

Олимпиада СПбГУ по информатике 2018/19 учебного года

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A	B	C	D	E	F	Sum
100	100	60	60	100	24	444

Task A (100)

```
#include <bits/stdc++.h>
using namespace std;
typedef long long ll;
#define IOS ios::sync_with_stdio(0); cin.tie(0);

int main() {
    IOS;
    int a, b;
    cin >> a >> b;
    if (b < a)
        cout << "NO";
    else if (b == a)
        cout << "YES";
    else {
        while (a <= b) {
            if (a == b) {
                cout << "YES";
                return 0;
            }
            a *= 2;
        }
        cout << "NO";
    }
    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);

int main() {
    IOS;
    int n;
    cin>>n;
    string kek;
    cin>>kek;
    int opos=-10,rpos=-10;
    for(int i=0;i<n;i++){
        if(kek[i]=='r'){
            if(i-opos<3){
                cout<<"Yes";
                return 0;
            }
            rpos=i;
        }
        if(kek[i]=='o'){
            if(i-rpos<2){
                cout<<"Yes";
                return 0;
            }
            opos=i;
        }
    }
    cout<<"No";
    return 0;
}
```

Task C (60)

```
n = int(input())
if n>1e3:
    a=0
    b=n-1
    ans=[]
    for i in range(n):
        ans.append(1+max(a,b))
        a+=1
        b-=1
    print(*ans)
    exit()
s=[]
for i in range(n):
    s.append([])
for i in range(n-1):
    a,b =map(int,input().split())
    s[a-1].append(b-1)
    s[b-1].append(a-1)
def dfs(prev,curr):
    su = 0
    for k in s[curr]:
        if k != prev:
            su += dfs(curr, k)
    return su + 1
def solve(a):
    lol = [0]
    for l in s[a]:
        lol.append(dfs(a,l))
    return max(lol)+1
ans= []
for i in range(n):
    ans.append(solve(i))
print(*ans)
```

Task D (60)

```
com=input()
t,n,p=map(int,input().split())
if com=="split":
    for i in range(t):
        lol = input()
        ans=[]
        if n==3:
            ans.append('a'+lol[:6])
            ans.append('b'+lol[3:])
            ans.append('c'+lol[:3]+lol[6:])
        else:
            ans.append('a' + lol[:6])
            ans.append('a' + lol[:6])
            ans.append('b' + lol[3:])
            ans.append('b' + lol[3:])
            ans.append('c' + lol[:3] + lol[6:])
        print(*ans)
elif com=="merge":
    for i in range(t):
        lol=input().split()
        ans=['']*9
        for g in lol:
            biba=[]
            if g[0]=='a':
                biba=[0,1,2,3,4,5]
            if g[0]=='b':
                biba=[3,4,5,6,7,8]
            if g[0]=='c':
                biba=[0,1,2,6,7,8]
            for p in range(6):
                ans[biba[p]]=g[p+1]
        aa=""
        for e in ans:
            aa+=e
        print(aa)
```

Task E (100)

```
import math
n = int(input())
if n==1:
    print(1)
    exit()
kek = []
for i in range(n):
    kek.append(list(map(int, input().split())))
Px,Py = map(int, input().split())
Qx,Qy = map(int, input().split())
x=(Qx-Px)*int(1e30/(((Qx-Px)**2+(Qy-Py)**2)**0.5))
y=(Qy-Py)*int(1e30/(((Qx-Px)**2+(Qy-Py)**2)**0.5))
def p(c):
    return (c[0]-x)**2+(c[1]-y)**2
ans=[]
ans2=[]
for k in kek:
    ans.append(p(tuple([k[0]-Px,k[1]-Py])))
    ans2.append(p(tuple([k[0]-Px,k[1]-Py])))
ans.sort()
# print(ans2)
if ans[1]==ans[0]:
    print(-1)
else:
    print(ans2.index(ans[0])+1)
```

Task F (24)

```
n,k = map(int , input().split())
lol=[]
for i in range(n):
    lol.append(list(map(int , input().split())))
req1 =0
req2=0
choise=[0]*n
ans=0
for i in range(n-1,-1,-1):
    req1+=lol[i][0]
    req2+=lol[i][1]
    a=0
    if n%2 or (k)%2 or (i+1)%2:
        a=1
    if req1>a+req2:
        choise[i]=1
        pr=req1
        req1-=k
        req1=max(0, req1)
        ans+=pr-req1
    else:
        choise[i]=2
        pr=req2
        req2-=k
        req2=max(0, req2)
        ans+=pr-req2
# print(choise)
print(ans)
```