

NAMUNAVIY MASALALAR

1-masala. Minimal farq

n ta butun son berilgan. Ikki element orasidagi minimal farqni toping.

Yechim (saralash + chiziqli yurish)

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

int main() {
    int n;
    cin >> n;
    vector<long long> a(n);
    for (int i = 0; i < n; i++) cin >> a[i];

    sort(a.begin(), a.end());
    long long mn = llabs(a[1] - a[0]);
    for (int i = 1; i < n - 1; i++)
        mn = min(mn, llabs(a[i + 1] - a[i]));

    cout << mn;
    return 0;
}
```

2-masala. Berilgan yig'indi

Saralangan massiv va son S berilgan. Shunday ikkita element bormi-yo'qmi tekshiringki, ularning yig'indisi S ga teng bo'lsin.

Yechim (two pointers)

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

int main() {
    int n;
    long long S;
    cin >> n >> S;
    vector<long long> a(n);
    for (int i = 0; i < n; i++) cin >> a[i];

    int l = 0, r = n - 1;
    while (l < r) {
```

```

        long long sum = a[l] + a[r];
        if (sum == S) {
            cout << "YES";
            return 0;
        } else if (sum < S) {
            l++;
        } else {
            r--;
        }
    }
    cout << "NO";
    return 0;
}

```

3-masala. Oraliq yig'indi so'rovlari

Massiv berilgan. Q ta so'rovda l r beriladi. Har biri uchun l dan r gacha yig'indini toping.

Yechim (prefix sum)

```

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

int main() {
    int n;
    cin >> n;
    vector<long long> a(n + 1), pref(n + 1, 0);

    for (int i = 1; i <= n; i++) {
        cin >> a[i];
        pref[i] = pref[i - 1] + a[i];
    }

    int q;
    cin >> q;
    while (q--) {
        int l, r;
        cin >> l >> r;
        cout << pref[r] - pref[l - 1] << "\n";
    }
    return 0;
}

```

4-masala. Eng uzun o'suvchi bo'lak

Ketma-ketlik berilgan. Ketma-ket joylashgan o'suvchi bo'lakning maksimal uzunligini toping.

Yechim (chiziqli algoritim)

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

int main() {
    int n;
    cin >> n;
    vector<int> a(n);
    for (int i = 0; i < n; i++) cin >> a[i];

    int cur = 1, mx = 1;
    for (int i = 1; i < n; i++) {
        if (a[i] > a[i - 1]) {
            cur++;
            mx = max(mx, cur);
        } else {
            cur = 1;
        }
    }
    cout << mx;
    return 0;
}
```

5-masala. Eng yaqin element

Shart:

Saralangan massiv va X son berilgan. X ga eng yaqin elementni toping (agar teng masofa bo'lsa, kichigini tanlang).

Yechim (binary search)

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

int main() {
    int n;
    long long X;
    cin >> n >> X;
    vector<long long> a(n);
    for (int i = 0; i < n; i++) cin >> a[i];
}
```

```

    int pos = lower_bound(a.begin(), a.end(), X) -
a.begin();

    if (pos == 0) {
        cout << a[0];
    } else if (pos == n) {
        cout << a[n - 1];
    } else {
        if (llabs(a[pos] - X) < llabs(a[pos - 1] - X))
            cout << a[pos];
        else
            cout << a[pos - 1];
    }
    return 0;
}

```

6-masala. Minimal bo‘lak uzunligi

Musbat sonlardan iborat massiv va S berilgan. Yig‘indisi kamida S bo‘lgan eng kichik uzluksiz bo‘lak uzunligini toping.

Agar yo‘q bo‘lsa 0.

Yechim (sliding window)

```

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

int main() {
    int n;
    long long S;
    cin >> n >> S;
    vector<long long> a(n);
    for (int i = 0; i < n; i++) cin >> a[i];

    long long sum = 0;
    int l = 0, ans = n + 1;
    for (int r = 0; r < n; r++) {
        sum += a[r];
        while (sum >= S) {
            ans = min(ans, r - l + 1);
            sum -= a[l];
            l++;
        }
    }
    if (ans == n + 1) cout << 0;
    else cout << ans;
}

```

```

        return 0;
    }

```

7-masala. Greedy tanlov

n ta vazifa berilgan, har birida bajarish vaqti bor. Bir kunda ketma-ket bajarilsa, eng ko‘p vazifani bajarish mumkin bo‘lsin.

Yechim (greedy + sort)

```

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

int main() {
    int n;
    long long T;
    cin >> n >> T;
    vector<long long> t(n);
    for (int i = 0; i < n; i++) cin >> t[i];

    sort(t.begin(), t.end());
    long long sum = 0;
    int cnt = 0;
    for (int i = 0; i < n; i++) {
        if (sum + t[i] <= T) {
            sum += t[i];
            cnt++;
        } else break;
    }
    cout << cnt;
    return 0;
}

```

8-masala. Eng katta juftlik ko‘paytmasi

Massivdan shunday ikki element tanlangi, ularning ko‘paytmasi maksimal bo‘lsin.

Yechim (saralash)

```

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

int main() {
    int n;
    cin >> n;

```

```

vector<long long> a(n);
for (int i = 0; i < n; i++) cin >> a[i];

sort(a.begin(), a.end());
long long ans = max(a[0] * a[1], a[n - 1] * a[n -
2]);
cout << ans;
return 0;
}

```

9-masala. Tub bo'lmaganlar soni

1 dan n gacha bo'lgan sonlar ichida tub bo'lmaganlar sonini toping.

Yechim (Eratosthenes elagi)

```

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

int main() {
    int n;
    cin >> n;
    vector<bool> prime(n + 1, true);
    prime[0] = prime[1] = false;

    for (int i = 2; i * i <= n; i++) {
        if (prime[i]) {
            for (int j = i * i; j <= n; j += i)
                prime[j] = false;
        }
    }

    int cnt = 0;
    for (int i = 1; i <= n; i++)
        if (!prime[i]) cnt++;

    cout << cnt;
    return 0;
}

```

10-masala. Eng katta bo'linuvchi bo'lak

Massiv berilgan. Yig'indisi K ga bo'linadigan eng uzun uzluksiz bo'lak uzunligini toping.

Yechim (prefix sum + map)

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

int main() {
    int n, K;
    cin >> n >> K;
    vector<long long> a(n);
    for (int i = 0; i < n; i++) cin >> a[i];

    map<int,int> first;
    long long sum = 0;
    int ans = 0;
    first[0] = -1;

    for (int i = 0; i < n; i++) {
        sum += a[i];
        int r = ((sum % K) + K) % K;
        if (first.count(r))
            ans = max(ans, i - first[r]);
        else
            first[r] = i;
    }
    cout << ans;
    return 0;
}
```