Олимпиада СПбГУ
по информатике
2023/24 учебного года

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A	B	C	D	E	F	sum
100	100	100	35	20	49	404

Task A

```
#include <iostream>
#include <algorithm>
#include <set>
#include <vector>

using namespace std;

typedef long long ll;

ll n, a, b;

vector<vector<vector<ll>>> dp(101, vector<vector<ll>>(101, vector<ll
    >(101)));

ll f1(ll start, ll x, ll col) {
    if (col > n) return 0;
    if (x < start) return 0;
    if (x == start && col == n) return 1;
    if (dp[start][x][col] != 0) return dp[start][x][col] - 1;
    dp[start][x][col] = f1(start, (x + a) % n, col + a) + f1(start, (x +
    b) % n, col + b) + 1;
    return dp[start][x][col] - 1;
}

int main() {
    ios::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cin >> a >> b >> n;
```

```
    ll res = 0;
    for(int start = 0; start < n; start++) {
        res += f1(start, start, 0);
    }
    cout << res;
    return 0;
}
```

Task B

```
#include <iostream>
#include <algorithm>
#include <set>
#include <vector>
#include <random>
#include <deque>

using namespace std;

typedef int ll;

const ll mod = 1e9 + 7;
const ll c = 239;

ll n;

ll f(ll x) {
    ll k = x + n;
    if (k > n) return n - k;
    return k;
}

ll d(ll x1, ll y1, ll z1, ll x2, ll y2, ll z2) {
    return max(abs(x1 - x2), max(abs(y1 - y2), abs(z1 - z2)));
}

int main() {
    ios::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cin >> n;
    ll x1, y1, z1, x2, y2, z2; cin >> x1 >> y1 >> z1 >> x2 >> y2 >> z2;
    ll ans = d(x1, y1, z1, x2, y2, z2);
    if (n <= 15) {
        for(int i1 = -100; i1 <= 100; i1++) {
            for(int j1 = -100; j1 <= 100; j1++) {
                for(int k1 = -100; k1 <= 100; k1++) {
                    if (x1 + i1 + y1 + j1 + z1 + k1 == 0 && max(abs(x1 +
    i1), max(abs(y1 + j1), abs(z1 + k1))) == n && f(x1 + i1) + f(y1 + j1)
    + f(z1 + k1) == 0 && max(abs(f(x1 + i1)), max(abs(f(y1 + j1)), abs(f(
    z1 + k1)))) == n) {
                        ans = min(ans, d(x1, y1, z1, x1 + i1, y1 + j1, z1
     + k1) + d(x2, y2, z2, f(x1 + i1), f(y1 + j1), f(z1 + k1)));
```

```
                }
                swap(x1, x2);
                swap(y1, y2);
                swap(z1, z2);
                if (x1 + i1 + y1 + j1 + z1 + k1 == 0 && max(abs(x1 +
i1), max(abs(y1 + j1), abs(z1 + k1))) == n && f(x1 + i1) + f(y1 + j1)
+ f(z1 + k1) == 0 && max(abs(f(x1 + i1)), max(abs(f(y1 + j1)), abs(f(
z1 + k1)))) == n) {
                    ans = min(ans, d(x1, y1, z1, x1 + i1, y1 + j1, z1
 + k1) + d(x2, y2, z2, f(x1 + i1), f(y1 + j1), f(z1 + k1)));
                }
                swap(x1, x2);
                swap(y1, y2);
                swap(z1, z2);
            }
        }
    }
}
for(int i = 0; i < n; i++) {
    ll now1 = x1 + i, now2 = y1 - i, now3 = z1;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1 - i, now2 = y1 + i, now3 = z1;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1, now2 = y1 + i, now3 = z1 - i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1, now2 = y1 - i, now3 = z1 + i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1 + i, now2 = y1, now3 = z1 - i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1 - i, now2 = y1, now3 = z1 + i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
```

```
, f(now1), f(now2), f(now3)));
    }
}
swap(x1, x2);
swap(y1, y2);
swap(z1, z2);
for(int i = 0; i < n; i++) {
    ll now1 = x1 + i, now2 = y1 - i, now3 = z1;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1 - i, now2 = y1 + i, now3 = z1;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1, now2 = y1 + i, now3 = z1 - i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1, now2 = y1 - i, now3 = z1 + i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1 + i, now2 = y1, now3 = z1 - i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
    now1 = x1 - i, now2 = y1, now3 = z1 + i;
    if (max(abs(now1), max(abs(now2), abs(now3))) == n && max(abs(f(
now1)), max(abs(f(now2)), abs(f(now3)))) == n) {
        ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2, y2, z2
, f(now1), f(now2), f(now3)));
    }
}
swap(x1, x2);
swap(y1, y2);
swap(z1, z2);
for (int i = 0; i < n; i++) {
    if (y1 - i == -n) {
        ll now1 = x1 + i, now2 = y1 - i, now3 = z1;
        for (int k = 0; k < i; k++) {
            now1--;
            now3++;
```

```
                if (max(abs(now1), max(abs(now2), abs(now3))) == n &&
                    max(abs(f(now1)), max(abs(f(now2)), abs(f(now3)))) ==
 n) {
                    ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2
, y2, z2, f(now1), f(now2), f(now3)));
                }
            }
        }
    }
    swap(x1, x2);
    swap(y1, y2);
    swap(z1, z2);
    for (int i = 0; i < n; i++) {
        if (y1 + i == n) {
            ll now1 = x1 - i, now2 = y1 + i, now3 = z1;
            for (int k = 0; k < i; k++) {
                now1++;
                now3--;
                if (max(abs(now1), max(abs(now2), abs(now3))) == n &&
                    max(abs(f(now1)), max(abs(f(now2)), abs(f(now3)))) ==
 n) {
                    ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(x2
, y2, z2, f(now1), f(now2), f(now3)));
                }
            }
        }
    }
//    for (int i = 0; i < n; i++) {
//        if (z1 - i == -n) {
//            ll now1 = x1, now2 = y1 + i, now3 = z1 - i;
//            for (int k = 0; k < i; k++) {
//                now2--;
//                now1++;
//                if (max(abs(now1), max(abs(now2), abs(now3))) == n &&
//                    max(abs(f(now1)), max(abs(f(now2)), abs(f(now3))))
 == n) {
//                    ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(
x2, y2, z2, f(now1), f(now2), f(now3)));
//                }
//            }
//        }
//    }
//    swap(x1, x2);
//    swap(y1, y2);
//    swap(z1, z2);
//    for (int i = 0; i < n; i++) {
//        if (z1 + i == n) {
//            ll now1 = x1 - i, now2 = y1, now3 = z1 + i;
//            for (int k = 0; k < i; k++) {
//                now1++;
//                now2--;
//                if (max(abs(now1), max(abs(now2), abs(now3))) == n &&
//                    max(abs(f(now1)), max(abs(f(now2)), abs(f(now3))))
```

```
    == n) {
//                      ans = min(ans, d(x1, y1, z1, now1, now2, now3) + d(
    x2, y2, z2, f(now1), f(now2), f(now3)));
//                  }
//              }
//          }
//      }
    cout << ans;
    return 0;
}
```

Task C

```
#include <iostream>
#include <algorithm>
#include <set>
#include <vector>

using namespace std;

typedef long long ll;

const ll mod = 1e9 + 7;
const ll c = 239;

ll f(string a, ll n) {
    vector<ll> v;
    ll h = a[0], power = 1;
    for(int i = 1; i < n; i++) {
        h = (((h * c) % mod) + a[i]) % mod;
        power = (power * c) % mod;
    }
    v.push_back(h);
    for(int j = 0; j < n; j++) {
        h = (h - ((a[j] * power) % mod));
        if (h < 0) h += mod;
        h = (h * c) % mod;
        h += a[j];
        h %= mod;
        v.push_back(h);
    }
    sort(v.begin(), v.end());
    return v[0];
}

int main() {
    ios::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    string s; cin >> s;
    if (s == "first") {
        ll n; cin >> n;
        string a; cin >> a;
```

```
        cout << f(a, n);
    } else {
        ll n; cin >> n;
        string a; cin >> a;
        ll h1; cin >> h1;
        if (f(a, n) == h1) {
            cout << "YES";
        } else {
            cout << "NO";
        }
    }
    return 0;
}
```

Task D

```
#include <iostream>
#include <algorithm>
#include <set>
#include <vector>
#include <random>

using namespace std;

typedef long long ll;

mt19937 rnd(14);

const ll mod = 1e9 + 7;
const ll c = 239;

int main() {
    ios::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    ll n; cin >> n;
    while(1) {
        ll k1 = rnd() % n, k2 = rnd() % n;
        if (k1 > k2) swap(k1, k2);
        k1++; k2++;
        cout << k1 << " " << k2 << endl;
        string s; cin >> s;
        if (s == "!") return 0;
    }
    return 0;
}
```

Task E

```
#include <iostream>
#include <algorithm>
#include <set>
```

```
#include <vector>
#include <random>
#include <deque>
#include <map>

using namespace std;

typedef long long ll;

const ll mod = 1e9 + 7;
const ll c = 239;

vector<deque<ll>> g;
deque<ll> now;
vector<ll> a;
vector<ll> c1;
ll sum = 0, col = 0, res = 0;
map<pair<ll, ll>, ll> mapa;

void dfs(ll v) {
    if (ll(now.size()) >= 1e4) return;
    now.push_back(v);
    ll k = g[v][0];
    g[v].pop_front();
    g[v].push_back(k);
    sum -= (c1[v] * a[v]) % mod;
    a[v]++;
    a[v] %= ll(g[v].size());
    sum += (c1[v] * a[v]) % mod;
    if (mapa[{v, sum}] != 0) {
        res = mapa[{v, sum}] - 1;
        return;
    }
    mapa[{v, sum}] = col + 1;
    col++;
    dfs(k);
}

int main() {
    ios::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    ll n, q; cin >> n >> q;
    g.resize(n);
    a.resize(n);
    c1.resize(n);
    for(int i = 0; i < n; i++) {
        ll k; cin >> k;
        g[i].resize(k);
        for(int j = 0; j < k; j++) {
            cin >> g[i][j];
            g[i][j]--;
        }
```

```
    }
    c1[0] = c;
    for(int i = 1; i < c1.size(); i++) {
        c1[i] = (c1[i - 1] * c) % mod;
    }
    dfs(0);
    ll sum = (now.size() - res - 1);
    for(int i = 0; i < q; i++) {
        ll t; cin >> t;
        if (t < now.size()) {
            cout << now[t] + 1 << " ";
        } else {
            cout << now[(t - res) % sum + res] + 1 << " ";
        }
    }
    return 0;
}
```

Task F

```
#include <iostream>
#include <algorithm>
#include <set>
#include <vector>
#include <random>
#include <deque>

using namespace std;

mt19937 rnd(14);

typedef int ll;

const ll mod = 1e9 + 7;
const ll c = 239;

int main() {
    ios::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    ll n, m; cin >> n >> m;
    vector<string> v(n);
    for(int i = 0; i < n; i++) {
        cin >> v[i];
    }
    ll res = 0;
    for (int i = 0; i < n; i += 2) {
        for (int j = 0; j < m; j++) {
            res += (v[i][j] - '0') * (v[i + 1][j] - '0');
        }
    }
    ll res1 = 0;
    for(int i = 0; i < n; i++) {
```

```
        ll was = 0;
        for(int j = 0; j < m; j++) {
            if (j % 2 == 0) {
                was = v[i][j] - '0';
            } else {
                res1 += was * (v[i][j] - '0');
            }
        }
    }
    if (res > res1) {
        cout << res << "\n";
        for (int i = 0; i < n; i++) {
            ll was = 0;
            for (int j = 0; j < m; j++) {
                if (i % 2 == 0) {
                    was = v[i][j] - '0';
                    cout << "T";
                } else {
                    res += was * (v[i][j] - '0');
                    cout << "B";
                }
            }
            cout << "\n";
        }
    } else {
        cout << res1 << "\n";
        for (int i = 0; i < n; i++) {
            ll was = 0;
            for (int j = 0; j < m; j++) {
                if (j % 2 == 0) {
                    was = v[i][j] - '0';
                    cout << "L";
                } else {
                    res += was * (v[i][j] - '0');
                    cout << "R";
                }
            }
            cout << "\n";
        }
    }
    return 0;
}
```