

Олимпиада СПбГУ по информатике 2018/19 учебного года

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A	B	C	D	E	F	Sum
100	100	100	0	46	0	346

Task A (100)

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

using namespace std;

int main()
{
#ifdef debug
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif // debug
    int n, m;
    cin >> n >> m;
    while(n <= m){
        if(n == m){
            cout << "Yes";
            return 0;
        }
        n*=2;
    }
    cout << "No";
    return 0;
}
```

Task B (100)

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

using namespace std;

string s;
int n;

int main()
{
#ifdef debug
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif // debug
    ios_base::sync_with_stdio(false); cin.tie(0);
    cin >> n >> s;
    for(int i = 0; i < n - 1; i++){
        if(s[i] == 'o' && s[i+1] == 'r'){
            cout << "Yes";
            return 0;
        }
    }
    for(int i = 0; i < n - 1; i++){
        swap(s[i], s[i+1]);
        if(s[i] == 'o' && s[i+1] == 'r'){
            cout << "Yes";
            return 0;
        }
    }
    if(i > 0)
        if(s[i-1] == 'o' && s[i] == 'r'){
            cout << "Yes";
            return 0;
        }
    if(i < n-2)
        if(s[i+1] == 'o' && s[i+2] == 'r'){
            cout << "Yes";
            return 0;
        }
    swap(s[i], s[i+1]);
}
cout << "No";
return 0;
}
```

Task C (100)

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

using namespace std;

int n, sz[100500], ans[100500];
vector< vector<int> > g;

void dfs(int v, int p){
    int tmp = 0, to, old;
    for(int i = 0; i < g[v].size(); i++){
        tmp = max(tmp, sz[g[v][i]]);
    }
    ans[v] = tmp + 1;
    for(int i = 0; i < g[v].size(); i++){
        to = g[v][i];
        if(to == p)
            continue;
        old = sz[v];
        sz[v] = n - sz[to];
        dfs(to, v);
        sz[v] = old;
    }
}

void calc_size(int v, int p){
    sz[v] = 1;
    int to;
    for(int i = 0; i < g[v].size(); i++){
        to = g[v][i];
        if(to == p)
            continue;
        calc_size(to, v);
        sz[v] += sz[to];
    }
}

int main()
{
#ifdef debug
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif // debug
    ios_base::sync_with_stdio(false); cin.tie(0);
    cin >> n;
    g.resize(n);
    int x, y;
    for(int i = 0; i < n - 1; i++){
        cin >> x >> y;
        g[x-1].push_back(y-1);
        g[y-1].push_back(x-1);
    }
    calc_size(0, -1);
    dfs(0, -1);
    for(int i = 0; i < n; i++)
        cout << ans[i] << ' ';
    return 0;
}
```

Task D (0)

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

using namespace std;

string s, cr, a, b;
int n, p, t;

int main()
{
#ifdef debug
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif // debug
    ios_base::sync_with_stdio(false); cin.tie(0);
    cin >> s >> t >> n >> p;
    if(s == "split"){
        for(int i = 0; i < t; i++){
            cin >> s;
            cr = {s[0], s[1], s[2], s[3], s[4], s[5], s[6]};
            cout << cr << '\n';
            cr = {s[2], s[3], s[4], s[5], s[6], s[7], s[8]};
            cout << cr << '\n';
            cr = {s[0], s[1], s[2], s[4], s[6], s[7], s[8]};
            cout << cr << endl;
        }
    }
    else{
        for(int i = 0; i < t; i++){
            cin >> a >> b;
            if(a[0] == b[2] && a[1] == b[3] && a[2] == b[4]
               && a[3] == b[5] && a[4] == b[6]){
                cout << b << a[5] << a[6] << endl;
                continue;
            }
            swap(a,b);
            if(a[0] == b[2] && a[1] == b[3] && a[2] == b[4]
               && a[3] == b[5] && a[4] == b[6]){
                cout << b << a[5] << a[6] << endl;
                continue;
            }
            if(a[0] == b[0] && a[1] == b[1] && a[2] == b[2]
               && a[3] == b[4] && a[4] == b[6]){
                cout << b << a[5] << a[6] << endl;
                continue;
            }
            swap(a,b);
            if(a[0] == b[0] && a[1] == b[1] && a[2] == b[2]
               && a[3] == b[4] && a[4] == b[6]){
                cout << b << a[5] << a[6] << endl;
                continue;
            }
            if(a[2] == b[0] && a[3] == b[2] && a[4] == b[4]
               && a[5] == b[5] && a[6] == b[6]){
                cout << a[0] << a[1] << b << endl;
                continue;
            }
            swap(a,b);
            if(a[2] == b[0] && a[3] == b[2] && a[4] == b[4]
               && a[5] == b[5] && a[6] == b[6]){
                cout << a[0] << a[1] << b << endl;
                continue;
            }
        }
    }
    return 0;
}
```

Task E (46)

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

using namespace std;

typedef long long ll;
typedef long double ld;

ll n, xp, yp, xq, yq, xend, yend;
ll x[100500], y[100500];
map<ll, int> was;

ll dist(int i){
    return (x[i]-xend)*(x[i]-xend) + (y[i]-yend)*(y[i]-yend);
}

int main()
{
#ifdef debug
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
#endif // debug
    ios_base::sync_with_stdio(false); cin.tie(0);
    cin >> n;
    for(int i = 0; i < n; i++)
        cin >> x[i] >> y[i];
    cin >> xp >> yp >> xq >> yq;
    xend = xp + (xq-xp)*2281337228, yend = yp + (yq-yp)*2281337228;
    ll mindist = dist(0), minid = 0, t;
    was[mindist]++;
    for(int i = 1; i < n; i++){
        t = dist(i);
        was[t]++;
        if(t < mindist){
            mindist = t;
            minid = i;
        }
    }
    if(was[mindist] > 1){
        cout << -1;
        return 0;
    }
    else
        cout << minid + 1;
    return 0;
}
```

Task F (—)