How do I perform a Sign Test in Excel step-by-step?

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The Sign Test is a statistical test used to analyze the significance of differences between two related samples. To perform a Sign Test in Excel, follow these step-by-step instructions:

1. Open Microsoft Excel and create a new spreadsheet.

2. Label two columns with the titles "Sample 1" and "Sample 2".

3. Enter the data for each sample in their respective columns.

4. Next, create a third column and label it "Differences". In this column, subtract the values of Sample 2 from Sample 1 for each row.

5. Then, create a fourth column and label it "Sign". In this column, assign a "+" sign if the difference is positive, and a "-" sign if the difference is negative.

6. Now, create a fifth column and label it "Rank". In this column, rank the absolute values of the differences from smallest to largest.

7. In the sixth column, label it "Count". In this column, count the number of "+" and "-" signs from the "Sign" column.

8. Calculate the sum of the ranks in the "Rank" column and enter it in a cell.

9. Calculate the number of observations in the "Count" column and enter it in another cell.

10. Next, use the formula "=BINOM.DIST()" in another cell to calculate the p-value. The formula should include the sum of ranks, the count of observations, and a probability of 0.5.

11. Finally, interpret the results. If the p-value is less than the chosen significance level (usually 0.05), the differences between the two samples are considered statistically significant.

12. You can also create a chart to visually represent the data and results.

By following these steps, you can easily perform a Sign Test in Excel to analyze the significance of differences between two related samples.

Perform a Sign Test in Excel (Step-by-Step)

A sign-test is a non-parametric test that is used to determine whether a population median is equal to

some value.

The following step-by-step example shows how to perform a sign test in Excel.

Step 1: Enter the Data

Suppose a manufacturing plant claims to produce widgets that weigh 50 pounds. To test this, an inspector goes out to the plant and randomly measures the weight of 20 widgets.

He then enters the following weights for each widget:

	A	B	C	D	E	F	G
1	**Weights**						
2	51						
3	52						
4	52						
5	50						
6	49						
7	47						
8	52						
9	55						
10	48						
11	49						
12	50						
13	51						
14	51						
15	51						
16	49						
17	46						
18	51						
19	52						
20	47						
21	52						
22							
23							
24							
25							
26							

We can perform a sign test to determine if the median weight is significantly different from 50 pounds.

Step 2: Calculate the Signs

Next, let's calculate the signs of each widget using the following rules:

If the weight of a widget is less than 50, assign it a sign of -1If the weight of a widget is equal to 50, assign it a

sign of 0If the weight of a widget is greater than 50, assign it a sign of 1

We'll use the following formula in Excel to do so:

	A	B	C	D	E	F	G	H
1	**Weights**	**Sign**						
2	51	1	=IF(A2<50, -1, IF(A2=50, 0, 1))					
3	52	1						
4	52	1						
5	50	0						
6	49	-1						
7	47	-1						
8	52	1						
9	55	1						
10	48	-1						
11	49	-1						
12	50	0						
13	51	1						
14	51	1						
15	51	1						
16	49	-1						
17	46	-1						
18	51	1						
19	52	1						
20	47	-1						
21	52	1						
22								
23								
24								
25								
26								

Step 3: Calculate the P-Value of the Test

Lastly, we'll use the following formulas to calculate the total positive signs and negative signs and calculate the corresponding p-value of the sign test:

	A	B	C	D	E
1	**Weights**	**Sign**			
2	51	1			
3	52	1			
4	52	1			
5	50	0			
6	49	-1			
7	47	-1			
8	52	1			
9	55	1			
10	48	-1			
11	49	-1			
12	50	0			
13	51	1			
14	51	1			
15	51	1			
16	49	-1			
17	46	-1			
18	51	1			
19	52	1			
20	47	-1			
21	52	1			
22					
23			*Formulas Used*		
24	**Positive**	11	=COUNTIF(B2:B21, 1)		
25	**Negative**	7	=COUNTIF(B2:B21, -1)		
26	**Sample Size**	18	=SUM(B24:B25)		
27	**p-value**	0.481	=BINOMDIST(B25, B26, 0.5, TRUE)*2		
28					
29					

The sign test uses the following null and alternative hypotheses:

H0: Population median weight = 20 poundsHA: Population median weight ? 20 pounds

Note: In this example, we multiplied the p-value by two since we performed a two-sided test. We also used the

smaller of the negative and positive counts since we used a two-sided test.

The following tutorials explain how to perform other common statistical tests in Excel: