

## Chapter 2 / Example 3

# Measures of dispersion

The number of days of precipitation in January in London for 2008–2017 is given in the table:

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Days of precipitation	19	16	21	21	13	21	30	26	21	15

(data from weatherline.co.uk)

- Write down the range of the number of days of precipitation in January in London for these years.
- Calculate the interquartile range of the number of days of precipitation in January in London for these years.
- Find the standard deviation of the number of days of precipitation in January in London for these years.
- Find whether the 30 cm precipitation in January 2014 is an outlier.

Open a new document and add a Lists & Spreadsheet page.

Type 'days' in the first cell.

Type the numbers 19, 16, 21, ... 15 in the first column.

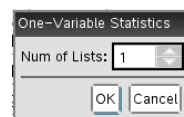
Press **enter** or ▼ after each number to move to the next cell.

The screenshot shows a TI-Nspire CX Lists & Spreadsheet page. Column A is labeled 'days'. The first five rows of data are entered: 19, 16, 21, 21, and 13. The cursor is in cell A5, which contains the number 13. The status bar at the bottom shows 'A5 13'.

To calculate a statistical summary of the data

Press **menu** 4:Statistics | 1:Stat Calculations | 1:One-Variable Statistics...

Click the touchpad on OK or press **enter**



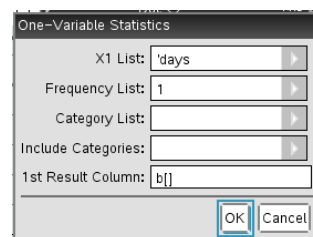
Open the drop down lists with ► and select using ▼ and **enter**

Choose 'days' for X1 List and leave Frequency List as 1.

The next two choices remain empty.

Leave the 1st Result Column as b[] as this is the next free column in the spreadsheet.

Press **enter** or use the touchpad to click OK.



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The GDC displays a list of statistics for the data.

Scroll down to see the minimum and maximum values.

The table of statistics shows that the minimum is 13 and the maximum is 30.

days	MinX	Q1X	MedianX	Q3X	MaxX
	13.	16.	21.	21.	30.

Add a new Calculator page to your document by pressing **ctrl** **doc** (+page) 1: Add Calculator.

The statistics that you calculated earlier are all stored as variables.

Press **var** **del**

days
stat.maxx
stat.medianx
stat.minx
stat.n
stat.q1x
stat.q3x
stat.results
stat.ssx
stat.stat
stat.sx
stat.values
stat.x
stat.ox

To calculate the range Use Range = maxx – minx.

Select stat.maxx and stat.minx from the list to enter the calculation.

The range is 17.

stat.MaxX - stat.MinX	17.
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To calculate the interquartile range Use IQR = q3x – q1x.

Select stat.q3x and stat.q1x from the list to enter the calculation.

The inter quartile range is 5.

stat.MaxX - stat.MinX	17.
stat.Q3X - stat.Q1X	5.

Select stat.ox, the standard deviation, from the list of stored variables.

The standard deviation is 4.80 days.

stat.MaxX - stat.MinX	17.
stat.Q3X - stat.Q1X	5.
stat.ox	4.79687

To determine whether 30 is an outlier use  $q3 + 1.5(IQR)$

Select stat.q3 and stat.q1 from the list to enter the calculation

stat.q1 **+** 1.5 ( stat.q3 **-** stat.q1 ).

$30 < 28.5$ , so 30 is an outlier.

stat.MaxX - stat.MinX	17.
stat.Q3X - stat.Q1X	5.
stat.ox	4.79687
stat.Q3X + 1.5 * (stat.Q3X - stat.Q1X)	28.5

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