How to calculate Sample Variance (S²) and Standard Deviation (S) using Excel

Variance (S²)	=	$\dfrac{\Sigma(x_i-\bar{x})^2}{n-1}$	S	=	$\sqrt{S^2}$	=	$\sqrt{\dfrac{\Sigma(x_i-\bar{x})^2}{n-1}}$

Question: The following data represent the total fat for burgers items from a sample of fast-food chains. Find the variance, and standard deviation.
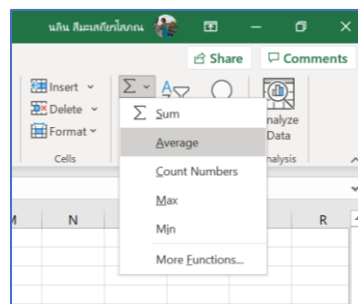
7, 9, 16, 18, 15, 16, 22, 25 27, 33, 39

■ Sample Variance (S²) Method 1:

Step 1 Enter all data in Excel software program

Step 2: Find the mean by using the AVERAGE function: **=AVERAGE(B2:B12)**

The average (mean) goes to any empty cell, say B13.

Step 3: **Subtract the mean (average) from each number in the sample:**
- move cursor to column C2
- Type: **=B2-B13** (mean value is in col B13, we will lock as a constant value)
- Click Enter. (You shall see the value of **x-mean** = -13.64 in column C2)
- move cursor to the corner of column C2 and drag until col C12

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The differences go to column C, beginning in C2.

Step 4: Square each difference and put the results to column **D**, beginning in **D2**:
- Move cursor to column **D2**
- Type: **=C2^2**
- Click Enter. (You shall see the value of (**x-mean**)^2 = 185.9504 in column D2)
- move cursor to the corner of column D2 and drag until col D12

Step 5: Add up the squared differences and divide the result by (n – 1) or the number of items in the sample minus 1:

- Move cursor to column **D15**
- Type: **=SUM(D2:D12)/(COUNT(B2:B12) - 1)**
- or **=SUM(D2:D12)/(11-1)**
- Click Enter. (You shall see the value of variance 95.5455 in column D15)

Method 2: Move cursor to D17 or any empty space and Type: =VAR.S(B2:B12)

b) Find the value of sample standard deviation:

Find the value of **sample standard deviation**:
- Move cursor to column **D18**
- Type: **=SQRT(D17)**
- Click Enter.

  You shall see the value of sample standard deviation 9.770084209 in column D18

Sample Variance of fast-food chains = 95.4545

Sample standard deviation   = 9.77