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# Python Program to check if given array is Monotonic

Difficulty Level : Easy • Last Updated : 05 Nov, 2018

Given an array **A** containing **n** integers. The task is to check whether the array is **Monotonic** or not. An array is monotonic if it is either **monotone increasing** or **monotone decreasing**.

An array A is monotone increasing if for all  $i \leq j$ ,  $A[i] \leq A[j]$ . An array A is monotone decreasing if for all  $i \leq j$ ,  $A[i] \geq A[j]$ .

Return **"True"** if the given array A is monotonic else return **"False"** (without quotes).

Examples:

Input : 6 5 4 4

Output : true

Input : 5 15 20 10

Output : false



## Approach:

An array is **monotonic** if and only if it is **monotone increasing**, or **monotone decreasing**. Since  $p \leq q$

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from 0 to len(A)-2.

**Note:** Array with **single element** can be considered to be both **monotonic increasing or decreasing**, hence returns "**True**".

**Below is the implementation of above approach:**

---

### Python3

```
# Python3 program to find sum in Nth group

# Check if given array is Monotonic
def isMonotonic(A):

    return (all(A[i] <= A[i + 1] for i in range(len(A) - 1)) or
            all(A[i] >= A[i + 1] for i in range(len(A) - 1)))

# Driver program
A = [6, 5, 4, 4]

# Print required result
print(isMonotonic(A))

# This code is written by
# Sanjit_Prasad
```



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**Time Complexity:**  $O(N)$ , where  $N$  is the length of array.

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