Assignment on Array

Problem 1: Awesh's Missing Number

Awesh is organizing a coding competition where participants need to solve a puzzle involving numbers. He gives them a shuffled array of consecutive numbers from 1 to n with one number missing. The task is to find the missing number.

Input	Output
5 3 4 1	2
1 2 4	3
7 8 10 9 6	5
1 3	2

Problem 2: Awesh's Unique Finder

Awesh has a unique challenge for you. He provides an array of integers where every element appears twice, except for one unique element. Your task is to find the unique element.

Input	Output
1 1 2	2
7 6 6 8 7 9	8
5 5 3 3 4	4
100 101 100 102 103 101 102	103

Problem 3: Awesh's Marathon Challenge

Awesh participates in a marathon, and he's keeping track of his split times at various checkpoints. However, his watch is sometimes faulty, leading to duplicate or inconsistent times. He wants to identify the maximum difference in split times to understand where his performance varies the most.

Problem Statement

Given an array of split times for a marathon, find the maximum difference between any two split times.

Input	Output
3 5 7 10	7
1 2 3 4 5	4
10 15 12 8	7
20 25 30 40	20

Problem 4: Awesh's Stock Portfolio

Awesh is tracking the value of his stock portfolio over time. He's interested in identifying a profitable window within a given range of days to maximize his returns. Help Awesh find the maximum profit that can be obtained by buying and selling stocks within a given range of days.

Problem Statement

Given an array of stock prices, find the maximum profit that can be obtained by buying on one day and selling on another day that comes after the buy day.

Input	Output
7 1 5 3 6 4	5
10 7 5 8 11 9	6
5 4 3 2 1	0
1 2 3 4 5	4