

Олимпиада СПбГУ по информатике 2020/21 учебного года

A	B	C	D	E	F	Sum
100	100	60	100	55	25	440

Task A ()

```
k = int(input())
if k == 1:
    print(1)
else:
    d = [0, 2, 3, 4, 5, 6, 7, 8, 9]
    print(d[(k - 1) % 9])
```

Task B ()

```
n, k = map(int, input().split())
s = list(input())
st = set()
ans = 0
ln = 0
for i in range(n):
    st.add(s[i])
    ln += 1
    if ln > k or len(st) > 3:
        st = set()
        st.add(s[i])
        ln = 1
        ans += 1
ans += 1
print(ans)
```

Task C ()

```
#include <bits/stdc++.h>
using namespace std;

struct r {
    int x, y;
    char lst;
};

bool cmp1(r r1, r r2) {
    return (r1.x < r2.x || (r1.x == r2.x && r1.y < r2.y));
}

bool cmp2(r r1, r r2) {
    return (r1.y < r2.y || (r1.y == r2.y && r1.x < r2.x));
}

int f(int a, int b) {
    return (((long long)a * 111 * 1000000) + (long long)b) % (1000000007);
}

int main() {
    ios::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    int n, x, y;
    cin >> n >> x >> y;
    vector<int> v(n);
    vector<int> w(n);
    for (int i = 0; i < n; ++i) {
        cin >> v[i];
    }
    for (int i = 0; i < n; ++i) {
        cin >> w[i];
    }
    vector<vector<r>> u(n + 1);
    vector<r> u1;
    vector<r> u2;
    r r0 = {0, 0, '-'};
    u[0].push_back(r0);
    int a, b;
    for (int i = 0; i < n; ++i) {
        u1.clear();
        for (int j = 0; j < u[i].size(); ++j) {
            if (u[i][j].x + v[i] <= x) {
                a = u[i][j].x + v[i];
                b = u[i][j].y;
                r ri = {a, b, 'x'};
                u1.push_back(ri);
            }
            if (u[i][j].y + w[i] <= y) {
                a = u[i][j].x;
                b = u[i][j].y + w[i];
                r ri = {a, b, 'y'};
                u1.push_back(ri);
            }
        }
    }
    sort(u1.begin(), u1.end(), cmp1);
    /*
    for (int j = 0; j < u[i + 1].size(); ++j) {
        cout << u[i + 1][j].x << " " << u[i + 1][j].y << " " << u[i + 1][j].lst << endl;
    }
    cout << endl;
    */
    if (u1.size() == 0) {
        cout << -1 << endl;
        exit(0);
    }
    u2.clear();
    u2.push_back(u1[0]);
    for (int j = 1; j < u1.size(); ++j) {
        if (u1[j].x != u1[j - 1].x && u1[j].y < u2[u2.size() - 1].y) {
            u2.push_back(u1[j]);
        }
    }
}
```

```

    }
}
sort(u2.begin(), u2.end(), cmp2);
u[i + 1].push_back(u2[0]);
for (int j = 1; j < u2.size(); ++j) {
    if (u2[j].y != u2[j - 1].y && u2[j].x < u[i + 1][u[i + 1].size() - 1].x) {
        u[i + 1].push_back(u2[j]);
    }
}
}
vector<char> ans;
int i = n;
int j = 0;
while (u[i][j].lst != '-') {
    ans.push_back(u[i][j].lst);
    a = u[i][j].x;
    b = u[i][j].y;
    if (u[i][j].lst == 'x') {
        a -= v[i - 1];
    }
    else {
        b -= w[i - 1];
    }
    i -= 1;
    for (int k = 0; k < u[i].size(); ++k) {
        if (u[i][k].x == a && u[i][k].y == b) {
            j = k;
            break;
        }
    }
}
reverse(ans.begin(), ans.end());
for (int i = 0; i < n; ++i) {
    cout << ans[i];
}
cout << endl;
}

```

Task D ()

```
n = int(input())
s = list(input())
u = []
cnt0 = cnt1 = 0
for i in range(2 * n):
    if s[i] == '[' or s[i] == ']':
        if i % 2 == 0:
            cnt0 += 1
        else:
            cnt1 += 1
ans = abs(cnt1 - cnt0)
cnt1, cnt0 = min(cnt1, cnt0), min(cnt0, cnt1)
print(ans)
```

Task E ()

```
def f(a, b, c):
    a, b, c = sorted([a, b, c])
    return str(a) + '␣' + str(b) + '␣' + str(c)

dct = dict()
for i in range(1, 11):
    for j in range(1, 11):
        if i == j:
            continue
        for k in range(1, 11):
            if i == k or j == k:
                continue
            for t in range(1, 11):
                if i == t or j == t or k == t:
                    continue
                d0 = f(j, k, t)
                d1 = f(i, k, t)
                d2 = f(i, j, t)
                if d0 in dct.keys() and dct[d0] == i:
                    continue
                if d1 in dct.keys() and dct[d1] == j:
                    continue
                if d2 in dct.keys() and dct[d2] == k:
                    continue
                dct[f(i, j, k)] = t
            break
        break
    break

##while True:
##    a, b, c = map(int, input().split())
##    print(dct[f(a, b, c)])

inp = input()
if inp == 'add':
    ans = []
    for _ in range(int(input())):
        n, k = map(int, input().split())
        if n == 10 and k == 3:
            a, b, c = map(int, input().split())
            ans.append(dct[f(a, b, c)])
        else:
            ans.append(234352)
    print('\n'.join(map(str, ans)))
else:
    ans = []
    for _ in range(int(input())):
        n, k = map(int, input().split())
        if n == 10 and k == 3:
            a, b, c, d = map(int, input().split())
            d0 = f(a, b, c)
            d1 = f(a, b, d)
            d2 = f(a, c, d)
            d3 = f(b, c, d)
            if dct[d0] == d:
                ans.append(d0)
            elif dct[d1] == c:
                ans.append(d1)
            elif dct[d2] == b:
                ans.append(d2)
            else:
                ans.append(d3)
        else:
            s1 = list(map(int, input().split()))
            s = []
            for i in range(k + 1):
                if s1[i] != 234352:
                    s.append(s1[i])
            ans.append('␣'.join(map(str, s)))
    print('\n'.join(map(str, ans)))
```

Task F ()

```
n = int(input())
print(4)
print(0, 1)
print(1, 0)
print(0, -1)
print(-1, 0)
d = [(0, 2), (1, 1), (2, 0), (1, -1), (0, -2), (-1, -1), (-2, 0), (-1, 1)]
for i in range(n):
    print(d[i][0], d[i][1])
```