How can I perform a Chi-Square Goodness of Fit Test in Google Sheets?

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April 25, 2024

The Chi-Square Goodness of Fit Test is a statistical method used to determine if observed data follows an expected distribution. In order to perform this test in Google Sheets, follow these steps:
1. Input your observed data in one column and the expected values in another column.
2. Calculate the sum of both columns and use it to find the degrees of freedom.
3. Use the formula "=CHISQ.TEST(observed values, expected values, degrees of freedom)" to obtain the test statistic.
4. Compare the test statistic to the critical value from the Chi-Square table with the corresponding degrees of freedom.
5. If the test statistic is greater than the critical value, reject the null hypothesis and conclude that the observed data does not fit the expected distribution.
6. If the test statistic is less than the critical value, fail to reject the null hypothesis and conclude that the observed data fits the expected distribution.
By following these steps, you can easily perform a Chi-Square Goodness of Fit Test in Google Sheets.

Chi-Square Goodness of Fit Test in Google Sheets (Step-by-Step)

A is used to determine whether or not a categorical variable follows a hypothesized distribution.

For example, suppose a shop owner claims that an equal number of customers come into his shop each weekday.

To test this hypothesis, an independent researcher records the number of customers that come into the shop on a given week and finds the following:

Monday: 50 customersTuesday: 60 customersWednesday: 40 customersThursday: 47

customersFriday: 53 customers

We can perform a Chi-Square Goodness of Fit Test to determine if the data is consistent with the shop owner's claim.

This following step-by-step example shows how to perform a Chi-Square Goodness of Fit Test in Google Sheets.

Step 1: Create the Data

First, let's input the data into Google Sheets in the following format:

	A	B	C	D	E
1	**Day**	**Observed**	**Expected**		
2	Monday	50	50		
3	Tuesday	60	50		
4	Wednesday	40	50		
5	Thursday	47	50		
6	Friday	53	50		
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Note: There were 250 customers total. If the shop owner expects an equal number to come into the shop each day then he would expect 50 customers per day.

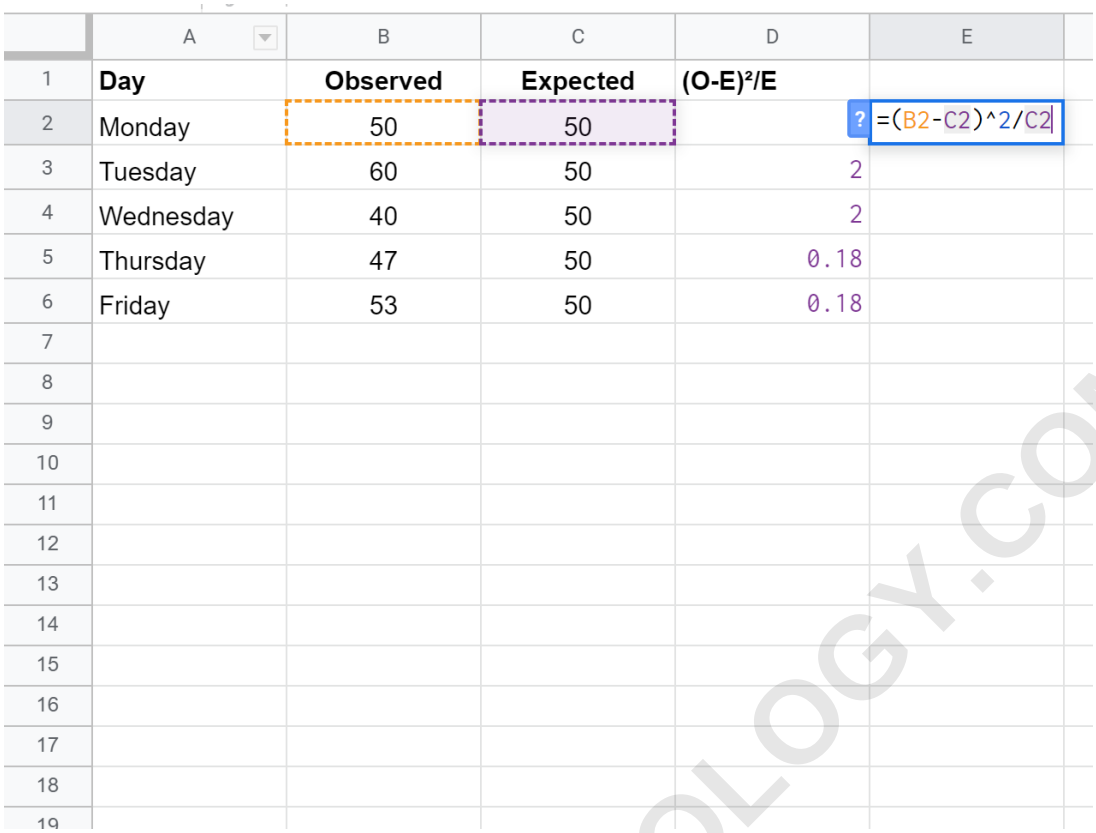
Step 2: Calculate the Difference Between Observed and Expected Values

The Chi-Square test statistic for the Goodness of Fit test is X2 = Σ(O-E)2 / E

where:

Σ: is a fancy symbol that means "sum"O: observed valueE: expected value

The following formula shows how to calculate (O-E)2 / E for each row:



	A	B	C	D	E
1	**Day**	**Observed**	**Expected**	**(O-E)²/E**	
2	Monday	50	50		=(B2-C2)^2/C2
3	Tuesday	60	50	2	
4	Wednesday	40	50	2	
5	Thursday	47	50	0.18	
6	Friday	53	50	0.18	
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Step 3: Calculate the P-Value

	A	B	C	D	E	F	G
1	**Day**	**Observed**	**Expected**	**(O-E)²/E**			
2	Monday	50	50	0			
3	Tuesday	60	50	2			
4	Wednesday	40	50	2			
5	Thursday	47	50	0.18			
6	Friday	53	50	0.18			
7			**X²**	4.36	=SUM(D2:D6)		
8			**p-value**	0.3595	=CHISQ.DIST.RT(D7, COUNT(D2:D6)-1)		
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Note: The function CHISQ.DIST.RT(x, deg_freedom) returns the right-tailed probability of the Chi-Square distribution associated with a test statistic x and a certain degrees of freedom. The degrees of freedom is calculated as n-1. In this case, deg_freedom = 5 - 1 = 4.

The X2 test statistic for the test is 4.36 and the corresponding p-value is 0.3595.

Since this p-value is not less than 0.05, we fail to reject the null hypothesis. This means we do not have sufficient evidence to say that the true distribution of customers is different from the distribution that the

shop owner claimed.