Олимпиада СПбГУ по информатике 2022/23 учебного года

A	B	C	D	E	F	Sum
100	100	100	100	40	0	440

Task A ()

```
#include<vector>
#include<iostream>

using namespace std;
int main() {
        vector<int> v;

        for (int i = 0; i< 6; i++)
        {
                int d1;
                cin >> d1;
                v.push_back(d1);
        }
        //cin >> d1 >> d2 >> d3 >> d4 >> d5 >> d6;

        vector<int> a;
        vector<int> b;

        vector<int> c;

        int j = 0;

        for (auto now : v) {
                a.clear();
                b.clear();
                --now; ++j;

                for (int i = 0; i < now; i++) {
                        a.push_back(c[i]);
                }
                for (int i = now; i < c.size(); i++) {
                        b.push_back(c[i]);
                }c.clear();

                for (auto now : a) {
                        c.push_back(now);
                }
                c.push_back(j);
                for (auto now : b) {
                        c.push_back(now);
                }
        }
        vector<int> ans(6, 0);

        for (int i = 0; i < 6; i++) {
                ans[c[i] - 1] = i + 1;
        }for (auto now : ans)cout << now << ' ';
}
```

Task B ()

```cpp
#include<iostream>
#include<string>

using namespace std;
int main() {
	string s;
	cin >> s;
	if (s == "first") {
		int n;
		cin >> n;
		long long int x = 0;
		for (int i = 0; i < n; i++)
		{
			int f;
			cin >> f;
			x += f;
		}
		x *= 100000;
		cout << x;
	}
	else{
		//15000
		int n;
		cin >> n;
		long long int x = 0;
		for (int i = 0; i < n; i++)
		{
			int f;
			cin >> f;
			x += f;
		}
		cout << x / 100000 / n + x % 100000;
	}
}
```

Task C ()

```
#include<vector>
#include<set>
#include<iostream>

using namespace std;

set<pair<int, int>> ans;


void add(int aaa, int bbb) {
        ans.insert({ min(aaa,bbb),
                        max(aaa,bbb) });
}

void addp(pair<int, int> ccc) { add(ccc.first, ccc.second); }



void checktwo(pair<int,int> fi,pair<int,int> se) {
        if (se.first > fi.first or se.second > fi.second) swap(fi, se);

        if (se.first <= fi.first and se.second <= fi.second) {
                if (se.first == fi.first and se.second < fi.second) {
                        add(fi.first, fi.second - se.second);
                }
                if (se.first < fi.first and se.second == fi.second) {
                        add(fi.first - se.first, fi.second);
                }
        }
}

void checkthree(pair<int, int> aa, pair<int, int> bb, pair<int, int> cc) {
        if (aa.first == bb.first + cc.first and bb.second==cc.second and aa.second > bb.second) {
                add(aa.second - bb.second,aa.first);
        }
        if (aa.first >= bb.first + cc.first and bb.second + cc.second > aa.second and aa.second>bb
            .second and aa.second > cc.second) {
                add(bb.first, aa.second - bb.second);
        }
        if (bb.second + cc.second == aa.second and bb.first + cc.first == aa.first) {
                add(bb.first, cc.second);
                add(bb.second, cc.first);
        }
        if (bb.second == cc.second and bb.second == aa.second and bb.first + cc.first < aa.first)
            {
                add(bb.second, aa.first - cc.first - bb.first);
        }
}

int main() {

        vector<pair<int, int>> pr(3);

        for (int i = 0; i < 3; i++)
        {
                cin >> pr[i].first >> pr[i].second;
                addp(pr[i]);
        }

        for(int i = 0 ;i  < 3;i++){
                for (int j = i + 1; j < 3; j++)
                {
                        checktwo(pr[i], pr[j]);
                        swap(pr[j].first, pr[j].second);
                        checktwo(pr[i], pr[j]);
                }
                swap(pr[i].first, pr[i].second);
                for (int j = i + 1; j < 3; j++)
                {
                        checktwo(pr[i], pr[j]);
                        swap(pr[j].first, pr[j].second);
                        checktwo(pr[i], pr[j]);
```

```
                }
        }

        //for (auto now : ans)cout << now.first << ' '<<now.second<<'\n';
        // 1 2 3
        // 1 3 2
        // 2 1 3
        // 2 3 1
        // 3 1 2
        // 3 2 1

        for (int i = 0; i < 3; i++) {
                for (int j = 0; j < 3; j++)
                {
                        if (i != j) {
                                for (int h = 0; h < 3; h++)
                                {
                                        if (i != j and j != h and h != i) {
                                                checkthree(pr[i], pr[j], pr[h]);
                                                swap(pr[h].first , pr[h].second);
                                                checkthree(pr[i], pr[j], pr[h]);
                                        }
                                }
                                swap(pr[j].first , pr[j].second);
                                for (int h = 0; h < 3; h++)
                                {
                                        if (i != j and j != h and h != i) {
                                                checkthree(pr[i], pr[j], pr[h]);
                                                swap(pr[h].first , pr[h].second);
                                                checkthree(pr[i], pr[j], pr[h]);
                                        }
                                }
                        }
                }

                swap(pr[i].first , pr[i].second);

                for (int j = 0; j < 3; j++)
                {
                        if (i != j) {
                                for (int h = 0; h < 3; h++)
                                {
                                        if (i != j and j != h and h != i) {
                                                checkthree(pr[i], pr[j], pr[h]);
                                                swap(pr[h].first , pr[h].second);
                                                checkthree(pr[i], pr[j], pr[h]);
                                        }
                                }
                                swap(pr[j].first , pr[j].second);
                                for (int h = 0; h < 3; h++)
                                {
                                        if (i != j and j != h and h != i) {
                                                checkthree(pr[i], pr[j], pr[h]);
                                                swap(pr[h].first , pr[h].second);
                                                checkthree(pr[i], pr[j], pr[h]);
                                        }
                                }
                        }
                }
        }
        //checkthree({4,6} , {2,3},{2,3});
        for (auto now : ans)cout << now.first << ' ' << now.second << '\n';
}
```

Task D ()

```
#include<vector>
#include<iostream>

using namespace std;

vector<int> a;
vector<int> startnim;

bool used[100];

pair<int,int> query(int i,int kol) {
        cout << i << ' ' << kol << '\n';
        cout.flush();

        pair<int, int> cc;
        cin >> cc.first >> cc.second;
        return cc;
}

int main() {
        int n;
        cin >> n;
        int xoor = 0;
        for (int i = 0; i < n; i++)
        {
                int f;
                cin >> f; ++f;
                a.push_back(f);
                startnim.push_back(f - 1);
                xoor ^= f;
        }

        if (xoor == 0) {
                cout << "-1 -1";
                return 0;
        }

        while (true) {
                for (int i = 0; i < n; i++) {
                        int now = a[i];

                        if ((now ^ xoor) < now) {
                                pair<int, int> cc;
                                if (used[i] == 0) {
                                        used[i] = 1;
                                        cc = query(i + 1, now - 1 - (now ^ xoor));


                                }
                                else {
                                        used[i] = 1;
                                        cc = query(i + 1, now - (now ^ xoor));
                                }

                                a[i] = (now ^ xoor);

                                if (cc.first == -1 and cc.second == -1) {
                                        return 0;
                                }

                                xoor = 0;

                                xoor ^= a[cc.first - 1];

                                if (cc.second == 0) {
                                        used[cc.first - 1] = 1;
                                        a[cc.first - 1] = startnim[cc.first - 1];
                                }
                                else {
                                        if (!used[cc.first - 1]) a[cc.first - 1]--;
                                        used[cc.first - 1] = 1;
                                        a[cc.first - 1] -= cc.second;
```

```
                                }

                                xoor ^= a[cc.first - 1];
                                break;
                            }
                        }
                    }
                }
```

Task E ()

Task F ()