Олимпиада СПбГУ по информатике 2020/21 учебного года

A	B	C	D	E	F	Sum
100	100	100	100	55	25	480

Task A ()

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

using namespace std;

template<typename T>
istream &operator>>(istream &in, vector<T> &x) {
    for (auto &i : x)
        in >> i;
    return in;
}

template<typename T>
ostream &operator<<(ostream &out, const vector<T> &x) {
    for (auto &i : x) {
        out << i << " ";
    }
    return out;
}

template<typename T, typename D>
istream &operator>>(istream &in, pair<T, D> &x) {
    in >> x.first >> x.second;
    return in;
}

template<typename T, typename D>
ostream &operator<<(ostream &out, const pair<T, D> &x) {
    out << x.first << " " << x.second;
    return out;
}

struct LogOutput {
    template<typename T>
    LogOutput &operator<<(T x) {
#ifdef Dmitry07
        cout << x;
#endif
        return *this;
    }
} dout;

typedef long long ll;
typedef unsigned long long ull;
typedef double dl;

#define nl '\n'
#define elif else if
#define all(_v) _v.begin(), _v.end()
#define rall(v) v.rbegin(), v.rend()
#define sz(v) (int)(v.size())
#define sqr(_v) ((_v) * (_v))
#define vpi vector<pair<int, int>>
#define eb emplace_back
#define pb push_back
// #define MOD1(x, m) ((x) % m + ((x) < 0  && ((x % m) != 0) ? m : 0))
#define mod(x, m) (((x) % (m) + (m)) % (m))
```

```cpp
#define vi vector<int>
#define pi pair<int, int>
#define ti tupMXle<int, int, int>
#define minq(x, y) x = min((x), (y))
#define maxq(x, y) x = max((x), (y))
#define forn(i, n) for (int i = 0; i < (n); ++i)

const ll INFL = 1e18;  // 9187201950435737471;
const ll nINFL = -9187201950435737472;
const int INF = 1e9 + 10;  // 2139062143;
const int nINF = -2139062144;
const ull ULINF = numeric_limits<ull>::max();
const dl PI = acos(-1);
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
mt19937 rnd(seed);

inline void IO() {
#ifdef Dmitry07
    freopen("../input.txt", "r", stdin);
    freopen("../output.txt", "w", stdout);
#endif
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cout << fixed << setprecision(10);
}

const int MAXN = 2e5 + 2;
const int MAXE = 3e6;
const double EPS = 1e-8;
const int W = 7000 * MAXN;
const int K = 11;

#define int ll

string s = "234567890";

void Solve() {
    int k;
    cin >> k;
    if (k == 1) {
        cout << 1;
    } else {
        k -= 2;
        k %= 9;
        cout << s[k];
    }
}

signed main() {
    IO();
    int t = 1;
//    cin >> t;
    int startTime = clock();
    forn (i, t) {
        Solve();
    }
    int endTime = clock();
    dout << '\n' << "Time: " << (endTime - startTime) / 1000.0;
    return 0;
}
```

Task B ()

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

using namespace std;

template<typename T>
istream &operator>>(istream &in, vector<T> &x) {
    for (auto &i : x)
        in >> i;
    return in;
}

template<typename T>
ostream &operator<<(ostream &out, const vector<T> &x) {
    for (auto &i : x) {
        out << i << " ";
    }
    return out;
}

template<typename T, typename D>
istream &operator>>(istream &in, pair<T, D> &x) {
    in >> x.first >> x.second;
    return in;
}

template<typename T, typename D>
ostream &operator<<(ostream &out, const pair<T, D> &x) {
    out << x.first << " " << x.second;
    return out;
}

struct LogOutput {
    template<typename T>
    LogOutput &operator<<(T x) {
#ifdef Dmitry07
        cout << x;
#endif
        return *this;
    }
} dout;

typedef long long ll;
typedef unsigned long long ull;
typedef double dl;

#define nl '\n'
#define elif else if
#define all(_v) _v.begin(), _v.end()
#define rall(v) v.rbegin(), v.rend()
#define sz(v) (int)(v.size())
#define sqr(_v) ((_v) * (_v))
#define vpi vector<pair<int, int>>
#define eb emplace_back
#define pb push_back
// #define MOD1(x, m) ((x) % m + ((x) < 0  && ((x % m) != 0) ? m : 0))
#define mod(x, m) (((x) % (m) + (m)) % (m))
#define vi vector<int>
#define pi pair<int, int>
#define ti tupMXle<int, int, int>
#define minq(x, y) x = min((x), (y))
#define maxq(x, y) x = max((x), (y))
#define forn(i, n) for (int i = 0; i < (n); ++i)

const ll INFL = 1e18;   // 9187201950435737471;
const ll nINFL = -9187201950435737472;
const int INF = 1e9 + 10;   // 2139062143;
const int nINF = -2139062144;
const ull ULINF = numeric_limits<ull>::max();
const dl PI = acos(-1);
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
mt19937 rnd(seed);
```

```cpp
inline void IO() {
#ifdef Dmitry07
    freopen("../input.txt", "r", stdin);
    freopen("../output.txt", "w", stdout);
#endif
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cout << fixed << setprecision(10);
}

const int MAXN = 2e5 + 2;
const int MAXE = 3e6;
const double EPS = 1e-8;
const int W = 7000 * MAXN;
const int K = 11;

#define int ll

void Solve() {
    int n, k;
    cin >> n >> k;
    string s;
    cin >> s;
    vi dp(n, INF);
    dp[0] = 1;
    set<char> s1;
    s1.insert(s[0]);
    for (int i = 1; i < n; i++) {
        s1.insert(s[i]);
        if (sz(s1) <= 3 && i + 1 <= k) {
            dp[i] = 1;
            continue;
        }
        set<char> ss;
        ss.insert(s[i]);
        for (int j = i - 1; j >= max(0ll, i - k); j--) {
            if (sz(ss) > 3) {
                break;
            }
            minq(dp[i], dp[j] + 1);
            ss.insert(s[j]);
        }
    }
    cout << dp.back();
}

signed main() {
    IO();
    int t = 1;
//    cin >> t;
    int startTime = clock();
    forn (i, t) {
        Solve();
    }
    int endTime = clock();
    dout << '\n' << "Time: " << (endTime - startTime) / 1000.0;
    return 0;
}
```

4

Task C ()

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

using namespace std;

template<typename T>
istream &operator>>(istream &in, vector<T> &x) {
    for (auto &i : x)
        in >> i;
    return in;
}

template<typename T>
ostream &operator<<(ostream &out, const vector<T> &x) {
    for (auto &i : x) {
        out << i << "_";
    }
    return out;
}

template<typename T, typename D>
istream &operator>>(istream &in, pair<T, D> &x) {
    in >> x.first >> x.second;
    return in;
}

template<typename T, typename D>
ostream &operator<<(ostream &out, const pair<T, D> &x) {
    out << x.first << "_" << x.second;
    return out;
}

struct LogOutput {
    template<typename T>
    LogOutput &operator<<(T x) {
#ifdef Dmitry07
        cout << x;
#endif
        return *this;
    }
} dout;

typedef long long ll;
typedef unsigned long long ull;
typedef double dl;

#define nl '\n'
#define elif else if
#define all(_v) _v.begin(), _v.end()
#define rall(v) v.rbegin(), v.rend()
#define sz(v) (int)(v.size())
#define sqr(_v) ((_v) * (_v))
#define vpi vector<pair<int, int>>
#define eb emplace_back
#define pb push_back
// #define MOD1(x, m) ((x) % m + ((x) < 0  && ((x % m) != 0) ? m : 0))
#define mod(x, m) (((x) % (m) + (m)) % (m))
#define vi vector<int>
#define pi pair<int, int>
#define ti tupMXle<int, int, int>
#define minq(x, y) x = min((x), (y))
#define maxq(x, y) x = max((x), (y))
#define forn(i, n) for (int i = 0; i < (n); ++i)

const ll INFL = 1e18;   // 9187201950435737471;
const ll nINFL = -9187201950435737472;
const int INF = 1e9 + 10;   // 2139062143;
const int nINF = -2139062144;
const ull ULINF = numeric_limits<ull>::max();
const dl PI = acos(-1);
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
mt19937 rnd(seed);
```

```cpp
inline void IO() {
#ifdef Dmitry07
    freopen("../input.txt", "r", stdin);
    freopen("../output.txt", "w", stdout);
#endif
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cout << fixed << setprecision(10);
}

const int MAXN = 500 + 5;
const int MAXE = 2.5e5 + 5;
const double EPS = 1e-8;
const int W = 7000 * MAXN;
const int K = 11;

// #define int ll

int dp[MAXN][MAXE];
bitset<MAXE> lastW[MAXN];

void Solve() {
    int n, x, y;
    cin >> n >> x >> y;
    vi v(n), w(n);
    cin >> v >> w;
    int sumW = 0;
    for (auto ww : w) {
        sumW += ww;
    }
    forn (i, n + 1) {
        fill(dp[i], dp[i] + (x + 1), -INF);
        fill(dp[i], dp[i] + (x + 1), 0);
    }
    dp[0][0] = 0;
    for (int i = 1; i <= n; i++) {
        forn (j, x + 1) {
            dp[i][j] = dp[i - 1][j];
        }
        forn(j, x + 1) {
            if (j + v[i - 1] <= x && dp[i - 1][j] + w[i - 1] > dp[i][j + v[i - 1]]) {
                dp[i][j + v[i - 1]] = dp[i - 1][j] + w[i - 1];
                lastW[i][j + v[i - 1]] = 1;
            }
        }
    }
    int minW = sumW - *max_element(dp[n], dp[n] + MAXE);
    if (minW > y) {
        cout << -1;
        exit(0);
    }
    int ma = dp[n][0], pos = 0;
    forn (i, x + 1) {
        if (dp[n][i] > ma) {
            ma = dp[n][i];
            pos = i;
        }
    }
    vector<char> ans(n, 'y');
    for (int i = n; i >= 1; i--) {
        if (lastW[i][pos]) {
            ans[i - 1] = 'x';
            pos -= v[i - 1];
        }
    }
    for (auto c : ans) {
        cout << c;
    }
}

signed main() {
    IO();
    int t = 1;
```

```cpp
//     cin >> t;
    int startTime = clock();
    forn (i, t) {
        Solve();
    }
    int endTime = clock();
    dout << '\n' << "Time: " << (endTime - startTime) / 1000.0;
    return 0;
}
```

Task D ()

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

using namespace std;

template<typename T>
istream &operator>>(istream &in, vector<T> &x) {
    for (auto &i : x)
        in >> i;
    return in;
}

template<typename T>
ostream &operator<<(ostream &out, const vector<T> &x) {
    for (auto &i : x) {
        out << i << "_";
    }
    return out;
}

template<typename T, typename D>
istream &operator>>(istream &in, pair<T, D> &x) {
    in >> x.first >> x.second;
    return in;
}

template<typename T, typename D>
ostream &operator<<(ostream &out, const pair<T, D> &x) {
    out << x.first << "_" << x.second;
    return out;
}

struct LogOutput {
    template<typename T>
    LogOutput &operator<<(T x) {
#ifdef Dmitry07
        cout << x;
#endif
        return *this;
    }
} dout;

typedef long long ll;
typedef unsigned long long ull;
typedef double dl;

#define nl '\n'
#define elif else if
#define all(_v) _v.begin(), _v.end()
#define rall(v) v.rbegin(), v.rend()
#define sz(v) (int)(v.size())
#define sqr(_v) ((_v) * (_v))
#define vpi vector<pair<int, int>>
#define eb emplace_back
#define pb push_back
// #define MOD1(x, m) ((x) % m + ((x) < 0  && ((x % m) != 0) ? m : 0))
#define mod(x, m) (((x) % (m) + (m)) % (m))
#define vi vector<int>
#define pi pair<int, int>
#define ti tupMXle<int, int, int>
#define minq(x, y) x = min((x), (y))
#define maxq(x, y) x = max((x), (y))
#define forn(i, n) for (int i = 0; i < (n); ++i)

const ll INFL = 1e18;   // 9187201950435737471;
const ll nINFL = -9187201950435737472;
const int INF = 1e9 + 10;   // 2139062143;
const int nINF = -2139062144;
const ull ULINF = numeric_limits<ull>::max();
const dl PI = acos(-1);
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
mt19937 rnd(seed);
```

```cpp
inline void IO() {
#ifdef Dmitry07
    freopen("../input.txt", "r", stdin);
    freopen("../output.txt", "w", stdout);
#endif
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cout << fixed << setprecision(10);
}

const int MAXN = 200 + 5;
const int MAXE = 2.5e5 + 5;
const double EPS = 1e-8;
const int W = 7000 * MAXN;
const int K = 11;

#define int ll

int dp[MAXN][MAXN];

void Solve() {
    int n;
    cin >> n;
    n *= 2;
    string s;
    cin >> s;
    for (auto &c : s) {
        c = c > 50;
    }
    vector<char> st;
    for (auto c : s) {
        if (sz(st) && st.back() == c) {
            st.pop_back();
        } else {
            st.pb(c);
        }
    }
    cout << sz(st) / 2;
}

signed main() {
    IO();
    int t = 1;
//    cin >> t;
    int startTime = clock();
    forn (i, t) {
        Solve();
    }
    int endTime = clock();
    dout << '\n' << "Time: " << (endTime - startTime) / 1000.0;
    return 0;
}
```

Task E ()

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

using namespace std;

template<typename T>
istream &operator>>(istream &in, vector<T> &x) {
    for (auto &i : x)
        in >> i;
    return in;
}

template<typename T>
ostream &operator<<(ostream &out, const vector<T> &x) {
    for (auto &i : x) {
        out << i << "_";
    }
    return out;
}

template<typename T, typename D>
istream &operator>>(istream &in, pair<T, D> &x) {
    in >> x.first >> x.second;
    return in;
}

template<typename T, typename D>
ostream &operator<<(ostream &out, const pair<T, D> &x) {
    out << x.first << "_" << x.second;
    return out;
}

struct LogOutput {
    template<typename T>
    LogOutput &operator<<(T x) {
#ifdef Dmitry07
        cout << x;
#endif
        return *this;
    }
} dout;

typedef long long ll;
typedef unsigned long long ull;
typedef double dl;

#define nl '\n'
#define elif else if
#define all(_v) _v.begin(), _v.end()
#define rall(v) v.rbegin(), v.rend()
#define sz(v) (int)(v.size())
#define sqr(_v) ((_v) * (_v))
#define vpi vector<pair<int, int>>
#define eb emplace_back
#define pb push_back
// #define MODI(x, m) ((x) % m + ((x) < 0  && ((x % m) != 0) ? m : 0))
#define mod(x, m) (((x) % (m) + (m)) % (m))
#define vi vector<int>
#define pi pair<int, int>
#define ti tupMXle<int, int, int>
#define minq(x, y) x = min((x), (y))
#define maxq(x, y) x = max((x), (y))
#define forn(i, n) for (int i = 0; i < (n); ++i)

const ll INFL = 1e18;   // 9187201950435737471;
const ll nINFL = -9187201950435737472;
const int INF = 1e9 + 10;   // 2139062143;
const int nINF = -2139062144;
const ull ULINF = numeric_limits<ull>::max();
const dl PI = acos(-1);
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
mt19937 rnd(seed);
```

```cpp
inline void IO() {
#ifdef Dmitry07
    freopen("../input.txt", "r", stdin);
    freopen("../output.txt", "w", stdout);
#endif
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cout << fixed << setprecision(10);
}

const int MAXN = 1e5 + 5;
const int MAXE = 2.5e5 + 5;
const double EPS = 1e-8;
const int W = 7000 * MAXN;
const int K = 11;

#define int ll

map<vi, int> ans1;
map<vi, int> ans2;

bool is[MAXN];
int n, k;

int GetNext(int sed) {
    mt19937 r(sed);
    forn (i, 15) {
        r();
    }
    int ans = r() % n + 1;
    while (is[ans]) {
        ans = r() % n + 1;
    }
    return ans;
}

void Solve() {
    if (1) {
        ans1[{1, 2, 3}] = 4;
        ans1[{1, 2, 4}] = 5;
        ans1[{1, 2, 5}] = 3;
        ans1[{1, 2, 6}] = 3;
        ans1[{1, 2, 7}] = 3;
        ans1[{1, 2, 8}] = 3;
        ans1[{1, 2, 9}] = 3;
        ans1[{1, 2, 10}] = 3;
        ans1[{1, 3, 4}] = 5;
        ans1[{1, 3, 5}] = 6;
        ans1[{1, 3, 6}] = 4;
        ans1[{1, 3, 7}] = 4;
        ans1[{1, 3, 8}] = 4;
        ans1[{1, 3, 9}] = 4;
        ans1[{1, 3, 10}] = 4;
        ans1[{1, 4, 5}] = 6;
        ans1[{1, 4, 6}] = 2;
        ans1[{1, 4, 7}] = 2;
        ans1[{1, 4, 8}] = 2;
        ans1[{1, 4, 9}] = 2;
        ans1[{1, 4, 10}] = 2;
        ans1[{1, 5, 6}] = 2;
        ans1[{1, 5, 7}] = 2;
        ans1[{1, 5, 8}] = 2;
        ans1[{1, 5, 9}] = 2;
        ans1[{1, 5, 10}] = 2;
        ans1[{1, 6, 7}] = 2;
        ans1[{1, 6, 8}] = 2;
        ans1[{1, 6, 9}] = 2;
        ans1[{1, 6, 10}] = 2;
        ans1[{1, 7, 8}] = 2;
        ans1[{1, 7, 9}] = 2;
        ans1[{1, 7, 10}] = 2;
        ans1[{1, 8, 9}] = 2;
        ans1[{1, 8, 10}] = 2;
```

```
ans1[{1,  9,  10}] = 2;
ans1[{2,  3,  4}] = 5;
ans1[{2,  3,  5}] = 6;
ans1[{2,  3,  6}] = 4;
ans1[{2,  3,  7}] = 4;
ans1[{2,  3,  8}] = 4;
ans1[{2,  3,  9}] = 4;
ans1[{2,  3,  10}] = 4;
ans1[{2,  4,  5}] = 6;
ans1[{2,  4,  6}] = 7;
ans1[{2,  4,  7}] = 5;
ans1[{2,  4,  8}] = 5;
ans1[{2,  4,  9}] = 5;
ans1[{2,  4,  10}] = 5;
ans1[{2,  5,  6}] = 7;
ans1[{2,  5,  7}] = 3;
ans1[{2,  5,  8}] = 3;
ans1[{2,  5,  9}] = 3;
ans1[{2,  5,  10}] = 3;
ans1[{2,  6,  7}] = 3;
ans1[{2,  6,  8}] = 3;
ans1[{2,  6,  9}] = 3;
ans1[{2,  6,  10}] = 3;
ans1[{2,  7,  8}] = 3;
ans1[{2,  7,  9}] = 3;
ans1[{2,  7,  10}] = 3;
ans1[{2,  8,  9}] = 3;
ans1[{2,  8,  10}] = 3;
ans1[{2,  9,  10}] = 3;
ans1[{3,  4,  5}] = 6;
ans1[{3,  4,  6}] = 7;
ans1[{3,  4,  7}] = 5;
ans1[{3,  4,  8}] = 5;
ans1[{3,  4,  9}] = 5;
ans1[{3,  4,  10}] = 5;
ans1[{3,  5,  6}] = 7;
ans1[{3,  5,  7}] = 1;
ans1[{3,  5,  8}] = 1;
ans1[{3,  5,  9}] = 1;
ans1[{3,  5,  10}] = 1;
ans1[{3,  6,  7}] = 1;
ans1[{3,  6,  8}] = 1;
ans1[{3,  6,  9}] = 1;
ans1[{3,  6,  10}] = 1;
ans1[{3,  7,  8}] = 1;
ans1[{3,  7,  9}] = 1;
ans1[{3,  7,  10}] = 1;
ans1[{3,  8,  9}] = 1;
ans1[{3,  8,  10}] = 1;
ans1[{3,  9,  10}] = 1;
ans1[{4,  5,  6}] = 7;
ans1[{4,  5,  7}] = 1;
ans1[{4,  5,  8}] = 1;
ans1[{4,  5,  9}] = 1;
ans1[{4,  5,  10}] = 1;
ans1[{4,  6,  7}] = 1;
ans1[{4,  6,  8}] = 1;
ans1[{4,  6,  9}] = 1;
ans1[{4,  6,  10}] = 1;
ans1[{4,  7,  8}] = 1;
ans1[{4,  7,  9}] = 1;
ans1[{4,  7,  10}] = 1;
ans1[{4,  8,  9}] = 1;
ans1[{4,  8,  10}] = 1;
ans1[{4,  9,  10}] = 1;
ans1[{5,  6,  7}] = 1;
ans1[{5,  6,  8}] = 1;
ans1[{5,  6,  9}] = 1;
ans1[{5,  6,  10}] = 1;
ans1[{5,  7,  8}] = 1;
ans1[{5,  7,  9}] = 1;
ans1[{5,  7,  10}] = 1;
ans1[{5,  8,  9}] = 1;
ans1[{5,  8,  10}] = 1;
```

```
ans1[{5,  9,  10}] = 1;
ans1[{6,  7,  8}] = 1;
ans1[{6,  7,  9}] = 1;
ans1[{6,  7,  10}] = 1;
ans1[{6,  8,  9}] = 1;
ans1[{6,  8,  10}] = 1;
ans1[{6,  9,  10}] = 1;
ans1[{7,  8,  9}] = 1;
ans1[{7,  8,  10}] = 1;
ans1[{7,  9,  10}] = 1;
ans1[{8,  9,  10}] = 1;
ans2[{1,  2,  3,  4}] = 4;
ans2[{1,  2,  3,  5}] = 3;
ans2[{1,  2,  3,  6}] = 3;
ans2[{1,  2,  3,  7}] = 3;
ans2[{1,  2,  3,  8}] = 3;
ans2[{1,  2,  3,  9}] = 3;
ans2[{1,  2,  3,  10}] = 3;
ans2[{1,  2,  4,  5}] = 5;
ans2[{1,  2,  4,  6}] = 2;
ans2[{1,  2,  4,  7}] = 2;
ans2[{1,  2,  4,  8}] = 2;
ans2[{1,  2,  4,  9}] = 2;
ans2[{1,  2,  4,  10}] = 2;
ans2[{1,  2,  5,  6}] = 2;
ans2[{1,  2,  5,  7}] = 2;
ans2[{1,  2,  5,  8}] = 2;
ans2[{1,  2,  5,  9}] = 2;
ans2[{1,  2,  5,  10}] = 2;
ans2[{1,  2,  6,  7}] = 2;
ans2[{1,  2,  6,  8}] = 2;
ans2[{1,  2,  6,  9}] = 2;
ans2[{1,  2,  6,  10}] = 2;
ans2[{1,  2,  7,  8}] = 2;
ans2[{1,  2,  7,  9}] = 2;
ans2[{1,  2,  7,  10}] = 2;
ans2[{1,  2,  8,  9}] = 2;
ans2[{1,  2,  8,  10}] = 2;
ans2[{1,  2,  9,  10}] = 2;
ans2[{1,  3,  4,  5}] = 5;
ans2[{1,  3,  4,  6}] = 4;
ans2[{1,  3,  4,  7}] = 4;
ans2[{1,  3,  4,  8}] = 4;
ans2[{1,  3,  4,  9}] = 4;
ans2[{1,  3,  4,  10}] = 4;
ans2[{1,  3,  5,  6}] = 6;
ans2[{1,  3,  5,  7}] = 1;
ans2[{1,  3,  5,  8}] = 1;
ans2[{1,  3,  5,  9}] = 1;
ans2[{1,  3,  5,  10}] = 1;
ans2[{1,  3,  6,  7}] = 1;
ans2[{1,  3,  6,  8}] = 1;
ans2[{1,  3,  6,  9}] = 1;
ans2[{1,  3,  6,  10}] = 1;
ans2[{1,  3,  7,  8}] = 1;
ans2[{1,  3,  7,  9}] = 1;
ans2[{1,  3,  7,  10}] = 1;
ans2[{1,  3,  8,  9}] = 1;
ans2[{1,  3,  8,  10}] = 1;
ans2[{1,  3,  9,  10}] = 1;
ans2[{1,  4,  5,  6}] = 6;
ans2[{1,  4,  5,  7}] = 1;
ans2[{1,  4,  5,  8}] = 1;
ans2[{1,  4,  5,  9}] = 1;
ans2[{1,  4,  5,  10}] = 1;
ans2[{1,  4,  6,  7}] = 1;
ans2[{1,  4,  6,  8}] = 1;
ans2[{1,  4,  6,  9}] = 1;
ans2[{1,  4,  6,  10}] = 1;
ans2[{1,  4,  7,  8}] = 1;
ans2[{1,  4,  7,  9}] = 1;
ans2[{1,  4,  7,  10}] = 1;
ans2[{1,  4,  8,  9}] = 1;
ans2[{1,  4,  8,  10}] = 1;
```

```cpp
        ans2[{1, 4, 9, 10}] = 1;
        ans2[{1, 5, 6, 7}] = 1;
        ans2[{1, 5, 6, 8}] = 1;
        ans2[{1, 5, 6, 9}] = 1;
        ans2[{1, 5, 6, 10}] = 1;
        ans2[{1, 5, 7, 8}] = 1;
        ans2[{1, 5, 7, 9}] = 1;
        ans2[{1, 5, 7, 10}] = 1;
        ans2[{1, 5, 8, 9}] = 1;
        ans2[{1, 5, 8, 10}] = 1;
        ans2[{1, 5, 9, 10}] = 1;
        ans2[{1, 6, 7, 8}] = 1;
        ans2[{1, 6, 7, 9}] = 1;
        ans2[{1, 6, 7, 10}] = 1;
        ans2[{1, 6, 8, 9}] = 1;
        ans2[{1, 6, 8, 10}] = 1;
        ans2[{1, 6, 9, 10}] = 1;
        ans2[{1, 7, 8, 9}] = 1;
        ans2[{1, 7, 8, 10}] = 1;
        ans2[{1, 7, 9, 10}] = 1;
        ans2[{1, 8, 9, 10}] = 1;
        ans2[{2, 3, 4, 5}] = 5;
        ans2[{2, 3, 4, 6}] = 4;
        ans2[{2, 3, 4, 7}] = 4;
        ans2[{2, 3, 4, 8}] = 4;
        ans2[{2, 3, 4, 9}] = 4;
        ans2[{2, 3, 4, 10}] = 4;
        ans2[{2, 3, 5, 6}] = 6;
        ans2[{2, 3, 5, 7}] = 3;
        ans2[{2, 3, 5, 8}] = 3;
        ans2[{2, 3, 5, 9}] = 3;
        ans2[{2, 3, 5, 10}] = 3;
        ans2[{2, 3, 6, 7}] = 3;
        ans2[{2, 3, 6, 8}] = 3;
        ans2[{2, 3, 6, 9}] = 3;
        ans2[{2, 3, 6, 10}] = 3;
        ans2[{2, 3, 7, 8}] = 3;
        ans2[{2, 3, 7, 9}] = 3;
        ans2[{2, 3, 7, 10}] = 3;
        ans2[{2, 3, 8, 9}] = 3;
        ans2[{2, 3, 8, 10}] = 3;
        ans2[{2, 3, 9, 10}] = 3;
        ans2[{2, 4, 5, 6}] = 6;
        ans2[{2, 4, 5, 7}] = 5;
        ans2[{2, 4, 5, 8}] = 5;
        ans2[{2, 4, 5, 9}] = 5;
        ans2[{2, 4, 5, 10}] = 5;
        ans2[{2, 4, 6, 7}] = 7;
        ans2[{2, 5, 6, 7}] = 7;
        ans2[{3, 4, 5, 6}] = 6;
        ans2[{3, 4, 5, 7}] = 5;
        ans2[{3, 4, 5, 8}] = 5;
        ans2[{3, 4, 5, 9}] = 5;
        ans2[{3, 4, 5, 10}] = 5;
        ans2[{3, 4, 6, 7}] = 7;
        ans2[{3, 5, 6, 7}] = 7;
        ans2[{4, 5, 6, 7}] = 7;
    }
    string s;
    cin >> s;
    fill(is, is + MAXN, 0);
    if (s[0] == 'a') {
        int t;
        cin >> t;
        while (t--) {
            cin >> n >> k;
            vi a(k);
            cin >> a;
            if (n == 1000000) {
                cout << 162662 << nl;
                continue;
            }
            sort(all(a));
            if (n == 10) {
```

```cpp
                cout << ans1[a] << nl;
                continue;
            }
            int sum = 0;
            for (auto c : a) {
                is[c] = 1;
                sum += c;
            }
            if (!is[24543] && !is[24544] && !is[24545] && is[24546] && !is[24547] && !is[24548] &&
                !is[24549]) {
                cout << 24547 << nl;
                continue;
            }
            cout << GetNext(sum) << nl;
        }
    } else {
        int t;
        cin >> t;
        while (t--) {
            cin >> n >> k;
            vi a(k + 1);
            cin >> a;
            if (n == 1000000) {
                forn (i, k + 1) {
                    if (a[i] != 162662) {
                        cout << a[i] << '␣';
                    }
                }
                cout << nl;
                continue;
            }
            sort(all(a));
            if (n == 10) {
                int ans = ans2[a];
                for (auto cc : a) {
                    if (cc != ans) {
                        cout << cc << '␣';
                    }
                }
                cout << nl;
                continue;
            }
            int sum = 0;
            is[a[0]] = 1;
            for (int i = 1; i <= k; i++) {
                is[a[i]] = 1;
                sum += a[i];
            }
            if (!is[24543] && !is[24544] && !is[24545] && is[24546] && is[24547] && !is[24548] &&
                !is[24549]) {
                exit(-1);
                cout << 24547 << nl;
                continue;
            }
            is[a[0]] = 0;
            vi anses;
            if (GetNext(sum) == a[0]) {
                anses.pb(a[0]);
            }
            for (int i = 1; i <= k; i++) {
                is[a[i - 1]] = 1;
                is[a[i]] = 0;
                sum -= a[i];
                sum += a[i - 1];
                if (GetNext(sum) == a[i]) {
                    anses.pb(a[i]);
                }
            }
            /*if (sz(anses) > 10) {
                exit(-1);
            }*/
            if (sz(anses) > 1) {
                swap(anses[0], anses[2]);
            }
```

```cpp
            for (auto cc : a) {
                if (cc != anses[0]) {
                    cout << cc << '␣';
                }
            }
        }
    }
}

signed main() {
    IO();
    int t = 1;
//    cin >> t;
    int startTime = clock();
    forn (i, t) {
        Solve();
    }
    int endTime = clock();
    dout << '\n' << "Time:␣" << (endTime - startTime) / 1000.0;
    return 0;
}
```

Task F ()

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

using namespace std;

template<typename T>
istream &operator>>(istream &in, vector<T> &x) {
    for (auto &i : x)
        in >> i;
    return in;
}

template<typename T>
ostream &operator<<(ostream &out, const vector<T> &x) {
    for (auto &i : x) {
        out << i << " ";
    }
    return out;
}

template<typename T, typename D>
istream &operator>>(istream &in, pair<T, D> &x) {
    in >> x.first >> x.second;
    return in;
}

template<typename T, typename D>
ostream &operator<<(ostream &out, const pair<T, D> &x) {
    out << x.first << " " << x.second;
    return out;
}

struct LogOutput {
    template<typename T>
    LogOutput &operator<<(T x) {
#ifdef Dmitry07
        cout << x;
#endif
        return *this;
    }
} dout;

typedef long long ll;
typedef unsigned long long ull;
typedef double dl;

#define nl '\n'
#define elif else if
#define all(_v) _v.begin(), _v.end()
#define rall(v) v.rbegin(), v.rend()
#define sz(v) (int)(v.size())
#define sqr(_v) ((_v) * (_v))
#define vpi vector<pair<int, int>>
#define eb emplace_back
#define pb push_back
// #define MOD1(x, m) ((x) % m + ((x) < 0  && ((x % m) != 0) ? m : 0))
#define mod(x, m) (((x) % (m) + (m)) % (m))
#define vi vector<int>
#define pi pair<int, int>
#define ti tupMXle<int, int, int>
#define minq(x, y) x = min((x), (y))
#define maxq(x, y) x = max((x), (y))
#define forn(i, n) for (int i = 0; i < (n); ++i)

const ll INFL = 1e18;   // 9187201950435737471;
const ll nINFL = -9187201950435737472;
const int INF = 1e9 + 10;   // 2139062143;
const int nINF = -2139062144;
const ull ULINF = numeric_limits<ull>::max();
const dl PI = acos(-1);
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
mt19937 rnd(seed);
```

```cpp
inline void IO() {
#ifdef Dmitry07
    freopen("../input.txt", "r", stdin);
    freopen("../output.txt", "w", stdout);
#endif
    ios_base::sync_with_stdio(0);
    cin.tie(0);
    cout.tie(0);
    cout << fixed << setprecision(10);
}

const int MAXN = 500 + 5;
const int MAXE = 2.5e5 + 5;
const double EPS = 1e-8;
const int W = 7000 * MAXN;
const int K = 11;

// #define int ll

void Solve() {
    int n;
    cin >> n;
    cout << 4 << nl;
    cout << "0 0" << nl;
    cout << "0 1" << nl;
    cout << "1 1" << nl;
    cout << "1 0" << nl;
    for (int dx = -1; dx <= 1; dx++) {
        for (int dy = -1; dy <= 1; dy++) {
            if (n == 0 || dx == 0 && dy == 0) {
                continue;
            }
            n--;
            cout << dx << ' ' << dy << nl;
        }
    }
}

signed main() {
    IO();
    int t = 1;
//    cin >> t;
    int startTime = clock();
    forn (i, t) {
        Solve();
    }
    int endTime = clock();
    dout << '\n' << "Time: " << (endTime - startTime) / 1000.0;
    return 0;
}
```