

1] There is a staircase with  $n$  steps. You need to reach the top and you can either climb 1 step or 2 steps at a time. In how many distinct ways can you reach the top of the staircase.

**Examples**

n: 2

Answer: 2

Explanation: [[1, 1], [2]]

n: 4

Answer: 5

Explanation: [[1, 1, 1, 1], [1, 1, 2], [1, 2, 1], [2, 1, 1], [2, 2]]

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2] Given an array  $A$ , find the length of the longest strictly increasing subsequence (LIS). A subsequence is a sequence that can be derived from an array by deleting some or no elements such that the order of the remaining elements remain the same.

**Example**

A: [10, 20, 2, 5, 3, 8, 8, 25, 6]

Result: 4

Explanation: Longest increasing subsequence: [2, 5, 8, 25]

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3] Given two strings  $s1$  and  $s2$ , find the length of their longest common subsequence (LCS). If there is no common subsequence, return 0. The strings are composed of lower case English alphabets. A subsequence of a string is a string that can be derived by deleting some or no characters such that the order of the remaining characters remain the same.

**Example**

s1: "workattech"

s2: "branch"

Result: 4

Explanation: Longest common subsequence is "rach"

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4] A maximum sum subsequence of an array is subsequence whose sum is maximum with the condition that the subsequence is sorted.

Given an array, find the sum of the maximum sum subsequence of that array.

#### Example

arr: [101, 4, 98, 103]

answer: 205

Explanation: 4+98+103

arr: [101, 4, 95, 103]

answer: 204

Explanation: 101+103

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5] Given a string, return the longest palindromic substring (LPS) in it.

Note: There can be multiple palindromic substrings with the max length. In case of conflict, return the substring that has the smallest starting index.

#### Examples

str: "abdcab"

LPS: "cdc"

str: "abdcba"

LPS: "abdcba"

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6] You are given two strings s1 and s2. Find the minimum number of operations required to convert s1 to s2.

Permitted Operations:

Insert a character

Delete a character

Replace a character

Strings s1 and s2 are composed of only lowercase English characters.

#### Example

s1: "hello"

s2: "seldom"

Result: 3

Explanation:

hello → sello (replace h with s)

sello → seldo (replace l with d)

seldo → seldom (insert m at end)

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