Longest sequence of average temperatures

This program searches for the longest sequence of average temperatures, in which the diffrrence between the maximum and minimum average temperatures in this sequence is below or equal to a parameter (entered by the user or other api), this parameter is 5 by default.

Note that If there are several maximum sequences, the latest sequence is returned.

Example

The table 1 lists the average temperatures recorded over 10 days:

Day	1	2	3	4	5	6	7	8	9	10
Average temperature	11	10	13	15	14	17	16	19	20	22

Table 1: Example of a test array

the longest sequence in this array for a parameter of 5 is the sequence that start in index 1 and ends in index 5. Every two members of this sequence have a diffrence less or equal to 5.

The algorithm

In order to detect our desired sequence, we calculate the average value of all members of this sequence and then verify if they are all within an interval centered by that average.

So for the sequence $[x_1..x_5]$ to verify our condition:

$$\forall\, x_i : \qquad |x_i - \overline{X_{1,5}}| < \frac{P}{2}$$

Where $\overline{X_{1,5}}$ is :

$$\overline{X_{1,5}} = \frac{\sum_{n=1}^{5} x_n}{5}$$

And P is our parameter.

Now supposing that the condition above is verified, the next step is to make sure that this sequence is a Maximum sequence.

Day	1	2	3	4	5	6	7	8	9	10
Average temperature	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}

Table 2: Example 2

To be continued...

Perspective

How to handle a stream of data instead of a static array?