

Олимпиада СПбГУ по информатике 2019/20 учебного года

A	B	C	D	E	F	Sum
100	100	100	40	0	0	340

Task A ()

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

using namespace std;

#define fst first
#define snd second
#define forn(i, n) for(int i = 0; i < int(n); ++i)
#define forab(i, a, b) for(int i = int(a); i < int(b); ++i)
#define fornr(i, n) for(int i = int(n) - 1; i >= 0; --i)
#define all(X) X.begin(), X.end()
#define sz(X) (int)(X.size())

typedef long long ll;
typedef long double ld;
typedef vector<int> vi;
typedef pair<int, int> pii;

int main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    int n;
    cin >> n;
    cout << n-1 << "\n";
    return 0;
}
```

Task B ()

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

using namespace std;

#define fst first
#define snd second
#define forn(i, n) for(int i = 0; i < int(n); ++i)
#define forab(i, a, b) for(int i = int(a); i < int(b); ++i)
#define fornrr(i, n) for(int i = int(n) - 1; i >= 0; --i)
#define all(X) X.begin(), X.end()
#define sz(X) (int)(X.size())
#define pb push_back

typedef long long ll;
typedef long double ld;
typedef vector<int> vi;
typedef pair<int, int> pii;
typedef pair<double, double> Point;

Point mid(const Point &a, const Point &b){
    return {(a.fst+b.fst)/2.0, (a.snd+b.snd)/2.0};
}

void read(Point &p){
    cin >> p.fst >> p.snd;
}
void print(const Point &p){
    cout << p.fst << "_" << p.snd << "\n";
}
Point operator - (const Point &a, const Point&b){
    return {(a.fst-b.fst), (a.snd-b.snd)};
}
Point operator + (const Point &a, const Point&b){
    return {(a.fst+b.fst), (a.snd+b.snd)};
}

ll len(const Point &a){
    return a.fst*a.fst+a.snd*a.snd;
}

Point start;

int operator*(const Point &a, const Point&b){
    return a.fst*b.snd-a.snd*b.fst;
}

bool cmp(const Point &a, const Point&b){
    Point c = a-start;
    Point d = b-start;
    if (c*d>0) return true;
    else if (c*d<0) return false;
    else return len(c)<len(d);
}
int main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    cout.precision(20);
    int n;
    cin >> n;
    if (n==6)
    {
        vector<Point> a(n);
        cout << "\n";
        forn(i, n)
        {
            read(a[i]);
            //print(a[i]);
        }
        Point mx = make_pair(-10000, -10000);
```

```

    forn(i, n){
        Point p = a[i];
        if (p.fst>mx.fst) mx = p;
        else if (p.fst==mx.fst && p.snd>mx.snd) mx = p;
    }
    start = mx;
    sort(all(a), cmp);
    //forn(i, n) print(a[i]);
    // << endl;
    print(a[0]);
    print(a[1]);
    print(mid(a[0], a[3]));
} else {
    vector<Point> a(6);
    read(a[0]);
    read(a[1]);
    Point m;
    read(m);
    Point d1 = a[0]-m;
    a[3] = m - d1;
    Point d2 = a[1]-m;
    a[4] = m - d2;

    Point d3 = mid(a[1], a[3])-m;
    double len1 = sqrt(d2.fst*d2.fst+d2.snd*d2.snd);
    double len2 = sqrt(d3.fst*d3.fst+d3.snd*d3.snd);
    d3.fst*=(len1/len2);
    d3.snd*=(len1/len2);
    a[2] = m+d3;
    a[5] = m-d3;

    forn(i, 6){
        print(a[i]);
    }
}
return 0;
}

```

Task C ()

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

using namespace std;

#define fst first
#define snd second
#define forn(i, n) for(int i = 0; i < int(n); ++i)
#define forab(i, a, b) for(int i = int(a); i < int(b); ++i)
#define fornrr(i, n) for(int i = int(n) - 1; i >= 0; --i)
#define all(X) X.begin(), X.end()
#define sz(X) (int)(X.size())
#define pb push_back

typedef long long ll;
typedef long double ld;
typedef vector<int> vi;
typedef pair<int, int> pii;
typedef pair<double, double> Point;

int main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    cout.precision(20);
    string t;
    cin >> t;
    int m = sz(t);
    int ans = 0;
    int q;
    cin >> q;
    while(q--){
        string s;
        cin >> s;
        int n = sz(s);
        int mx = 0;
        forn(i, n){
            int len = 0, j = 0;
            while(i+len < n && j < m){
                while(j < m && t[j] != s[i+len]) j++;
                if (j < m) len++, j++;
            }
            mx = max(mx, len);
        }
        ans += m-mx;
    }
    cout << ans << "\n";
    return 0;
}
```

Task D ()

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

using namespace std;

#define fst first
#define snd second
#define forn(i, n) for(int i = 0; i < int(n); ++i)
#define forab(i, a, b) for(int i = int(a); i < int(b); ++i)
#define fornrr(i, n) for(int i = int(n) - 1; i >= 0; --i)
#define all(X) X.begin(), X.end()
#define sz(X) (int)(X.size())
#define pb push_back

typedef long long ll;
typedef long double ld;
typedef vector<int> vi;
typedef pair<int, int> pii;
typedef pair<double, double> Point;

const int N = 1000;

int d[N][N];
pii a[N][N];
int main()
{
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    cout.precision(20);
    int n, m;
    cin >> n >> m;
    int sx, sy, fx, fy;
    cin >> sx >> sy >> fx >> fy;
    forn(i, N) forn(j, N) d[i][j] = 2e9;
    sx--, sy--, fx--, fy--;
    forn(i, n)
    {
        forn(j, m)
        {
            cin >> a[i][j].fst >> a[i][j].snd;
        }
    }
    d[sx][sy] = 0;
    set<pair<int, pii>> > q;
    q.insert({0, {sx, sy}});
    while(!q.empty()){
        int dist = q.begin()->fst;
        pii p = q.begin()->snd;
        q.erase(q.begin());
        int cx = p.fst + a[p.fst][p.snd].fst, cy = p.snd + a[p.fst][p.snd].snd;
        forab(dx, -n, n+1){
            forab(dy, -m, m+1){
                int nx = cx+dx, ny = cy+dy;
                if (0<=nx && nx < n && 0<=ny && ny<=m){
                    if (d[nx][ny]>dist+abs(dx)+abs(dy)){
                        q.erase({d[nx][ny], {nx, ny}});
                        d[nx][ny]=dist+abs(dx)+abs(dy);
                        q.insert({d[nx][ny], {nx, ny}});
                    }
                }
            }
        }
    }
    cout << d[fx][fy] << "\n";
    return 0;
}
```

Task E ()

Task F ()