

Chapter 5 / Example 7

Calculating mean and standard deviation

It is expected that a GDC will be used to calculate the population standard deviation and variance.

A group of 40 students were asked how many times they visited the dentist in the last year.

Their responses were:

3, 0, 2, 5, 7, 6, 8, 0, 4, 1, 6, 3, 0, 5, 6, 5, 3, 6, 2, 7, 6, 0, 4, 4, 6, 6, 5, 7, 0, 1, 2, 5, 8, 0, 4, 3, 4, 6, 7, 5.

Calculate the mean and standard deviation for this data.

The data can be summarized in a frequency table

x	0	1	2	3	4	5	6	7	8
f	6	2	3	4	5	7	8	3	2

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

Type 'x' in the first cell and press **enter**.

Type 0, 1, 2, 3, etc. in the first column.

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

A	x	B	C	D
1	0			
2	1			
3	2			
4	3			
5	4			

Type 'f' in the cell to the right of 'score' and press **enter**.

Enter the frequencies of each of the number of visits in the second column.

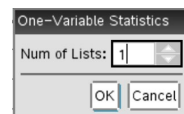
Use the **▲ ▼ ► ◀** keys on the touchpad to navigate the spreadsheet.

A	x	B	f	C	D
1	0	6			
2	1	2			
3	2	3			
4	3	4			
5	4	5			

To calculate an estimate of the mean and standard deviation of the number of visits represented in the table.

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

Since the statistics refer to just one list click the touchpad on OK or press **enter**.



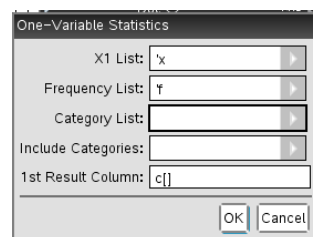
Open the drop down lists with **►** and select using **▼** and **enter**.

Choose 'x' for X1 List and 'f' for Frequency List.

The next two choices remain empty.

The 1st Result Column can remain as c[] as this is the third 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.

The results show that the estimate of the mean (\bar{x}) is 4.

So the average number of visits to the dentist is 4.

A	x	B	f	C	D
=					=OneVar(
1	0	6	Title		One-Va...
2	1	2	\bar{x}		4.
3	2	3	Σx		160.
4	3	4	Σx^2		868.
5	4	5	$s_x := s_{n-1}$		2.41788

D1 = "One-Variable Statistics"

For the standard deviation, it is important to select the population standard deviation, σ_x .

Scroll down to see the σ_x using ▼.

$\sigma_x = 2.39$.

A	x	B	f	C	D
=					=OneVar(
2	1	2	\bar{x}		4.
3	2	3	Σx		160.
4	3	4	Σx^2		868.
5	4	5	$s_x := s_{n-1}$		2.41788
6	5	7	$\sigma_x := \sigma_{n-1}$		2.38747

D6 = 2.3874672772627

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**

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.σx
stat.Σx

Select $\text{stat.}\sigma_x$, press **x²** and press **enter**.

The variance is 5.7.

$\text{stat.}\sigma_x^2$	5.7
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