



# Essential Math for Data Analysis Using Excel Online

## Module 1, Lab 3: Very Mean Lab

### Learning Objectives

- Practice finding the mean with Excel Online using “fill series” (manually building a formula) and using the canned Excel formula.

### Description

Learners will work with a set of numbers and practice finding the mean using sigma notation. They will then create a formula in Excel to find the mean using both the SUM and AVERAGE functions.

### Data set

Mod1Lab1.csv

### Overview

The mean of a set of values is the mathematical average of those values, which is an incredibly useful tool in data analysis. In this lab, we'll practice finding the mean using a couple different tricks in Excel.

### What You'll Need

To complete the lab, you will need the online version of Microsoft Excel.

### Exercise 1: Find the Mean using SUM

1. Open the data set in Excel. Here's what the data look like:

	A	B	C
1	id	age	entrylevel
2	1	45	N
3	2	50	N
4	3	46	Y
5	4	51	N
6	5	35	N
7	6	24	N
8	7	30	N
9	8	37	N
10	9	45	N
11	10	55	N
12	11	19	Y
13	12	24	Y
14	13	45	N
15	14	18	N
16	15	32	N
17	16	35	N
18	17	32	N
19	18	33	N
20	19	25	N
21	20	53	N
--			

- What is the mean age of all the people in the data set? The mean is the average value of all 20 ages, which means you want to find the sum of those ages and then divide that sum by the number of values.
- First, jot down the mathematical formula. You can use either “x-bar” or the generic *M*.

$$\bar{x} = \frac{\sum(x)}{n}$$

Translation: The mean (x-bar) is the sum of all the variables in *x* (the ages) divided by the number of people (*n*, which is 20 in this case). You could also replace x-bar at the beginning with *M*, but the rest of the formula will be identical. Here’s what that formula would look like if you did the sum by hand, using all 20 ages from the data set:

$$\bar{x} = \frac{45 + 50 + 46 + 51 + 35 + 24 + 30 + 37 + 45 + 55 + 19 + 24 + 45 + 18 + 32 + 35 + 32 + 33 + 25 + 53}{20}$$

- Set up an Excel formula to do the heavy lifting. Create a new row below the data set for the mean age.

fx		mean age		
	A	B	C	
1	id	age	entrylevel	
2	1	45	N	
3	2	50	N	
4	3	46	Y	
5	4	51	N	
6	5	35	N	
7	6	24	N	
8	7	30	N	
9	8	37	N	
10	9	45	N	
11	10	55	N	
12	11	19	Y	
13	12	24	Y	
14	13	45	N	
15	14	18	N	
16	15	32	N	
17	16	35	N	
18	17	32	N	
19	18	33	N	
20	19	25	N	
21	20	53	N	
22	mean age			

Now click into cell B22 and create the formula. As you saw in the previous lab, the sum of all the ages is **=SUM(B2:B21)**. The mean age is this sum divided by 20 (the number of people), so end the formula by typing **/20**. Make sure you type the division slash *after* closing the parentheses in the SUM formula.

fx =SUM(B2:B21)/20

Hit Enter and *voila*, there's your mean value in cell B22.

fx =SUM(B2:B21)/20			
	A	B	C
1	id	age	entrylevel
2	1	45	N
3	2	50	N
4	3	46	Y
5	4	51	N
6	5	35	N
7	6	24	N
8	7	30	N
9	8	37	N
10	9	45	N
11	10	55	N
12	11	19	Y
13	12	24	Y
14	13	45	N
15	14	18	N
16	15	32	N
17	16	35	N
18	17	32	N
19	18	33	N
20	19	25	N
21	20	53	N
22	mean age	36.7	

The mean or average age is 36.7 years.

### Exercise 2: Find the Mean using AVERAGE

There's another method in Excel for calculating the mean: the AVERAGE function. It does the summing and dividing all together, in one handy function. Let's find that same mean from the previous exercise using this function instead.

1. The mean age of all the people in this data set is once again given by this formula:

$$\bar{x} = \frac{\sum(x)}{n}$$

2. Go back and delete the SUM formula you entered in cell B22.

fx mean age			
	A	B	C
1	id	age	entrylevel
2	1	45	N
3	2	50	N
4	3	46	Y
5	4	51	N
6	5	35	N
7	6	24	N
8	7	30	N
9	8	37	N
10	9	45	N
11	10	55	N
12	11	19	Y
13	12	24	Y
14	13	45	N
15	14	18	N
16	15	32	N
17	16	35	N
18	17	32	N
19	18	33	N
20	19	25	N
21	20	53	N
22	mean age		

- In its place, use the AVERAGE function. The syntax here is **=AVERAGE(first value:last value)**. Excel will automatically count the number of values and divide the sum by that number. In this case, you want the average of B2 to B21.

fx =AVERAGE(B2:B21)

Hit Enter. The average should be the same mean age we found in Exercise 1, or 36.7 years.

<b>f<sub>x</sub></b>	<b>=AVERAGE(B2:B21)</b>		
	<b>A</b>	<b>B</b>	<b>C</b>
<b>1</b>	<b>id</b>	<b>age</b>	<b>entrylevel</b>
2	1	45	N
3	2	50	N
4	3	46	Y
5	4	51	N
6	5	35	N
7	6	24	N
8	7	30	N
9	8	37	N
10	9	45	N
11	10	55	N
12	11	19	Y
13	12	24	Y
14	13	45	N
15	14	18	N
16	15	32	N
17	16	35	N
18	17	32	N
19	18	33	N
20	19	25	N
21	20	53	N
<b>22</b>	mean age	36.7	