The Longest Increasing Subsequence

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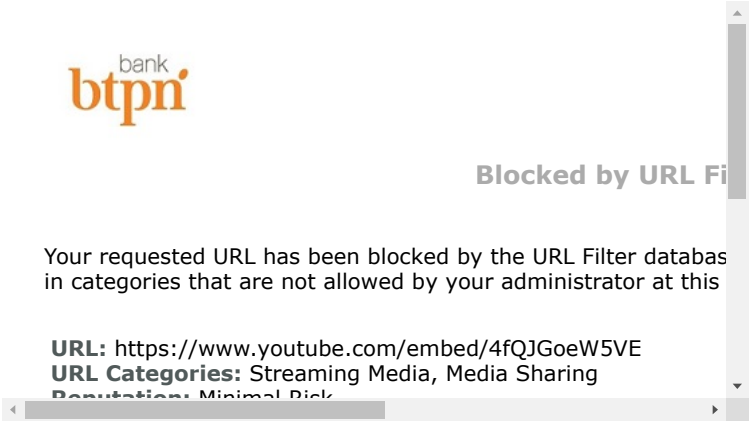
Problem Submissions Leaderboard Discussions Editorial

An Introduction to the Longest Increasing Subsequence Problem

The task is to find the length of the longest subsequence in a given array of integers such that all elements of the subsequence are sorted in strictly ascending order. This is called the Longest Increasing Subsequence (LIS) problem.

For example, the length of the LIS for $[15, 27, 14, 38, 26, 55, 46, 65, 85]$ is 6 since the longest increasing subsequence is $[15, 27, 38, 55, 65, 85]$.

Here's a great YouTube video of a lecture from MIT's Open-CourseWare covering the topic.



This is one approach which solves this in quadratic time using dynamic programming. A more efficient algorithm which solves the problem in $O(n \log n)$ time is available here.

In this challenge, you simply have to find the length of the longest strictly increasing subsequence of the given sequence.

Input Format

The first line contains a single integer n.
The next n lines describe the contents of the array. Specifically, the ith following line contains a_i, the ith element of the array.

Constraints

- $1 \leq n \leq 10^6$
- $1 \leq a_i \leq 10^5$

Output Format

Print a single line containing a single integer denoting the length of the longest increasing subsequence.

Sample Input 0

```
5
2
7
4
3
8
```

Sample Output 0

```
3
```

Explanation 0

$[2, 7, 8]$ is the longest increasing subsequence, hence the answer is 3 (the length of this subsequence).

Submissions:12973

Max Score:60

Difficulty: Advanced

Rate This Challenge:

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Current Buffer (saved locally, editable) Java 7

```
import java.io.*;
import java.util.*;
import java.text.*;
import java.math.*;
import java.util.regex.*;

public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
    }
}
```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code