**Shift – 1**

**Question: Find Common Height Difference or Detect Invalid Input**

Find Common Height Difference or Detect Invalid Input

Given the height of a tree for 4 consecutive weeks, calculate the difference between each week.

If any height is negative, return "Not valid inputs".

If any two weekly differences are the same, return that difference.

If all differences are different, return "None".

APPROACH

Step 1: Check if any height is negative. If so, return "Not valid inputs".

Step 2: Calculate the differences:

diff1 = height2 - height1

diff2 = height3 - height2

diff3 = height4 - height3

Step 3: If any two of the above differences are the same, return the common difference.

Step 4: If all differences are different, return "None".

Input:

Four integers representing the height of the tree in 4 consecutive weeks.

Example 1:

Input: 2, 4, 6, 7

Output: 2

4-2 =2

6-4=2

Explanation: Differences are 2, 2, and 1 -> 2 appears twice.

Example 2:

Input: 5, 10, 11, 13

Output: None

Explanation: Differences are 5, 1, and 2 - all different.

Example 3:

Input: -1, 3, 4, 5

Output: Not valid inputs

Explanation: Negative height is invalid.

**Shift – 2**

**Question 1: Tower of Hanoi - Print Only Number of Steps**

Problem Statement:

Given the number of disks n, print the total number of moves required to solve the Tower of Hanoi problem. You do not need to print the

actual steps, just the number of steps.

Formula:

The number of steps required to solve Tower of Hanoi with n disks is:

steps = 2n - 1

Test Case 1:

Input:

1

Output:

1

Explanation:

21 - 1 = 1 move

Test Case 2:

Input:

2

Output:

3

Explanation:

22 - 1 = 3 moves

**Question 2: 2D Array Row Order Based on Even/Odd Row Index**

Problem Statement:

Given a 2D array with m rows and n columns, print the elements of the array such that:

Rows with even indices (0, 2, 4, ... ) are printed in the same order.

Rows with odd indices (1, 3, 5, ... ) are printed in reverse order.

Input Format:

First line: Two integers m and n

Next m lines: Each contains n integers

Test Case 1:

Input:

44

1234

5678

9 10 11 12

13 14 15 16

Output:

1234

8765

9 10 11 12

16 15 14 13

Test Case 2:

Input:

35

10 20 30 40 50

60 70 80 90 100

110 120 130 140 150

Output:

10 20 30 40 50

100 90 80 70 60

110 120 130 140 150