Problem A
Ntonic Sequence

Source file: sequence.{c | cpp | java}
Input file: sequence.in

A sequence is monotonic if it is either strictly increasing or decreasing. For example, <2, 4, 8, 9> or <9, 6, 5, 3> are monotonic sequences. A bitonic sequence is a sequence that first monotonically increases, then monotonically decreases or vice-versa. For example, <4; 6; 8; 3; -2>, <9; 2; -4; -10; -5> are bitonic sequences. A sequence is polytonic, if it is neither monotonic, nor bitonic. For example, <1; 3; 12; 4; 2; 10> is a polytonic sequence. Given a sequence of *n* integers, your task is to determine whether it is mono, bi, or polytonic sequence.

Input

The input consists of several sequences of numbers. Each sequence starts with *n* (0< *n* <= 1000), the number of integers in the sequence, followed by *n* 32-bit signed integers separated by whitespace and/or newline. Input is terminated by a sequence having *n*=0, which should not be processed.

Output

For each sequence, you are to output one line, containing the sequence number, a space and only the type, i.e., “mono”, “bi” or “poly”.

Sample Input

```
4 2 4 8 9
6 1 3 12 4
   2 10
5 9
2 -4 -10 -5
0
```

Output for Sample Input

```
1 mono
2 poly
3 bi
```