

# REPEAT + CALCULATE OF MEASURES FOR ASSOCIATION

Homework H3.5  
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## Measures for Association

- Support      Percentage of how often an association appears in the whole dataset
- Confidence      How often the rule is found to be true
- Lift      Ratio of how often the association occurs compared to if the values were independent






















# Association Rules $X \Rightarrow Y$

- Support  $Support = \frac{frq(X, Y)}{N}$
- Confidence  $Confidence = \frac{frq(X, Y)}{frq(X)}$
- Lift  $Lift = \frac{Support}{Support(X) \times Support(Y)}$

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## Item sets of a shopping basket

1	2	3	4	5	6	7	8
							
							
							
							

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# 1. What is the support of the item set {Bier, Orangensaft}?

$$\text{Support} = \frac{\text{frq}(X, Y)}{N}$$

$$\text{Support} = \frac{\text{frq}(\text{Bier}, \text{Orangensaft})}{N}$$

$$\text{Support} = \frac{2}{8} = \frac{1}{4} = 25\%$$

1	2	3	4	5	6	7	8
							
							
							
							

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# 2. What is the confidence of {Bier} → {Milch}?

$$\text{Confidence} = \frac{\text{frq}(X, Y)}{\text{frq}(X)}$$

$$\text{Confidence} = \frac{\text{frq}(\text{Bier}, \text{Milch})}{\text{frq}(\text{Bier})}$$

$$\text{Confidence} = \frac{4}{6} = \frac{2}{3} = 66,67\%$$

1	2	3	4	5	6	7	8
							
							
							
							






















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### 3. Which association rules have support and confidence of at least 50%?

Frequencies:











- Milch: 5
- Limonade: 2
- Bier: 6
- Apfelsaft: 4
- Orangensaft: 4

1	2	3	4	5	6	7	8
							
							
							
							

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### 3. Which association rules have support and confidence of at least 50%?

X/Y					
	X	S = 1/8 C = 1/5	S = 1/2 C = 4/5	S = 3/8 C = 5/8	S = 1/4 C = 2/5
	S = 1/8 C = 1/2	X	S = 1/4 C = 1	0	S = 1/8 C = 1/2
	S = 1/2 C = 2/3	S = 1/4 C = 1/3	X	S = 3/8 C = 1/2	S = 1/4 C = 1/3
	S = 3/8 C = 3/4	0	S = 3/8 C = 3/4	X	S = 1/4 C = 1/2
	S = 1/4 C = 1/2	S = 1/8 C = 1/4	S = 1/4 C = 1/2	S = 1/4 C = 1/2	X

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X/Y					
 	X	X	$S = 1/8$ $C = 1$	0	0
 	X	$S = 1/8$ $C = 1/4$	X	$S = 1/4$ $C = 1/2$	$S = 1/8$ $C = 1/4$
 	X	0	$S = 1/4$ $C = 2/3$	X	$S = 1/4$ $C = 2/3$
 	X	0	$S = 1/8$ $C = 1/2$	$S = 1/4$ $C = 1$	X
 	$S = 1/8$ $C = 1/2$	X	X	0	$S = 1/8$ $C = 1/2$
 	-	X	-	X	-
 	0	X	$S = 1/8$ $C = 1$	0	X
 	$S = 1/4$ $C = 2/3$	0	X	X	$S = 1/8$ $C = 1/3$
 	$S = 1/8$ $C = 1/2$	$S = 1/8$ $C = 1/2$	X	$S = 1/8$ $C = 1/2$	X
 	$S = 1/4$ $C = 1$	0	$S = 1/8$ $C = 1/2$	X	X

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Vielen Dank für die Aufmerksamkeit!

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