1. Best Time to Buy and Sell Stock

Say you have an array for which the ith element is the price of a given stock on

If you were only permitted to complete at most one transaction (ie, buy one and sell one share of the stock), design an algorithm to find the maximum profit.

Note that you cannot sell a stock before you buy one.

Example 1:

Input : [7,1,5,3,6,4]

Output: 5

Explanation Buy on day 2 (price 1) and sell on day 5 (price 6), profit = 6 – 1 = 5.

Not 7-1 = 6 as selling price needs to be larger than buying price.

Example 2:

Input : [7,6,4,3,1]

Output: 0

Explanation : in this case, no transaction is done, i.e. max profit = 0.

1. Climbing Stairs

You are climbing a stair case. It takes n steps to reach to the top.

Each time you can either climb 1 or 2 steps. In how many distinct ways can you climb to the top?

Note: Given n will be a positive integer.

Example 1:

Input: 2

Output: 2

Explanation. There are two ways to climb to the top.

1.1 step + 1 step

2. 2 steps

Example 2

Input : 3

Output: 3

Explanation: There are three ways to climb to the top

1. 1 step + 1 step + 1 step

2. 1 step + 2 steps

3. 2 steps + 1 step

1. Single Number

Given a non-empty array of integers, every element appears twice except for one. Find that single one.

Note:

Your algorithm should have a linear runtime complexity. Could you implement it without using extra memory?

Example 1:

Input: [2,2,1]

Output: 1

Example 2:

Input: [4,1,2,1,2]

Output: 4