

How do you calculate the expected value in Excel?

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The process of calculating the expected value in Excel involves using a mathematical formula to determine the anticipated outcome of a random variable. This is achieved by multiplying each possible value of the variable by its corresponding probability, and then summing all of these values together. This calculation can be easily performed in Excel by inputting the values and probabilities into designated cells, and using the formula function to compute the expected value. This allows for a quick and accurate determination of the most likely outcome, making it a useful tool for decision making and analysis in various fields such as finance and statistics.

Calculate Expected Value in Excel

A probability distribution tells us the probability that a takes on certain values.

For example, the following probability distribution tells us the probability that a certain soccer team scores a certain number of goals in a given game:

Goals (X)	Probability P(X)
0	0.18
1	0.34
2	0.35
3	0.11
4	0.02

To find the expected value of a probability distribution, we can use the following formula:

$$\mu = \sum x * P(x)$$

where:

x: Data value
P(x): Probability of value

For example, the expected number of goals for the soccer team would be calculated as:

$\mu = 0*0.18 + 1*0.34 + 2*0.35 + 3*0.11 + 4*0.02 = 1.45$
goals.

The following example provides a step-by-step example of how to calculate the expected value of a probability distribution in Excel.

Step 1: Enter the Data

First, let's enter the data values and corresponding probabilities for a given probability distribution:

	A	B	C	D	E	F	G	H
1	Value	Probability						
2	0	0.1						
3	1	0.14						
4	2	0.23						
5	3	0.07						
6	4	0.12						
7	5	0.11						
8	6	0.17						
9	7	0.04						
10	8	0.02						
11								
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22								

Step 2: Multiply Values and Probabilities

Next, we'll multiply the first number in the 'Values' column with the first number in the 'Probability' column:

	A	B	C	D	E	F	G
1	Value	Probability	Value * Probability				
2	0	0.1	0	=A2*B2			
3	1	0.14					
4	2	0.23					
5	3	0.07					
6	4	0.12					
7	5	0.11					
8	6	0.17					
9	7	0.04					
10	8	0.02					
11							
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21							

We'll then copy and paste this formula down to every cell in column C:

	A	B	C	D	E	F	G
1	Value	Probability	Value * Probability				
2	0	0.1	0				
3	1	0.14	0.14				
4	2	0.23	0.46				
5	3	0.07	0.21				
6	4	0.12	0.48				
7	5	0.11	0.55				
8	6	0.17	1.02				
9	7	0.04	0.28				
10	8	0.02	0.16				
11							
12							
13							
14							
15							
16							
17							
18							
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20							
21							

Step 3: Calculate Expected Value

Lastly, we can calculate the expected value of the probability distribution by using **SUM(C2:C10)** to sum all of the values in column C:

C11 $\times$ $\checkmark$ f_x =SUM(C2:C10)							
	A	B	C	D	E	F	G
1	Value	Probability	Value * Probability				
2	0	0.1	0				
3	1	0.14	0.14				
4	2	0.23	0.46				
5	3	0.07	0.21				
6	4	0.12	0.48				
7	5	0.11	0.55				
8	6	0.17	1.02				
9	7	0.04	0.28				
10	8	0.02	0.16				
11		Expected Value:	3.3				
12							
13							
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16							
17							
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19							
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21							
22							
23							

The expected value for this probability distribution is 3.3.

The following tutorials explain how to calculate other descriptive statistics in Excel: