# hp calculators

HP 50g Average sales prices

The STAT menu

Averages and Standard Deviations

Practice finding average sale prices and standard deviations
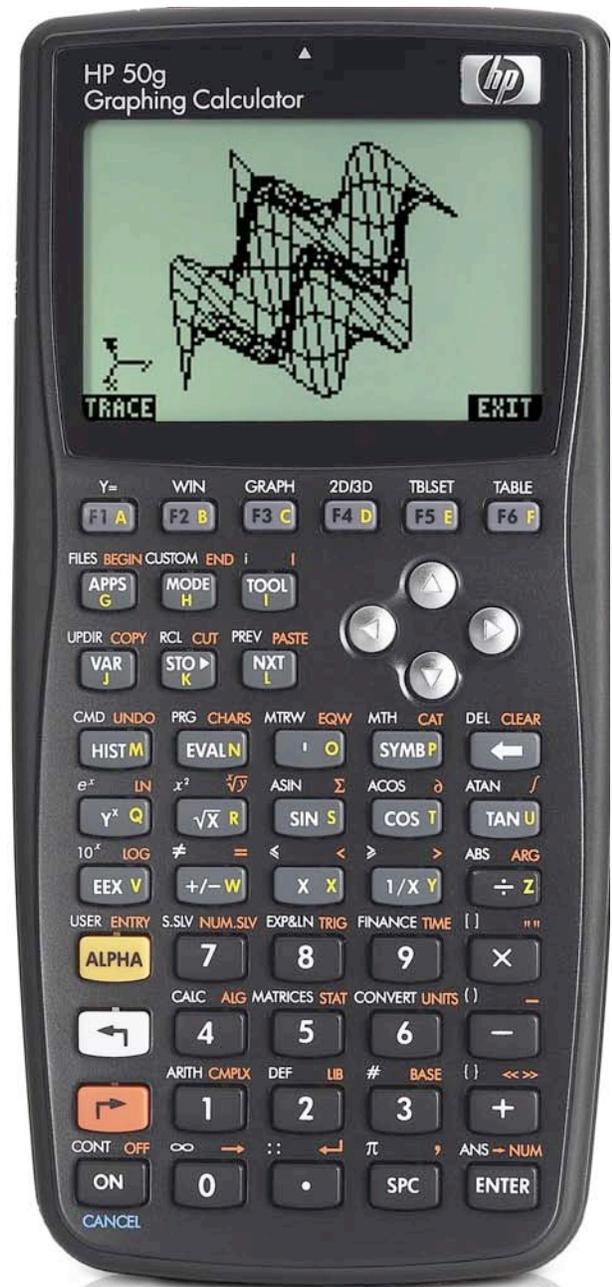
The STAT menu

The Statistics menu is accessed from the ORANGE shifted function of the (5) key by pressing (→) _STAT_ . When pressed, a CHOOSE box is displayed with a number of problem areas within statistics where the HP 50g can be applied.

Figure 1

The first choice deals with calculating many values related to the statistics of a single variable, such as the average, standard deviation and others. The second choice deals with placing data within bins or classes and is useful when dealing with frequency distributions or when there is a need to summarize data within a histogram. The third choice, Fit Data.. is used to compute trend lines. The fourth choice allows for the computation of summary statistics from a data set, such as the sum of all X values, the sum of all the Y values squared, and others. The fifth choice allows for the evaluation of many different hypothesis tests and the sixth choice allows for the construction of confidence intervals around a sample mean.

To calculate characteristics about a single variable, press (ENTER) to immediately choose the Single-var function..

The screen displayed allows for the entry of the existing data for the determination of many single variable statistics. The ∑DAT field at the top of the screen is where a matrix containing the statistics data is entered.


Figure 2

The statistics that can be calculated from this screen include the mean or average, the standard deviation, the variance, the total, the maximum value and the minimum value. The screen also includes a CHOOSE box to tell the calculator whether the data is sample data or population data. This influences the formula used to calculate the standard deviation and variance.

To enter the single variable data to be analyzed, make sure the cursor is on the ∑DAT field, press the (F1) key at the top left of the keyboard to register the choice of ▐EDIT▌. When pressed, the MatrixWriter is started to allow for the entry of the statistical data as shown in the screen below.

Figure 3

In many ways, this screen works like any spreadsheet. Enter numbers and they will go in the highlighted cell. The menu labels at the lower left corner of the screen, ▐GO→▌ and ▐GO↓▌, determine the direction the cursor moves after a data point has been entered, either right to the next column or down to the next row. In this example, the selection is to move right after each data point has been entered. This is indicated by the square present next to the ▐GO→▌ menu label. To change the way the cursor will move, press the menu label for the direction desired and the square in the menu label will change accordingly. If a column is too small to show the data entered, the ▐+WID▌ and ▐WID→▌ menu keys may be used to expand or shrink the area displayed for each column.

Enter the first X data value by keying in the numbers and pressing the (ENTER) key. The cursor will move to the right into the second column. Since we are working with single variable data here (such as sales prices), only one column of data will be entered. Use the

and keys to move back to the first column and enter the second X data value. Continue entering the numbers in column 1 until all have been entered. Since the variable for ∑DAT will hold its contents from one calculation to the next, be alert to extra rows of data that may exist below the last row entered for the current calculation. Any rows not needed can be deleted if the cursor is on the row to be deleted by pressing the NXT key and then pressing the menu label above the F2 key. Continue entering the values in column 1 until all have been entered. The screen will look something like this:
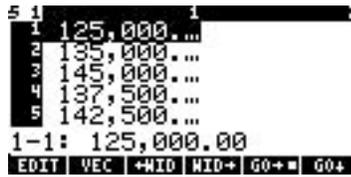
Figure 4

To accept the data as input, press the ENTER key to return to the previous menu. If an error is noticed, use the cursor keys before pressing the ENTER key to move to the cell with the incorrect value. Key in the correct value and press the ENTER key. Do this until all data values have been corrected and press the ENTER key again to return to the previous menu. The screen will now look something like this:

Figure 5

If the data to be analyzed includes all possible values (such as all the houses in a zip code), then the data is Population data. If it does not include all possible values, then it is sample data. To change the Type of data indicated to the calculator, press the key to move the cursor to the Type: field and press (above the F2 key) to open a small CHOOSE box with the possible choices listed (Sample or Population). The screen displayed will look like this:
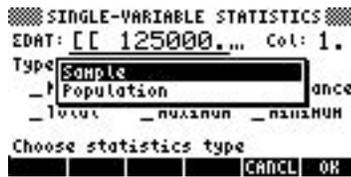
Figure 6

Use the cursor keys to make the proper selection and press shown above the F6 key. Use the key to move the cursor down to the checkbox locations on the data input screen. To have the calculator compute a value, press the menu label above the key. Note that this places a check mark beside the label on the screen to indicate the calculator will return this value when the key is pressed. Place checks beside each value desired and then press the key. The calculator display will then look something like this:

Figure 7

Once these data items are viewed, pressing STAT will return you to the STAT menu where you can reenter the Single-var.. area if desired.

Averages and standard deviations

The average is defined as the sum of all data points divided by the number of data points included. It is a measure of central tendency and is the most commonly used. A standard deviation is a measure of dispersion around a central value. To compute the standard deviation, the sum of the squared differences between each individual data point and the average of all the data points is taken and then divided by the number of data points included (or, in the case of sample data, the number of data points included minus one). The square root of this value is then taken to obtain the standard deviation. The property of the standard deviation is such that when the underlying data is normally distributed, approximately 68% of all values will lie within one standard deviation on either side of the mean and approximately 95% of all values will lie within two standard deviations on either side of the mean. This has application to many fields, particularly when trying to decide if an observed value is unusual by being significantly different from the mean.

Practice finding average sale prices and standard deviations

Example 1: The sales price of the last 10 homes sold in the Parkdale community were: $198,000; $185,000; $205,200; $225,300; $206,700; $201,850; $200,000; $189,000; $192,100; $200,400. What is the average of these sales prices and what is the sample standard deviation? Would a sales price of $240,000 be considered unusual in the same community?

Solution: Be sure to clear out any rows already containing values before entering the data.
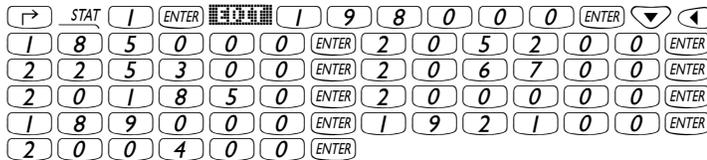
Figure 8

Figure 9

Figure 10

Answer: The average sales price is $200,355 and the sample standard deviation is $11,189. Within two standard deviations on either side of this average, in this case between $177,977 and $222,733, 95% of all home sales prices should fall. If a home were to sell for $240,000 in this area, it would be an unusual event.

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Example 2: The sales price of the last 7 homes sold in the real estate office's zip code were: $245,000; $265,000; $187,000; $188,000; $203,000; $241,900; $222,000. What is the average of these sales prices and what is the sample standard deviation?

Solution: Be sure to clear out any rows already containing values before entering the data.

[→] STAT [1] (ENTER) ▓EDIT▓ [2][4][5][0][0][0] (ENTER) ▼ ◄
[2][6][5][0][0][0] (ENTER) [1][8][7][0][0][0] (ENTER)
[1][8][8][0][0][0] (ENTER) [2][0][3][0][0][0] (ENTER)
[2][4][1][9][0][0] (ENTER) [2][2][2][0][0][0] (ENTER)

Figure 11

(ENTER) ▼ (▶) ✔CHK (▶) ✔CHK

Figure 12

▓OK▓
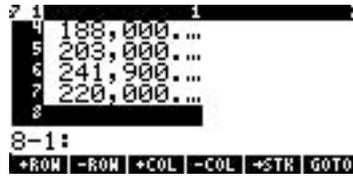
Figure 13

Answer: The average sales price is $221,700 and the sample standard deviation is $30,318.81.