

Олимпиада СПбГУ по информатике 2018/19 учебного года

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A	B	C	D	E	F	Sum
100	100	100	0	35	72	407

Task A (100)

```
n = int(input())
m = int(input())
while n < m:
    n *= 2
if n == m:
    print('Yes')
else:
    print('No')
```

Task B (100)

```
import sys

n = int(input())
s = input()
a = 0
if 'or' in s or 'ro' in s:
    print('Yes')
    sys.exit()

for i in range(2,n):
    if s[i] == 'r' and s[i-2] == 'o':
        a += 1
if a > 0:
    print('Yes')
else:
    print('No')
```

Task C (100)

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

using namespace std;
long long const maxn = 1e5 + 1;

long long n;
vector <long long> sh(maxn, -1);
vector <long long> g[maxn];
vector <long long> jojo(maxn);

long long dfs(long long v, long long p){
    jojo[v] = p;
    if (sh[v] != -1) {
        return sh[v];
    }
    long long res = 1;
    for (long long jj : g[v]) {
        if (jj != p) {
            res += dfs(jj, v);
        }
    }
    sh[v] = res;
    return sh[v];
}

int main() {
    cin >> n;
    for (long long i = 0; i < n - 1; ++i) {
        long long jj, v;
        cin >> jj >> v;
        g[v].push_back(jj);
        g[jj].push_back(v);
    }
    dfs(1, 0);

    for (long long i = 1; i <= n; ++i) {
        long long answer = -1;
        for (long long jj : g[i]) {
            if (jj != jojo[i]) {
                answer = max(answer, sh[jj]);
            }
        }
        answer = max(answer, n - sh[i]);
        cout << answer + 1 << " ";
    }
}
```

Task D (—)

Task E (35)

```
n = int(input())
a, b = [], []

for i in range(n):
    x = list(map(int, input().split()))
    a.append(x[0])
    b.append(x[1])

th, th1 = input(), input()

mnogo = 1000000000000000000000000
ans = []

for i in range(n):
    ans.append((b[i] * b[i] + (mnogo - a[i]) * (mnogo - a[i]), i))

ans.sort(key=lambda x: x[0])

if (n == 1):
    print('1')
elif (ans[0][0] == ans[1][0]):
    print('-1')
else:
    print(ans[0][1]+1)
```

Task F (72)

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

using namespace std;

int main() {
#define int long long
    int n, k;
    cin >> n >> k;
    int gogog[2][n + 1];
    int bobob[2][n + 1];
    int dan[2][n + 1];

    int r[n + 1], b[n + 1];
    for (int i = 1; i <= n; ++i) {
        cin >> r[i] >> b[i];
    }

    dan[0][1] = min(k, r[1]);
    gogog[0][1] = max((int)0, k - r[1]);
    bobob[0][1] = 0;

    dan[1][1] = min(k, b[1]);
    gogog[1][1] = 0;
    bobob[1][1] = max((int)0, k - b[1]);

    for (int i = 2; i <= n; ++i) {
        int jo = gogog[0][i - 1] + k;
        int ji = bobob[0][i - 1];

        int x = min(jo, r[i]) + min(ji, b[i]);

        int ma = gogog[1][i - 1] + k;
        int mo = bobob[1][i - 1];

        int y = min(ma, r[i]) + min(mo, b[i]);

        if (dan[0][i - 1] + x >= dan[1][i - 1] + y) {
            dan[0][i] = dan[0][i - 1] + x;
            gogog[0][i] = max((int)0, jo - r[i]);
            bobob[0][i] = max((int)0, ji - b[i]);
        }
        else {
            dan[0][i] = dan[1][i - 1] + y;
            gogog[0][i] = max((int)0, ma - r[i]);
            bobob[0][i] = max((int)0, mo - b[i]);
        }

        jo = gogog[0][i - 1];
        ji = bobob[0][i - 1] + k;

        x = min(jo, r[i]) + min(ji, b[i]);

        ma = gogog[1][i - 1];
        mo = bobob[1][i - 1] + k;

        y = min(ma, r[i]) + min(mo, b[i]);

        if (dan[0][i - 1] + x >= dan[1][i - 1] + y) {
            dan[1][i] = dan[0][i - 1] + x;
            gogog[1][i] = max((int)0, jo - r[i]);
            bobob[1][i] = max((int)0, ji - b[i]);
        }
        else {
            dan[1][i] = dan[1][i - 1] + y;
            gogog[1][i] = max((int)0, ma - r[i]);
            bobob[1][i] = max((int)0, mo - b[i]);
        }
    }
}
```

```
    }  
    cout << max(dan[0][n], dan[1][n]);  
}
```