

# Nested Tables and Association

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# Association

- What is an Association?
- What is a Nested Table?
- A row in a nested table for an association contains
  - a Transaction ID
  - an Item Set (Multi-valued)
- Because the Item Set is multi-valued, the item set is represented by a table.
- Because each observation of an association contains an item set, the association table is a nested table.

# Association

- Transaction Examples:
  - Payment at the grocery store (checkout)
  - Netflix Customer
- Item set examples:
  - Flour Milk Eggs
  - “Die Hard”, “Die Hard 2”, “Live Free or Die Hard”, “A Good Day to Die Hard”

# Flat Table to Nested Table

Party	Person
Halloween	Tom
Labor Day	Rose
Salmon Days	Carl
Labor Day	Jane
Halloween	Harry
Salmon Days	Harry
Salmon Days	Greg
Salmon Days	Keith
Halloween	Jill
Halloween	Dick
Halloween	Joan
Halloween	Jane
Labor Day	Tom
Salmon Days	Jill
Labor Day	Sue

# Flat Table to Nested Table

Group By Common Event

Party	Person
Halloween	Tom
Labor Day	Rose
Salmon Days	Carl
Labor Day	Jane
Halloween	Harry
Salmon Days	Harry
Salmon Days	Greg
Salmon Days	Keith
Halloween	Jill
Halloween	Dick
Halloween	Joan
Halloween	Jane
Labor Day	Tom
Salmon Days	Jill
Labor Day	Sue



Party	Person
Halloween	Dick
Halloween	Harry
Halloween	Jane
Halloween	Jill
Halloween	Joan
Halloween	Tom
Labor Day	Jane
Labor Day	Rose
Labor Day	Sue
Labor Day	Tom
Salmon Days	Carl
Salmon Days	Greg
Salmon Days	Harry
Salmon Days	Jill
Salmon Days	Keith

# Flat Table to Nested Table

Sort By Common Event

Party	Person
Halloween	Tom
Labor Day	Rose
Salmon Days	Carl
Labor Day	Jane
Halloween	Harry
Salmon Days	Harry
Salmon Days	Greg
Salmon Days	Keith
Halloween	Jill
Halloween	Dick
Halloween	Joan
Halloween	Jane
Labor Day	Tom
Salmon Days	Jill
Labor Day	Sue

Party	Person
Halloween	Dick
Halloween	Harry
Halloween	Jane
Halloween	Jill
Halloween	Joan
Halloween	Tom
Labor Day	Jane
Labor Day	Rose
Labor Day	Sue
Labor Day	Tom
Salmon Days	Carl
Salmon Days	Greg
Salmon Days	Harry
Salmon Days	Jill
Salmon Days	Keith

Common Event:  
Halloween

Common Event:  
Labor Day

Common Event:  
Salmon Days

# Flat Table to Nested Table

Party	Person
Halloween	Tom
Labor Day	Rose
Salmon Days	Carl
Labor Day	Jane
Halloween	Harry
Salmon Days	Harry
Salmon Days	Greg
Salmon Days	Keith
Halloween	Jill
Halloween	Dick
Halloween	Joan
Halloween	Jane
Labor Day	Tom
Salmon Days	Jill
Labor Day	Sue



Party	Person
Halloween	Dick
Halloween	Harry
Halloween	Jane
Halloween	Jill
Halloween	Joan
Halloween	Tom
Labor Day	Jane
Labor Day	Rose
Labor Day	Sue
Labor Day	Tom
Salmon Days	Carl
Salmon Days	Greg
Salmon Days	Harry
Salmon Days	Jill
Salmon Days	Keith



# Flat Table to Nested Table

Party	Person
Halloween	Tom
Labor Day	Rose
Salmon Days	Carl
Labor Day	Jane
Halloween	Harry
Salmon Days	Harry
Salmon Days	Greg
Salmon Days	Keith
Halloween	Jill
Halloween	Dick
Halloween	Joan
Halloween	Jane
Labor Day	Tom
Salmon Days	Jill
Labor Day	Sue



Party	Person
Halloween	Dick
Halloween	Harry
Halloween	Jane
Halloween	Jill
Halloween	Joan
Halloween	Tom
Labor Day	Jane
Labor Day	Rose
Labor Day	Sue
Labor Day	Tom
Salmon Days	Carl
Salmon Days	Greg
Salmon Days	Harry
Salmon Days	Jill
Salmon Days	Keith



Party	Person
Halloween	Dick
	Harry
	Jane
	Jill
	Joan
Labor Day	Tom
	Jane
	Rose
	Sue
Salmon Days	Tom
	Carl
	Greg
	Harry
	Jill
	Keith



# Flat Table to Nested Table

Party	Person
Halloween	Tom
Labor Day	Rose
Salmon Days	Carl
Labor Day	Jane
Halloween	Harry
Salmon Days	Harry
Salmon Days	Greg
Salmon Days	Keith
Halloween	Jill
Halloween	Dick
Halloween	Joan
Halloween	Jane
Labor Day	Tom
Salmon Days	Jill
Labor Day	Sue



Party	Person
Halloween	Dick
Halloween	Harry
Halloween	Jane
Halloween	Jill
Halloween	Joan
Halloween	Tom
Labor Day	Jane
Labor Day	Rose
Labor Day	Sue
Labor Day	Tom
Salmon Days	Carl
Salmon Days	Greg
Salmon Days	Harry
Salmon Days	Jill
Salmon Days	Keith



Party	Person
Halloween	Dick
	Harry
	Jane
	Jill
	Joan
Labor Day	Tom
	Jane
	Rose
	Sue
Salmon Days	Tom
	Carl
	Greg
	Harry
	Jill
	Keith

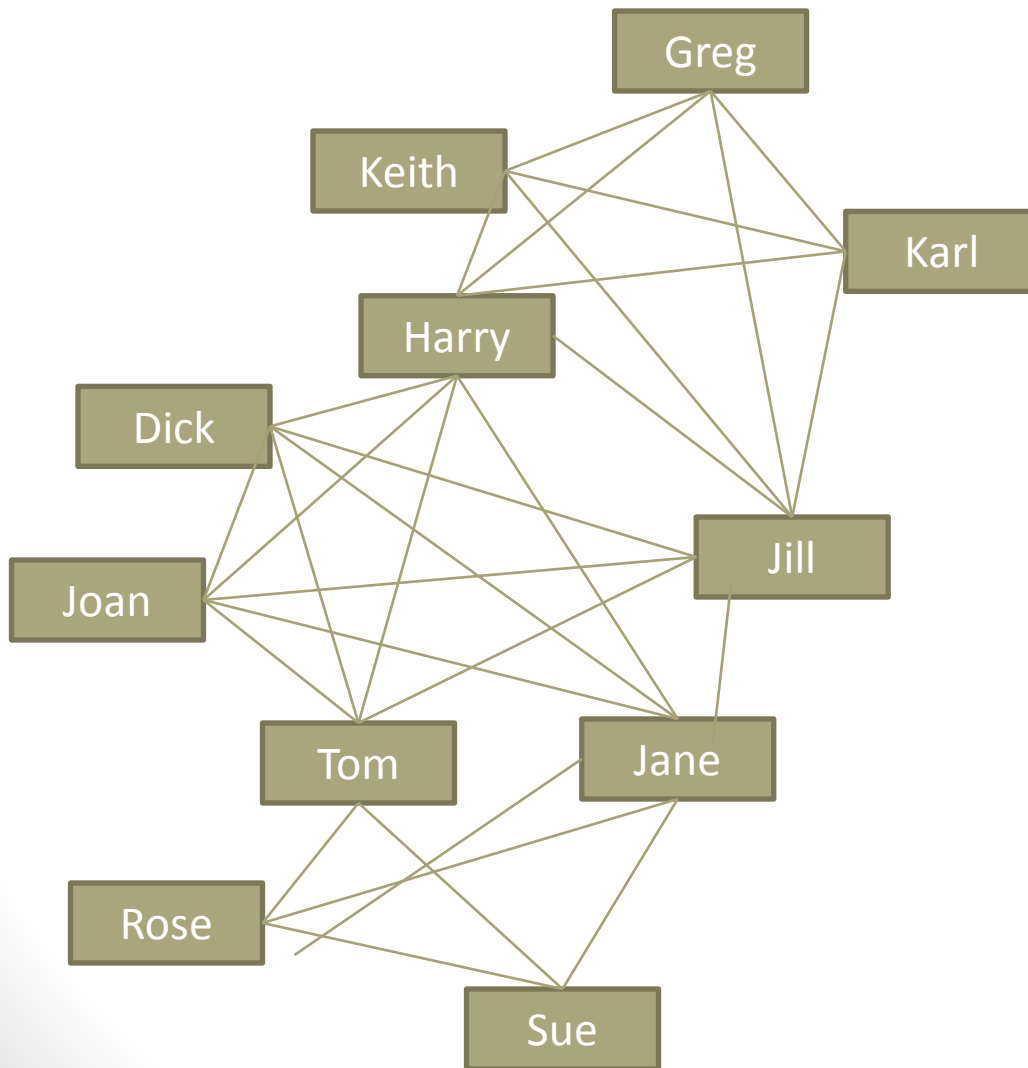
Transaction ID

Item

# Nested Table to Association

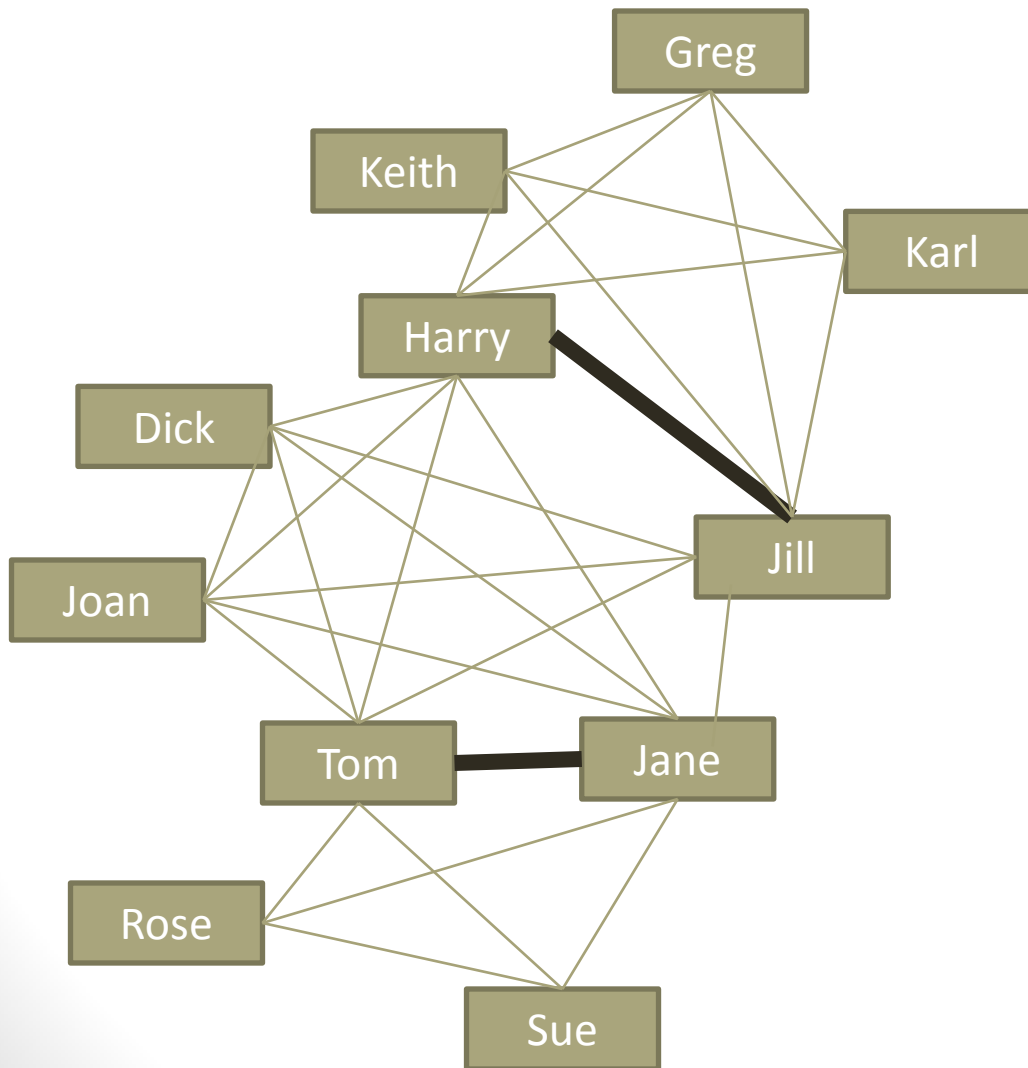
Transaction ID		Item	
Party		Person	
Halloween		Dick	
		Harry	
		Jane	
		Jill	
		Joan	
		Tom	
Labor Day		Jane	
		Rose	
		Sue	
		Tom	
Salmon Days		Carl	
		Greg	
		Harry	
		Jill	
		Keith	

# Nested Table to Association



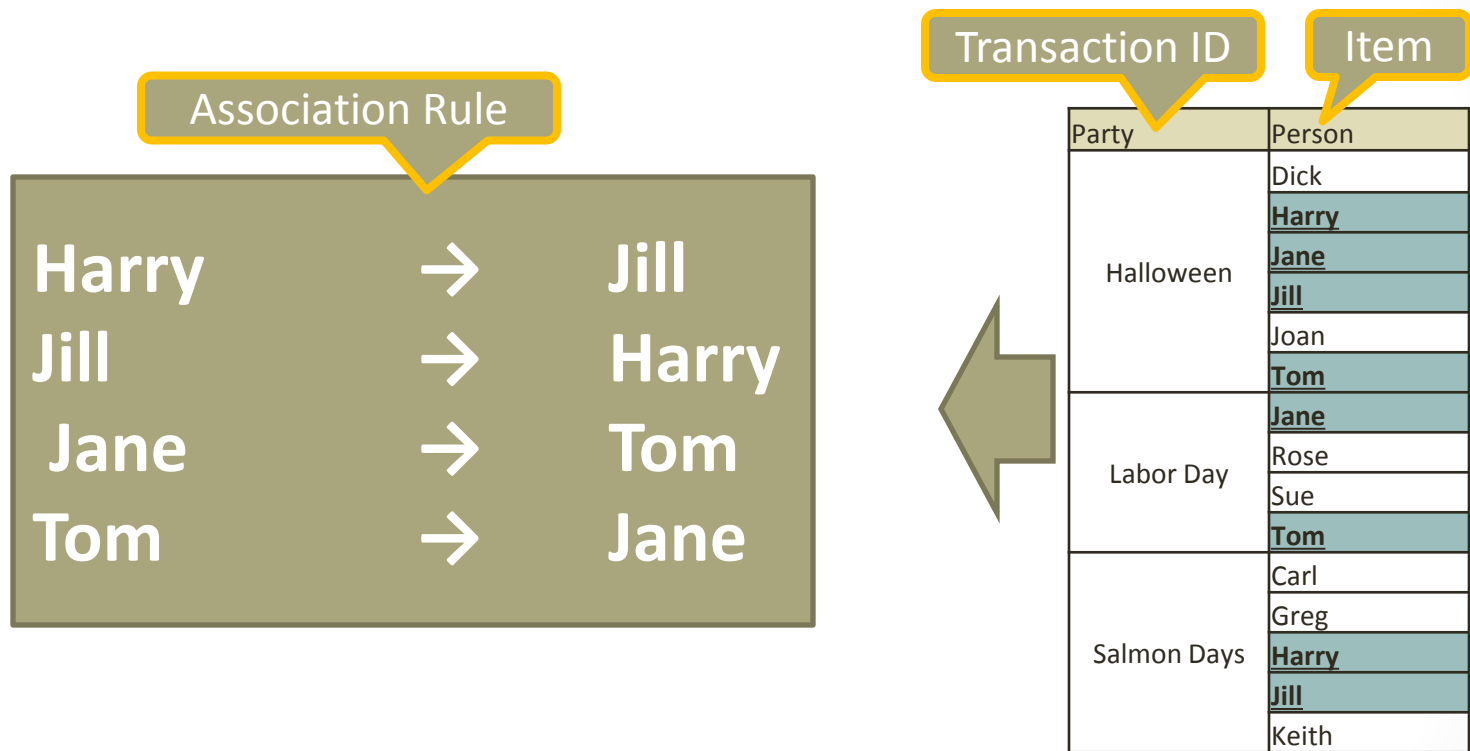
Transaction ID		Item	
Party		Person	
Halloween		Dick	
		Harry	
		Jane	
		Jill	
		Joan	
		Tom	
Labor Day		Jane	
		Rose	
		Sue	
		Tom	
Salmon Days		Carl	
		Greg	
		Harry	
		Jill	
		Keith	

# Nested Table to Association

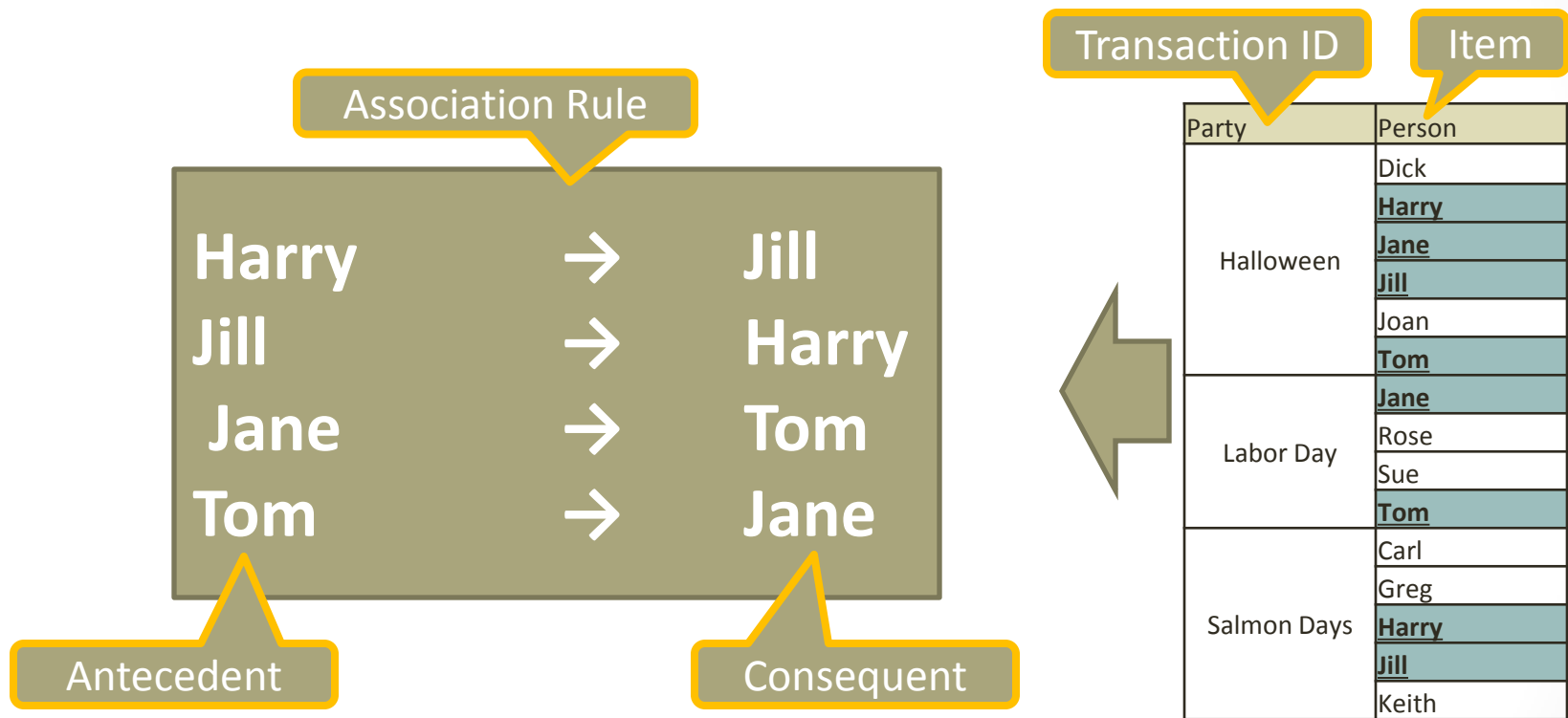


Transaction ID		Item	
Party		Person	
Halloween		Dick	
		Harry	
		Jane	
		Jill	
		Joan	
		Tom	
Labor Day		Jane	
		Rose	
		Sue	
		Tom	
Salmon Days		Carl	
		Greg	
		Harry	
		Jill	
		Keith	

# Nested Table to Association



# Nested Table to Association



# Links

- Association walkthrough in Predixion Insight:  
[https://www.predixionsoftware.com/help/webframe.html#01\\_Association\\_Model\\_Walkthrough.html](https://www.predixionsoftware.com/help/webframe.html#01_Association_Model_Walkthrough.html).
- Association rule learning:  
[http://en.wikipedia.org/wiki/Association\\_rule\\_learning](http://en.wikipedia.org/wiki/Association_rule_learning)
- Association Rule Learning and the Apriori Algorithm:  
<http://www.r-bloggers.com/association-rule-learning-and-the-apriori-algorithm/>
- R-package: <http://cran.r-project.org/web/packages/arules/arules.pdf>

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