

# Олимпиада СПбГУ по информатике 2018/19 учебного года

Гаврилов Кирилл Анатольевич

A	B	C	D	E	F	Sum
100	100	100	60	100	7	467

## Task A (100)

```
#include <bits/stdc++.h>
using namespace std;
typedef long long ll;
#define IOS ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);
int const maxn=1e6;
int n,m;
void input(){
    cin>>n;
    cin>>m;
}
void solve(){
    bool flag=false;
    while (n<101){
        if (n==m){
            flag=true;
        }
        n*=2;
    }
    if (flag){
        cout<<"Yes";
    }
    else{
        cout<<"No";
    }
}
int main() {
    IOS
    input(),solve();
    return 0;
}
```

## Task B (100)

```
#include <bits/stdc++.h>
using namespace std;
typedef long long ll;
#define IOS ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);
int const maxn=1e6;
int n;
string temp;
void input(){
    cin>>n;
    cin>>temp;
}
void solve(){
    bool flag=false;
    for (int i=0;i<n-1;i++){
        if ((temp[i]=='o'&&temp[i+1]=='r') || (temp[i]=='r'&&temp[i+1]=='o')){
            flag=true;
        }
    }
    for (int i=0;i<n-2;i++){
        if ((temp[i]=='o'&&temp[i+2]=='r')){
            flag=true;
        }
    }
    if (flag){
        cout<<"Yes";
    }
    else{
        cout<<"No";
    }
}
int main() {
    IOS
    input(),solve();
    return 0;
}
```

## Task C (100)

```
#include <bits/stdc++.h>
using namespace std;
typedef long double ll;
#define IOS ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);
int const maxn=1e6;
int n;
vector<int> adj[maxn];
vector<int> ans[maxn];
bool used[maxn];
int after[maxn];
int curr[maxn];
int dfs(int v,int yet){
    int g=yet;
    used[v]=true;
    for (size_t i=0;i<adj[v].size();i++){
        int tm=adj[v][i];
        if (!used[tm]){
            int now=dfs(tm,yet+1);
            yet=now;
        }
    }
    after[v]=yet-g;
    return yet;
}
void input(){
    cin>>n;
    fill (curr,curr+maxn,0);
    fill (used,used+maxn,false);
    int from,to;
    for (int i=0;i<n-1;i++){
        cin>>from>>to;
        adj[from].push_back(to);
        adj[to].push_back(from);
    }
}
void solve(){
    if (n==1){
        cout<<1;
        return;
    }
    dfs(1,0);
    for (int i=1;i<=n;i++){
        for (size_t j=0;j<adj[i].size();j++){
            int lol=adj[i][j];
            if (after[i]>after[lol]){
                ans[i].push_back(after[lol]+1);
            }
            else{
                ans[i].push_back(n-after[i]-1);
            }
        }
        sort(ans[i].begin(),ans[i].end());
        cout<<ans[i][ans[i].size()-1]+1<<"_";
    }

    return;
}

int main() {
    IOS
    input(),solve();
    return 0;
}
```

## Task D (60)

```
type=input()
c='zzz'
t,n,p=map(int,input().split())
if type=="split":
    if n==3:
        for i in range(t):
            now=input()
            first=now[0:6]+'a'
            second=now[3:9]+'b'
            third=now[0:3]+now[6:9]+'c'
            lul=first
            lol=second
            a=[]
            a.append(first)
            a.append(second)
            a.append(third)
            print(*a)
    else:
        for i in range(t):
            now = input()
            first = now[0:6] + 'a'
            second = now[3:9] + 'b'
            third = now[0:3] + now[6:9] + 'c'
            lul = first
            lol = second
            a=[]
            a.append(first)
            a.append(second)
            a.append(third)
            a.append(lul)
            a.append(lol)
            print(*a)
else:
    if n==3:
        for i in range(t):
            x,y=map(str,input().split())
            if (x[6]=='a'):
                if (y[6]=='b'):
                    print(x[0:6]+y[3:6])
                    continue
                else:
                    print(x[0:6]+y[3:6])
                    continue
            elif x[6]=='b':
                if (y[6]=='a'):
                    print(y[0:6]+x[3:6])
                    continue
                else:
                    print(y[0:3]+x[0:6])
                    continue
            else:
                if y[6]=='a':
                    print(y[0:6] + x[3:6])
                    continue
                else:
                    print(x[0:3] + y[0:6])
                    continue
    else:
        for i in range(t):
            x,y,z=map(str,input().split())
            if x==y:
                y=z
            if (x[6]=='a'):
                if (y[6]=='b'):
                    print(x[0:6]+y[3:6])
                    continue
                else:
                    print(x[0:6]+y[3:6])
                    continue
```

```

elif x[6]=='b':
    if (y[6]=='a'):
        print(y[0:6]+x[3:6])
        continue
    else:
        print(y[0:3]+x[0:6])
        continue
else:
    if y[6]=='a':
        print(y[0:6] + x[3:6])
        continue
    else:
        print(x[0:3] + y[0:6])
        continue

```

### Task E (100)

[illegible]

## Task F (7)

```
#include <bits/stdc++.h>
using namespace std;
typedef long long ll;
#define IOS ios::sync_with_stdio(0); cin.tie(0); cout.tie(0);
#pragma gcc.optimize()
int const maxn=1e6;
int n,k;
int r[40];
int b[40];
int ans[40][3];
void go(int v,int yet,int exr,int exb){
    if (v==n){
        ans[v][0]=max(ans[v][0],yet);
        return;
    }
    if (exr<=ans[v][1]&&exb<=ans[v][2]&&yet<=ans[v][0]&&(!ans[v][0]==0)){
        return;
    }
    if (yet>ans[v][0]){
        ans[v][0]=yet;
        ans[v][1]=exr;
        ans[v][2]=exb;
    }
    int bec=0,nowr=0,nowb=0;

    nowb=exb+k;
    bec=yet+min(nowb,b[v]);
    nowb-=bec-yet;
    nowr=exr-min(r[v],exr);
    bec+=exr-nowr;
    if (v==n-1){
        ans[n][0]=max(bec,ans[n][0]);
    }
    else
        go(v+1,bec,nowr,nowb);
    bec=0,nowr=0,nowb=0;
    nowr=exr+k;
    bec=yet+min(nowr,r[v]);
    nowr-=bec-yet;
    nowb=exb-min(b[v],exb);
    bec+=exb-nowb;
    if (v==n-1){
        ans[n][0]=max(bec,ans[n][0]);
    }
    else
        go(v+1,bec,nowr,nowb);
}
void input(){
    cin>>n>>k;
    for (int i=0;i<n;i++){
        cin>>r[i]>>b[i];
    }
}
void solve(){
    go(0,0,0,0);
    cout<<ans[n][0];
    return;
}

int main() {
    IOS
    input(),solve();
    return 0;
}
```