# Олимпиада СПбГУ
# по информатике
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24fin0292 – Марчук Софья Тарасовна

| A | B | C | D | E | F | sum |
|---|---|---|---|---|---|---|
| 100 | 100 | 100 | 100 | 20 | 57 | 477 |

## Task A

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

#define int long long
int a, b;
int get_dp (int n) {
    vector<int> dp(n + 1, 0); dp[0] = 1;
    for (int i = 1; i <= n; i++) {
        if (i >= a) {
            dp[i] += dp[i - a];
        }
        if (i >= b) {
            dp[i] += dp[i - b];
        }
    }
    return dp[n];
}

signed main() {
    int n;
    cin >> a >> b >> n;
    int ans = 0;
    if (n >= a) {
        for (int i = 0; i < a; i++) {
            ans += get_dp(n - a);
        }
    }
    if (n >= b) {
        for (int i = 0; i < b; i++) {
```

```
            ans += get_dp(n - b);
        }
    }
    cout << ans << endl;
    return 0;
}
/*
 * 536098299
 */
```

## Task B

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

#define int long long

int get (int x1, int y1, int z1, int x2, int y2, int z2) {
    int ans = abs(x1 - x2) + abs(y1 - y2) + abs(z1 - z2) - max(abs(x1 -
   x2), max(abs(y1 - y2), abs(z1 - z2)));
    return ans;
}

signed main() {
    int n;
    cin >> n;
    int x1, y1, z1, x2, y2, z2;
    cin >> x1 >> y1 >> z1 >> x2 >> y2 >> z2;
    int ans = get(x1, y1, z1, x2, y2, z2);
    ans = min(ans, get(x1, y1, z1, - 2 * n + x2, n + y2, (n + z2)));
    ans = min(ans, get(x1, y1, z1, n + x2, -2 * n + y2, (n + z2)));
    ans = min(ans, get(x1, y1, z1, (-n + x2), (-n + y2), 2 * n + z2));
    ans = min(ans, get(x1, y1, z1, n + x2, n + y2, -2 * n + z2));
    ans = min(ans, get(x1, y1, z1, 2 * n + x2, -n + y2, (-n + z2)));
    ans = min(ans, get(x1, y1, z1, -n + x2, 2 * n + y2, (-n + z2)));
    cout << ans << endl;
    return 0;
}
/*
 * 536098299
 */
```

## Task C

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

#define int long long

const int N = 100001;
const int mod = 1e9 + 1329;
```

```
signed main() {
    int h = 0;
    int p = 179;
    vector<int> pows(N + 1, 1);
    for (int i = 1; i <= N; i++) {
        pows[i] = pows[i - 1] * p;
        pows[i] %= mod;
    }
    string type; cin >> type;
    int n; cin >> n;
    if (type == "first") {
        string s; cin >> s;
        int h = 0;
        for (int i = 0; i < n; i++) {
            h += (s[i] - ' ') * pows[i];
            h %= mod;
        }
        cout << h << endl;
    } else {
        string s;
        cin >> s;
        int cur_h = 0; cin >> cur_h;
        int h = 0;
        for (int i = 0; i < n; i++) {
            h += (s[i] - ' ') * pows[i];
            h %= mod;
        }
        if (h == cur_h) {
            cout << "YES" << endl;
            return 0;
        }
        for (int i = n - 1; i > 0; i--) {
            h -= (pows[n - 1] * (s[i] - ' ')) % mod;
            h = (h + mod * mod) % mod;
            h *= pows[1];
            h %= mod;
            h += pows[0] * (s[i] - ' ');
            h %= mod;
            if (h == cur_h) {
                cout << "YES" << endl;
                return 0;
            }
        }
        cout << "NO" << endl;
    }
    return 0;
}
/*
 * 536098299
 */
```

# Task D

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

#define int long long

signed main() {
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    int n;
    cin >> n;
    for (int Z = 0; Z < 1000000000000; Z++) {
        vector<int> ans;
        for (int i = 0; i < n; i++) {
            cout << "1 1" << endl;
            char ansi;
            cin >> ansi;
            if (ansi == '!') {
                return 0;
            }
            if (ansi == '>' && i != n - 1) {
                ans.push_back(i);
            }
        }
        int num = 0;
        for (int i = ans.size() - 1; i >= 0; i--) {
            cout << (ans[i] - num + n) % n + 1 << " " << (ans[i] + 1 -
    num + n) % n + 1 << endl;
            char ansi; cin >> ansi;
            if (ansi == '!') {
                return 0;
            }
            num++;
        }
        for (int i = 0; i < n - ans.size(); i++) {
            cout << "1 1" << endl;
            char ansi; cin >> ansi;
            if (ansi == '!') {
                return 0;
            }
        }
        for (int i = 0; i < n; i++) {
            cout << "1 1" << endl;
            char ansi; cin >> ansi;
            if (ansi == '!') {
                return 0;
            }
        }
    }
    return 0;
}
/*
 * 536098299
```

```
 */
```

## Task E

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

#define int long long
const int N = 100001;
vector<vector<int>> g(N);
vector<int> ans(N + 1, 1), x(N + 1, 0);

int move (int nowi, int t) {
    nowi = g[nowi][x[nowi]++ % g[nowi].size()];
    return nowi;
}

signed main() {
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    int n, q;
    cin >> n >> q;
    for (int i = 0; i < n; i++) {
        int d; cin >> d;
        for (int j = 0; j < d; j++) {
            int a; cin >> a;
            g[i + 1].push_back(a);
        }
    }
    int nowi = 1;
    for (int t = 0; t <= N; t++) {
        ans[t] = nowi;
        nowi = move(nowi, t);
    }
    vector<int> ansi;
    for (int i = 0; i < q; i++) {
        int t; cin >> t;
        ansi.push_back(ans[t]);
    }
    for (auto i : ansi) {
        cout << i << " ";
    }
    return 0;
}
/*
 * 536098299
 */
```

## Task F

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

```
using namespace std;

#define int long long

signed main() {
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    int w, h;
    cin >> h >> w;
    vector<string> s(h);
    for (int i = 0; i < h; i++) {
        cin >> s[i];
    }
    int ansi1 = 0;
    vector<string> aa(h);
    for (int aaa = 0; aaa < w / 2; aaa++) {
        int a1 = 0, a2 = 0;
        for (int j = aaa * 2; j <= aaa * 2 + 1; j++) {
            for (int i = 0; i < h / 2; i++) {
                a1 += (s[i * 2][j] - '0') * (s[i * 2 + 1][j] - '0');
                //aa[i * 2] += "T";
                //aa[i * 2 + 1] += "B";
            }
        }
        for (int i = 0; i < h; i++) {
            a2 += (s[i][aaa * 2] - '0') * (s[i][aaa * 2 + 1] - '0');
        }
        int a3 = 0;
        for (int j = aaa * 2; j <= aaa * 2 + 1; j++) {
            for (int i = 0; i < h / 2; i++) {
                a3 += (s[(i * 2 - 1 + h) % h][j] - '0') * (s[i * 2][j] -
    '0');
                //aa[i * 2] += "T";
                //aa[i * 2 + 1] += "B";
            }
        }
        if (a3 > max(a1, a2)) {
            ansi1 += a3;
            for (int j = aaa * 2; j <= aaa * 2 + 1; j++) {
                for (int i = 0; i < h / 2; i++) {
                   //a3 += (s[(i * 2 - 1 + h) % h][j] - '0') * (s[i * 2][
    j] - '0');
                    aa[i * 2] += "B";
                    aa[i * 2 + 1] += "T";
                }
            }
        } else if (a2 > max(a1, a3)) {
            ansi1 += a2;
            for (int i = 0; i < h; i++) {
                aa[i] += "LR";
            }
        } else {
```

```
            ansi1 += a1;
            for (int j = aaa * 2; j <= aaa * 2 + 1; j++) {
                for (int i = 0; i < h / 2; i++) {
                   // a1 += (s[i * 2][j] - '0') * (s[i * 2 + 1][j] - '0')
    ;
                    aa[i * 2] += "T";
                    aa[i * 2 + 1] += "B";
                }
            }
        }
    }
    int anso = 0, anso1 = 0;
    vector<string> ans(h, ""), ans1(h, "");
    for (int i = 0; i < h; i++) {
        for (int j = 0; j < w / 2; j++) {
            ans[i] += "LR";
            ans1[i] += "RL";
            anso += (s[i][j * 2] - '0') * (s[i][j * 2 + 1] - '0');
            anso1 += (s[i][j * 2] - '0') * (s[i][(j * 2 - 1 + w) % w] - '
    0');
            //cout << (j * 2 - 1 + w) % w << endl;
        }
    }
    if (ansi1 > max(anso, anso1)) {
        cout << ansi1 << endl;
        for (auto i : aa) {
            cout << i << endl;
        }
        return 0;
    }
    if (anso > anso1) {
        cout << anso << endl;
        for (auto i: ans) {
            cout << i << endl;
        }
    } else {
        cout << anso1 << endl;
        for (auto i : ans1) {
            cout << i << endl;
        }
    }
    return 0;
}
/*
 * 536098299
 */
```