> k;
        if (v == -1 && k == -1) {
            playing = false;
            break;
        }
        v--;

        if (k == 0) rebooted[v] = 1, a[v] = org_a[v];
        else a[v] -= k;
    }
}
```

Task E ()

```
// clang-format off
#include <iostream>
#include <cstdio>
#include <cstdlib>
#include <cmath>
#include <algorithm>
#include <vector>
#include <map>
#include <set>
#include <bitset>
#include <queue>
#include <stack>
#include <sstream>
#include <cstring>
#include <numeric>
#include <ctime>
#include <cassert>
#include <random>
#include <deque>
#include <valarray>
#include <map>
#include <unordered_map>
#include <set>
#include <unordered_set>
#include <deque>
#include <functional>
#include <list>

using namespace std;

#define DEBUG

#define re return
#define fi first
#define se second
#define mp make_pair
#define pb emplace_back
#define all(x) x.begin(), x.end()
#define mfor(i, start, end) for (int i = (start); i < (end); i++)
#define rep(i, n) for (int i = 0; i < (n); i++)
#define rrep(i, n) for (int i = (n) - 1; i >= 0; i--)
#define fill(x, y) memset(x, y, sizeof(x))
#define sqr(x) ((x)*(x))
#define unq(x) (x.resize(unique(all(x)) - x.begin()))
#define ba back()
#define popcount __builtin_popcountll
#define fastIO() {ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);}
#define readArr(arr, n) {for (int i = 0; i < n; i++) cin >> arr[i];}
#define nl '\n'
#define uset unordered_set
#define umap unordered_map

#ifdef DEBUG

#define deb(x) cout << #x << "=" << x << ' '
#define debnl(x) cout << #x << "=" << x << endl
#define name(x) cout << #x << ' ';
#define print(v) {cout << #v << endl; for (auto x : v) cout << x << ' '; cout << endl;}
#define printnl(v) {cout << #v << endl; for (auto x : v) cout << x << endl;}
#define print1(v) {cout << #v << endl; for (auto x : v) cout << x + 1 << ' '; cout << endl;}
#define print2d(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y << ' ';
    cout << endl; }}
#define print2d1(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << y + 1 << ' '
    ; cout << endl; }}
#define printpair(v) { cout << #v << endl; for (auto x : v) cout << '(' << x.first << ',' << x.
    second << ')' << ' '; cout << endl; };
#define print2dpair(v) { cout << #v << endl; for (auto x : v) { for (auto y : x) cout << '(' << y.
    first << ',' << y.second << ')' << ' '; cout << endl; }}

#else
```

```
#define deb(x)
#define debnl(x)
#define name(x)
#define print(v)
#define printnl(v)
#define print1(v)
#define print2d(v)
#define print2d1(v)
#define printpair(v)
#define print2dpair(v)


#endif // DEBUG

typedef vector<int> vi;
typedef vector<vi> vvi;
typedef vector<vvi> vvvi;
typedef pair<int, int> ii;
typedef vector<ii> vii;
typedef vector<vii> vvii;
typedef vector<vvii> vvvii;
typedef long long ll;
typedef unsigned long long ull;
typedef vector<char> vc;
typedef vector<vc> vvc;
typedef pair<ll, ll> pll;
typedef vector<ll> vll;
typedef vector<vll> vvll;
typedef vector<vvll> vvvll;
typedef vector<pll> vpll;
typedef vector<vpll> vvpll;
typedef vector<vvpll> vvvpll;
typedef long double LD;
typedef double D;
typedef pair<D, D> pdd;
typedef pair<LD, LD> pldd;

template<class T1, class T2> ostream& operator << (ostream &o, pair<T1, T2> x) {re o << '(' << x.
    fi << ",␣" << x.se << ')';}
template<class T1, class T2> istream& operator >> (istream &o, pair<T1, T2> &x) {re o >> x.fi >> x
    .se;}
template<class T1, class T2> pair<T1, T2> operator + (pair<T1, T2> a, pair<T1, T2> b) {a.fi += b.
    fi; a.se += b.se; re a;}
template<class T1, class T2> pair<T1, T2> operator - (pair<T1, T2> a, pair<T1, T2> b) {a.fi -= b.
    fi; a.se -= b.se; re a;}
template<class T1, class T2> void operator += (pair<T1, T2> &a, pair<T1, T2> b) {a.fi += b.fi; a.
    se += b.se;}
template<class T1, class T2> void operator -= (pair<T1, T2> &a, pair<T1, T2> b) {a.fi -= b.fi; a.
    se -= b.se;}
template<class T> vector<T> operator + (vector<T> a, vector<T> b) { a.insert(a.end(), b.begin(), b
    .end()); re a; }
template<class T> void operator += (vector<T> &a, vector<T> b) { a.insert(a.end(), b.begin(), b.
    end()); }

mt19937 rnd(12);

const int INF = 1e9 + 1;
const ll mod = 1e9 + 7;
const int N = 10;
const int P = 11;
int dp[N+1][N+1];
int ps[N+1];

int mult(ll a, ll b) {
    return (a * b) % mod;
}

int add(int a, int b) {
    if (a + b > mod) return a + b - mod;
    return a + b;
}


void build_ps() {
```

```
    ps[0] = 1;
    for (int i = 0; i < N; i++) {
        ps[i + 1] = mult(ps[i], P);
    }
}

void precalc() {
    dp[0][0] = 1;
    for (int i = 1; i <= N; i++){
        for (int x = 0; x <= N; x++){
            for (int y = 0; y <= x; y++){
                dp[i][x] += dp[i-1][y];
            }
        }
    }
}

vvi seqs;
vi curseq;
map<int, int> match;

int get_hash(vi &a) {
    int h = 0;
    for (int i = 0; i < N; i++) {
        h = add(h, mult(ps[i], a[i]));
    }
    return h;
}

void gen(int i){
    if (i == N){
        match[get_hash(curseq)] = seqs.size();
        seqs.push_back(curseq);
        return;
    }

    for (int x = ((i == 0) ? 0 : curseq[i - 1]); x <= N; x++){
        curseq.push_back(x);
        gen(i+1);
        curseq.pop_back();
    }
}

void solve1();
void solve2();

signed main() {
        fastIO();
        //freopen("file.in", "r", stdin);
        //freopen("file.out", "w", stdout);

    build_ps();
    gen(0);

        int T = 1;
        string role;
        cin >> T;
        cin >> role;
        while (T--) {
                //              cout << "Case #" << tt + 1 << ": ";
                if (role == "transmit") solve1();
                else solve2();
        }
}


/* ================ actual code starts here ================ */

void solve1(){
    int n;
    cin >> n;
    n--;
    vvi ans(N, vi(N));
    for (int i = 0; i < N; i++){
```

```
        for (int j = 0; j < seqs[n][i]; j++){
            ans[i][j] = 1;
        }
    }

    for (int i = 0; i < N; i++){
        for (int j = 0; j < N; j++){
            cout << ans[i][j];
        }
        cout << nl;
    }

    cout << nl;

}

void solve2() {
    vvi a(N, vi(N));

    for (int i = 0; i < N; i++) {
        for (int j = 0; j < N; j++) {
            char c;
            cin >> c;
            a[i][j] = c - '0';
        }
    }

    vi seq(N);
    for (int i = 0; i < N; i++) seq[i] = accumulate(all(a[i]), 0);
    sort(all(seq));
    int n = match[get_hash(seq)] + 1;
    cout << n << nl;

}
```

Task F ()

```
a = int(input())
b = int(input())
print(a + b)
```