

***Rotman***

**Master of  
Management  
Analytics**

# INTRO TO JMP – PART 2

Bootcamp

August 7, 2023 Prepared by Jay / [TDMDAL](#)



Rotman School of Management  
UNIVERSITY OF TORONTO

# Plan

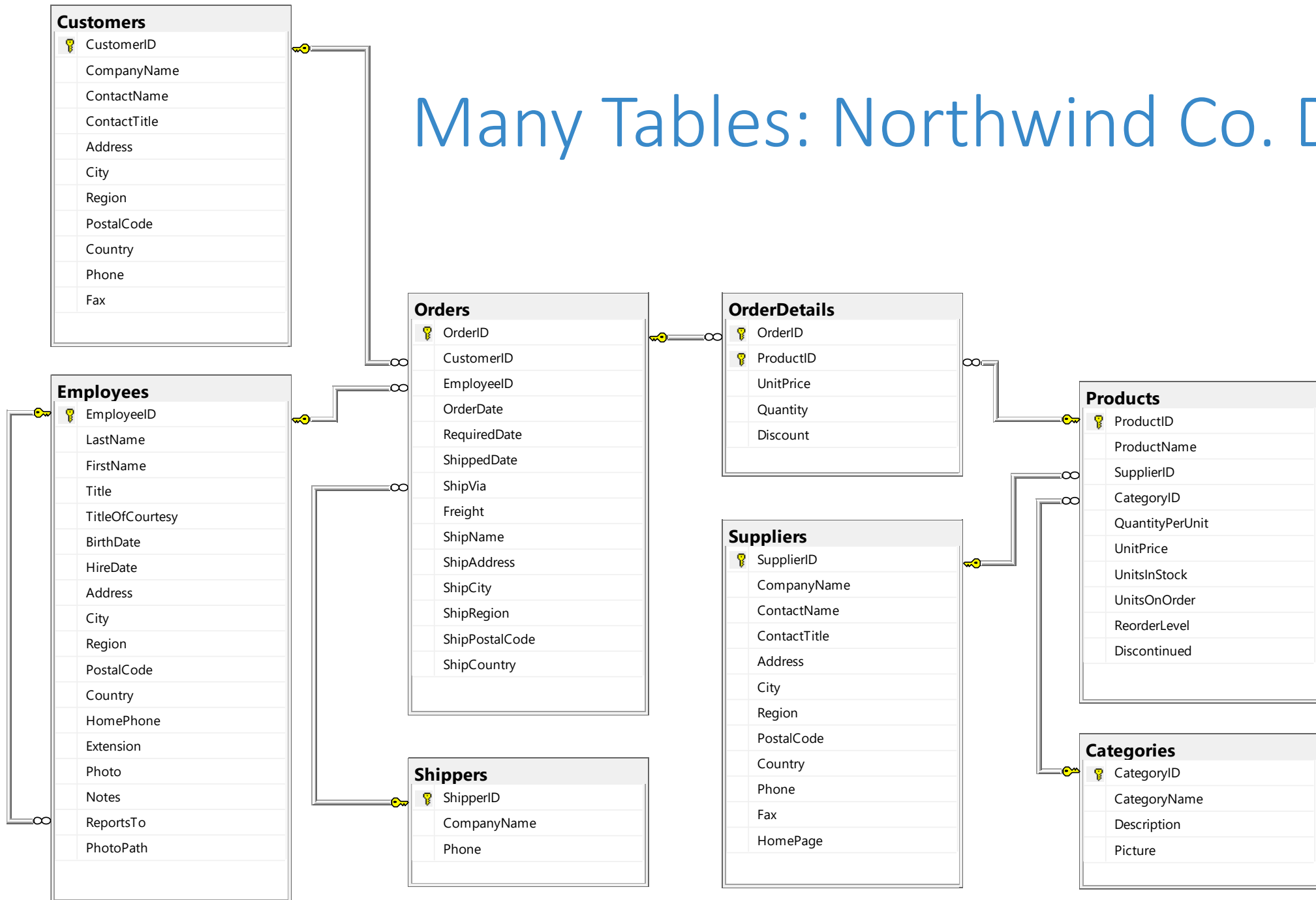
- Session 1
  - Workflow overview
  - Basic data manipulation
- Session 2
  - **Join data tables**
  - JMP graphing
- Session 3
  - Modelling
  - JMP Journal
  - JMP Scripting Language

# Join Data Tables

- Relationship between data tables
  - one-to-one
  - **one-to-many**
  - many-to-many
- Database terminology
  - **primary key**: uniquely identifies an observation in its own table
  - **foreign key**: uniquely identifies an observation in another table



# Many Tables: Northwind Co. DB



# Join – Inner Join

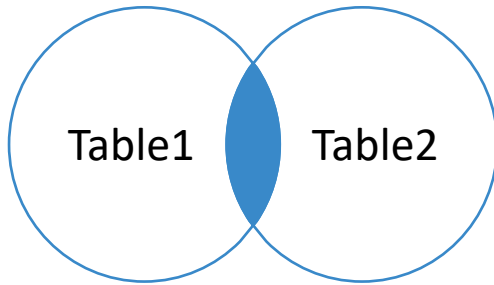


Table1

pk	t1c1
1	a
2	b

Table2

fk	t2c1
1	c
1	d
3	e

pk	t1c1	fk	t2c1
1	a	1	c
1	a	1	d

Join - JMP Pro

Join rows from several sources by matching value.

Join 'Table1' with

- Table2
- Table1

Options

- Preserve main table order
- Update main table with data from second table
- Merge same name columns
- Match Flag

Main Table

- Copy formula
- Suppress formula evaluation

Second Table

- Copy formula
- Suppress formula evaluation

Source Columns

Table1

- pk
- t1c1

Table2

- fk
- t2c1

Matching Specification

By Matching Columns

Match Columns

Match pk=fk

Drop multiples  Main Table  With Table

Include non-matches  Main Table  With Table

Inner Join

Output Columns

- Select columns for joined table

Action

OK

Cancel

Remove

Recall

Help

Output table name:

Keep dialog open

Save Script to Source Table

# Join – Left (Outer) Join

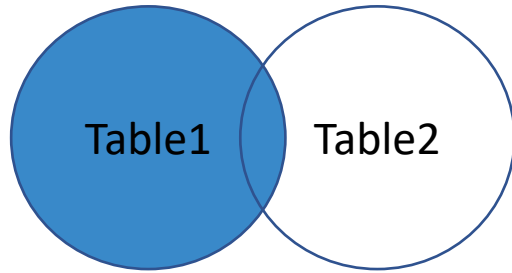


Table1

pk	t1c1
1	a
2	b

Table2

fk	t2c1
1	c
1	d
3	e

pk	t1c1	fk	t2c1
1	a	1	c
1	a	1	d
2	b		

Join - JMP Pro

Join rows from several sources by matching value.

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- Match Flag

Main Table

- Copy formula
- Suppress formula evaluation

Second Table

- Copy formula
- Suppress formula evaluation

Source Columns

- Table1**
  - pk
  - t1c1
- Table2**
  - fk
  - t2c1

Matching Specification

By Matching Columns

Match Columns

Match pk=fk

Drop multiples  Main Table  With Table

Include non-matches

Left Outer Join

Output Columns

- Select columns for joined table

Action

OK

Cancel

Remove

Recall

Help

Output table name:

Keep dialog open

Save Script to Source Table

# Join - Left (Outer) Join With Exclusion (Demo)

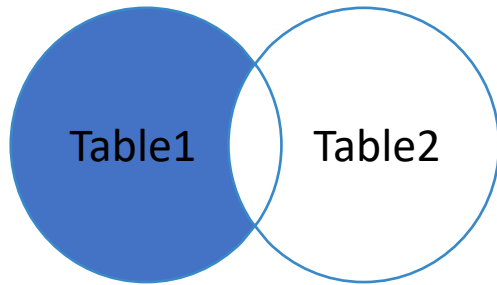


Table1		Table2	
pk	t1c1	fk	t2c1
1	a	1	c
2	b	1	d
		3	e

pk	t1c1	fk	t2c1
2	b		

- step 1: left (outer) join
- step 2: filter rows (row selection)
  - fk is missing
- step 3: subset table according to filtering result

# Join – Right Outer Join\*

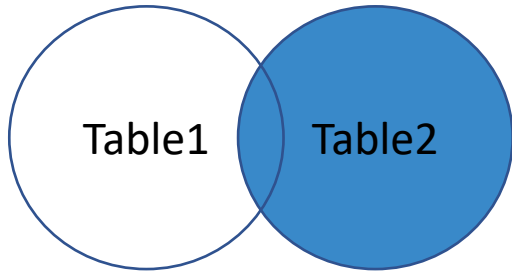


Table1

pk	t1c1
1	a
2	b

Table2

fk	t2c1
1	c
1	d
3	e

pk	t1c1	fk	t2c1
1	a	1	c
1	a	1	d
		3	e

Join - JMP Pro

Join rows from several sources by matching value.

Join 'Table1' with

- Table2
- Table1

Options

- Preserve main table order
- Update main table with data from second table
- Merge same name columns
- Match Flag

Main Table

- Copy formula
- Suppress formula evaluation

Second Table

- Copy formula
- Suppress formula evaluation

Source Columns

- Table1**
  - pk
  - t1c1
- Table2**
  - fk
  - t2c1

Matching Specification

By Matching Columns

Match Columns

Match pk=fk

Drop multiples  Main Table  With Table

Include non-matches

Right Outer Join

Output Columns

- Select columns for joined table

Action

OK

Cancel

Remove

Recall

Help

Output table name:

Keep dialog open

Save Script to Source Table



# Join - Right Outer Join With Exclusion\*

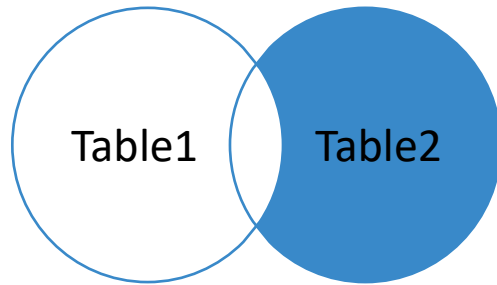


Table1

pk	t1c1
1	a
2	b

Table2

fk	t2c1
1	c
1	d
3	e

pk	t1c1	fk	t2c1
		3	e

- step 1: right (outer) join
- step 2: filter rows (row selection)
  - pk is missing
- step 3: subset table according to filtering result

# Join – Full Outer Join

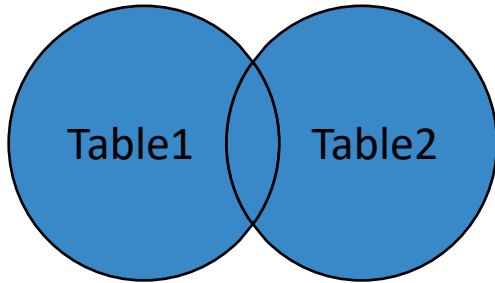


Table1

pk	t1c1
1	a
2	b

Table2

fk	t2c1
1	c
1	d
3	e

pk	t1c1	fk	t2c1
1	a	1	c
1	a	1	d
2	b		
		3	e

Join - JMP Pro

Join rows from several sources by matching value.

Join 'Table1' with

- Table2
- Table1

Options

- Preserve main table order
- Update main table with data from second table
- Merge same name columns
- Match Flag

Main Table

- Copy formula
- Suppress formula evaluation

Second Table

- Copy formula
- Suppress formula evaluation

Source Columns

Table1

- pk
- t1c1

Table2

- fk
- t2c1

Matching Specification

By Matching Columns

Match Columns

Match pk=fk

Drop multiples  Main Table  With Table

Include non-matches

Full Outer Join

Output Columns

- Select columns for joined table

Action

OK

Cancel

Remove

Recall

Help

Output table name:

Keep dialog open

Save Script to Source Table

# Join – Full Outer Join with Exclusion

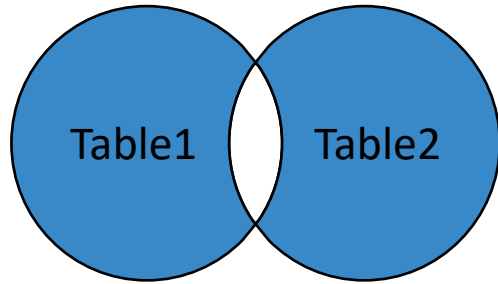


Table1

pk	t1c1
1	a
2	b

Table2

fk	t2c1
1	c
1	d
3	e

pk	t1c1	fk	t2c1
2	b		
		3	e

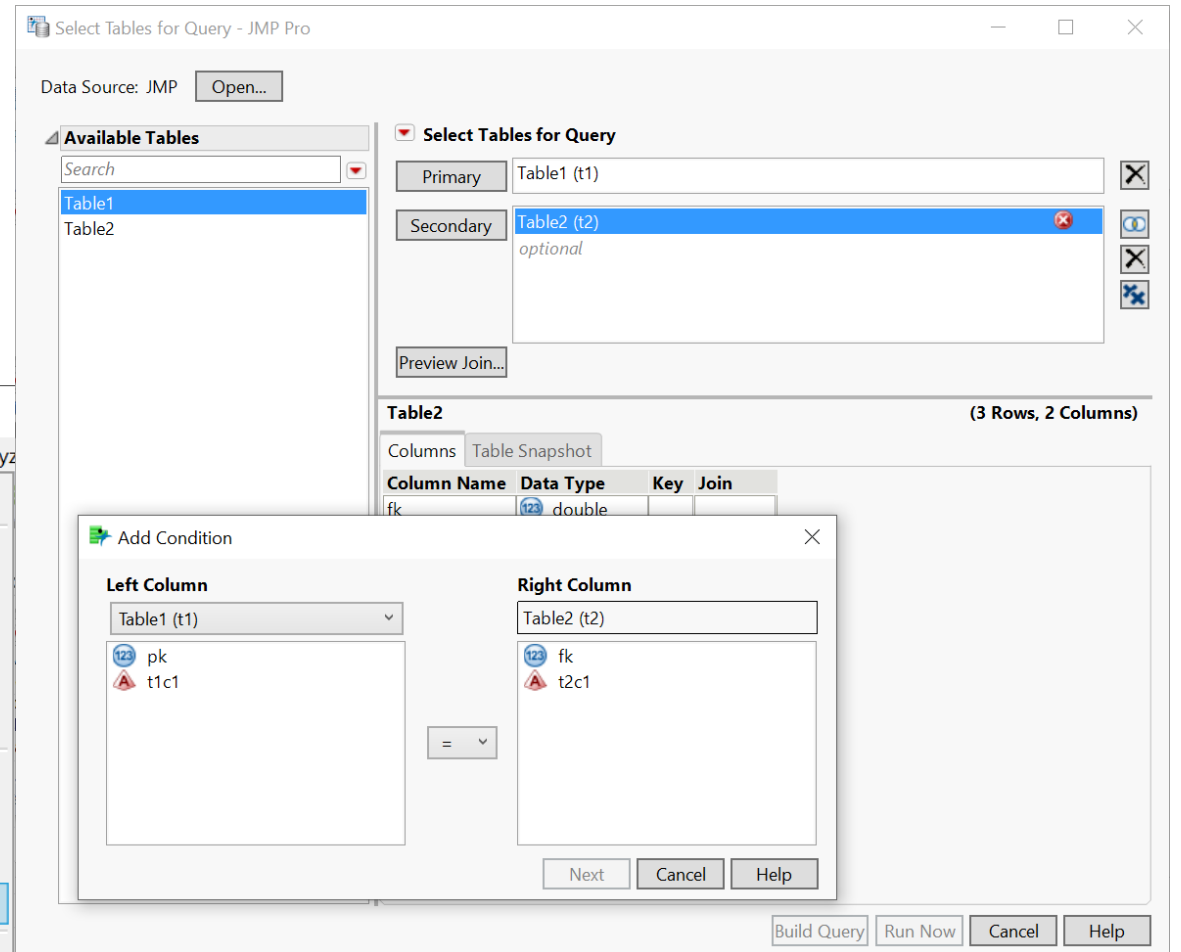
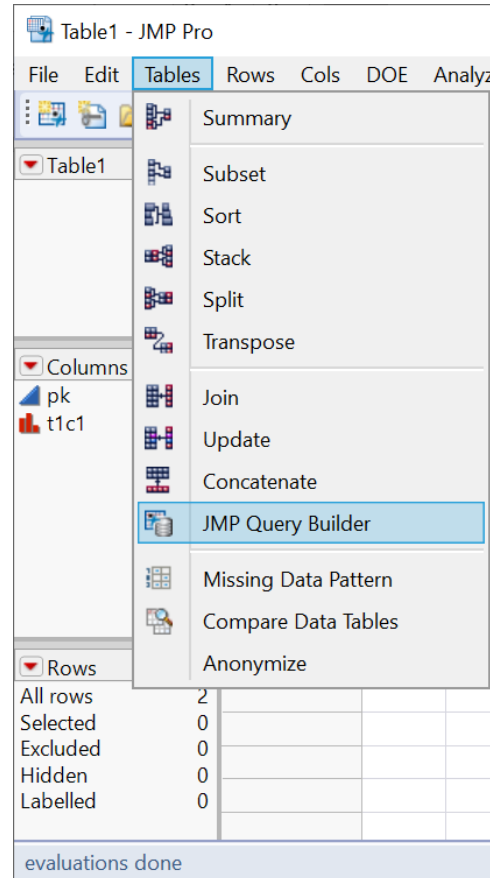
- step 1: Full (outer) join
- step 2: filter rows (row selection)
  - pk is missing **OR** fk is missing
- step 3: subset table according to filtering result

# Your Turn (Hands-on)

- Load the Table1.jmp and Table2.jmp data tables
  - The two tables are inside data\basics\ folder
- Implement the Full Outer Join with Exclusion case

# JMP Query Builder

- Similar as the Join menu
- Learn on your own
  - query builder will make more sense after you complete the SQL bootcamp



# Your Turn (Hands-on)

- Show all products and their associated suppliers
  - Use tables from Northwind Co.
  - Display the **ProductID**, **ProductName**, and **CompanyName** of the Suppliers
- **Before you start**, let's talk about JMP Project

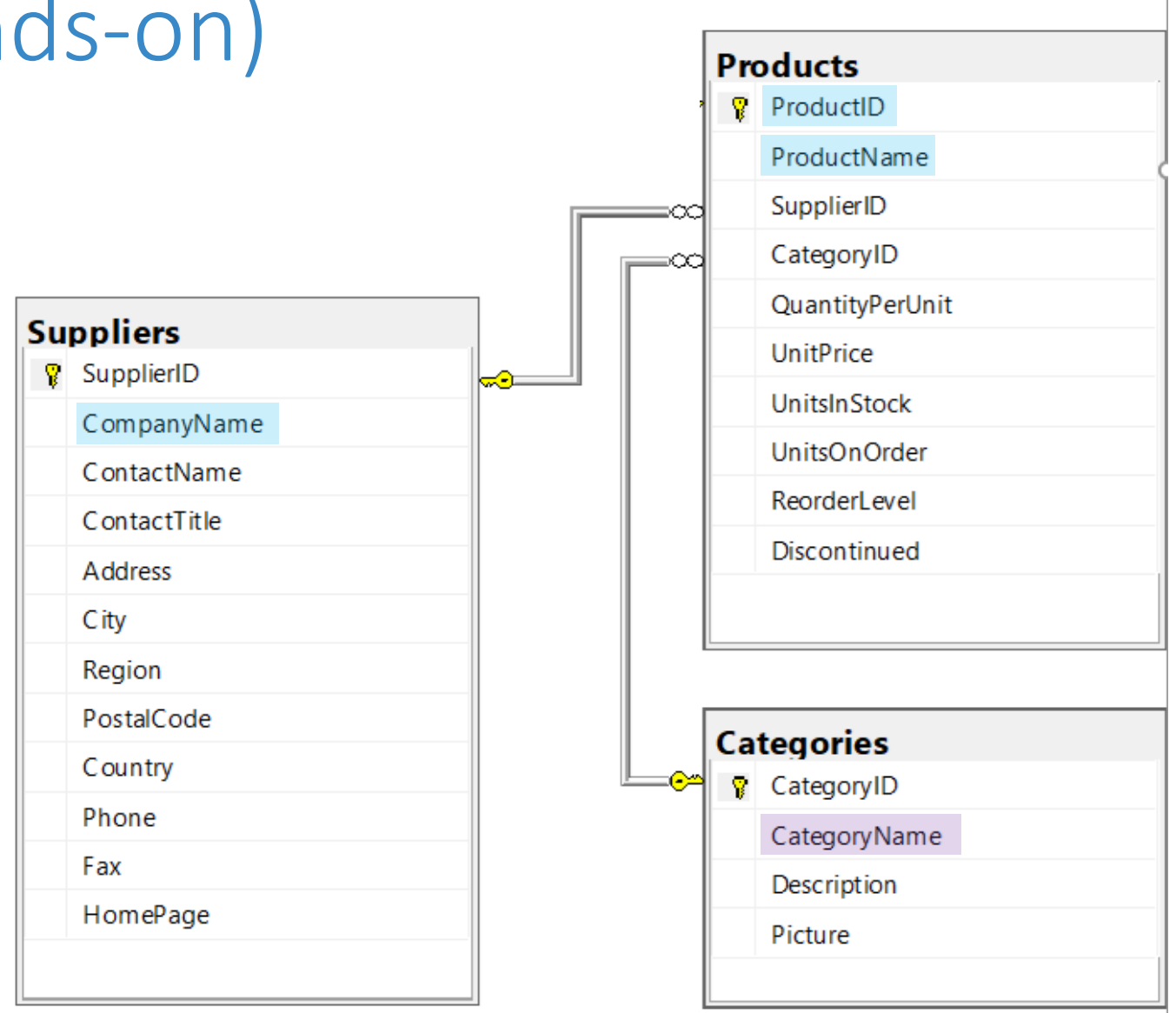
	ProductID	ProductName	CompanyName	
1	1	Chai	Exotic Liquids	
2	2	Chang	Exotic Liquids	
3	3	Aniseed Syrup	Exotic Liquids	
4	4	Chef Anton's Caj...	New Orleans Caj...	
5	5	Chef Anton's Gu...	New Orleans Caj...	
6	6	Grandma's Boyse...	Grandma Kelly's ...	
7	7	Uncle Bob's Orga...	Grandma Kelly's ...	
8	8	Northwoods Cra...	Grandma Kelly's ...	
9	9	Mishi Kobe Niku	Tokyo Traders	
10	10	Ikura	Tokyo Traders	
11	11	Queso Cabrales	Cooperativa de Q...	
12	12	Queso Mancheg...	Cooperativa de Q...	
13	13	Konbu	Mayumi's	
14	14	Tofu	Mayumi's	
15	15	Genen Shouyu	Mayumi's	
16	16	Pavlova	Pavlova, Ltd.	
17	17	Alice Mutton	Pavlova, Ltd.	
18	18	Carnarvon Tigers	Pavlova, Ltd.	
19	19	Teatime Chocolat...	Specialty Biscuits,...	
20	20	Sir Rodney's Mar...	Specialty Biscuits,...	
21	21	Sir Rodney's Sco...	Specialty Biscuits,...	
22	22	Gustaf's Knäckeb...	DR Knäckebrod AB	

# JMP Project (Demo)

- Organize your data analysis with project
  - data tables
  - reports
  - scripts
  - journals
  - ...
- Getting-started resources
  - Short video: [Creating, Navigating, Saving and Archiving Projects](#)
  - Document: [Create a Project](#)

# Your Turn Now (Hands-on)

- Show all products and their associated suppliers
  - Use tables from Northwind Co.
  - Display the **ProductID**, **ProductName**, and **CompanyName** of the Suppliers
- What if we also want to display the **CategoryName**



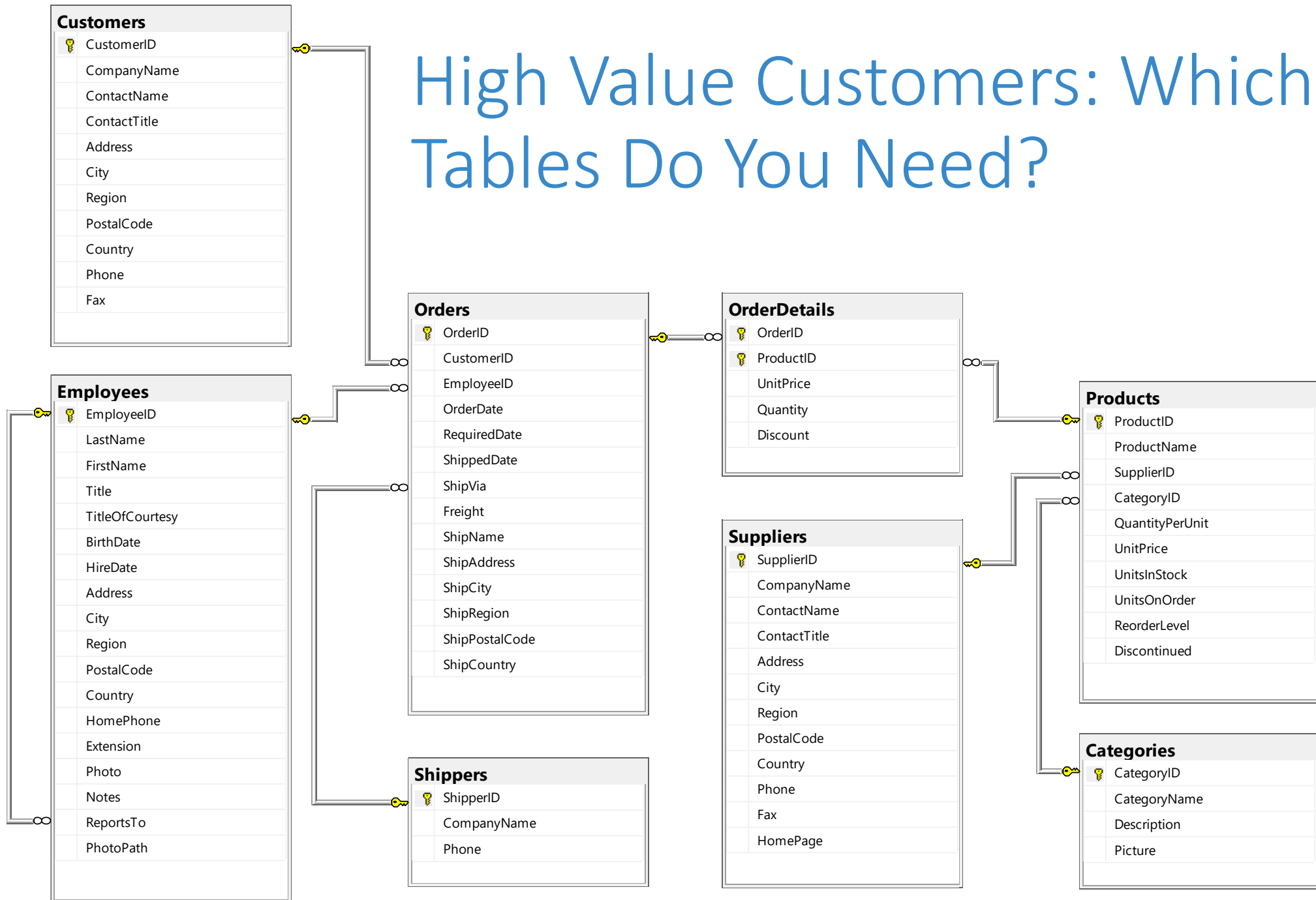


# Your Turn (Hands-on): High Value Customers

- Find high value customers
  - We define high-value customers as those who have made total order  $\geq$  \$15,000 (ignore discount) in **2016**
  - Note: only consider orders in year 2016 (**OrderDate**)
  - Display **CustomerID** and its corresponding total order value

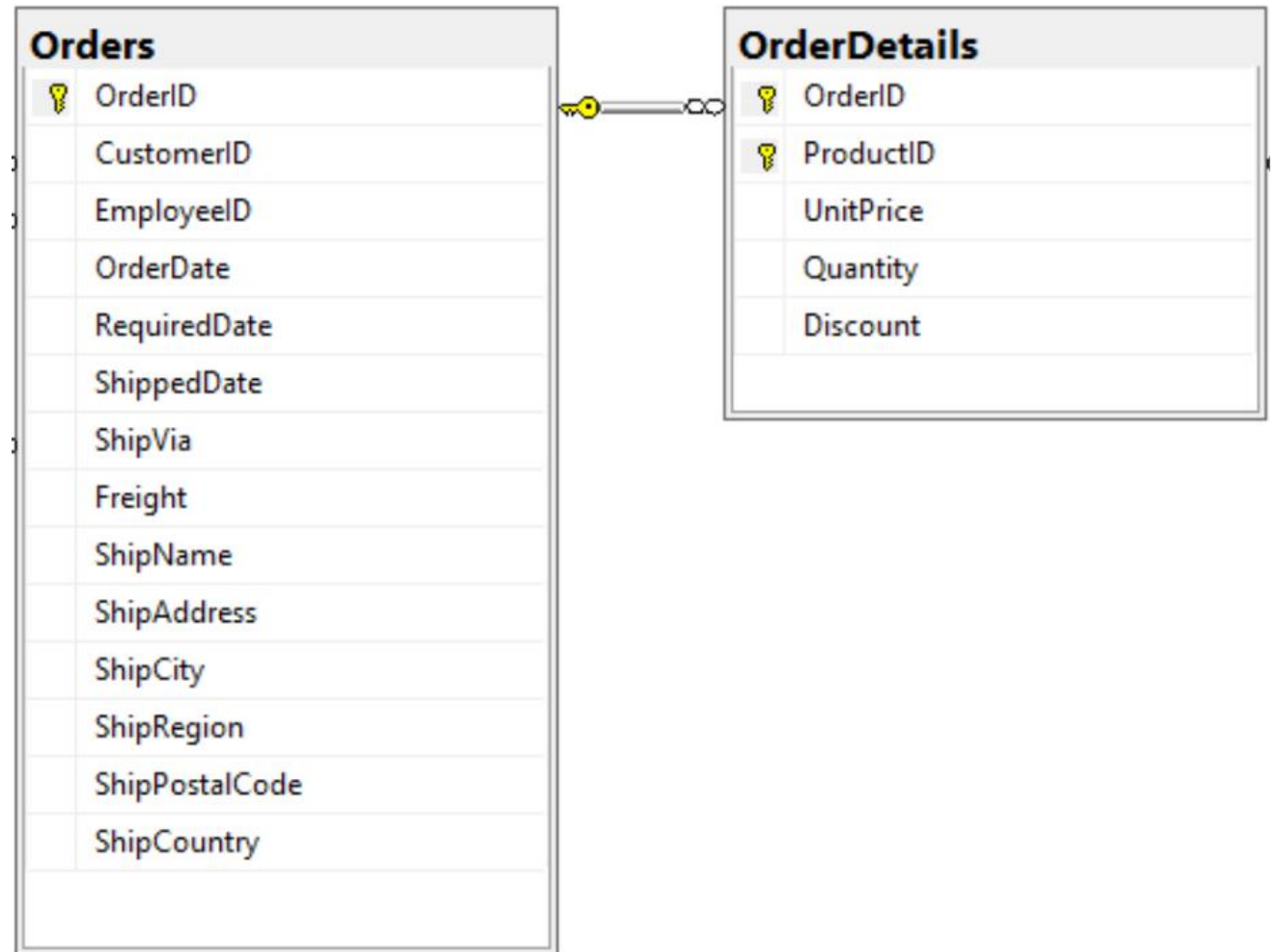
		<b>CustomerID</b>	<b>Total</b>	
	1	SAVEA	42806.25	
	2	ERNSH	42598.9	
	3	QUICK	40526.99	
	4	HANAR	24238.05	
	5	HUNGO	22796.34	
	6	RATTC	21725.6	
	7	KOENE	20204.95	
	8	FOLKO	15973.85	
	9	WHITC	15278.9	

# High Value Customers: Which Tables Do You Need?



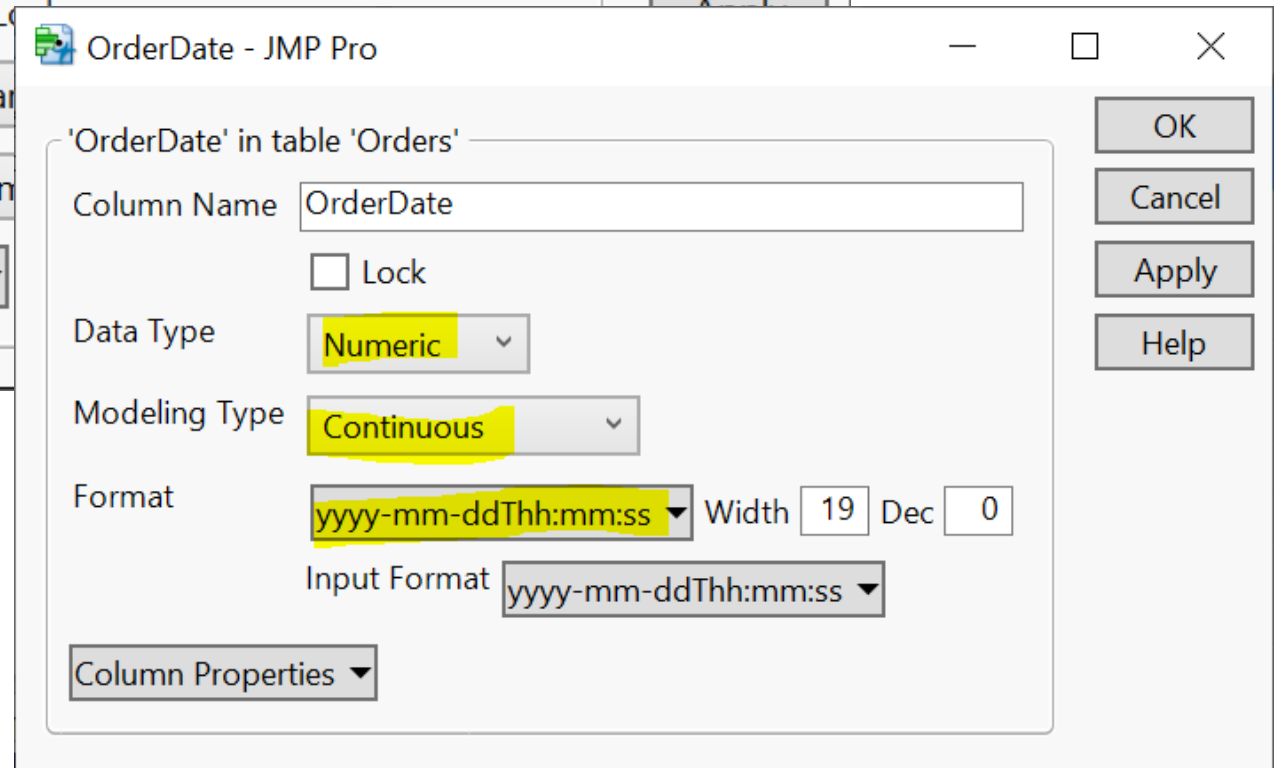
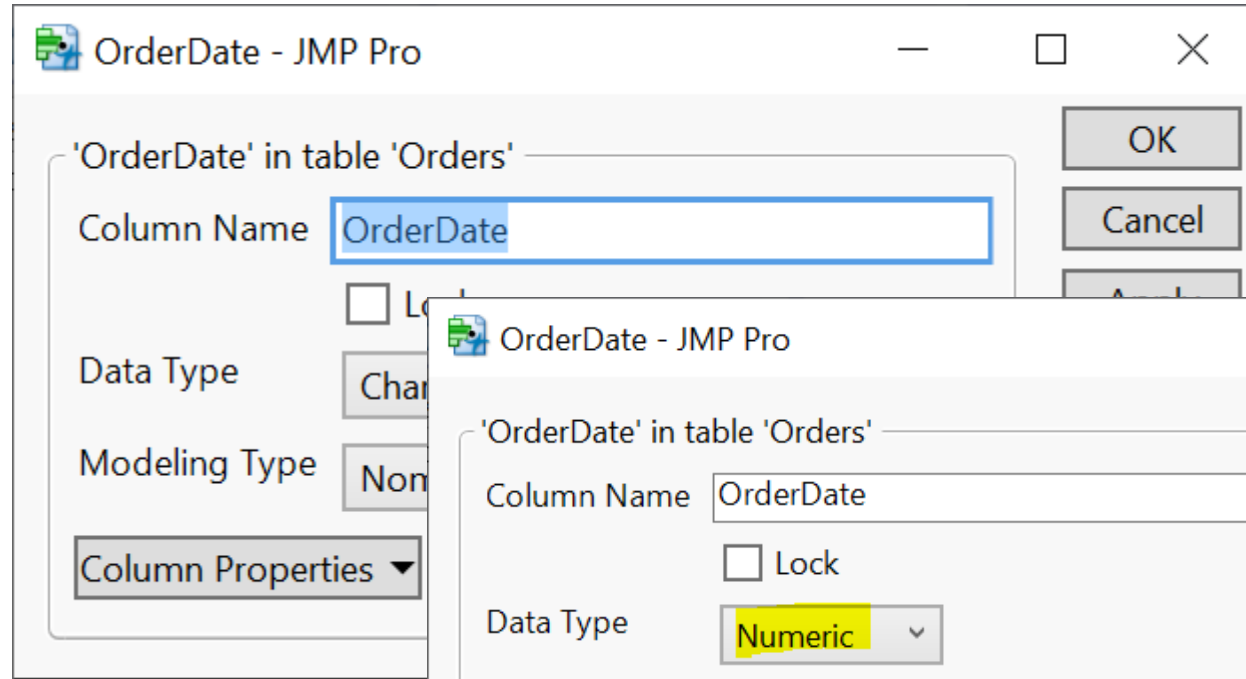
# Your Turn (Hands-on): High Value Customers

- After you finish the exercise, reflect on the following
  - how many steps did you take?
  - Is there an optimal way (order of the steps) of doing this?
  - Can you reproduce the result easily
  - pros and cons of point-and-click



# A Quick Detour – Date & Time

- Column Info
  - Data Type
  - Modeling Type
  - Format



# Your Turn (Take home)

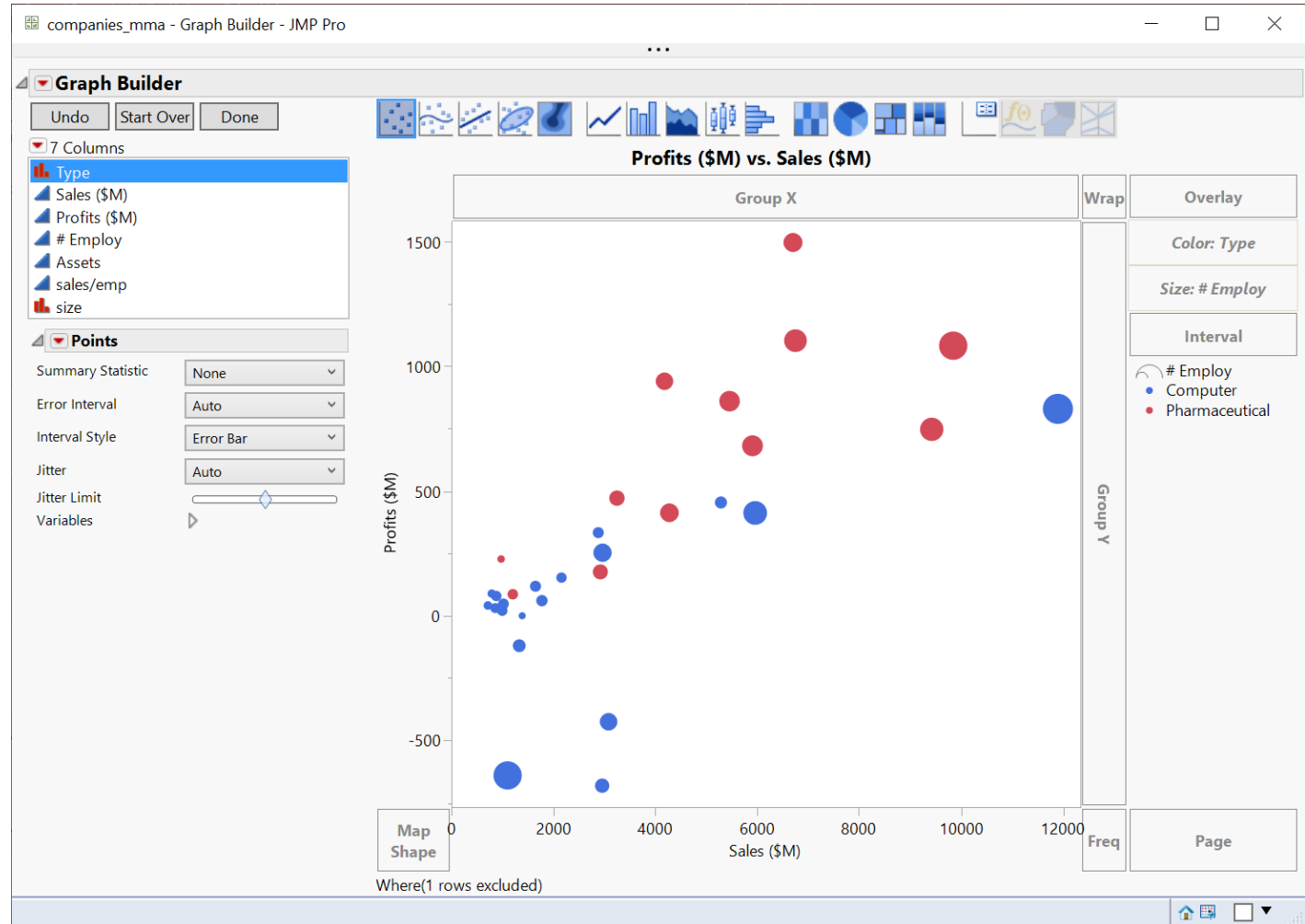
- Q1. Find customers that never placed an order
- Q2. Find customers who never placed an order from Margaret Peacock (EmployeeID 4)

# Plan

- Session 1
  - Workflow overview
  - Basic data manipulation
- Session 2
  - Join data tables
  - **JMP graphing**
- Session 3
  - Modelling
  - JMP Journal
  - JMP Scripting Language

# JMP Graphing (Demo)

- Graph Builder
- Labelling



# Your Turn (Hands-on)

- Import the gapminder.csv file (data/basics/gapminder.csv)
- Create a Data Filter on the **year** column
  - First change the year col modeling type to ordinal
- Use the Graph Builder to plot
  - **LifeExp** (Y) vs **gpdPerCap** (X)
  - Use **pop** for marker Size
  - Use **continent** for marker Color
  - Use the data filter on **year** to explore the change of Y vs X over the years



# Your Turn (Hands-on)

Data Filter f... — □ ×

**Data Filter**

Clear Favorites Help

Select  Show  Include  
142 matching rows

Inverse

year (12)	
1952	142
1957	142
1962	142
1967	142
1972	142
1977	142
1982	142
1987	142
1992	142
1997	142
2002	142
2007	142

AND OR

Home □ ▼

gapminder - Graph Builder - JMP Pro — □ ×

**Graph Builder**

Undo Start Over Done

6 Columns

- country
- continent
- year
- lifeExp
- pop
- gdpPerCap

**Points**

Summary Statistic: None

Error Interval: Auto

Interval Style: Error Bar

Jitter: Auto

Jitter Limit: [Slider]

Variables: ▶

**lifeExp vs. gdpPerCap**

Group X

Group Y

Wrap Overlay

Color: continent

Size: pop

Interval

pop

- Africa
- Americas
- Asia
- Europe
- Oceania

Map Shape

lifeExp

gdpPerCap

20 30 40 50 60 70 80

0 20000 40000 60000 80000 100000 120000

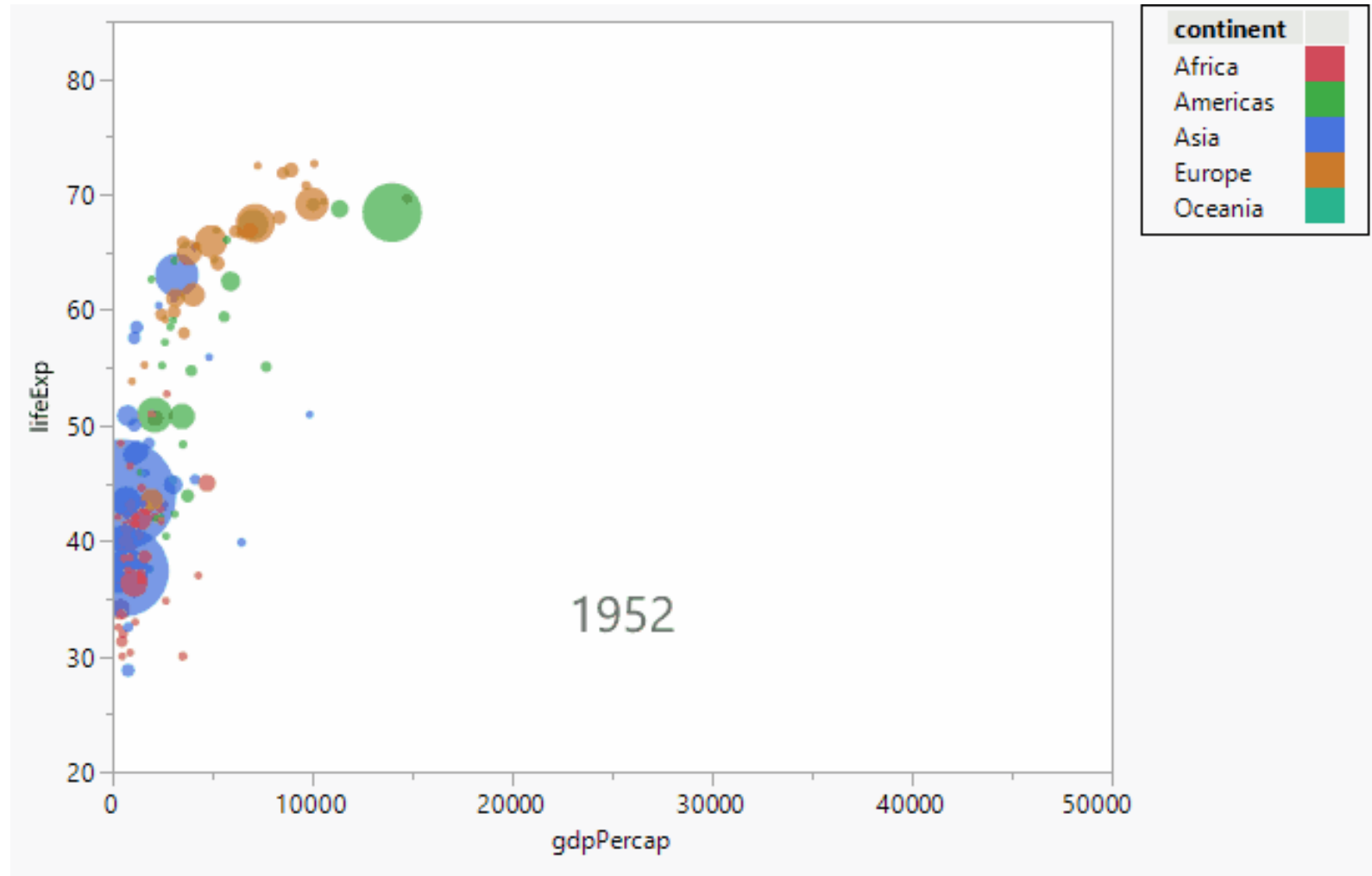
Freq Page

142 rows selected

Home □ ▼

# Your Turn (Hands-on): Challenge

- How to animate the previous graph as a time lapse video?



# Your Turn (Hands-on): Challenge

- How to animate the previous graph as a time lapse video?
- Hint
  - Method 1: Data Filter Animation
  - Method 2 (better): Bubble plot

