



Notebook - Maratona de Programação

Py tá $O(N)$

Contents

1	Template	2
1.1	Template	2
2	Algoritmos	2
2.1	Binary Search Last True	2
2.2	Binary Search First True	2

1 Template

1.1 Template

```
1 #include <bits/stdc++.h>
2
3 using namespace std;
4
5 const int MAX = 2e5+17;
6
7 int main() {
8     ios::sync_with_stdio(false);
9     cin.tie(NULL);
10
11
12
13     return 0;
14 }
```

2 Algoritmos

2.1 Binary Search Last True

```
1 int first_true(int lo, int hi, function<bool(int)> f) {
2     {
3         hi++;
4     }
5 }
```

```
3     while (lo < hi) {
4         int mid = lo + (hi - lo) / 2;
5         if (f(mid)) {
6             hi = mid;
7         } else {
8             lo = mid + 1;
9         }
10    }
11    return lo;
12 }
```

2.2 Binary Search First True

```
1 int last_true(int lo, int hi, function<bool(int)> f)
2 {
3     lo--;
4     while (lo < hi) {
5         int mid = lo + (hi - lo + 1) / 2;
6         if (f(mid)) {
7             lo = mid;
8         } else {
9             hi = mid - 1;
10        }
11    }
12    return lo;
13 }
```