

'Reasoning from Evidence' Testing a New Deodorant - Example #1 (solution)

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The aim of this assessment is to provide the opportunity for you to:


- select appropriate methods to analyze a data set, including appropriate graphs and calculations
- use data analysis to draw conclusions from the evidence obtained.

A scientist is testing a new deodorant before it goes into production. She has created two possible fragrances, A and B, and two possible names, 'Bouquet' and 'Hunter'. She conducts an experiment to see which combination of fragrance and packaging people prefer. 40 people are asked to smell a small amount of the deodorants, sprayed from 4 cans.



They are not told that 'Bouquet A' and 'Hunter A' both contain exactly the same fragrance, A, or that 'Bouquet B' and 'Hunter B' both contain the same fragrance, B. Each person is asked to fill in a sheet, ticking a box to show how he or she feels about each of the four deodorants.

Sex M



Bouquet A	✓				
Bouquet B					✓
Hunter A			✓		
Hunter B				✓	

For example, this person is male. He hates Bouquet A, thinks Bouquet B is wonderful, that Hunter A is average and Hunter B is quite nice. The 40 results from the experiment are shown on pages 2 to 5.

Write a report saying which fragrance (A or B) and name (Hunter or Bouquet) are likely to be the most suitable if she wants to sell the deodorant to (i) females and (ii) males. Use tables and/or graphs in your report and make sure you explain in detail how you arrive at your conclusions.

Testing a new deodorant - Data Sheet 1

Sex M

Bouquet A	✓				
Bouquet B					✓
Hunter A			✓		
Hunter B				✓	

Sex M

Bouquet A		✓			
Bouquet B			✓		
Hunter A			✓		
Hunter B				✓	

Sex Female

Bouquet A			✓		
Bouquet B			✓		
Hunter A			✓		
Hunter B			✓		

Sex M

Bouquet A		✓			
Bouquet B			✓		
Hunter A			✓		
Hunter B		✓			

Sex F

Bouquet A				✓	
Bouquet B					✓
Hunter A				✓	
Hunter B					✓

Sex m

Bouquet A					✓
Bouquet B				✓	
Hunter A			✓		
Hunter B				✓	

Sex Female

Bouquet A					✓
Bouquet B				✓	
Hunter A					✓
Hunter B			✓		

Sex M

Bouquet A				✓	
Bouquet B		✓			
Hunter A				✓	
Hunter B			✓		

Sex Female

Bouquet A				✓	
Bouquet B			✓		
Hunter A				✓	
Hunter B		✓			

Sex female

Bouquet A			✓		
Bouquet B				✓	
Hunter A			✓		
Hunter B		✓			

Testing a new deodorant - Data Sheet 2

Sex Male

Bouquet A		✓			
Bouquet B			✓		
Hunter A				✓	
Hunter B					✓

Sex Female

Bouquet A		✓			
Bouquet B					✓
Hunter A			✓		
Hunter B				✓	

Sex Female

Bouquet A			✓		
Bouquet B				✓	
Hunter A					✓
Hunter B				✓	

Sex MALE

Bouquet A			✓		
Bouquet B		✓			
Hunter A					✓
Hunter B					✓

Sex MALE

Bouquet A				✓	
Bouquet B	✓				
Hunter A				✓	
Hunter B	✓				

Sex male

Bouquet A	✓				
Bouquet B	✓				
Hunter A		✓			
Hunter B			✓		

Sex Female

Bouquet A				✓	
Bouquet B					✓
Hunter A				✓	
Hunter B					✓

Sex Female

Bouquet A			✓		
Bouquet B				✓	
Hunter A			✓		
Hunter B				✓	

Sex Male

Bouquet A	✓				
Bouquet B		✓			
Hunter A			✓		
Hunter B				✓	

Sex F

Bouquet A				✓	
Bouquet B		✓			
Hunter A				✓	
Hunter B				✓	


Testing a new deodorant - Data Sheet 3

Sex M



Bouquet A			✓		
Bouquet B			✓		
Hunter A				✓	
Hunter B				✓	

Sex F



Bouquet A			✓		
Bouquet B					✓
Hunter A		✓			
Hunter B				✓	

Sex female



Bouquet A				✓	
Bouquet B					✓
Hunter A				✓	
Hunter B					✓

Sex M




Bouquet A				✓	
Bouquet B		✓			
Hunter A				✓	
Hunter B				✓	

Sex Female




Bouquet A			✓		
Bouquet B				✓	
Hunter A			✓		
Hunter B					✓

Sex Male




Bouquet A					✓
Bouquet B				✓	
Hunter A					✓
Hunter B				✓	

Sex male




Bouquet A			✓		
Bouquet B	✓				
Hunter A					✓
Hunter B					✓

Sex FEMALE




Bouquet A			✓		
Bouquet B				✓	
Hunter A		✓			
Hunter B				✓	

Sex female



Bouquet A				✓	
Bouquet B				✓	
Hunter A					✓
Hunter B					✓


Sex M



Bouquet A			✓		
Bouquet B		✓			
Hunter A				✓	
Hunter B			✓		


Testing a new deodorant - Data Sheet 4

Sex male




Bouquet A		✓		
Bouquet B			✓	
Hunter A				✓
Hunter B		✓		

Sex Female




Bouquet A				✓
Bouquet B				✓
Hunter A				✓
Hunter B				✓

Sex Male




Bouquet A		✓		
Bouquet B		✓		
Hunter A		✓		
Hunter B		✓		

Sex f



Bouquet A				✓
Bouquet B			✓	
Hunter A		✓		
Hunter B			✓	

Sex female




Bouquet A			✓	
Bouquet B				✓
Hunter A		✓		
Hunter B			✓	

Sex male




Bouquet A			✓	
Bouquet B		✓		
Hunter A				✓
Hunter B			✓	

Sex male




Bouquet A			✓	
Bouquet B			✓	
Hunter A			✓	
Hunter B				✓

Sex F




Bouquet A		✓		
Bouquet B				✓
Hunter A			✓	
Hunter B				✓

Sex Female



Bouquet A				✓
Bouquet B				✓
Hunter A				✓
Hunter B				✓

Sex Male

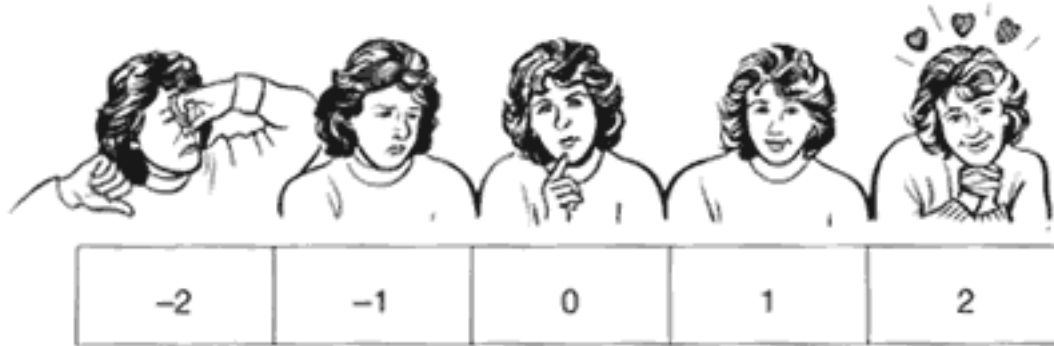


Bouquet A		✓		
Bouquet B		✓		
Hunter A				✓
Hunter B				✓

Testing a New Deodorant - Sample Solution

The following approach shows just one of the many ways the data may be analyzed. It should not be seen as prescriptive.

On the next page, we have drawn bar charts to show how many people gave each rating to each product. The pictorial ratings have been represented by the numbers -2, -1, 0, 1, 2 as shown below:



This enables a mean rating to be calculated for each product, giving

		Males		Females	
		Fragrance		Fragrance	
		A	B	A	B
Name	Bouquet	$\frac{-3}{20}$	$\frac{-7}{20}$	$\frac{12}{20}$	$\frac{24}{20}$
	Hunter	$\frac{17}{20}$	$\frac{13}{20}$	$\frac{10}{20}$	$\frac{20}{20}$

Thus it may be seen that the males seem to be more affected by the name than are the females, preferring 'Hunter'. There also appears to be a slight preference for fragrance A.

The females appear more able to distinguish the fragrance, preferring B, while there is also a slight preference for the name 'Bouquet'.

