Олимпиада СПбГУ по информатике 2019/20 учебного года

A	B	C	D	E	F	Sum
100	100	100	100	100	18	518

Task A ()

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

using namespace std;

#define all(arr) arr.begin(), arr.end()
#define rall(arr) arr.rbegin(), arr.rend()
#define ll long long
#define range(i, n) for(int i = 0; i < n; ++i)

const int maxN = 1e5;
const int md = 998244353;

void solve() {
    int n; cin >> n;
    cout << n - 1;
}

int main() {
    int tests=1;
    while(tests--) solve();
    return 0;
}
```

Task B ()

```python
class Vector:
    def __init__(self, x, y):
        self.x = x
        self.y = y

    def __add__(self, other):
        return Vector(self.x + other.x, self.y + other.y)

    def __sub__(self, other):
        return Vector(self.x - other.x, self.y - other.y)


EPS = 0.001

def solve1():
    arr = []
    for i in range(6):
        x, y = map(float, input().split())
        arr.append(Vector(x, y))
    mid = arr[0]
    for i in range(1, 6):
        mid = mid + arr[i]
    mid.x /= 6
    mid.y /= 6
    for i in range(6):
        for j in range(i):
            for e in range(j):
                a1, b1, c1 = arr[i], arr[j], arr[e]
                mid2 = a1 + b1
                mid2 = mid2 + c1
                mid2.x /= 3
                mid2.y /= 3
                if abs(mid2.x - mid.x) < EPS and abs(mid2.y - mid.y) < EPS:
                    for v in (a1, b1, c1):
                        print(v.x, v.y)
                    return


def solve2():
    arr = [None] * 6
    for i in range(3):
        x, y = map(float, input().split())
        arr[i * 2] = Vector(x, y)
    mid = arr[0] + arr[2] + arr[4]
    mid.x /= 3
    mid.y /= 3
    for i in range(6):
        if arr[i] is None:
            obr = (i + 3) % 6
            v = arr[obr] - mid
            v.x = -v.x
            v.y = -v.y
            arr[i] = mid + v
    for i in range(6):
        print(arr[i].x, arr[i].y)


def solve():
    n = int(input())
    if n == 6:
        solve1()
    else:
        solve2()


solve()
```

Task C ()

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

using namespace std;

#define all(arr) arr.begin(), arr.end()
#define rall(arr) arr.rbegin(), arr.rend()
#define ll long long
#define range(i, n) for(int i = 0; i < n; ++i)

const int maxN = 1e5;
const int md = 998244353;

void solve() {
    string t;
    cin >> t;
    int n; cin >> n;
    int answer = 0;
    range(i, n) {
        string s; cin >> s;
        int curans = t.size();
        range(i, s.size()) {
            int ans = t.size();
            for(int j=i, e=0; e < t.size() && j < s.size(); ++j, ++e) {
                while(e < t.size() && t[e] != s[j]) {
                    e++;
                }
                if (e != t.size()) ans--;
            }
            curans = min(ans, curans);
        }
        answer += curans;
    }
    cout << answer;
}

int main() {
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    int tests=1;
    while(tests--) solve();
    return 0;
}
```

Task D ()

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

using namespace std;

#define all(arr) arr.begin(), arr.end()
#define rall(arr) arr.rbegin(), arr.rend()
#define ll long long
#define range(i, n) for(int i = 0; i < n; ++i)

const int maxN = 1e3+5;
const int md = 998244353;
const int INFi = 2*1e9;

int n, m, Ar, Ac, Br, Bc;
pair<int, int> t[maxN][maxN];
vector<pair<int, int>> from[maxN][maxN];
int dist[maxN][maxN], dist2[maxN][maxN];

int get_dist(int r, int c) {
    int res = 0;
    if (r < 0) {
        r++;
        res++;
    }
    if (r > n) {
        r--;
        res++;
    }
    if (c > m) {
        c--;
        res++;
    }
    if (c < 0) {
        c++;
        res++;
    }
    return res + dist[r][c];
}

int di[4] = {0, 0, -1, 1};
int dj[4] = {1, -1, 0, 0};

void solve() {
    cin >> n >> m >> Ar >> Ac >> Br >> Bc;
    if (Ar == Br && Ac == Bc) {
        cout << 0;
        return;
    }
    for(int i = 1; i <= n; ++i) {
        for(int j = 1; j <= m; ++j) {
            cin >> t[i][j].first >> t[i][j].second;
            int ito = i + t[i][j].first;
            int jto = j + t[i][j].second;
            from[ito][jto].push_back({i, j});
        }
    }
    range(i, n + 2) range(j, m + 2) dist[i][j] = dist2[i][j] = INFi;
    dist[Br][Bc] = dist2[Br][Bc] = 0;
    int visited = (n + 2) * (m + 2);
    deque<pair<int, int>> q;
    q.push_front({Br, Bc});
    while(!q.empty()) {
        auto v = q.front();
        q.pop_front();
        for(auto u: from[v.first][v.second]) {
            if (dist[u.first][u.second] > dist[v.first][v.second]) {
                dist[u.first][u.second] = dist[v.first][v.second];
                q.push_front(u);
            }
        }
        range(i, 4) {
            int inew = v.first + di[i];
```

```cpp
                int jnew = v.second + dj[i];
                if (inew < 0 || inew > n + 1 || jnew < 0 || jnew > m + 1) continue;
                if (dist[inew][jnew] > dist[v.first][v.second] + 1) {
                    dist[inew][jnew] = dist[v.first][v.second] + 1;
                    q.push_back({inew, jnew});
                }
            }
        }
    }
    cout << dist[Ar+t[Ar][Ac].first][Ac+t[Ar][Ac].second];
}

int main() {
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
    int tests=1;
    while(tests--) solve();
    return 0;
}
```

Task E ()

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

using namespace std;

#define all(arr) arr.begin(), arr.end()
#define rall(arr) arr.rbegin(), arr.rend()
#define ll long long
#define range(i, n) for(int i = 0; i < n; ++i)

const int maxN = 1e3+5;
const int md = 998244353;
const int INFi = 2*1e9;
int n, m, B;
vector<pair<int, int>> v;
pair<ll, ll> req(ll r1, ll c1, ll r2, ll c2) {
    cout << "?_" << r1 << "_" << c1 << "_" << r2 << "_" << c2 << endl;
    pair<ll, ll> res;
    cin >> res.first >> res.second;
    return res;
}

void ans(ll r, ll c) {
    cout << "!_" << r << "_" << c << endl;
    exit(0);
}

void solve1() {
        auto p = req(v[0].first, v[0].second, v[0].first + n, v[0].second);
    if (p.first == v[0].first) {
        ans(n, 0);
    } else {
    ans(0, 0);
    }
}

void go(int step, int i, set<int> current) {
    if (step == -1) {
        ans(1ll*(*current.begin())*n, 0);
    }
    int x = 1 << step;
    set<int> current2;
    while(current2.size() < x) {
        ll u = *current.begin();
        current.erase(current.begin());
        ll u2 = *current.begin();
        current.erase(current.begin());
        current2.insert(u);
        current2.insert(u2);
        auto p = req(v[i].first + 1ll * u * n, v[i].second, v[i].first + 1ll * u2 * n, v[i].second
            );
        ll v = p.first / n;
        current2.erase(v);
        current.erase(v);
    }
    go(step-1, i+1, current2);
}

void solve2() {
    set<int> cur;
    ll x = 1 << B;
    range(i, x) cur.insert(i);
    go(B-1, 0, cur);
}

void solve() {
    cin >> n >> m >> B;
    v.resize(B);
    range(i, B) cin >> v[i].first >> v[i].second;
    range(i, B) v[i].first --;
    range(i, B) v[i].second --;
    solve2();
}
```

```cpp
int main() {
    //ios_base::sync_with_stdio(false);
    //cin.tie(0);
    //cout.tie(0);
    int tests=1;
    while(tests--) solve();
    return 0;
}
```

Task F ()

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

using namespace std;

#define all(arr) arr.begin(), arr.end()
#define rall(arr) arr.rbegin(), arr.rend()
#define ll long long
#define range(i, n) for(int i = 0; i < n; ++i)

const int maxN = 1e6;
const int md = 998244353;
const int INFi = 2*1e9;
int n, m;
int answer[maxN];
int vis[27];
int dfs(int v, int p, int h, int f, vector<vector<int>> &g) {
    //cout << v << " " << p << " " << h << " " << f << "\n";
    int ans = -1;
    if (v == f) ans = h;
    vis[v] = 1;
    for(auto u: g[v]) {
        if (u == p) continue;
        if (vis[u]) return INFi;
        ans = max(ans, dfs(u, v,  h + 1, f, g));
    }
    return ans;
}

void get_ans(vector<int> &p) {
    //range(i, n) cout << p[i] << " ";
    //cout << "\n";
    vector<vector<int>> g(n);
    for(int i = 1; i < n; ++i) {
        g[p[i]].push_back(i);
        g[i].push_back(p[i]);
    }
    int c = 0;
    range(i, n) {
        range(j, i) {
            range(e, n) vis[e] = 0;
            int f = dfs(i, -1, 0, j, g);
            if (f == -1 || f == INFi) return;
            c += f;
        }
    }
    answer[c]++;
}

void go(int i, vector<int> &p) {
    if (i == n) {
        get_ans(p);
        return;
    }
    range(j, n) {
        if (i == j) continue;
        p[i] = j;
        go(i + 1, p);
    }
}

void solve() {
    cin >> n >> m;
    vector<int> p(n);
    p[0] = -1;
    go(1, p);
    for(int i = 1; i <= m; ++i) cout << answer[i] << " ";
}

int main() {
    ios_base::sync_with_stdio(false);
    cin.tie(0);
    cout.tie(0);
```

```
        int tests=1;
        while(tests--) solve();
        return 0;
}
```