

Power Query and Data Transformation Power BI

By Ahmad Mousa

Class Objectives

By the end of this lesson, you will be able to:



Understand and Utilize Power Query



Perform Data Import and Transformation



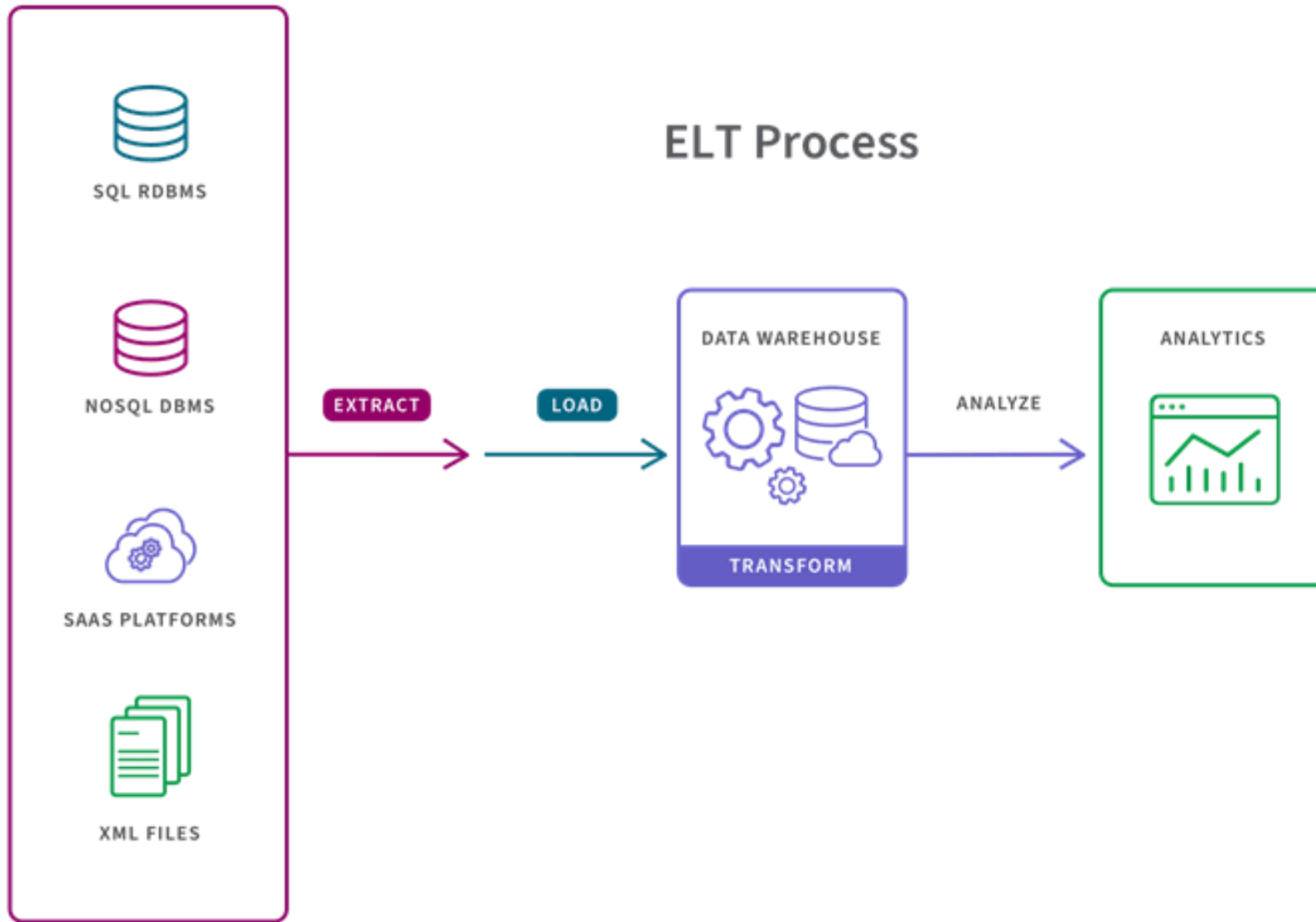
Create and Apply Custom Data Transformations



Enhance Data Quality and Consistency

WELCOME





Data cleaning

Headers

Missing

Data type

De-pivotting

Out layers

Irrelevant

Inconsistent

Duplicate



er BI

rt

Get data

Pa

Navigator

Display Options

Customer Data.xlsx [8]

☐ Customers by Country

☒ Monthly Orders by Sales Rep

☐ Prices and Costs per Location

☐ Product Class Sales Ratio

☐ Purple Products per Customer

☐ Qty Sold Most Recent Month

☐ Shippers Orders

☐ Totals to Date per Country

Totals to Date per Country

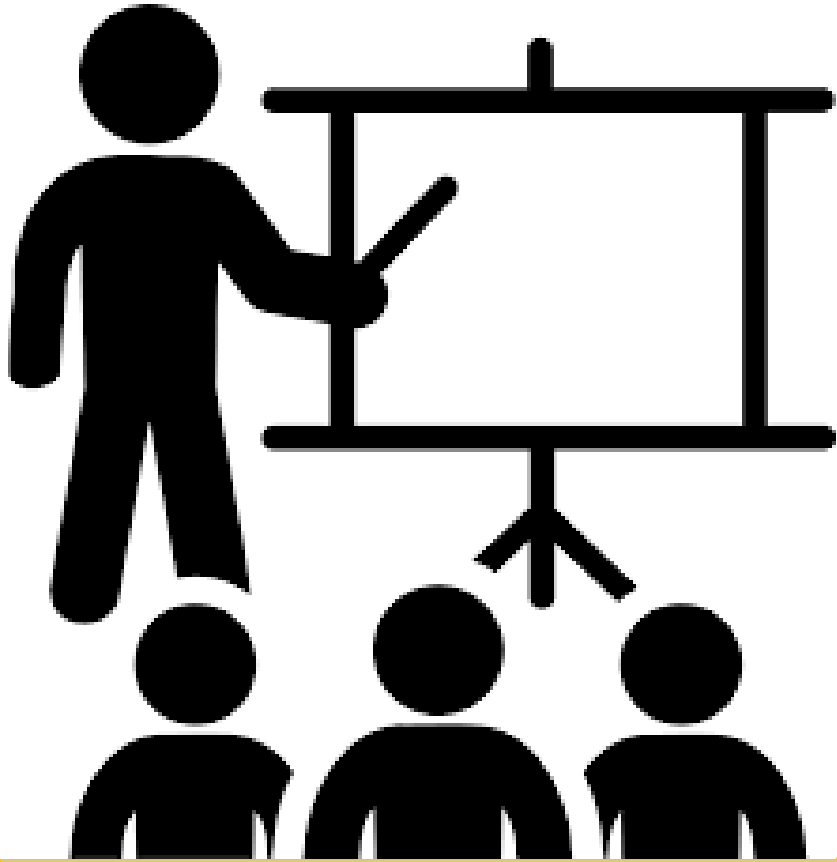
Preview downloaded on Thursday

Row Labels	Year to Date Sales	Quarter to Date Sales
Argentina	1664.7	1664.7
Aruba	5879.7	5879.7
Australia	9899.99	9899.99
Austria	2328.5	96
Bahamas	659.7	659.7
Bangladesh	65.7	65.7
Barbados	329.85	329.85
Belgium	9799.5	6839.4
Bermuda	5879.7	5879.7
Bolivia	97.02	97.02
Brazil	1885.1	1885.1
British Virgin Islands	33.9	33.9
Canada	58426	440.13
Chile	17.5	17.5
China	12526.5	12526.5
Colombia	27	27
Costa Rica	2497.05	2497.05
Czech Republic	329.85	329.85
Denmark	46.5	46.5
Dominican Republic	27	27
Ecuador	33.9	33.9
Fevnt	5219.55	5219.55

Load

Transform Data

Cancel



Instructor Demonstration: Power Query and Data Transformations

Suggested Time:
15 minutes



Questions ?



Home Transform Add Column View Tools Help

New Source Recent Sources Enter Data Data source settings Manage Parameters Refresh Preview Properties Advanced Editor Manage Choose Columns Remove Columns Reduce Rows Sort Split Column Group By Data Type: Any Use First Row as Headers Replace Values Combine Text Analytics Vision Azure Machine Learning Insights

s [3]

ot Table

hase Overview

chase Tracker

= Table.TransformColumnTypes(#"Promoted Headers",{{"Apocalypse Food Prep

	ABC Apocalypse Food Prep Overview	ABC Column2	ABC 123 Column3	ABC 123 Column4
1	null	null	null	
2	null	null	null	
3	Location	Products		1/1/2022
4	Costco	Bottled Water		4.25
5	Costco	Canned Vegetables		0.85
6	Costco	Dried Beans		20.99
7	Costco	Duct Tape		5
8	Costco	Flashlight		13
9	Costco	Milk		2.3
10	Costco	Rice		23
11				

Apocalypse Food Prep Overview	null
Column2	null
Column3	null
Column4	null
Column5	null

Query Settings

▲ PROPERTIES

Name

Purchase Overview

[All Properties](#)

▲ APPLIED STEPS

Source

Navigation

Promoted Headers

✕ Changed Type



f_x

= Table.Skip("#Changed Type",2)



ABC Apocalypse Food Prep Overview



ABC Column2



ABC 123 Column3



ABC 123 Column4

/

Costco

Milk

2.3

8

Costco

Rice

23

9

Costco

Rope

13.5

10

Costco

Water Filter

29

11

null

Costco Total

111.89

12

Target

Bottled Water

4.99

13

Target

Canned Vegetables

0.65

14

Target

Dried Beans

23.99

15

Target

Duct Tape

6

16

Target

Flashlight

12.5

17

Target

Milk

2.2

18

Target

Rice

22.99

19

Target

Rope

15

20

Target

Water Filter

38

21

null

Target Total

126.32

22

Walmart

Bottled Water

5

File Home Transform Add Column View Tools Help

Group By Use First Row as Headers

Transpose Reverse Rows Count Rows

Data Type: Any Detect Data Type Rename

Split Column Format Merge Columns Extract Parse

Statistics Standard Scientific

Trigonometry Rounding Information

Date Time Duration

Run R script Run Python script

- Queries [3]
- Pivot Table
 - Purchase Overview
 - Purchase Tracker

fx = Table.SelectRows(#"Changed Type", each [Apocalypse Food Prep Overview] <> null)

	ABC Apocalypse Food Prep Overview	ABC Column2	ABC Column3	ABC Column4
1	Location	Products	1/1/2022	
2	Costco	Bottled Water	4.25	
3	Costco	Canned Vegetables	0.85	
4	Costco	Dried Beans	20.99	
5	Costco	Duct Tape	5	
6	Costco	Flashlight	13	
7	Costco	Milk	2.3	
8	Costco	Rice	23	
9	Costco	Rope	13.5	
10	Costco	Water Filter	29	
11	Target	Bottled Water	4.99	
12	Target	Canned Vegetables	0.65	
13	Target	Dried Beans	23.99	
14	Target	Duct Tape	6	
15	Target	Flashlight	12.5	
16				

Query Settings

PROPERTIES

Name

Purchase Overview

All Properties

APPLIED STEPS

- Source
- Navigation
- Promoted Headers
- Changed Type
- Filtered Rows
- Removed Top Rows

ome

Transform

Add Column

View

Tools

Help

New Query

Recent Sources

Enter Data

Data source settings

Manage Parameters

Refresh Preview

Properties

Advanced Editor

Manage

Choose Columns

Remove Columns

Reduce Rows

Sort

Split Column

Group By

Data Type: Any

Use First Row as Headers

Replace Values

Combine

Transform

Query Settings

ble

Overview

e Tracker

fx

= Table.RemoveColumns("#Promoted Headers1",{"Grand Total"})

		ABC 123 1/1/2022	ABC 123 2/1/2022	ABC 123 3/1/2022	ABC 123 4/1/2022
1		4.25	4.49	4.8	4.
2		0.85	0.85	0.85	0.
3		20.99	22.99	22.99	23.
4		5	null	5.25	n
5		13	null	13	n
6		2.3	2.4	2.5	2
7		23	23.99	24.99	25.
8		13.5	null	14	n
9		29	null	31	n
10		4.99	5.15	5.25	5.
11		0.65	0.69	0.74	0.
12		23.99	24.99	25.45	25.
13		6	null	6.25	n
14		12.5	null	12.75	n
15		2.2	2.45	2.7	
16					

Query Settings

PROPERTIES

Name

Purchase Overview

All Properties

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Filtered Rows

Promoted Headers

Removed Columns

Removed Top Rows

File Home Transform Add Column View Tools Help

Group By Use First Row as Headers Count Rows

Table

Transpose Reverse Rows

Data Type: Text Detect Data Type Rename

Any Column

Replace Values Fill Pivot Column Convert to List

Unpivot Columns Move

Split Column Format Merge Columns Extract Parse

Text Column

Statistics Standard Scientific

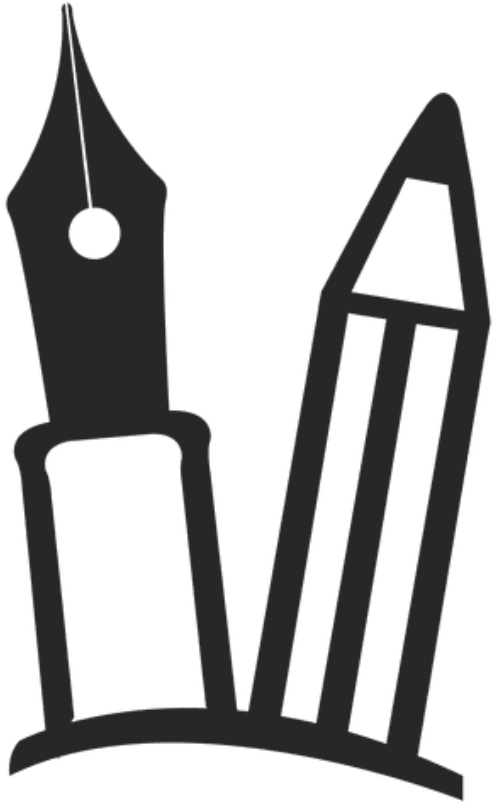
Number Column

Trigonometry Rounding Information

- Queries [3]
- Pivot Table
 - Purchase Overview
 - Purchase Tracker

fx = Table.UnpivotOtherColumns(#"Removed Columns", {"Location", "Products"}, "Attribute", "Value")

	AB _C Location	AB _C Products	AB _C Attribute	ABC ₁₂₃ Value
1	Costco	Bottled Water	1/1/2022	4.25
2	Costco	Bottled Water	2/1/2022	4.49
3	Costco	Bottled Water	3/1/2022	4.8
4	Costco	Bottled Water	4/1/2022	4.89
5	Costco	Canned Vegetables	1/1/2022	0.85
6	Costco	Canned Vegetables	2/1/2022	0.85
7	Costco	Canned Vegetables	3/1/2022	0.85
8	Costco	Canned Vegetables	4/1/2022	0.85
9	Costco	Dried Beans	1/1/2022	20.99
10	Costco	Dried Beans	2/1/2022	22.99
11	Costco	Dried Beans	3/1/2022	22.99
12	Costco	Dried Beans	4/1/2022	23.99
13	Costco	Duct Tape	1/1/2022	5
14	Costco	Duct Tape	3/1/2022	5.25
15	Costco	Flashlight	1/1/2022	13
16	Costco	Flashlight	3/1/2022	13
17	Costco	Milk	1/1/2022	2.3
18	Costco	Milk	2/1/2022	2.4

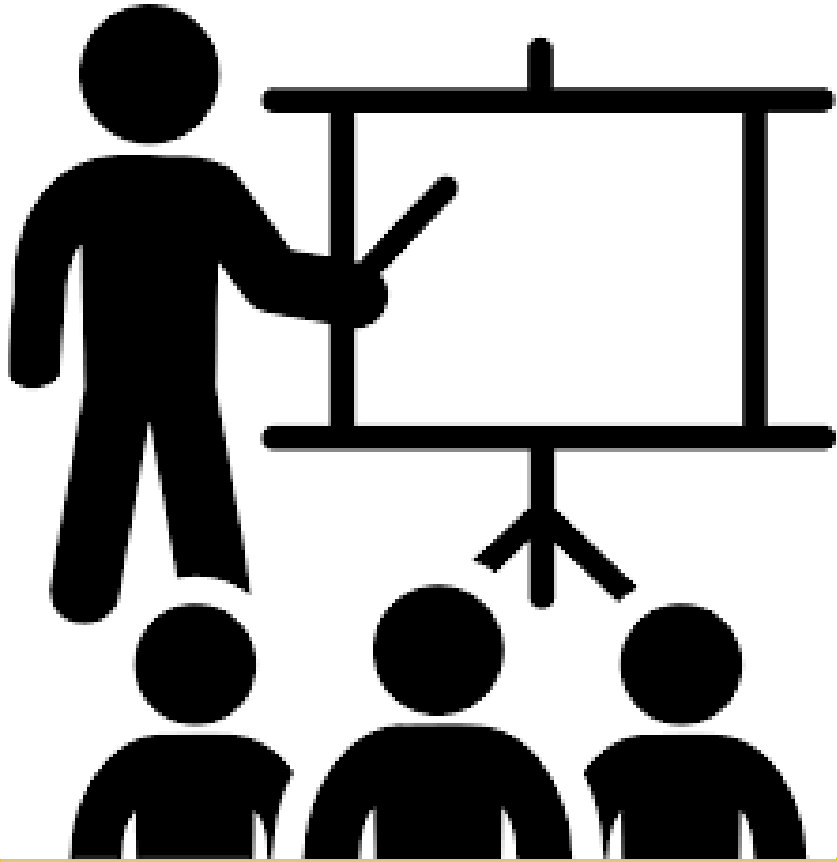


Students Do: IPEDS Data Transformations

Suggested Time:
20 minutes







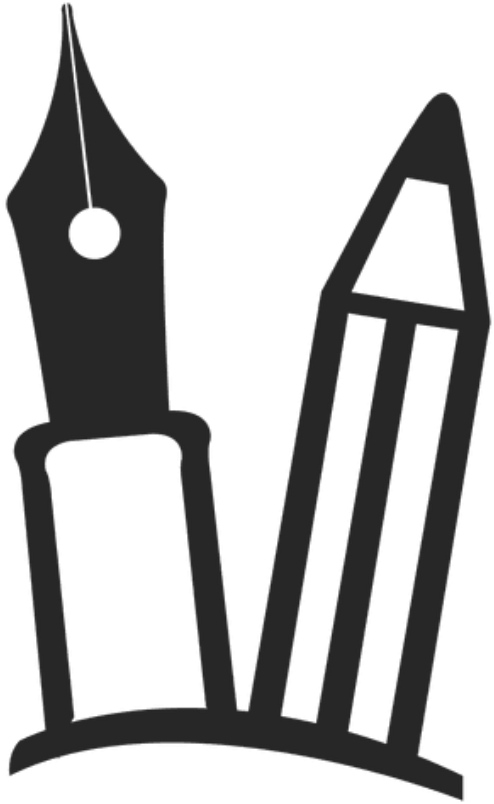
Instructor Demonstration: separate columns and fix data types.

Suggested Time:
10 minutes



Questions ?





Everyone Do: Apocalypse Food Prep Transformations

Suggested Time:
20 minutes



Activity: Explore Data

- Using **Apocalypse Food.xlsx**, do the following:
 - Change the names of the table
 - Fix the header of the tables
 - Remove the row that have missing value
 - Fix the data type and the format
 - Unpevot the date

- **Hint:**



- Don't forget to save the file once finished.



Home


Transform

Add Column


View

Tools


Help




New Source ▾




Recent Sources ▾




Enter Data



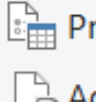
Data source settings



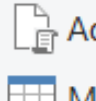
Manage Parameters ▾




Refresh Preview ▾



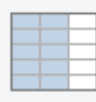
Properties




Advanced Editor




Manage ▾



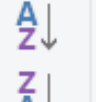
Choose Columns ▾




Remove Columns ▾




Reduce Rows ▾



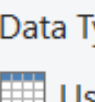
Sort



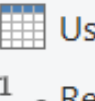
Split Column ▾



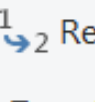
Group By



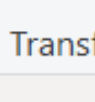
Data Type



Use



1 2 Rep



Transform

New Query

Data Sources

Parameters

Query

Manage Columns

ies [7]

<

Pivot Table

urchase Overview

urchase Tracker

course

course1Students

course2Students


erge1

✕

✓

fx

= Table.TransformColumnTypes(Course1Students_Table,{{"ID", Int64.Type},

<div></div> 1 ² 3 ID ▾	AB _C Firstname ▾	AB _C Lastname ▾	AB _C Course
1	1 Reza	Rad	Math
2	2 Mike	Woody	Math
3	3 Jimmy	Mitchel	Math

Join



Append

Concatenate rows from three or more tables into a single table.

☐ Two tables ☒ Three or more tables

Available tables

Course1Students (Current)
Pivot Table
Purchase Overview
Purchase Tracker
Course
Course2Students

Add >>

Tables to append

Course1Students (Current)
Course2Students

Enter
DataData source
settings

Data Sources

Manage
Parameters

Parameters

Refresh
Preview

Properties



Advanced Editor



Manage

Query

Choose
Columns

Manage Columns

Remove
ColumnsReduce
RowsA
Z
Z
A

Sort

Split
ColumnGroup
By

Data Type: Whole Number



Use First Row as Headers



1 2 Replace Values

Transform



fx

`= Table.Combine({#"Changed Type", Course2Students})`

123 ID



ABC Firstname



ABC Lastname



ABC Course



1

1

Reza

Rad

Math

2

2

Mike

Woody

Math

3

3

Jimmy

Mitchel

Math

4

10

Shaun

Mitchel

English

5

11

Mary

Stuart

English

ID	Firstname	Lastname	Course
1	Reza	Rad	Math
2	Mike	Woody	Math
3	Jimmy	Mitchel	Math
10	Shaun	Mitchel	English
11	Mary	Stuart	English

Course



ID	Title	Timing	Capacity
1	Math	Q1 2017	15
2	Physics	Q1 2017	5
3	English	Q1 2017	25

Join Kind

Left Outer (all from first, matching from second)



☐ Use fuzzy matching to perform the merge

Choose Columns

Remove Columns

Reduce Rows

Sort

Split Column

Group By

Transform

Data Type: Text

Use First Row as Headers

Replace Values

Combine

Text Analytics

Vision

Azure Machine Learning

AI Insights

Course.1",{"Course.1.Title"})

Course	Course.1.Timing	Course.1.Capacity
Math	Q1 2017	
Math	Q1 2017	
Math	Q1 2017	
English	Q1 2017	
English	Q1 2017	

Query Settings

PROPERTIES

Name

Course1Students

All Properties

APPLIED STEPS

Source

Navigat...

Change...

Append...

VISUALIZING MERGE JOIN TYPES USING VENN DIAGRAMS

Right Outer Join



Inner Join



Full Outer Join



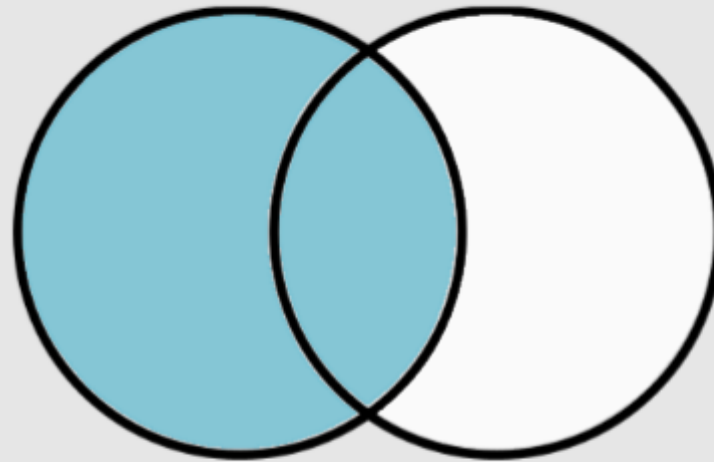
Left Anti Join



Right Anti Join



All from Table A, matching from Table B



Left Outer Join

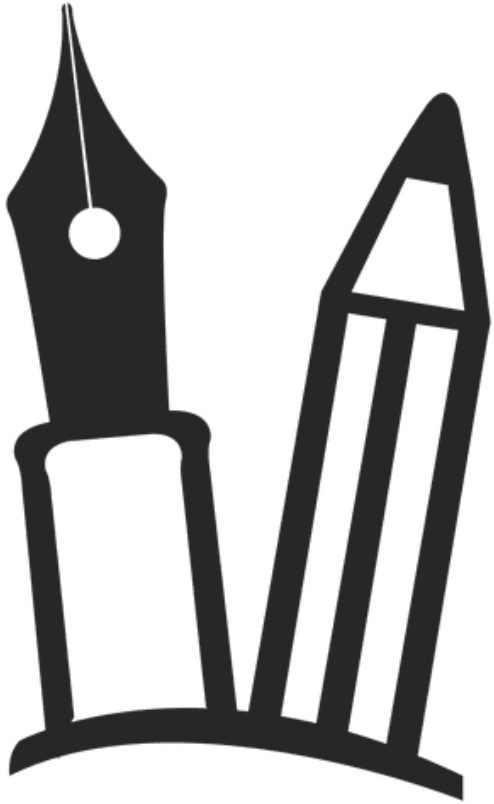
Merged Table

Table A

Customer Name	IsJoined
Brad Pitt	✓
Tom Hanks	✓
Robert	✓
Angelina Jolie	✓
Ben Affleck	✓

Customer ID	Email
1	1@s.com
2	2@s.com
4	41@s.com
4	42@s.com
5	5@s.com

Customer ID	Customer Name	Email
1	Brad Pitt	



Everyone Do: Join Rental

Suggested Time:
15 minutes



Activity: Explore Data

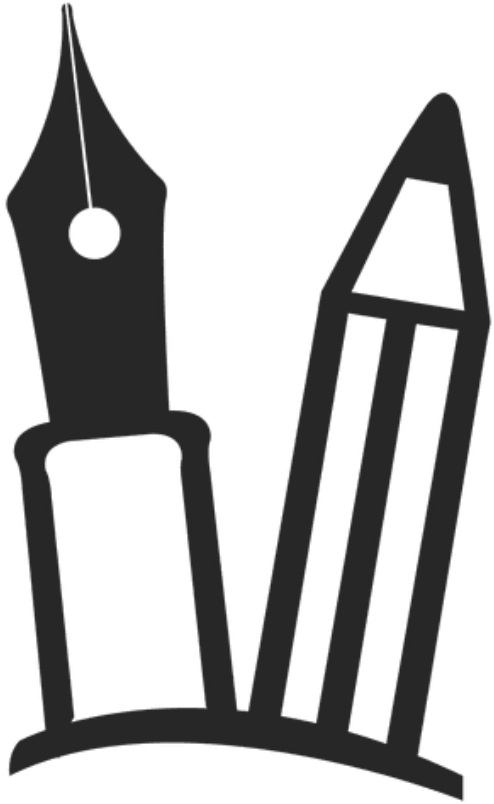
- Using **GolobalRental1.xlsx**, do the following:
 - Append GolobalRental1 and GolobalRental2.
 - Join film.xlsx to GolobalRental1.xlsx Table in the appropriate column

- **Hint:**



- Don't forget to save the file once finished.





Suggested Time:
25 minutes







**THE
END**