Олимпиада СПбГУ по информатике 2019/20 учебного года

A	B	C	D	E	F	Sum
100	100	0	20	89	0	309

Task A ()

```cpp
#include <iostream>

using namespace std;

int main() {
    int a;
    cin >> a;
    cout << a - 1;
}
```

Task B ()

```java
import java.util.Scanner;

import static java.lang.Math.*;

public class Main {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        double[] x = new double[6];
        double[] y = new double[6];
        int n = scanner.nextInt();
        for(int i = 0; i < n; i++) {
            x[i] = Double.parseDouble(scanner.next());
            y[i] = Double.parseDouble(scanner.next());
        }
        if (n == 6) {
            double sx = 0;
            double sy = 0;
            for(int i = 0; i < 6; i++) {
                sx += x[i];
                sy += y[i];
            }
            sx /= 6;
            sy /= 6;
            printPoint(sx, sy);
            for(int i = 0; i < 6; i++) {
                if(x[i] > sx && y[i] > sy) {
                    printPoint(x[i] - sx, y[i] - sy);
                    printPoint(0, 0);
                    return;
                }
            }
        } else {
            double phi = atan(y[1] / x[1]);
            double r = sqrt(y[1] * y[1] + x[1] * x[1]);
            for(int i = 0; i < 6; i++) {
                printPoint(x[0] + r * cos(phi), y[0] + r * sin(phi));
                phi += PI / 3;
            }
        }
    }

    public static void printPoint(double x, double y) {
        System.out.println(x + "␣" + y);
    }
}
```

Task C ()

Task D ()

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

using namespace std;

int iabs(int a) {
    return a > 0 ? a : -a;
}

int main()
{
    int n, m;
    cin >> n >> m;
    if(n != 1) {
        if(m == 3) cout << 1;
        else cout << 4;
        return 0;
    }
    int ar, ac, br, bc;
    cin >> ar >> ac >> br >> bc;
    int c1 = ac - 1;
    int c2 = bc - 1;
    vector<pair<int, int>> a(m);
    for(int i = 0; i < m; i++) {
        int r, c;
        cin >> r >> c;
        a[i] = { r, c };
    }
    if(c1 == c2) {
        cout << 0;
        return 0;
    }
    int ans = 0;
    if(a[c1].first != 0) ans++;
    c1 += a[c1].second;
    ans += iabs(c1 - c2);
    if(c1 < c2) {
        for(int i = c1; i < c2; i++) {
            if(0 <= i && i < m && a[i].first == 0 && a[i].second == 1)
                ans--;
        }
    } else {
        for(int i = c1; i > c2; i--) {
            if(0 <= i && i < m && a[i].first == 0 && a[i].second == -1)
                ans--;
        }
    }
    cout << ans;
}
```

Task E ()

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

using namespace std;

inline int p(int i) {
    return 1 << i;
}

int main()
{
    int mx2 = 0;
    int n, m, B;
    cin >> n >> m >> B;
    vector<int> x(B);
    vector<int> y(B);
    for(int i = 0; i < B; i++)
        cin >> x[i] >> y[i];
    for(int i = 0; i < B; i++) {
        x[i]--;
        y[i]--;
    }
    int k = p(B);
    vector<bool> ok(k, true);
    int id = 0;

    while(k > 1) {
        int i = 0;
        int cur = 0;
        while(i < k) {
            bool brk = false;
            i += 2;

            if(cur == ok.size()) break;
            while(!ok[cur]) {
                cur++;
                if(cur == ok.size()) {
                    brk = true;
                    break;
                }
            }
            if(brk) break;
            cout << "? " << x[id] + n * 1ll * cur << ' ' << y[id] << ' ';

            cur++;
            if(cur == ok.size()) {
                cout << mx2++ << ' ' << m * 2 << '\n';
                fflush(stdout);
                int x0, y0;
                cin >> x0 >> y0;
                x0 /= n;
                if(0 <= x0 && x0 < ok.size())
                    ok[x0] = false;
                break;
            }
            while(!ok[cur]) {
                cur++;
                if(cur == ok.size()) {
                    brk = true;
                    cout << mx2++ << ' ' << m * 2 << '\n';
                    fflush(stdout);
                    int x0, y0;
                    cin >> x0 >> y0;
                    x0 /= n;
                    if(0 <= x0 && x0 < ok.size())
                        ok[x0] = false;
                    break;
                }
            }
            if(brk) break;
            cout << x[id] + n * 1ll * cur << ' ' << y[id] << '\n';
```

```cpp
            cur++;

            fflush(stdout);

            int x0, y0;
            cin >> x0 >> y0;
            x0 /= n;
            if(0 <= x0 && x0 < ok.size())
                ok[x0] = false;
        }
        k /= 2;
        id++;
    }

    int cur = 0;
    while(!ok[cur]) cur++;
    cout << "!_" << n * 1ll * cur << "_0\n";
    fflush(stdout);
}
```

Task F ()