

A researcher wants to test if a bag of candies contains an equal number of each color.  
According to the company, the bag should have an equal distribution of colors.  
You randomly select 100 candies from the bag and record the following results:

Red: 28

Blue: 20

Green: 25

Yellow: 27

You want to test if the observed distribution of colors is significantly different from the expected distribution.  
Test at the alpha significance level 0.05

**Null hypothesis ( $H_0$ ):** The colors are equally distributed, meaning each color has an expected count of 25.

**Alternative hypothesis ( $H_1$ ):** The colors are not equally distributed.

	<b><math>O_i</math> (Observed)</b>	<b><math>E_i</math> (Expected)</b>
<b>RED</b>	28	
<b>BLUE</b>	20	
<b>GREEN</b>	25	
<b>YELLOW</b>	27	

umber of each color (red, blue, green, and yellow).  
ution of these colors.  
ollowing observed counts:

ntly different from the expected distribution.

g the observed frequencies do not significantly differ from the expected fre  
ed, meaning the observed frequencies differ significantly from the expectec

Test criterion

quencies.  
l frequencies.

A company wants to know if there is a relationship between gender and product preference. A survey is conducted, and the responses are as follows:

	<b>Product A</b>	<b>Product B</b>	<b>Total</b>
<b>Male</b>	40	30	
<b>Female</b>	50	80	
<b>Total</b>			

The company wants to test if product preference is independent of gender. Test at the alpha significance level 0.05

**Null hypothesis ( $H_0$ ):** Product preference is independent of gender

**Alternative hypothesis ( $H_1$ ):** Product preference is dependent on gender

Expected frequencies

	<b>Product A</b>	<b>Product B</b>
<b>Male</b>		
<b>Female</b>		

r (male, female) and preference for a type of product (Product A, Pr

f gender.

er.  
gender.

Test criterion	Product A	Product B
<b>Male</b>		
<b>Female</b>		

product B).