# Power BI

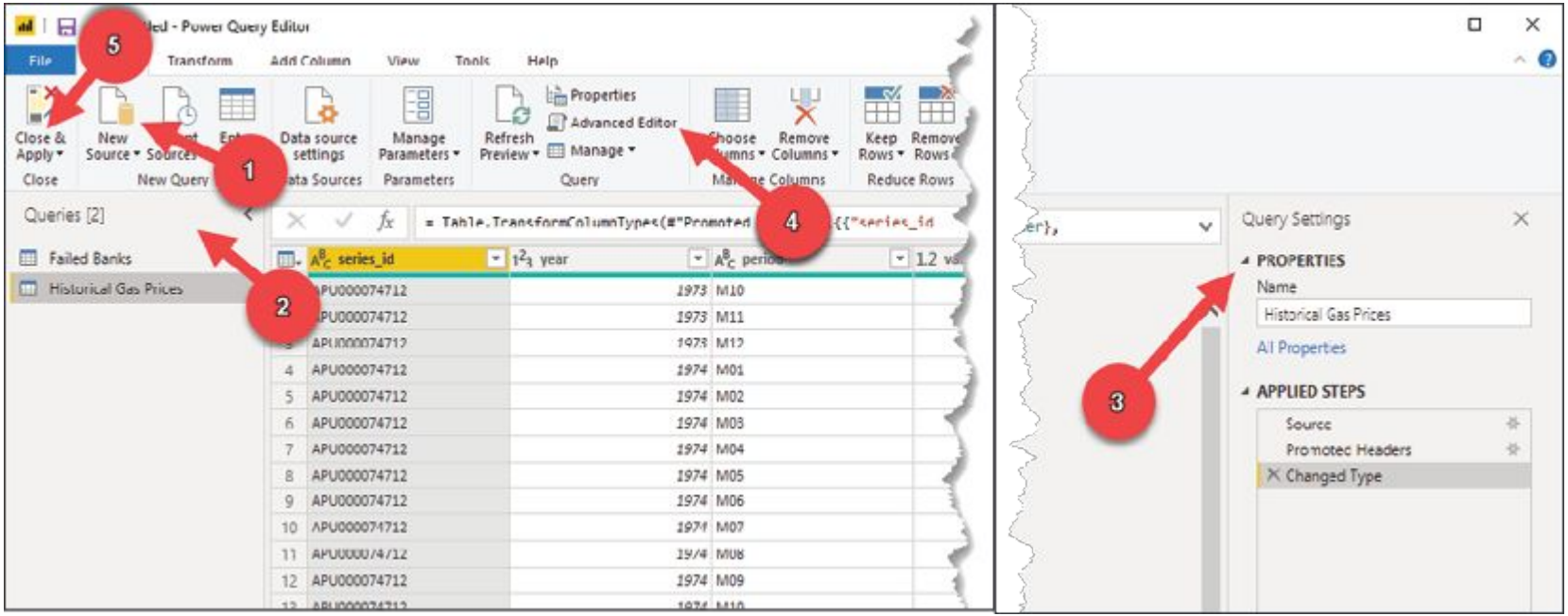
Professor Ernesto Lee

# What we will cover

- The Power Query Editor
- Transform basics
- Advanced data transformation c
- AI Insights
- Univariate Analysis
- Bivariate Analysis
- Correlation Analysis

# Where Do I Manage Cleaning My Data in Power BI?

## Power Query Editor



# Data Cleaning in Power BI

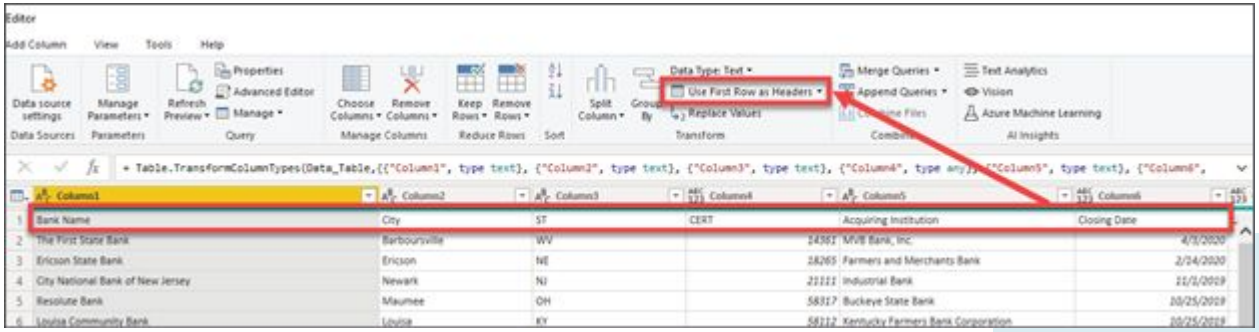
**Deleting transforms**: If you make a mistake and need to undo a step, you can click the Delete button next to a step.

**Modifying transforms**: This can be done with any step that has a gear icon next to it.

**Changing the order of transforms**: If you realize that it is better for one step to execute before another one, you can change the order of how the steps are executed.

**Selecting previous steps**: Clicking on any step prior to the current one will allow you to see how your query results would change one step earlier in the process.

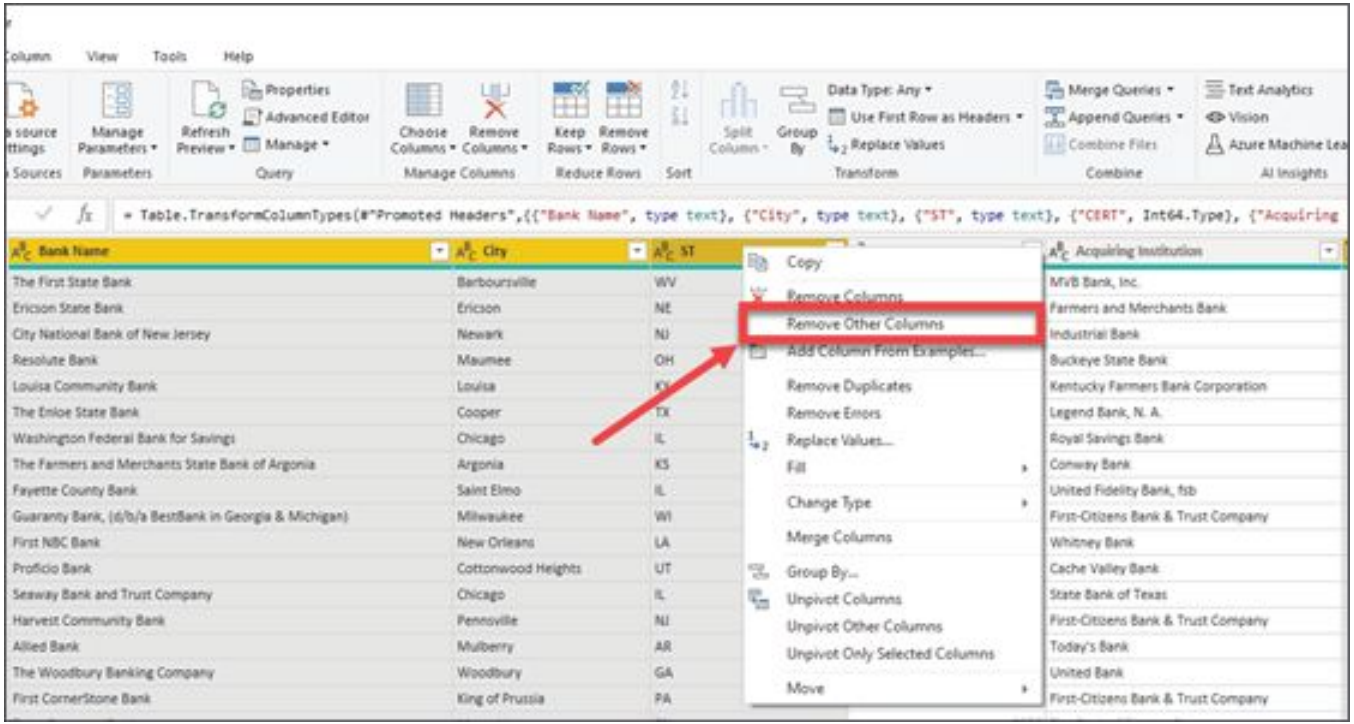
# Use First Row as Headers

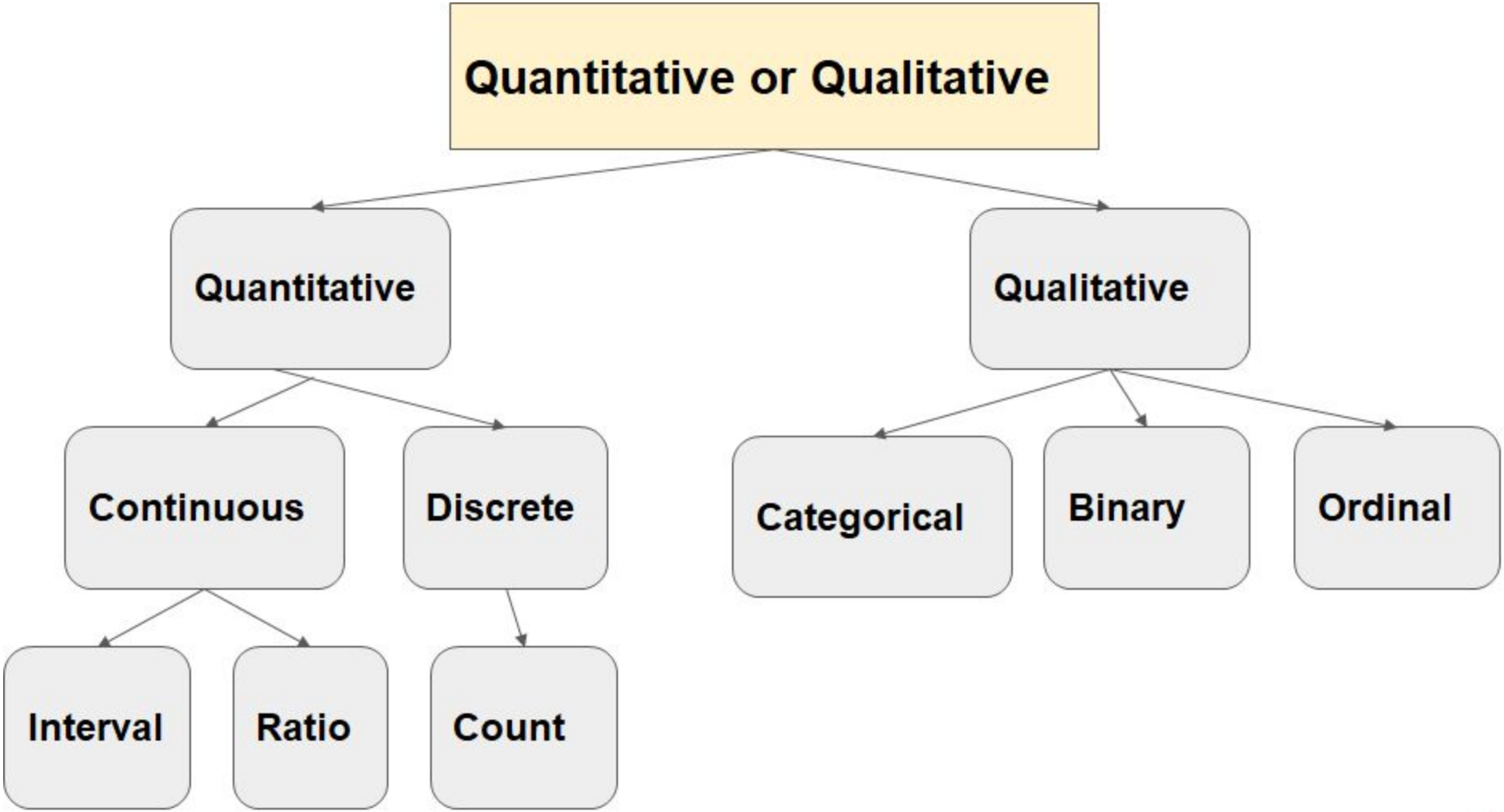



https://bit.ly/2410C

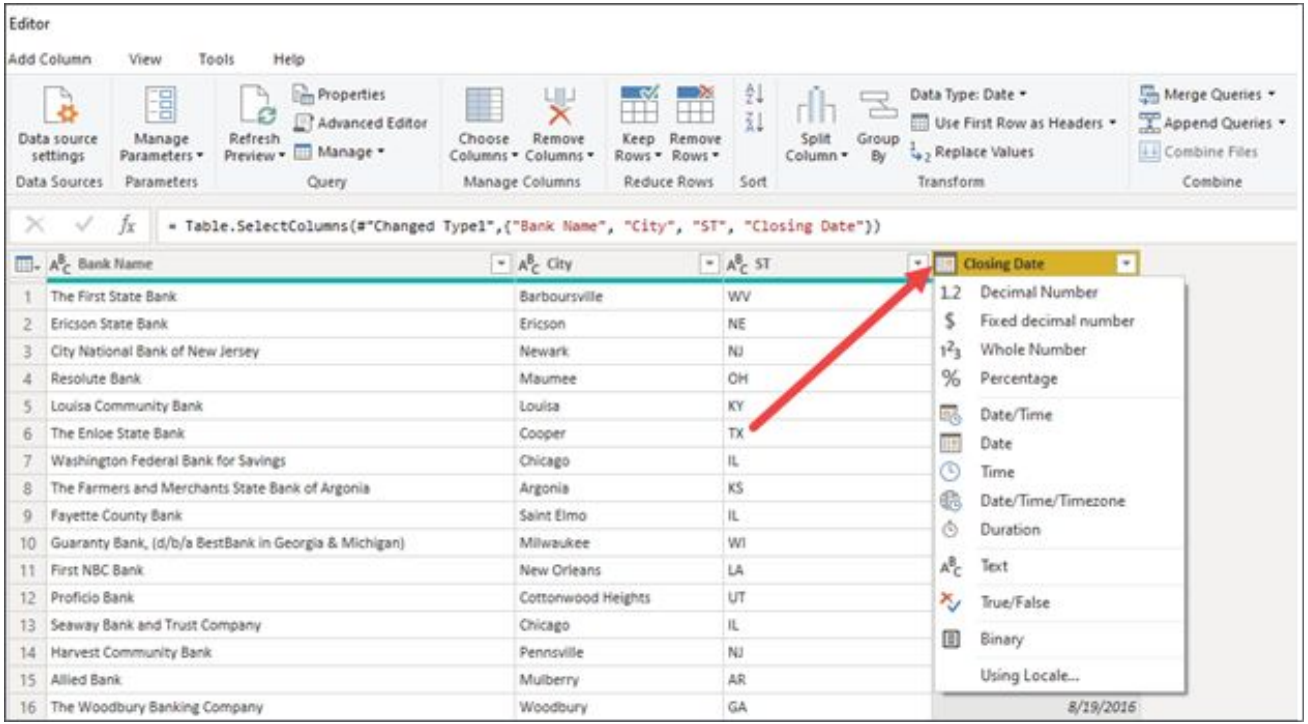
*Do Mini.md in the link above

# Remove Columns

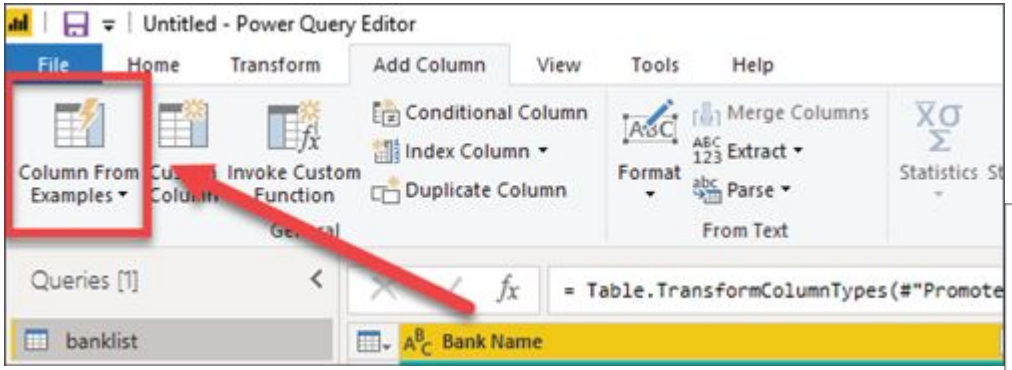


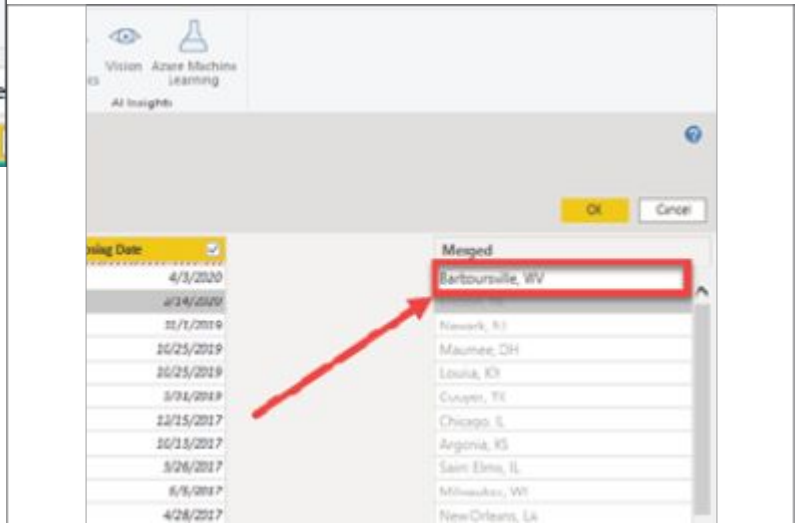

Quantitative or Qualitative
Quantitative
Qualitative
Continuous
Discrete
Categorical
Binary
Ordinal
Interval
Ratio
Count

# Changing Data Types



# Create Column from Examples



# Advanced Data Transformations

# Conditional Columns

## Split Column by Delimiter

Specify the delimiter used to split the text column.

Select or enter delimiter

--Custom--

,

Split at

- Left-most delimiter
- Right-most delimiter
- Each occurrence of the delimiter

▷ Advanced options

## Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name

State Name

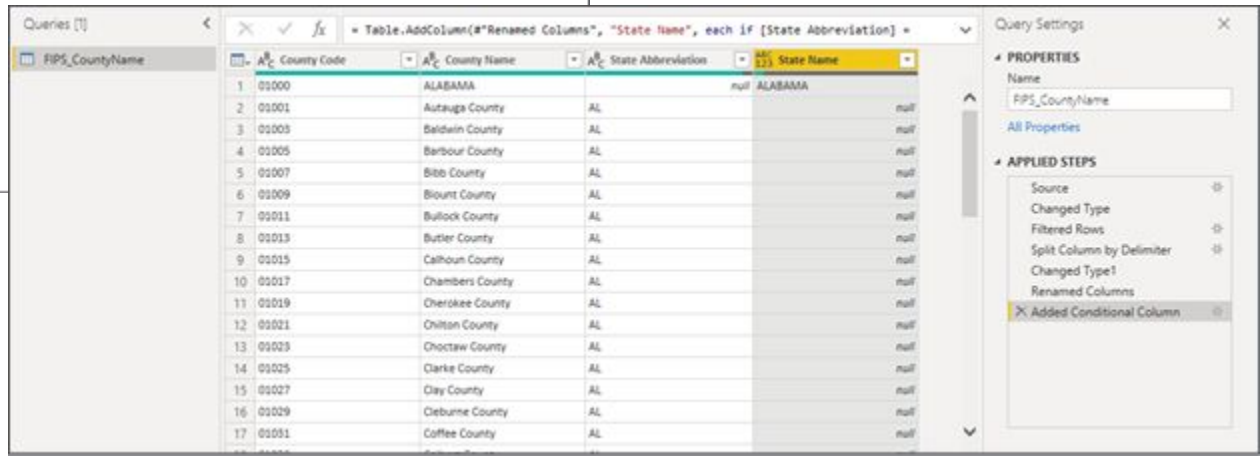
| | Column Name | Operator | Value | Output |
|---|---|---|---|---|
| If | State Abbreviation | equals | null | Then: County Name |

Add Clause

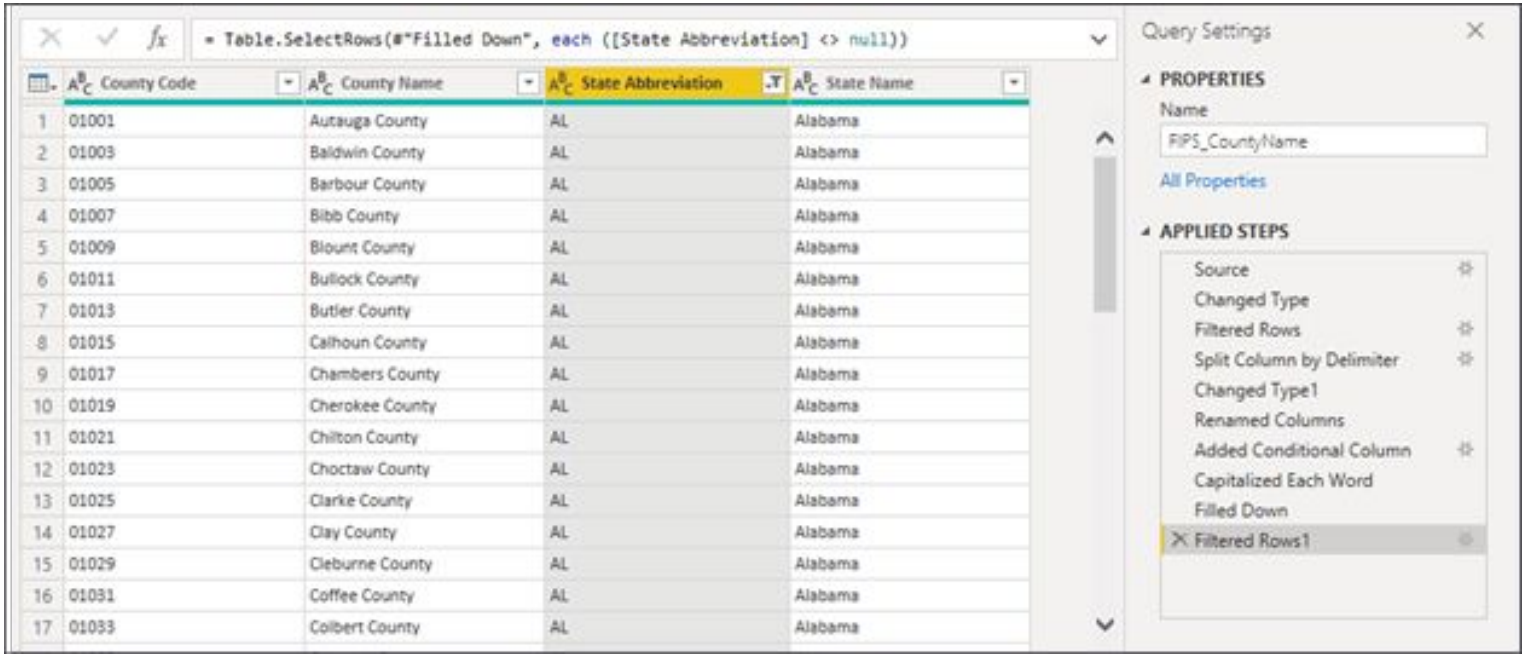
Else

null

OK Cancel



# Fill Down


= Table.SelectRows(#"Filled Down", each ([State Abbreviation] <> null))
County Code
County Name
State Abbreviation
State Name
1 01001 Autauga County AL Alabama
2 01003 Baldwin County AL Alabama
3 01005 Barbour County AL Alabama
4 01007 Bibb County AL Alabama
5 01009 Blount County AL Alabama
6 01011 Bullock County AL Alabama
7 01013 Butler County AL Alabama
8 01015 Calhoun County AL Alabama
9 01017 Chambers County AL Alabama
10 01019 Cherokee County AL Alabama
11 01021 Chilton County AL Alabama
12 01023 Choctaw County AL Alabama
13 01025 Clarke County AL Alabama
14 01027 Clay County AL Alabama
15 01029 Cleburne County AL Alabama
16 01031 Coffee County AL Alabama
17 01033 Colbert County AL Alabama
Query Settings
PROPERTIES
Name
FIPS_CountyName
All Properties
APPLIED STEPS
Source
Changed Type
Filtered Rows
Split Column by Delimiter
Changed Type1
Renamed Columns
Added Conditional Column
Capitalized Each Word
Filled Down
Filtered Rows1

# Unipivot

| Year | Florida | Pennsylvania | New York | California | Texas |
|---|---|---|---|---|---|
| 2018 | 21312211 | 12823989 | 19862512 | 39776830 | 28704330 |
| 2017 | 20984400 | 12805537 | 19849399 | 39536653 | 28304596 |
| 2016 | 20656589 | 12787085 | 19836286 | 39296576 | 27904862 |

# Unipivot

| Year | State | Population |
|---|---|---|
| 2018 | Florida | 21312211 |
| 2018 | Pennsylvania | 12823989 |
| 2018 | New York | 19862517 |
| 2018 | California | 39776830 |
| 2018 | Texas | 28704330 |
| 2017 | Florida | 20984400 |
| 2017 | Pennsylvania | 12805537 |
| 2017 | New York | 19849399 |
| 2017 | California | 39536653 |
| 2017 | Texas | 28304596 |
| 2016 | Florida | 20656589 |
| 2016 | Pennsylvania | 12787085 |
| 2016 | New York | 19836286 |
| 2016 | California | 39296570 |
| 2016 | Texas | 27904862 |

# Unipivot

| | Column1 | Column2 | Column3 | Column4 | Column5 | Column6 |
|---|---|---|---|---|---|---|
| 1 | GDP per capita PPP, with projections | 1764 | 1765 | 1766 | 1767 | 1768 |
| 2 | Abkhazia | null | null | null | null | null |
| 3 | Afghanistan | null | null | null | null | null |
| 4 | Akrotiri and Dhekelia | null | null | null | null | null |
| 5 | Albania | null | null | null | null | null |
| 6 | Algeria | null | null | null | null | null |
| 7 | American Samoa | null | null | null | null | null |
| 8 | Andorra | null | null | null | null | null |
| 9 | Angola | null | null | null | null | null |
| 10 | Anguilla | null | null | null | null | null |
| 11 | Antigua and Barbuda | null | null | null | null | null |
| 12 | Argentina | null | null | null | null | null |
| 13 | Armenia | null | null | null | null | null |
| 14 | Aruba | null | null | null | null | null |
| 15 | Australia | null | null | null | null | null |
| 16 | Austria | 1403.59853 | 1404.448052 | 1405.298088 | 1406.148639 | 1406.999704 |
| 17 | Azerbaijan | null | null | | | |
| 18 | Bahamas | null | null | | | |
| 19 | Bahrain | null | null | | | |
| 20 | Bangladesh | 614.52257 | 614.3627258 | | | |
| 21 | Barbados | null | null | | | |
| 22 | Belarus | null | null | | | |
| 23 | Belgium | 1532.258772 | 1532.859642 | | | |

Queries [1]

Income

```
= Table.RenameColumns(#"Unpivoted Other Columns",{{"Attribute",
```

| | Country | Year | Income |
|---|---|---|---|
| 1 | Afghanistan | 1800 | 472.0534996 |
| 2 | Afghanistan | 1820 | 472.0534996 |
| 3 | Afghanistan | 1913 | 638.3786419 |
| 4 | Afghanistan | 1950 | 757.3187954 |
| 5 | Afghanistan | 1951 | 766.7521974 |
| 6 | Afghanistan | 1952 | 779.4453145 |
| 7 | Afghanistan | 1953 | 812.8562795 |
| 8 | Afghanistan | 1954 | 815.3595213 |
| 9 | Afghanistan | 1955 | 816.414838 |
| 10 | Afghanistan | 1956 | 837.0669354 |
| 11 | Afghanistan | 1957 | 820.8530296 |
| 12 | Afghanistan | 1958 | 849.7400695 |
| 13 | Afghanistan | 1959 | 856.2288434 |
| 14 | Afghanistan | 1960 | 868.4982226 |
| 15 | Afghanistan | 1961 | 857.3586549 |
| 16 | Afghanistan | 1962 | 853.10071 |
| 17 | Afghanistan | 1963 | 849.4447177 |

Query Settings

PROPERTIES

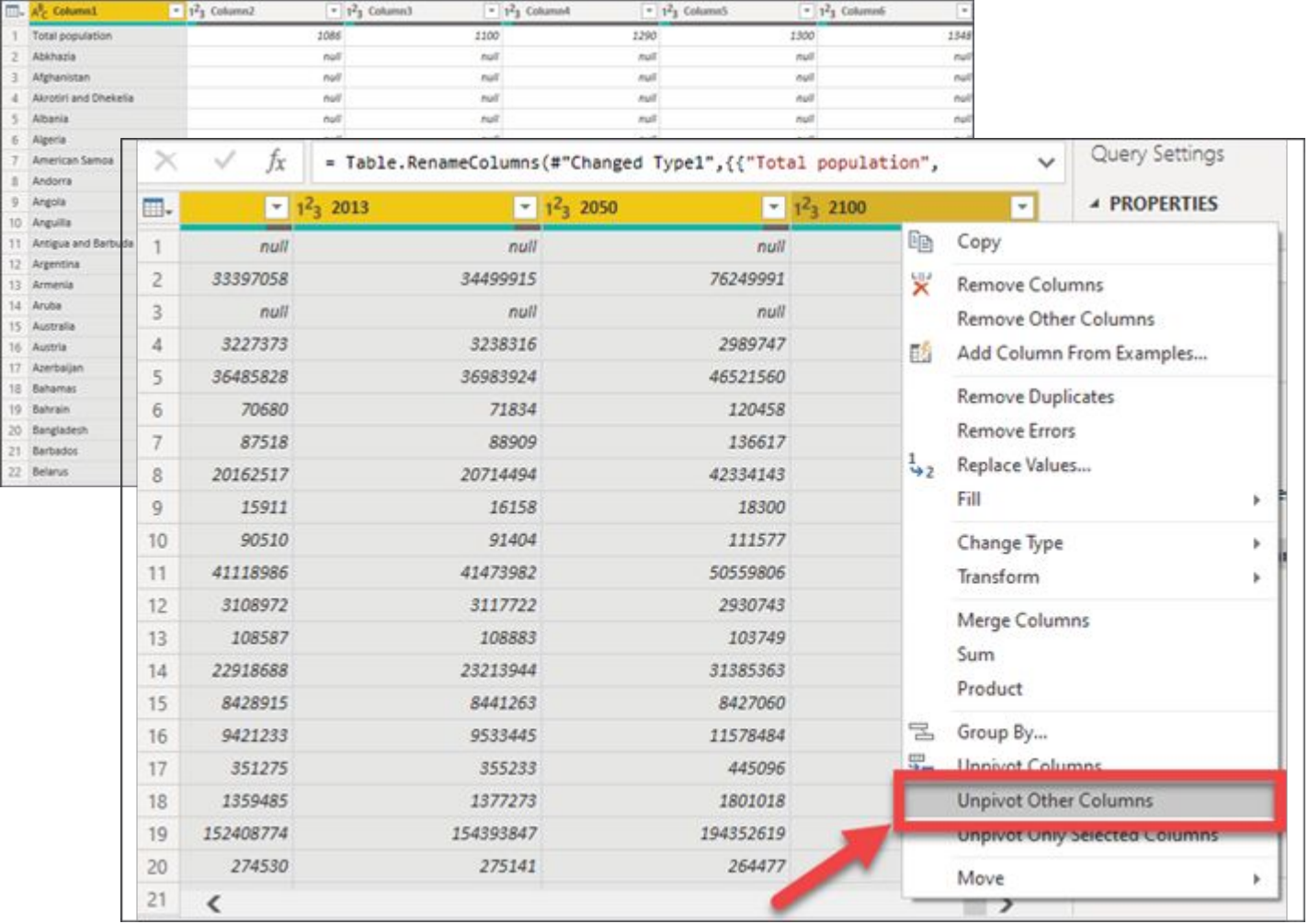
Name

Income

All Properties

APPLIED STEPS

- Source
- Navigation
- Changed Type
- Promoted Headers
- Changed Type1
- Renamed Columns
- Unpivoted Other Columns
- Renamed Columns1


Column1 Column2 Column3 Column4 Column5 Column6
1 Total population 1086 1100 1290 1300 1348
2 Abkhazia null null null null null
3 Afghanistan null null null null null
4 Akrotiri and Dhekelia null null null null null
5 Albania null null null null null
6 Algeria
7 American Samoa
8 Andorra
9 Angola
10 Anguilla
11 Antigua and Barbuda
12 Argentina
13 Armenia
14 Aruba
15 Australia
16 Austria
17 Azerbaijan
18 Bahamas
19 Bahrain
20 Bangladesh
21 Barbados
22 Belarus
= Table.RenameColumns(#"Changed Type1",{{"Total population",
Query Settings
PROPERTIES
1 2013 2050 2100
1 null null null
2 33397058 34499915 76249991
3 null null null
4 3227373 3238316 2989747
5 36485828 36983924 46521560
6 70680 71834 120458
7 87518 88909 136617
8 20162517 20714494 42334143
9 15911 16158 18300
10 90510 91404 111577
11 41118986 41473982 50559806
12 3108972 3117722 2930743
13 108587 108883 103749
14 22918688 23213944 31385363
15 8428915 8441263 8427060
16 9421233 9533445 11578484
17 351275 355233 445096
18 1359485 1377273 1801018
19 152408774 154393847 194352619
20 274530 275141 264477
21
Copy
Remove Columns
Remove Other Columns
Add Column From Examples...
Remove Duplicates
Remove Errors
Replace Values...
Fill
Change Type
Transform
Merge Columns
Sum
Product
Group By...
Unpivot Columns
Unpivot Other Columns
Unpivot Only Selected Columns
Move

# Merge Queries

- Left Outer (all rows from the first table, only matching rows from the second)
- Right Outer (all rows from the second table, only matching rows from the first)
- Full Outer (all rows from both tables)
- Inner (only matching rows from both tables)
- Left Anti (rows only in the first table)
- Right Anti (rows only in the second table)

# Merge

Select tables and matching columns to create a merged table.

Population

| Country 1 | Year 2 | Population |
|---|---|---|
| Afghanistan | 1800 | 3280000 |
| Afghanistan | 1820 | 3280000 |
| Afghanistan | 1870 | 4207000 |
| Afghanistan | 1913 | 5730000 |
| Afghanistan | 1950 | 8151455 |

Income

| Country 1 | Year 2 | Income |
|---|---|---|
| Afghanistan | 1800 | 472.0534996 |
| Afghanistan | 1820 | 472.0534996 |
| Afghanistan | 1913 | 638.3786419 |
| Afghanistan | 1950 | 757.3187954 |
| Afghanistan | 1951 | 766.7521974 |

Join Kind

Inner (only matching rows)

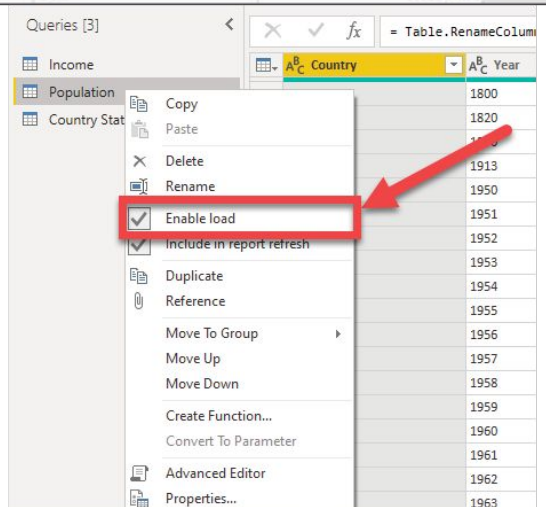
☐ Use fuzzy matching to perform the merge

▷ Fuzzy matching options

✓ The selection matches 17221 of 22127 rows from the first table, and 1722...

OK Cancel

| | Total population | Year | Population | Income |
|---|---|---|---|---|
| 1 | Afghanistan | 1800 | 3280000 | 472.0534996 |
| 2 | Afghanistan | 1820 | 3280000 | 472.0534996 |
| 3 | Afghanistan | 1913 | 5730000 | 638.3786419 |
| 4 | Afghanistan | 1950 | 8151455 | 757.3187954 |
| 5 | Afghanistan | 1951 | 8276820 | 766.7521974 |
| 6 | Afghanistan | 1952 | 8407148 | 779.4453145 |
| 7 | Afghanistan | 1953 | 8542906 | 812.8562795 |
| 8 | Afghanistan | 1954 | 8684494 | 815.3595213 |
| 9 | Afghanistan | 1955 | 8832253 | 816.414838 |
| 10 | Afghanistan | 1956 | 8986449 | 837.0669354 |
| 11 | Afghanistan | 1957 | 9147286 | 820.8530296 |
| 12 | Afghanistan | 1958 | 9314915 | 849.7400695 |
| 13 | Afghanistan | 1959 | 9489453 | 856.2288434 |
| 14 | Afghanistan | 1960 | 9671046 | 868.4982226 |
| 15 | Afghanistan | 1961 | 9859928 | 857.3586549 |
| 16 | Afghanistan | 1962 | 10056480 | 853.10071 |
| 17 | Afghanistan | 1963 | 10261254 | 849.4447177 |
| 18 | Afghanistan | 1964 | 10474903 | 846.2672818 |



# Append Query

## Append

Concatenate rows from two tables into a single table.

(•) Two tables ( ) Three or more tables

Primary table

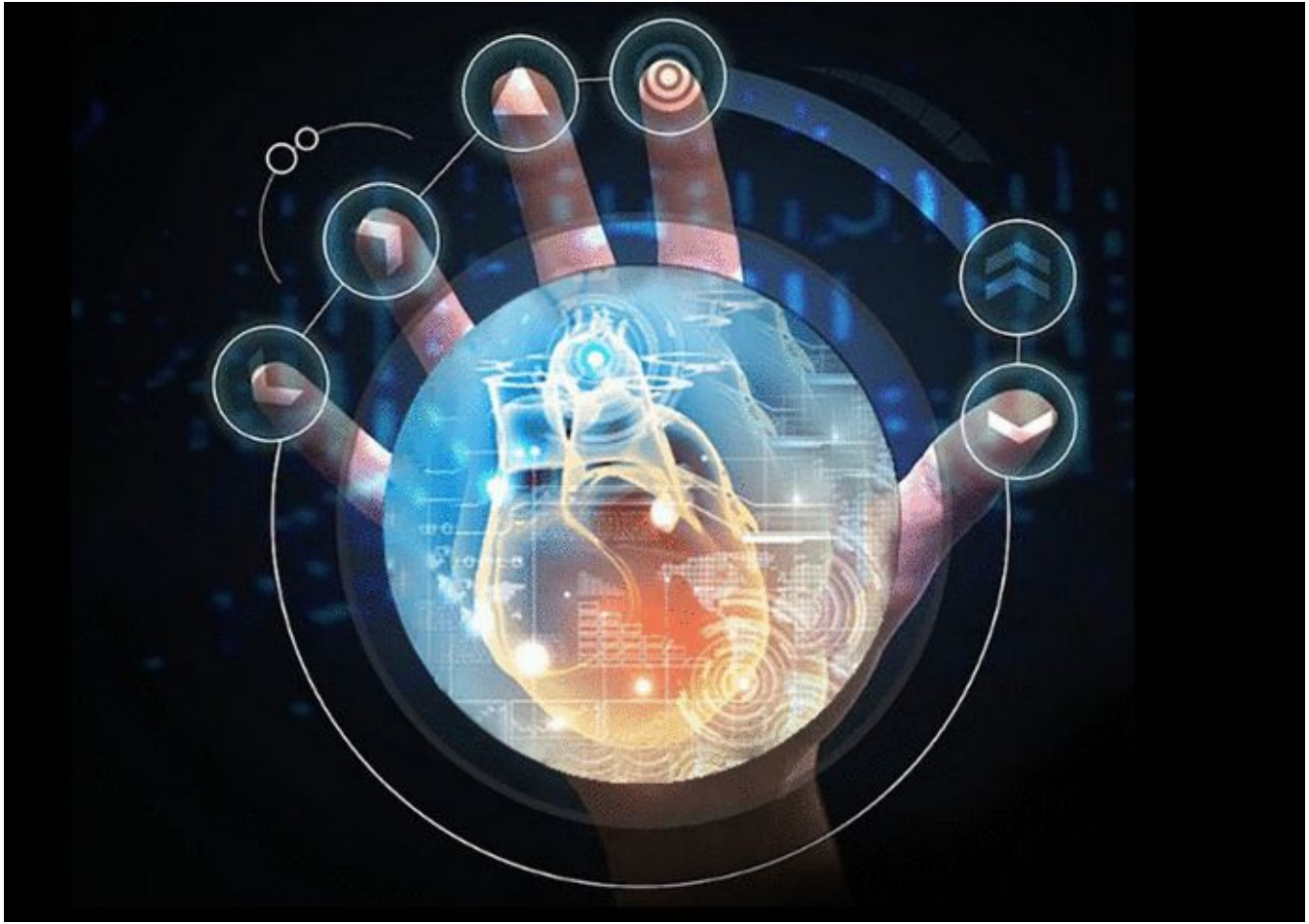
Credit Card Complaints

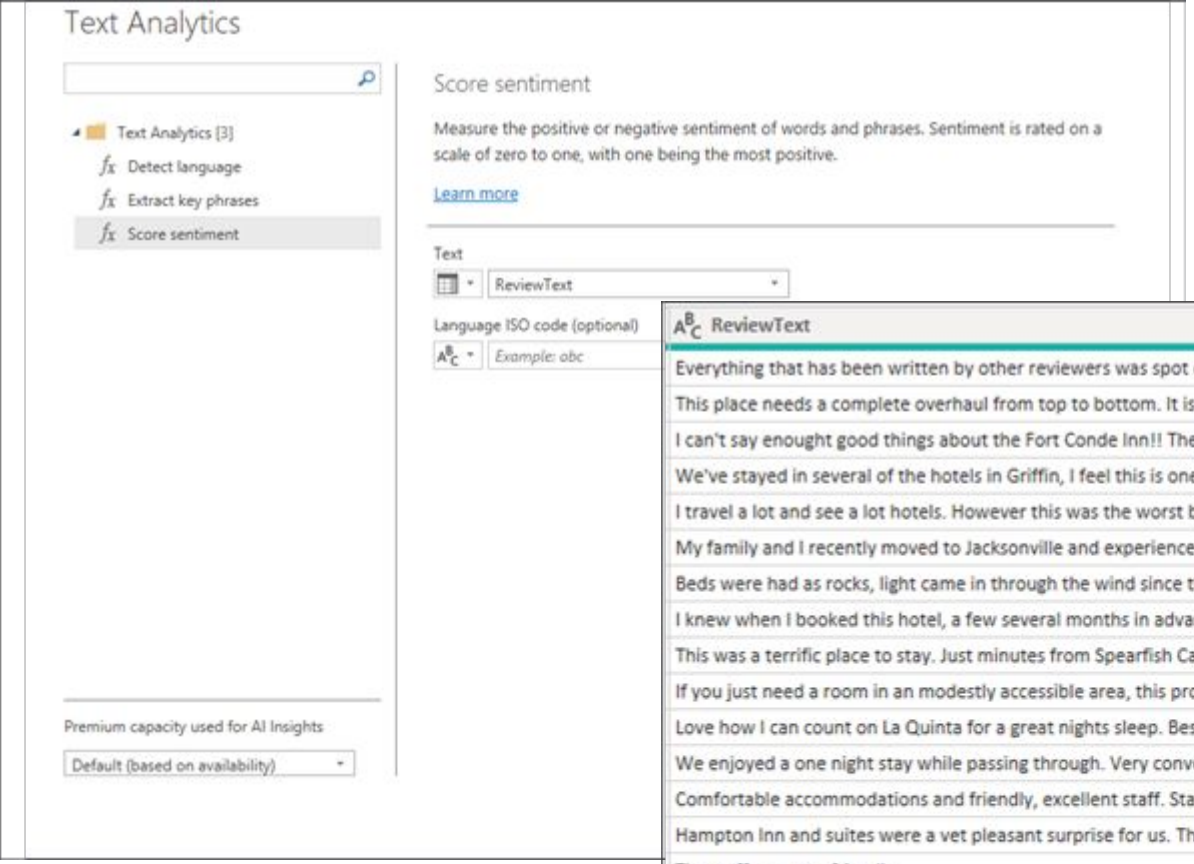
Table to append to the primary table

Student Loan Complaints

| | Complaint ID | Product | Sub-product | Issue | Sub-issue | St |
|---|---|---|---|---|---|---|
| 1 | 1429682 | Credit card | | Credit line increase/decrease | | NC |
| 2 | 1430686 | Credit card | | Billing statement | | PA |
| 3 | 1429869 | Credit card | | Advertising and marketing | | IL |
| 4 | 1427544 | Credit card | | Billing disputes | | WI |
| 5 | 1427873 | Credit card | | APR or interest rate | | NJ |
| 6 | 1428112 | Credit card | | Credit determination | | NY |
| 7 | 1430459 | Credit card | | Billing disputes | | NJ |
| 8 | 1425175 | Credit card | | Privacy | | NC |
| 9 | 1425203 | Credit card | | Other | | FL |
| 10 | 1424483 | Credit card | | Advertising and marketing | | NY |
| 11 | 1424843 | Credit card | | Billing disputes | | FL |
| 12 | 1422868 | Credit card | | Advertising and marketing | | MN |
| 13 | 1423026 | Credit card | | Late fee | | VA |
| 14 | 1423176 | Credit card | | Customer service / Customer relations | | CA |
| 15 | 1423531 | Credit card | | Closing/Cancelling account | | WA |
| 16 | 1424194 | Credit card | | Other | | CA |
| 17 | 1424522 | Credit card | | Late fee | | MD |
| 18 | 1421071 | Credit card | | Identity theft / Fraud / Embezzlement | | CA |
| 19 | 1420918 | Credit card | | Billing disputes | | MD |
| 20 | 1420893 | Credit card | | Payoff process | | OH |
| 21 | 1421027 | Credit card | | Closing/Cancelling account | | FL |
| 22 | 1421773 | Credit card | | Transaction issue | | AZ |
| 23 | 1421915 | Credit card | | Customer service / Customer relations | | MO |

# Power BI and AI






| ReviewText | Title | Score sentiment |
|---|---|---|
| Everything that has been written by other reviewers was spot on. It is ... | Very accommodating | 0.762831211 |
| This place needs a complete overhaul from top to bottom. It is run do... | OLD, RUN-DOWN SMELLS MUSTY - AV... | 0.030658334 |
| I can't say enought good things about the Fort Conde Inn!! The place it... | A True Gem | 0.929421484 |
| We've stayed in several of the hotels in Griffin, I feel this is one of the ... | One of the best in Griffin | 0.770861864 |
| I travel a lot and see a lot hotels. However this was the worst bathroo... | Not good at all | 0.206676841 |
| My family and I recently moved to Jacksonville and experienced some ... | Great Experience! | 0.880086839 |
| Beds were had as rocks, light came in through the wind since there we... | Felt more like a boarding house | 0.82157588 |
| I knew when I booked this hotel, a few several months in advance, I kn... | Buyer Beware | 0.134426296 |
| This was a terrific place to stay. Just minutes from Spearfish Canyon an... | great place to stay | 0.9487046 |
| If you just need a room in an modestly accessible area, this property d... | Amenities Lacking | 0.677353084 |
| Love how I can count on La Quinta for a great nights sleep. Best beds! | Great Room | 0.987293124 |
| We enjoyed a one night stay while passing through. Very convenient o... | Very nice property | 0.941030383 |
| Comfortable accommodations and friendly, excellent staff. Stayed for ... | Enjoyable | 0.985230923 |
| Hampton Inn and suites were a vet pleasant surprise for us. The king s... | Best place in town | 0.947005153 |
| The staff was very friendly. | Comfortable Suite Hotel | 0.981755257 |
| A very pleasant stay, convenient to everything in Albany. | My six night stay at Days Inn | 0.950045943 |
| My husband spent 6 days at Hyatt Place Northpoint. The staff was extr... | Great place to stay | 0.933157802 |
| I was visiting family at a nearby Army base and wanted to stay at a hot... | A great find! | 0.702835798 |
| Underwhelmed. This hotel smells bad, has some loud, partying guests. | Don't Bother Staying Here.... | 0.020978987 |
| This is our 3rd year returning to Gatlinburg and I must say this is the b... | Love!!!!!!! | 0.24581942 |

# Univariate Analysis

# Bivariate Analysis

# Correlation