Ramps   X09467_en

In this exercice we say that in the position i of vector v there is a *ramp* when the elements $v[i]$, $v[i+1]$ y $v[i+2]$ are sorted in strictly increasing or decreasing order.

For example, when $n = 7$ and $v = [4, 5, 4, 3, -4, 2, 4]$ there are ramps at the positions 1, 2 and 4. When $v = [0, 0, 0, 0, 0, 0]$ there are no positions with a ramp.

Two positions with a ramp, i and j with $i < j$, are *potentially conflictive* if the corresponding ramps involve some common position.

In the previous example, the ramps at positions 1 and 2 are potentially conflictive, the one at position 2 is potentially conflictive with the ramp at position 4. The ramp at position 1 does not share any position with the ramp at position 4, therefore the ramps at positions 1 and 4 are not potentially conflictive.

Write a program indicating the positions with a ramp and the number of pairs (i, j) with $i < j$ corresponding to positions with a ramp and potentially conflictive.

Your program must define, implement and use the following procedures:

vector <**bool**> *ramps_pos*(**const** *vector* <**int**>& *V*);

which, given a vector of integers, returns a vector, with the same dimension, of boolean values, where the position i holds the value **true** if and only if the vector V has a ramp a position i.

int *pot_conflictive* (**const** *vector* <**bool**>& *B*);

which, given a vector indicating the positions with a ramp determines the number of pairs of positions (i, j), $i < j$, with a ramp and potentially conflictive.

Input

The input is formed by a non-empty sequence of cases. Each case is described by an integer $n \geq 3$ followed by the n integer values of the corresponding vector.

Output

Print, for each case, the positions having a ramp and the number of pairs of positions (i, j) with $i < j$ having a ramp and potentially conflictive.

Follow the format especified in the examples. Your code must follow the rules of style and the adequate comments. The simplicity and efficiency of the proposed solutions will be taken into consideration for the evaluation.

Sample input 1

```
6
0 0 0 0 0 0
7
1 2 3 4 3 2 1
```

Sample output 1

```
positions with a ramp:
potentially conflictive: 0
---
positions with a ramp: 0 1 3 4
potentially conflictive: 3
---
```

Sample input 2

```
3
7 8 7
3
7 8 9
3
8 7 6
```

Sample output 2

```
positions with a ramp:
potentially conflictive: 0
---
positions with a ramp: 0
potentially conflictive: 0
---
positions with a ramp: 0
potentially conflictive: 0
---
```

Sample input 3

```
8
9 8 7 6 5 4 3 2
9
0 1 2 1 0 1 2 1 0
```

Sample output 3

```
positions with a ramp: 0 1 2 3 4 5
potentially conflictive: 9
---
positions with a ramp: 0 2 4 6
potentially conflictive: 3
---
```

Sample input 4

```
6
1 2 3 4 5 6
7
100  90  80  90 100 90 80
```

Sample output 4

```
positions with a ramp: 0 1 2 3
potentially conflictive: 5
---
positions with a ramp: 0 2 4
potentially conflictive: 2
---
```

Sample input 5

```
6
0 1 0 1 0 1
```

Sample output 5

```
positions with a ramp:
potentially conflictive: 0
---
```

Problem information

Author: Professorat de PRO1
Translator: Maria Serna

Generation: 2026-01-25T13:26:09.516Z