# REPEAT + CALCULATE OF MEASURES FOR ASSOCIATION

Homework H3.5 Robin Beer – Abdulkarim Joukhadar

### **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 $X \Rightarrow Y$

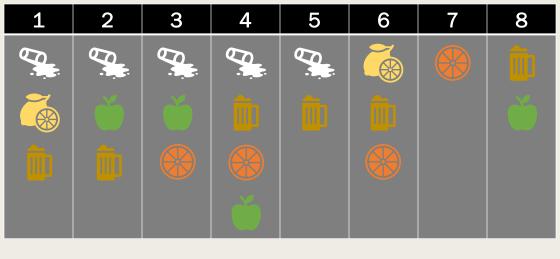
■ Support 
$$Support = \frac{frq(X,Y)}{N}$$

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

$$\textit{Lift} = \frac{Support}{Support(X) \times Support(Y)}$$

15.10.2020

### Item sets of a shopping basket



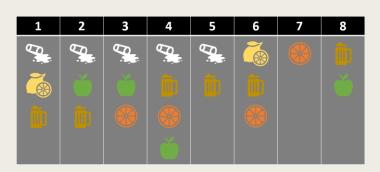
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# 1. What is the support of the item set {Bier, Orangensaft}?

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

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

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



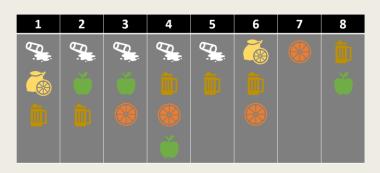
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# 2. What is the confidence of {Bier}→{Milch}?

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

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

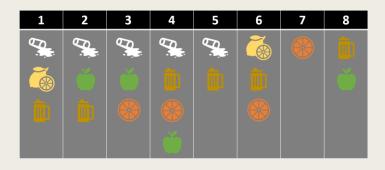
Confidence = 
$$\frac{4}{6} = \frac{2}{3} = 66,67\%$$



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

#### Frequencies:

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



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

X/Y	00			Č	
<b>Q</b> 0	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
Č	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

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	Χ

Vielen Dank für die Aufmerksamkeit!