

# Introduction to Power BI: Making Visualizing Data More Accessible

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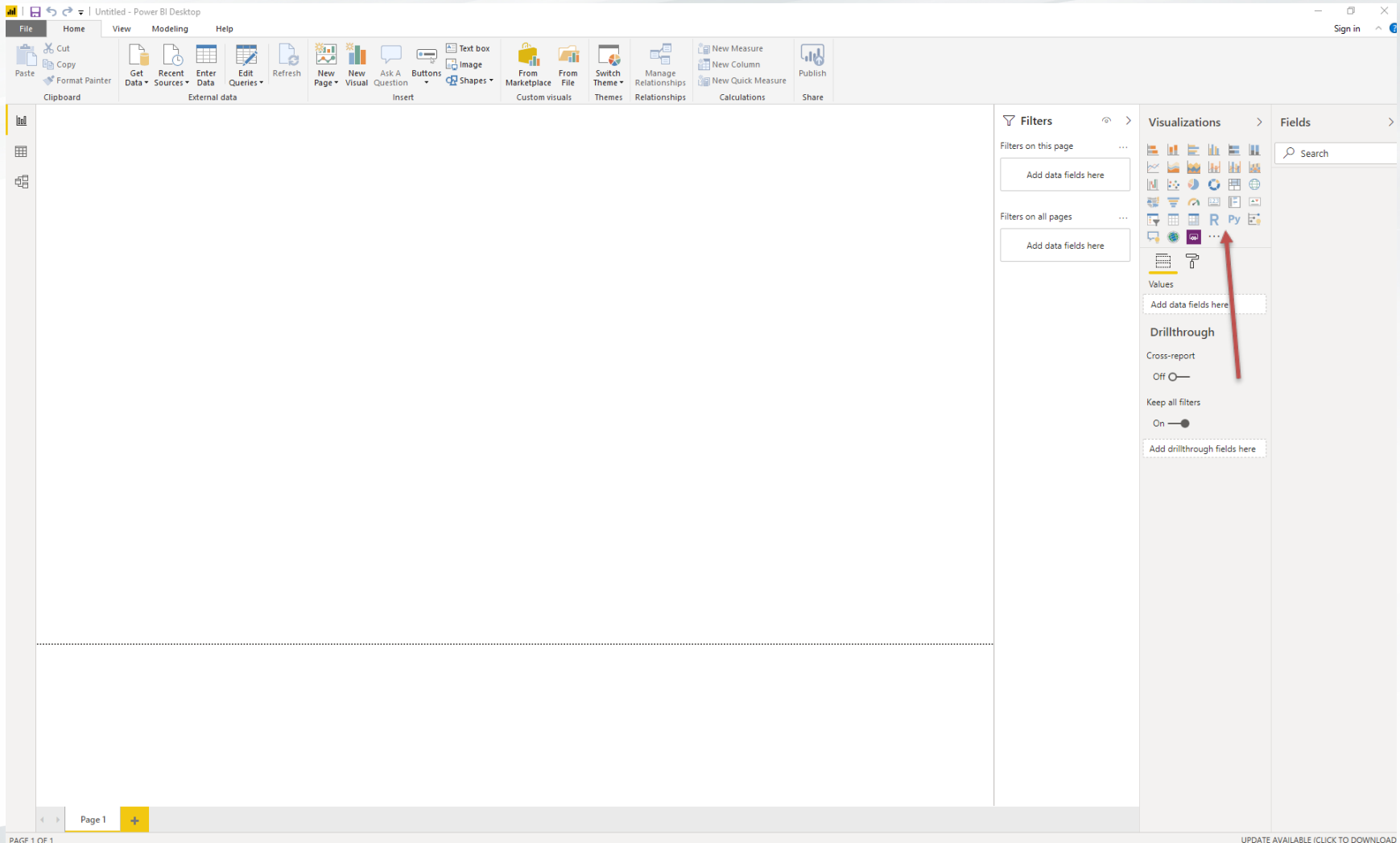
# What does “BI” stand for?

- The “BI” in Power BI stands for

## **Business Intelligence**

- Technology-driven analysis of data for the purpose of making strategic decisions

# Power BI Desktop Workspace



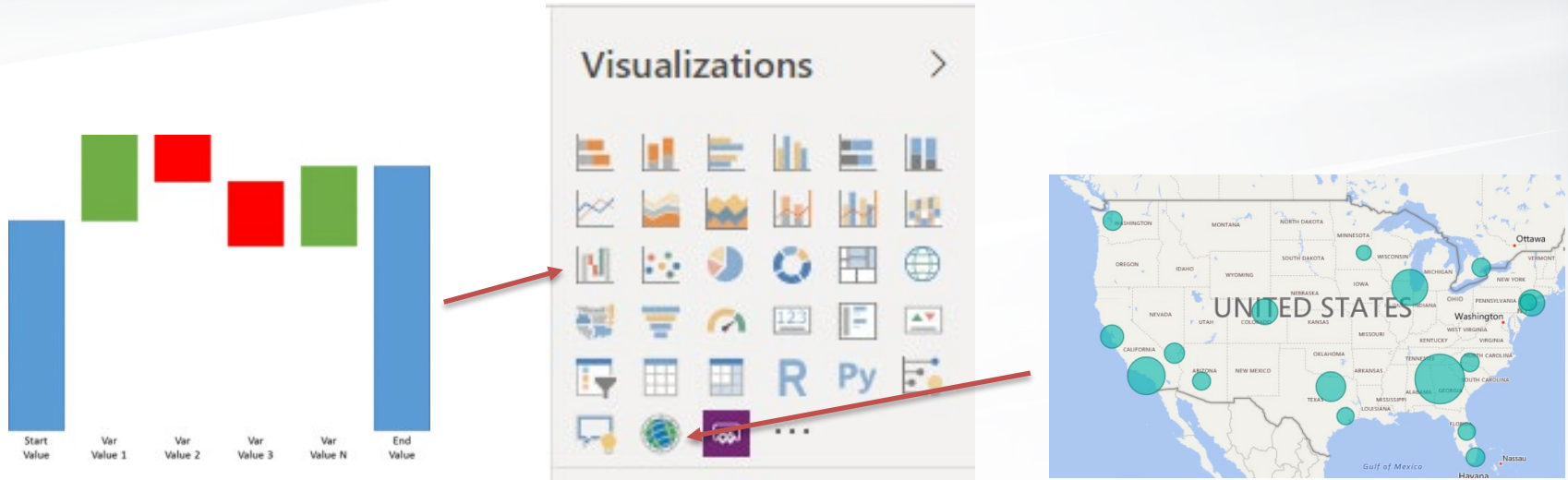
# Power BI Desktop Workspace

The screenshot displays the Power BI Desktop interface. The main workspace shows a blank report page titled "Count of UnitID". The ribbon at the top includes tabs for File, Home, View, Modeling, Help, Visual tools, Format, and Data / Drill. The Visual tools tab is active, showing options like New Page, New Visual, Ask A Question, Buttons, Text box, Image, Shapes, From Marketplace, From File, Switch Theme, Manage Relationships, New Measure, New Column, New Quick Measure, and Publish. The right-hand pane contains the Filters, Visualizations, and Fields sections. The Fields section shows a list of fields including Data\_Age, Grand total (E...), and UnitID. The bottom pane is a Python script editor with the following code:

```
Python script editor
1 # The following code to create a dataframe and remove duplicated rows is always executed and acts as a preamble for your script:
2
3 # dataset = pandas.DataFrame(UnitID)
4 # dataset = dataset.drop_duplicates()
5
6 # Paste or type your script code here:
```

At the bottom left, it says "PAGE 1 OF 1" and "Page 1". At the bottom right, there is a link to "UPDATE AVAILABLE (CLICK TO DOWNLOAD)".

# Visualizations



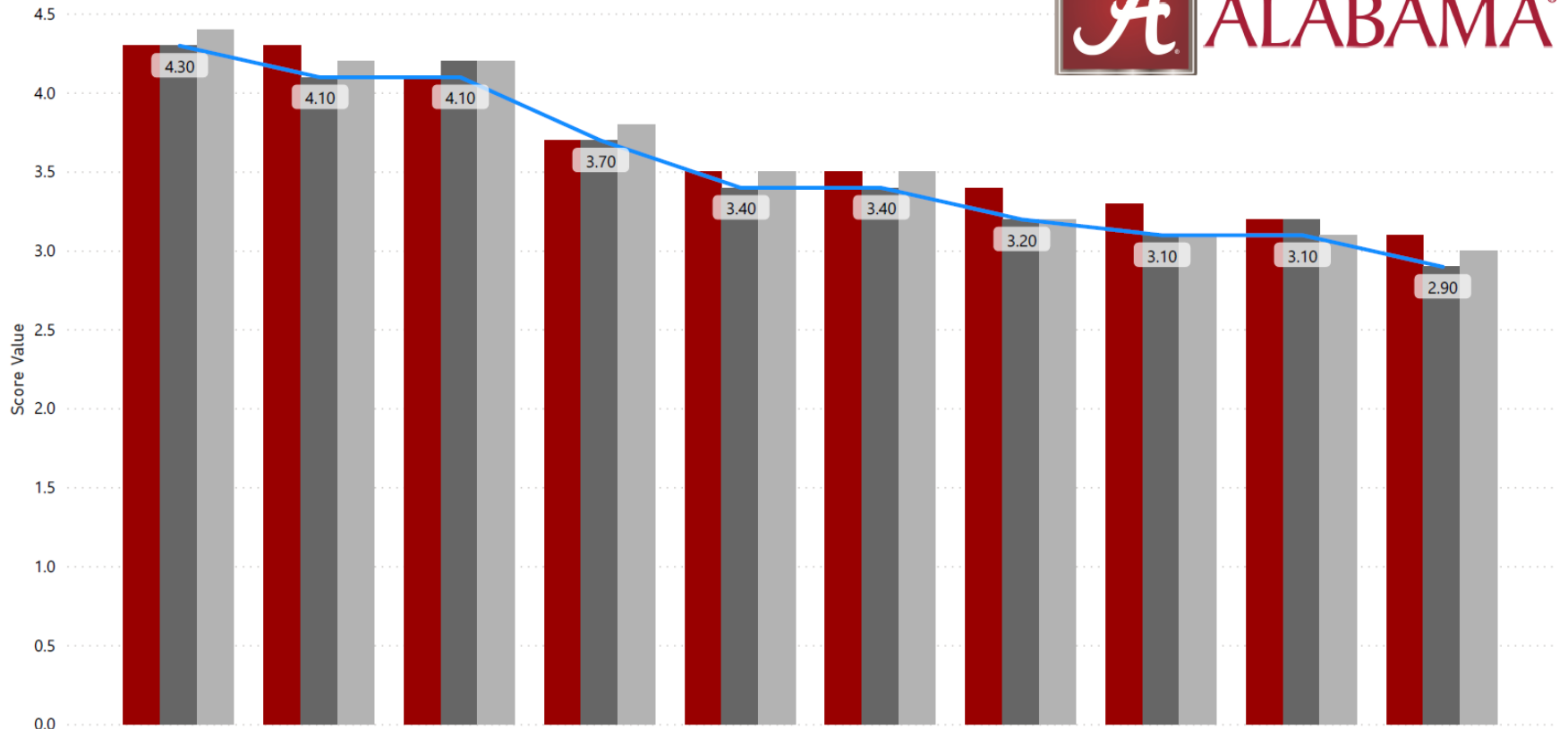
The Visualizations panel has buttons for the most commonly used items such as bar charts and line graphs, as well as more advanced visualizations like waterfall charts and geographic maps. You can also import custom visualizations from templates or from the Microsoft marketplace.



# Line and Clustered Column Chart

Undergraduate Academic Reputation

● Dean ● President ● Provost ● Overall Peer Assessment Score



(Institution names hidden per Data Use Agreement)

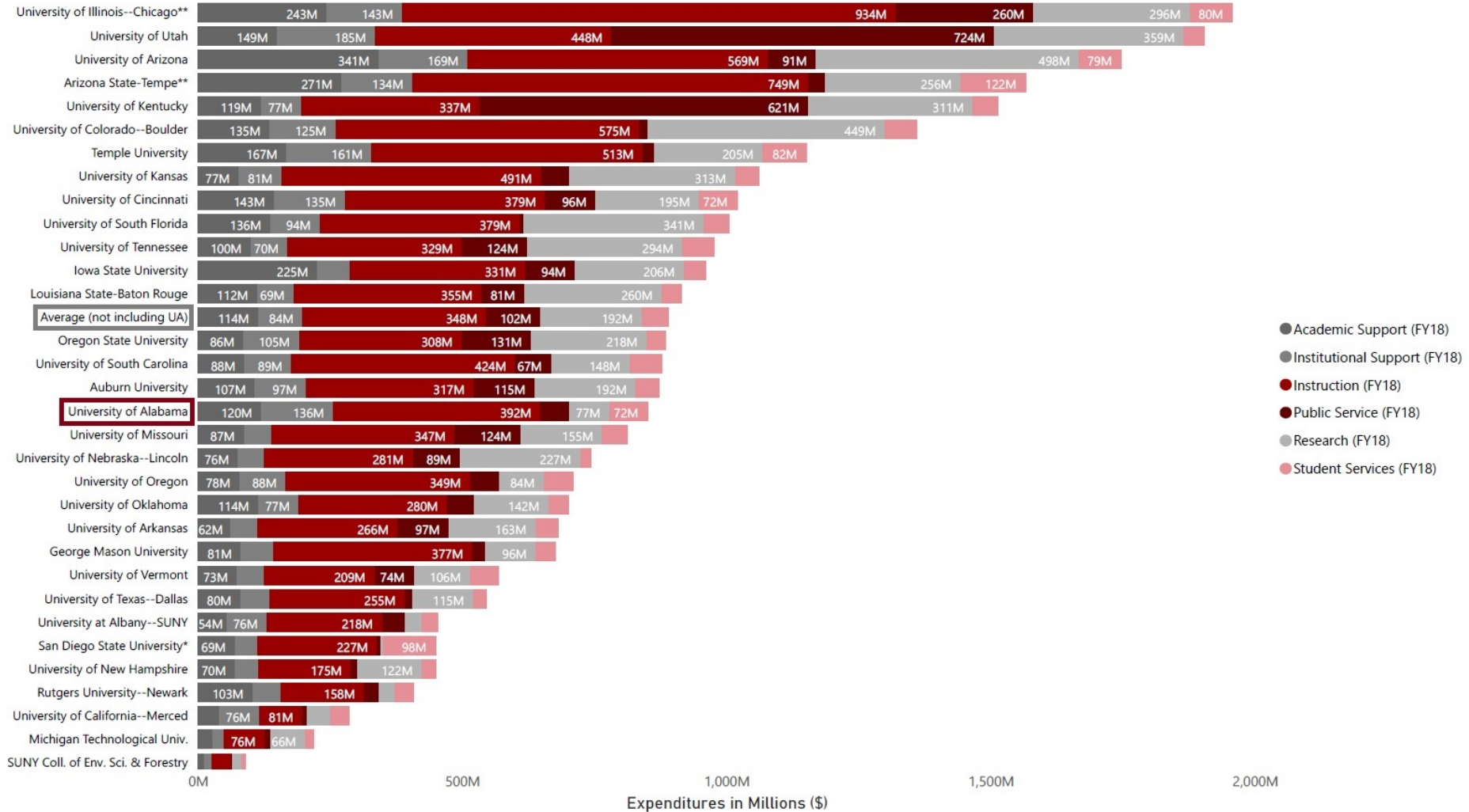


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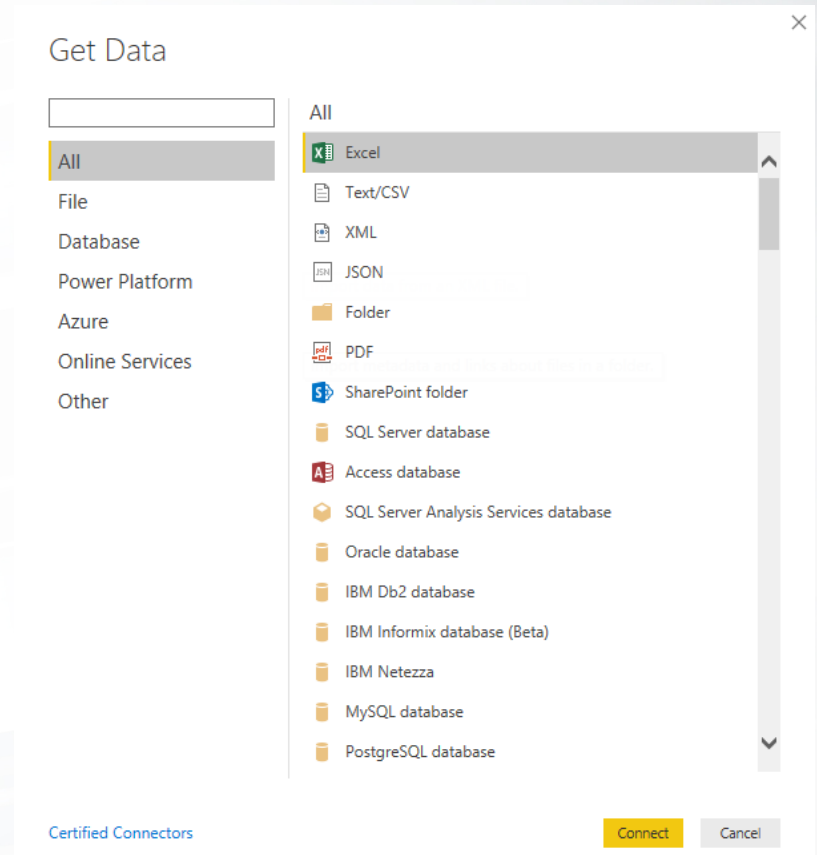
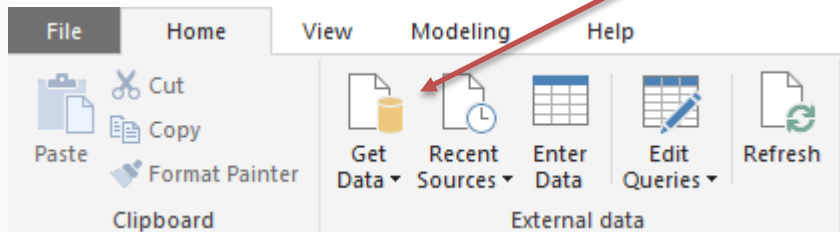
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# Stacked Horizontal Bar Chart

Categorical Expenditures for Fiscal Year 2018



# Data Management





# Data Management

Navigator

Display Options ▾

AL group enrollment by race-sex Fall 2018.xlsx...

✓ Data\_3-5-2020 (1)

Data\_3-5-2020 (1)

UnitID	Institution Name	Grand total men (EF2018A)
100812	Athens State University	
100858	Auburn University	
101189	Faulkner University	
101462	J. F. Drake State Community and Technical College	
102049	Samford University	

The data in the preview has been truncated due to size limits.

< >

Load Transform Data Cancel

The “Transform Data” option opens the Power Query Editor.

You can edit your data at this point, or click “Load” to complete the import and open the Query Editor later if you need to.

# Power Query Editor

The screenshot displays the Power Query Editor window with the following components:

- File Menu:** Close & Apply, Close, New Source, Recent Sources, Enter Data, Data source settings, Data Sources, Manage Parameters, Refresh Preview, Advanced Editor, Manage Query, Properties, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Sort, Split Column, Group By, Data Type: Whole Number, Use First Row as Headers, Replace Values, Merge Queries, Append Queries, Combine Files, Combine.
- Queries [2]:** Data\_3-5-2020, Data\_3-5-2020 (1).
- Data Table:** A table with columns: UnitID, Institution Name, Grand total men (EF2018A Full-time students Undergraduate...), and Grand total women (EF2018A Full-time students Undergraduate...). The first row is highlighted.
- Right-click Context Menu:** A menu is open over the first row, showing options: Copy, Text Filters, Replace Values... (highlighted), Drill Down, and Add as New Query.
- Replace Values Dialog:** A dialog box titled 'Replace Values' is open, showing 'Value To Find' as 'Athens State University' and 'Replace With' as an empty field. The 'Advanced options' section is expanded.
- Query Settings Pane:** A pane on the right showing 'PROPERTIES' (Name: Data\_3-5-2020) and 'APPLIED STEPS' (Source, Navigation, Promoted Headers, Changed Type).

Annotations on the image include:

- A red arrow pointing to the 'UnitID' column header with the text 'Click for dropdown options'.
- A red arrow pointing to the 'Institution Name' cell with the text 'Right click cell to edit'.
- A red circle around the 'APPLIED STEPS' section of the 'Query Settings' pane.

At the bottom left, it says '86 COLUMNS, 8 ROWS Column profiling based on top 1000 rows'. At the bottom right, it says 'PREVIEW DOWNLOADED AT 1:47 PM'.

# Power Query Editor

ALAIR PBI Demo - Power Query Editor

File Home Transform Add Column View Help

Close & Apply Close New Source Recent Sources Enter Data Data source settings Manage Parameters Refresh Preview Advanced Editor Manage Query Choose Columns Remove Columns Keep Rows Remove Rows Sort Split Column Group By Data Type: Whole Number Use First Row as Headers Replace Values Merge Queries Append Queries Combine Files Combine

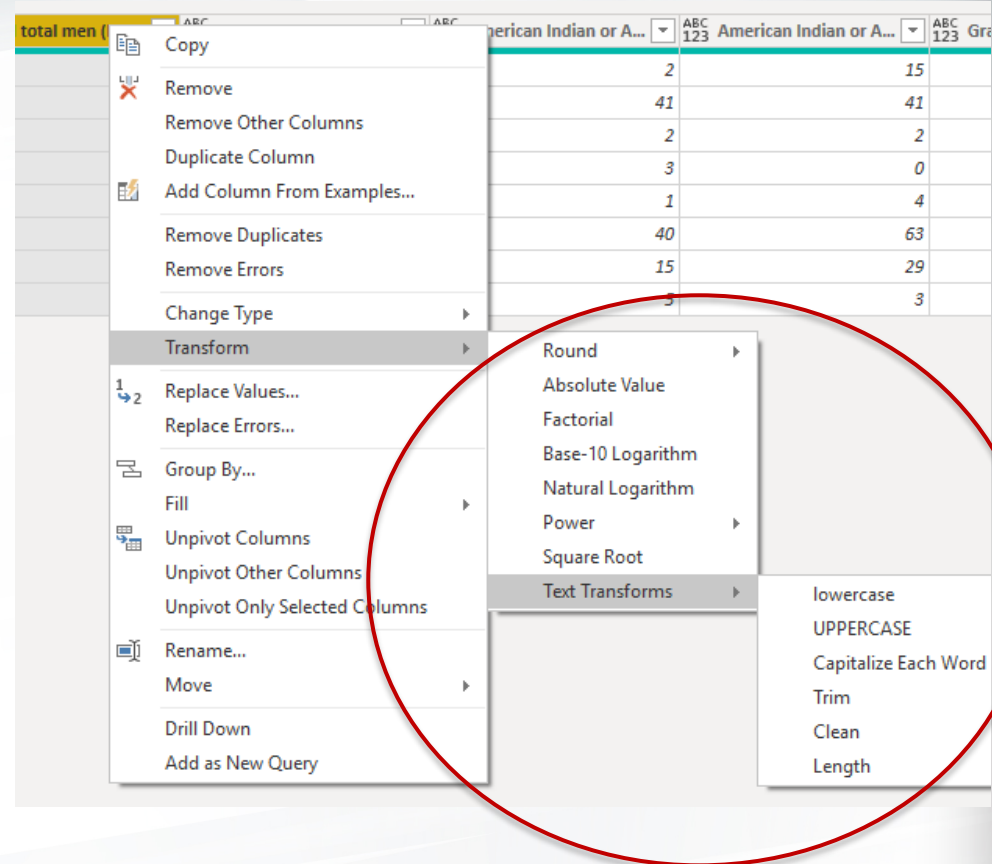
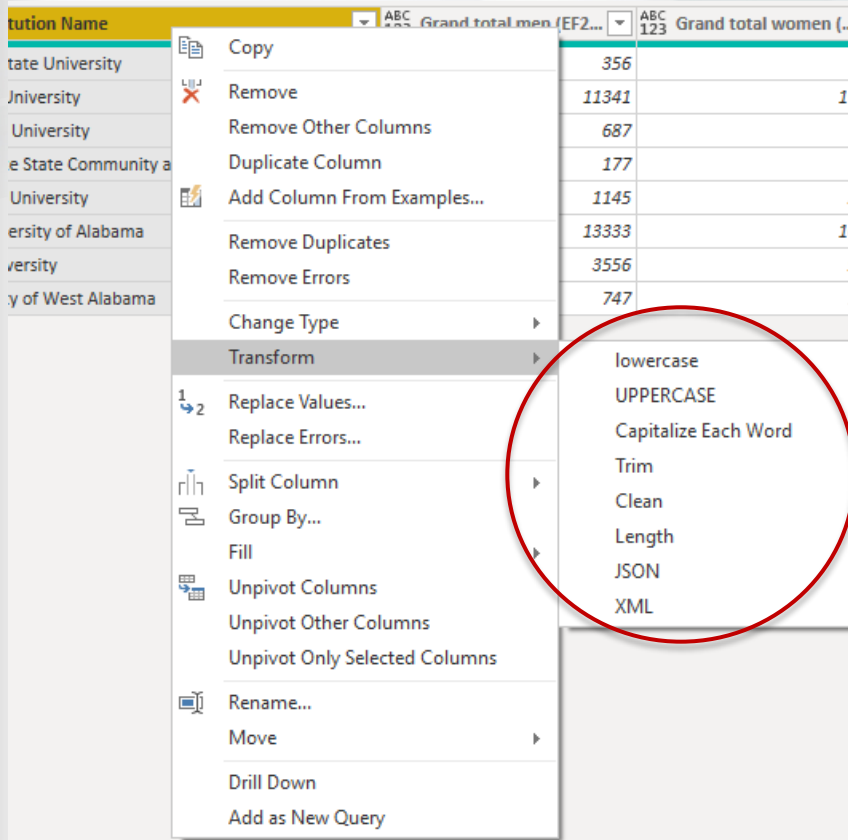
Queries [2]  
Data\_3-5-2020  
Data\_3-5-2020 (1)

UnitID	Institution Name	Grand total men	Grand total women	American Indian or A...	American In
1	100812 Athens State University			2	
2	100858 Auburn University			41	
3	101189 Faulkner University			2	
4	101462 J. F. Drake State Community and Technical College			3	
5	102049 Samford University			1	
6	100751 The University of Alabama			40	
7	102368 Troy University			15	
8	101587 University of West Alabama			5	

Right click column for options

- Copy
- Remove
- Remove Other Columns
- Duplicate Column
- Add Column From Examples...
- Remove Duplicates
- Remove Errors
- Change Type
  - Decimal Number
  - Fixed decimal number
  - ☒ Whole Number
  - Percentage
  - Date/Time
    - Date
    - Time
    - Date/Time/Timezone
    - Duration
  - Text
  - True/False
  - Binary
  - Using Locale...
- Transform
  - Replace Values...
  - Replace Errors...
- Group By...
- Fill
  - Unpivot Columns
  - Unpivot Other Columns
  - Unpivot Only Selected Columns
- Rename...
- Move
  - Drill Down
  - Add as New Query

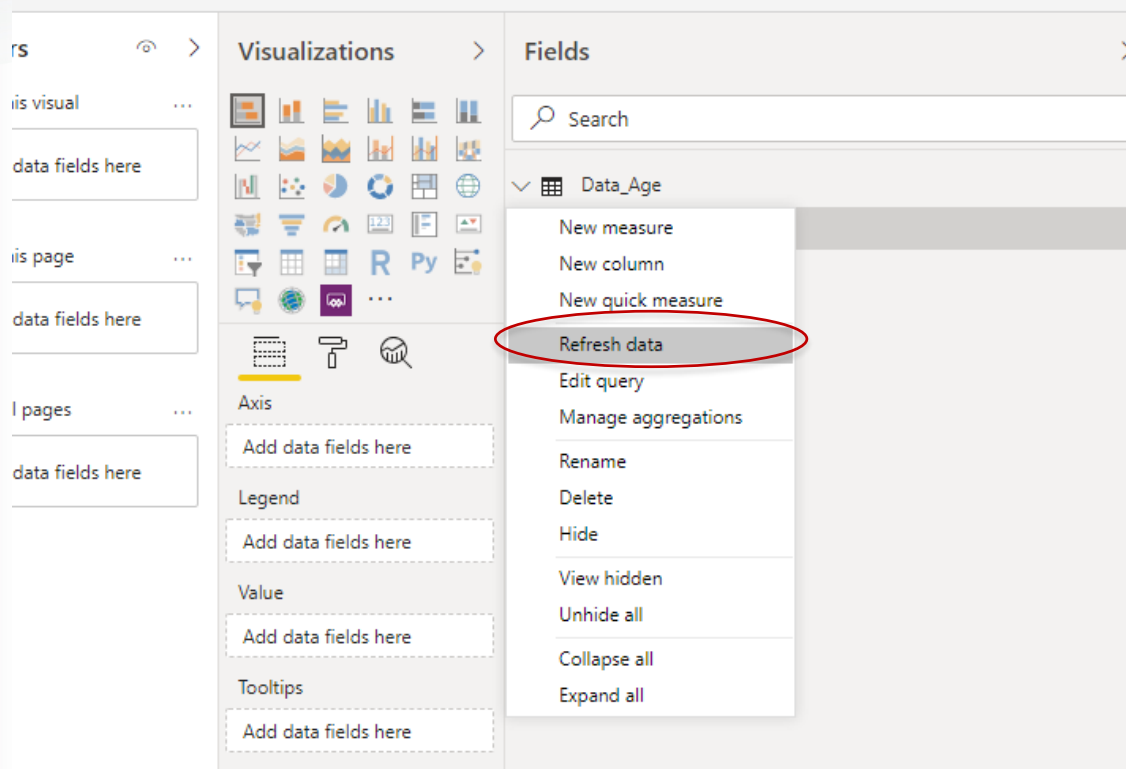
# Power Query Editor



Transformation options are automatically different for text and numeric variables

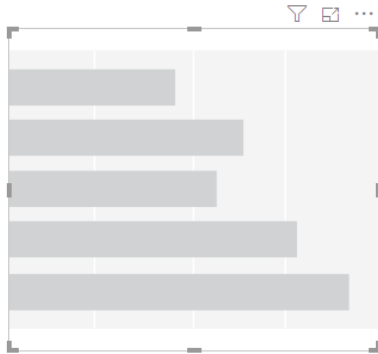


# Power Query Editor



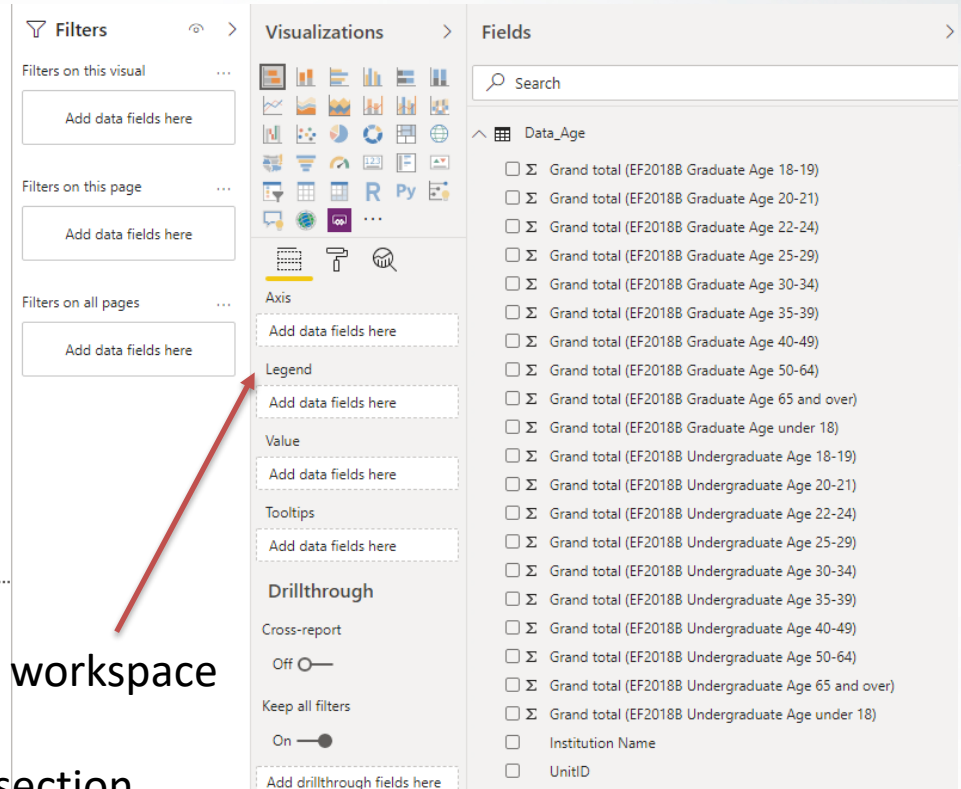
You can also edit your data outside of PBI, then right click on the dataset and select “Refresh data”. As long as the path is still valid, any changes will update on your visualizations.

# Visualizations



An empty dummy graph appears in your workspace when you choose a visualization.

Drag and drop variables from the Fields section onto the empty graph or into the appropriate section on the Visualizations pane. PBI will do nothing if you try to drop a variable into a section that requires another data type.



The screenshot displays the Power BI interface with three main panes: Filters, Visualizations, and Fields. The Filters pane on the left shows sections for 'Filters on this visual', 'Filters on this page', and 'Filters on all pages', each with an 'Add data fields here' button. The Visualizations pane in the center shows a grid of visualization icons, with the 'Table' icon selected. Below the icons are sections for 'Axis', 'Legend', 'Value', 'Tooltips', 'Drillthrough', 'Cross-report', and 'Keep all filters', each with an 'Add data fields here' button. The Fields pane on the right shows a search bar and a list of data fields under the 'Data\_Age' category. A red arrow points from the 'Add data fields here' button in the Visualizations pane to the 'Add data fields here' button in the Fields pane.

**Filters**

Filters on this visual ...  
Add data fields here

Filters on this page ...  
Add data fields here

Filters on all pages ...  
Add data fields here

**Visualizations**

Axis  
Add data fields here

Legend  
Add data fields here

Value  
Add data fields here

Tooltips  
Add data fields here

Drillthrough

Cross-report  
Off

Keep all filters  
On

Add drillthrough fields here

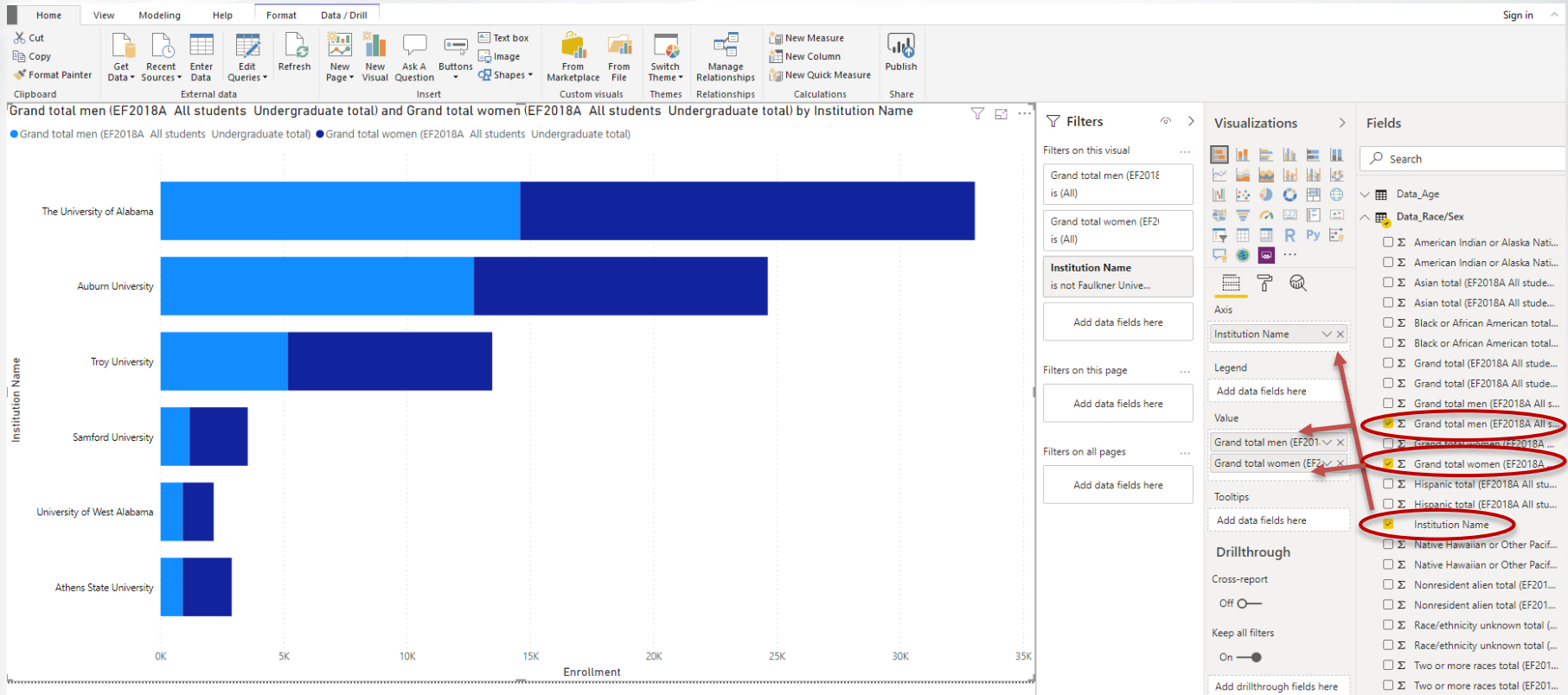
**Fields**

Search

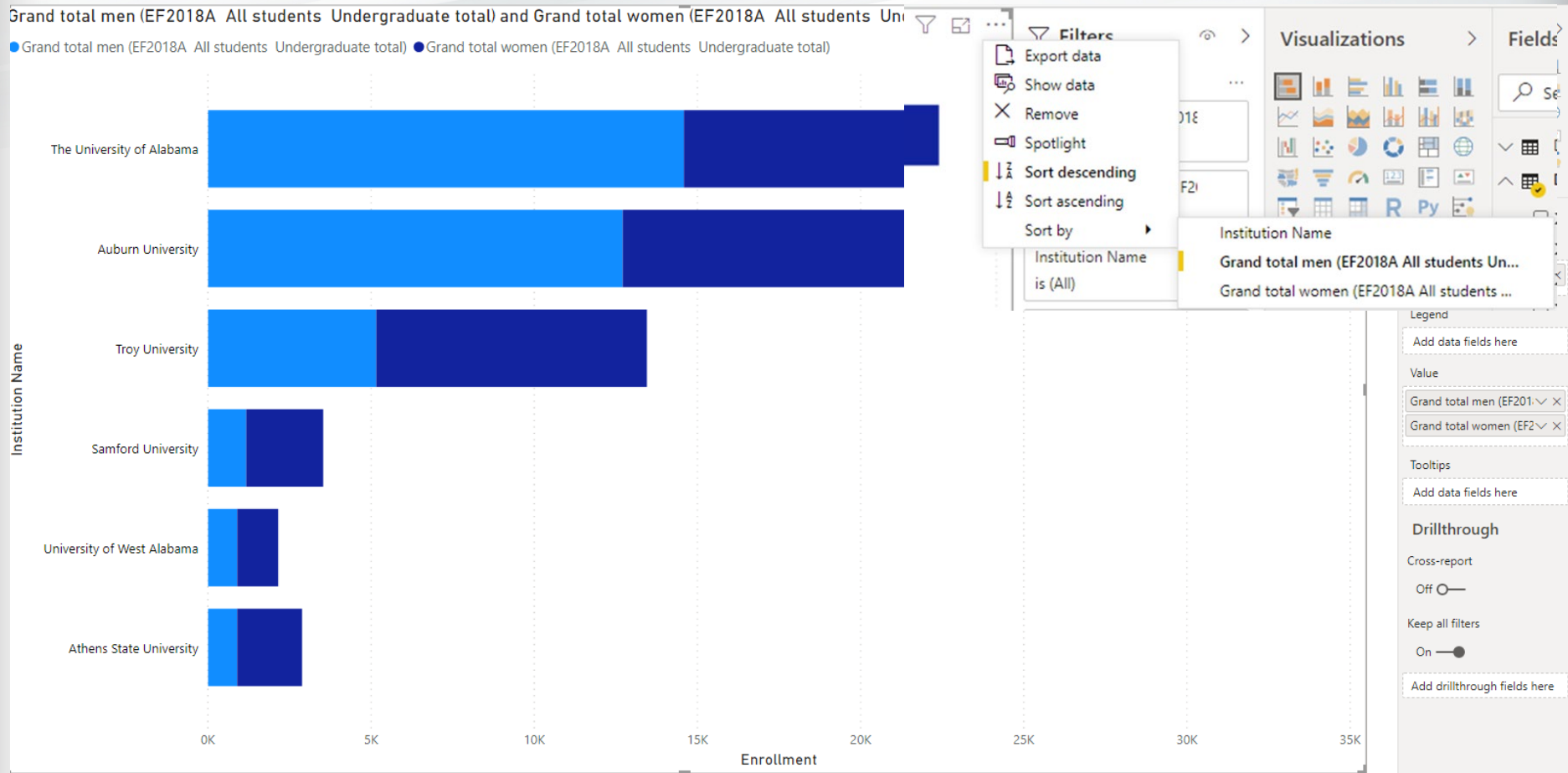
**Data\_Age**

- ☐ Grand total (EF2018B Graduate Age 18-19)
- ☐ Grand total (EF2018B Graduate Age 20-21)
- ☐ Grand total (EF2018B Graduate Age 22-24)
- ☐ Grand total (EF2018B Graduate Age 25-29)
- ☐ Grand total (EF2018B Graduate Age 30-34)
- ☐ Grand total (EF2018B Graduate Age 35-39)
- ☐ Grand total (EF2018B Graduate Age 40-49)
- ☐ Grand total (EF2018B Graduate Age 50-64)
- ☐ Grand total (EF2018B Graduate Age 65 and over)
- ☐ Grand total (EF2018B Graduate Age under 18)
- ☐ Grand total (EF2018B Undergraduate Age 18-19)
- ☐ Grand total (EF2018B Undergraduate Age 20-21)
- ☐ Grand total (EF2018B Undergraduate Age 22-24)
- ☐ Grand total (EF2018B Undergraduate Age 25-29)
- ☐ Grand total (EF2018B Undergraduate Age 30-34)
- ☐ Grand total (EF2018B Undergraduate Age 35-39)
- ☐ Grand total (EF2018B Undergraduate Age 40-49)
- ☐ Grand total (EF2018B Undergraduate Age 50-64)
- ☐ Grand total (EF2018B Undergraduate Age 65 and over)
- ☐ Grand total (EF2018B Undergraduate Age under 18)
- ☐ Institution Name
- ☐ UnitID

# Visualizations

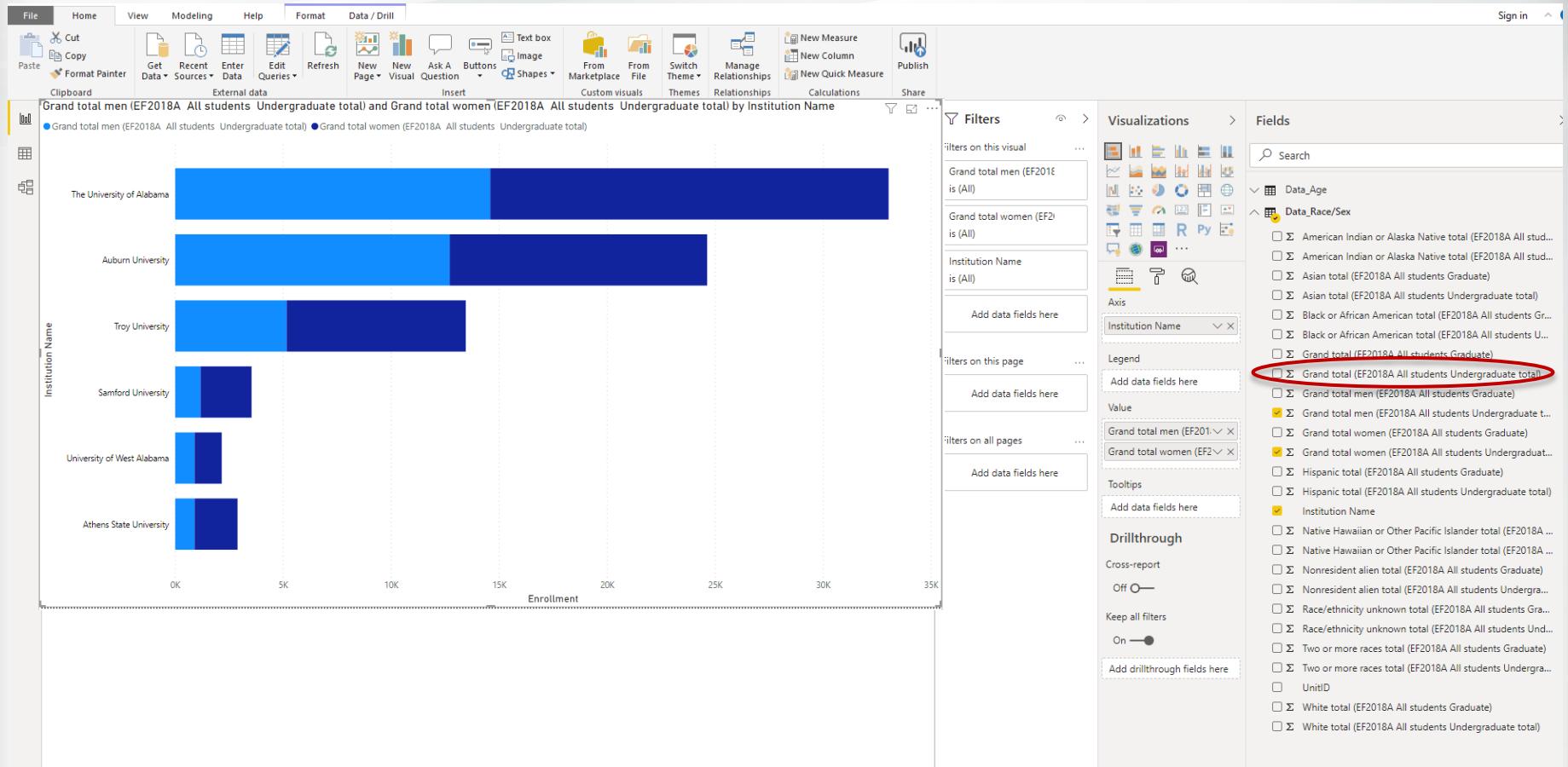


# Visualizations





# Visualizations



# Visualizations

The screenshot displays a data visualization tool interface with three main panels: Filters, Visualizations, and Fields.

**Filters Panel:**

- Filters on this visual:**
  - Grand total men (EF2018A All students Undergraduate total) is (All)
  - Grand total women (EF2018A All students Undergraduate total) is (All)
  - Institution Name is (All)
- Filters on this page:**
  - Add data fields here
- Filters on all pages:**
  - Add data fields here

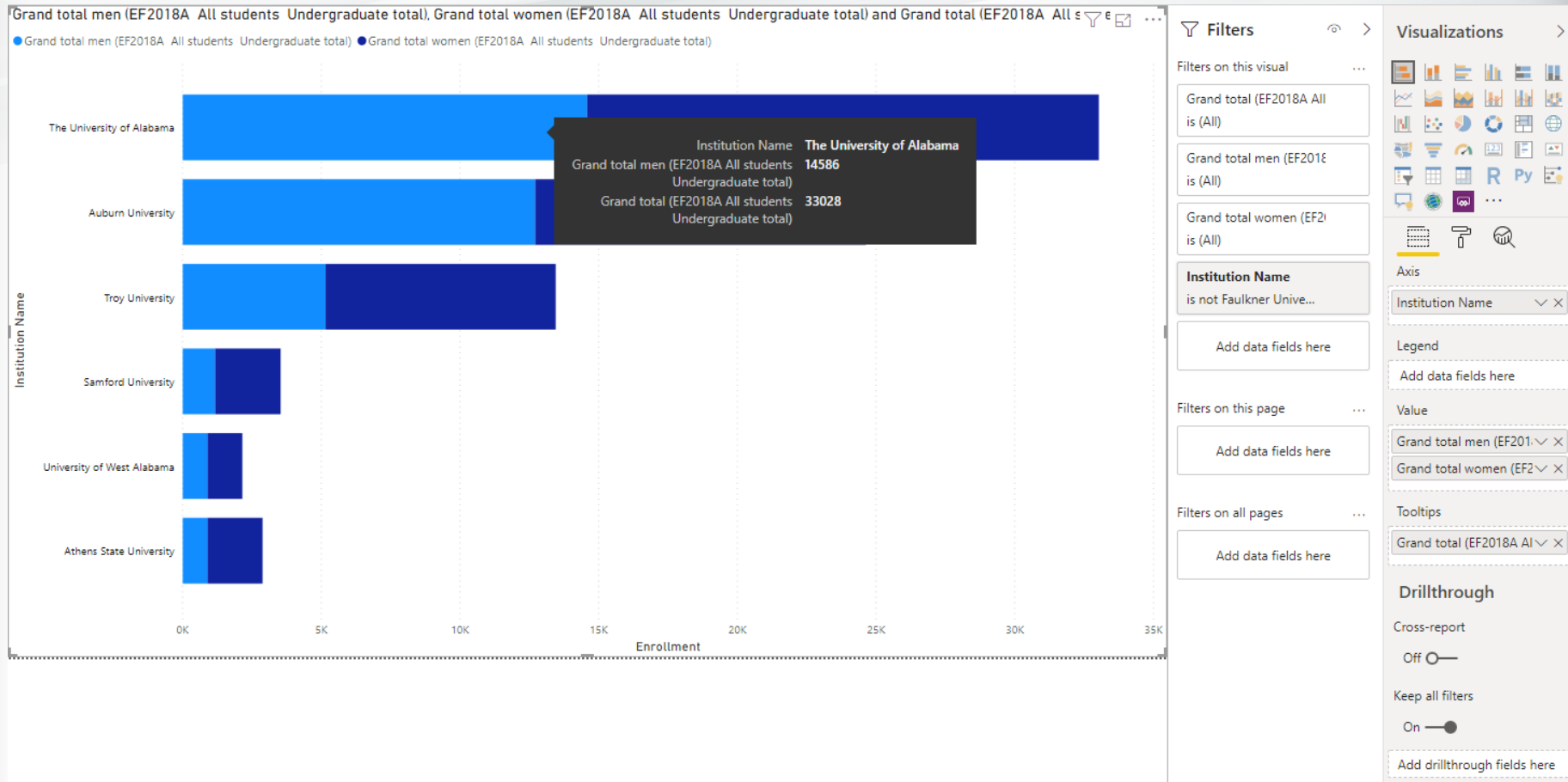
**Visualizations Panel:**

- Axis:** Institution Name
- Legend:** Add data fields here
- Value:**
  - Grand total men (EF2018A All students Undergraduate total)
  - Grand total women (EF2018A All students Undergraduate total)
- Tooltips:** Add data fields here
- Drillthrough:**
  - Cross-report: Off
  - Keep all filters: On
  - Add drillthrough fields here

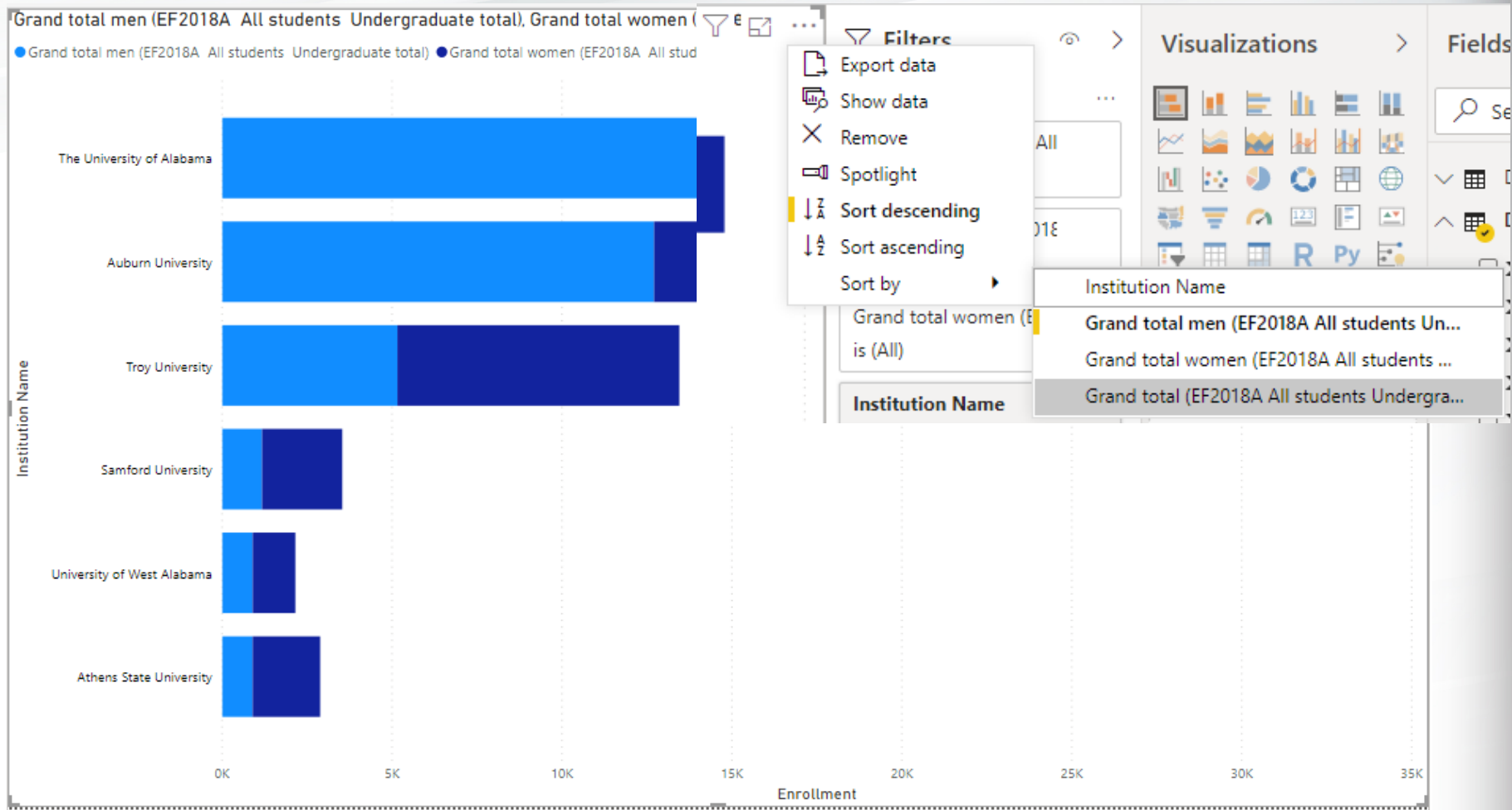
**Fields Panel:**

- Data\_Age:**
  - ☐ American Indian or Alaska Native total (EF2018A All students Undergraduate total)
  - ☐ American Indian or Alaska Native total (EF2018A All students Undergraduate total)
  - ☐ Asian total (EF2018A All students Graduate)
  - ☐ Asian total (EF2018A All students Undergraduate total)
  - ☐ Black or African American total (EF2018A All students Graduate)
  - ☐ Black or African American total (EF2018A All students Undergraduate total)
  - ☐ Grand total (EF2018A All students Graduate)
  - ☐ Grand total (EF2018A All students Undergraduate total)
  - ☐ Grand total men (EF2018A All students Graduate)
  - ☒ Grand total men (EF2018A All students Undergraduate total)
  - ☐ Grand total women (EF2018A All students Graduate)
  - ☒ Grand total women (EF2018A All students Undergraduate total)
  - ☐ Hispanic total (EF2018A All students Graduate)
  - ☐ Hispanic total (EF2018A All students Undergraduate total)
  - ☒ Institution Name
  - ☐ Native Hawaiian or Other Pacific Islander total (EF2018A All students Graduate)
  - ☐ Native Hawaiian or Other Pacific Islander total (EF2018A All students Undergraduate total)
  - ☐ Nonresident alien total (EF2018A All students Graduate)
  - ☐ Nonresident alien total (EF2018A All students Undergraduate total)
  - ☐ Race/ethnicity unknown total (EF2018A All students Graduate)
  - ☐ Race/ethnicity unknown total (EF2018A All students Undergraduate total)
  - ☐ Two or more races total (EF2018A All students Graduate)
  - ☐ Two or more races total (EF2018A All students Undergraduate total)
  - ☐ UnitID
  - ☐ White total (EF2018A All students Graduate)
  - ☐ White total (EF2018A All students Undergraduate total)

# Visualizations

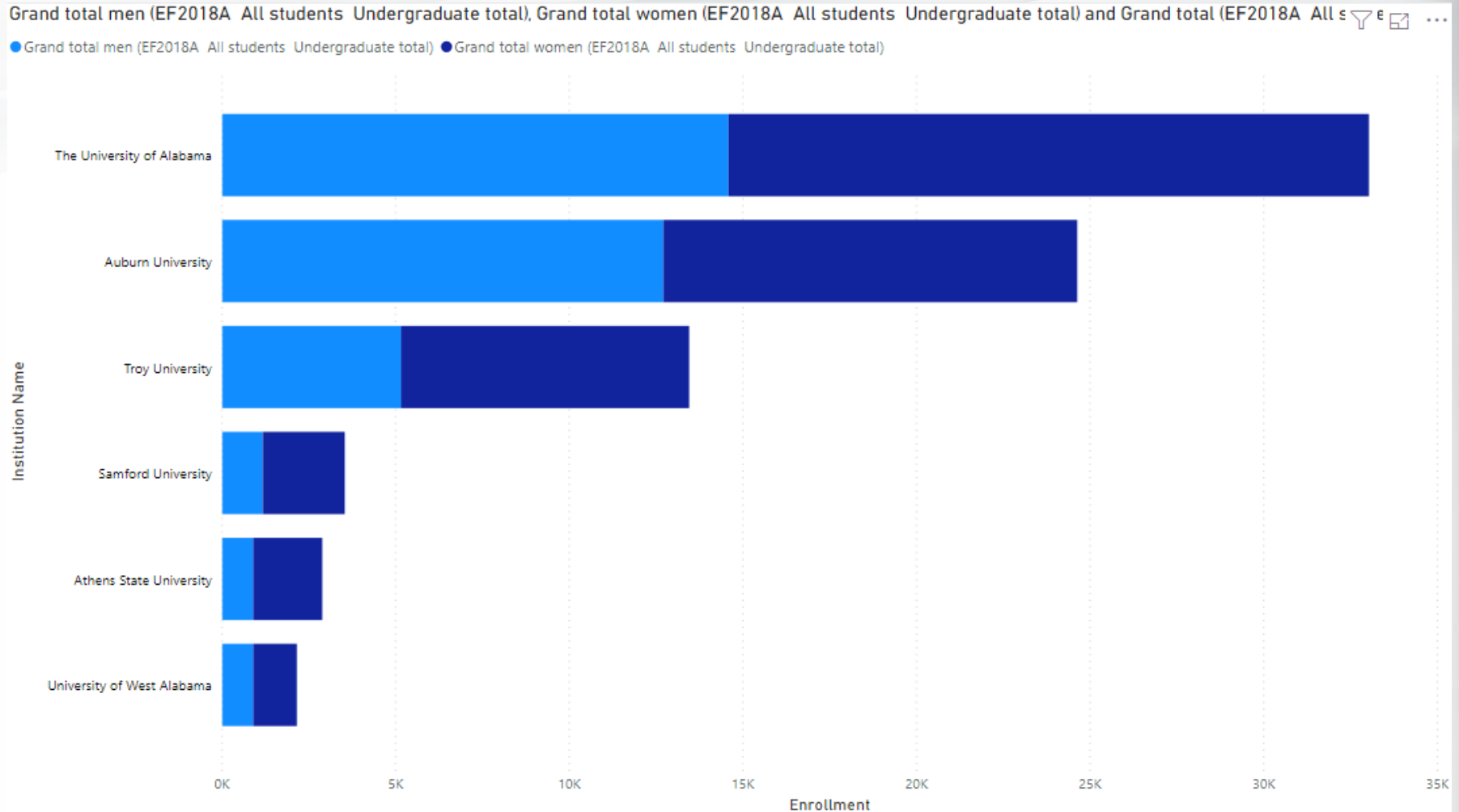


# Visualizations





# Visualizations



# Visualizations

Visualizations >

Format

Axis

Institution Name

Legend

Add data fields here

Value

Grand total men (EF2018A All students Undergraduate total)

Grand total women (EF2018A All students Undergraduate total)

Tooltips

Grand total (EF2018A All students Undergraduate total)

Search

General

Legend On

Y axis On

X axis On

Data colors

Data labels Off

Plot area

Title On

Background On

Lock aspect Off

Border Off

Tooltip On

Visual header On

# Visualizations

The image shows two side-by-side panels of the Power BI visualization settings interface. The left panel is the 'Format' pane, and the right panel is the 'Design' pane. A red arrow points from the 'Title' toggle in the left pane to the 'Title' section in the right pane.

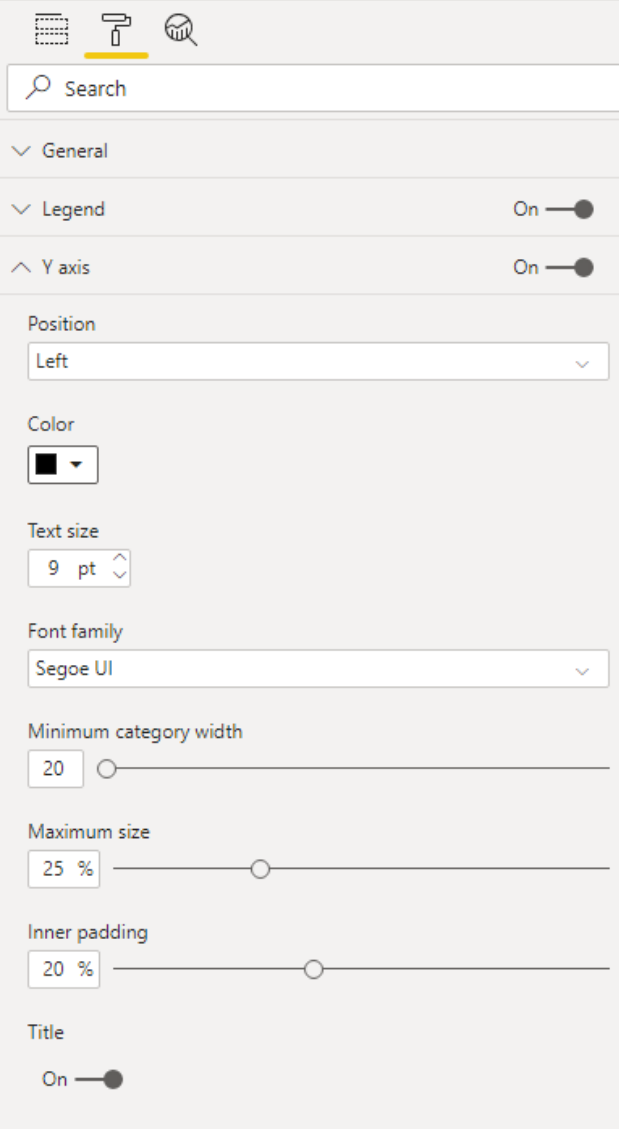
**Left Panel (Format):**

- Search bar
- X axis: On
- Data colors
- Data labels: Off
- Plot area
- Title: On
- Title text: Fall 2018 Enrollment by Sex
- Word wrap: Off
- Font color: Black
- Background color: White
- Alignment: Left
- Text size: 14 pt
- Font family: DIN
- Revert to default button

**Right Panel (Design):**

- Color: Black
- Text size: 9 pt
- Font family: Segoe UI
- Display units: Auto
- Value decimal places: Auto
- Title: On
- Style: Show title only
- Title color: Black
- Axis title: Enrollment
- Title text size: 12 pt

# Visualizations



Search

General

Legend On

Y axis On

Position  
Left

Color  
■

Text size  
9 pt

Font family  
Segoe UI

Minimum category width  
20

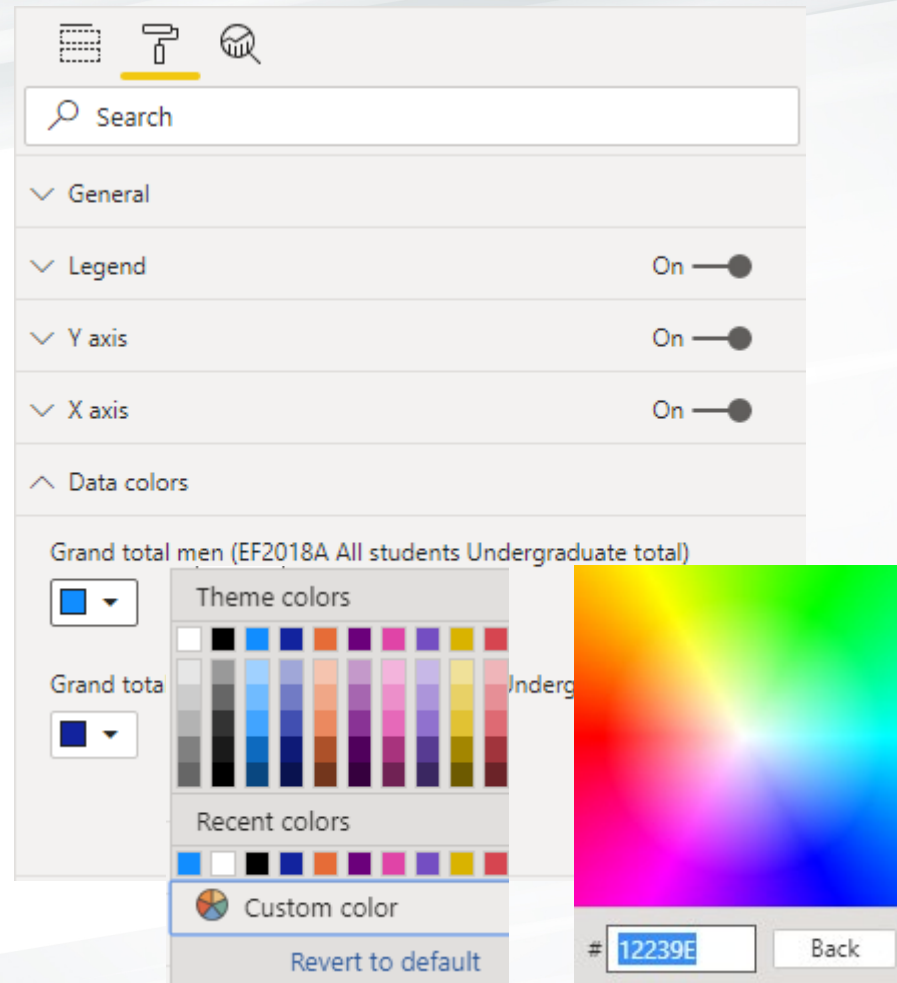
Maximum size  
25 %

Inner padding  
20 %

Title  
On



# Visualizations

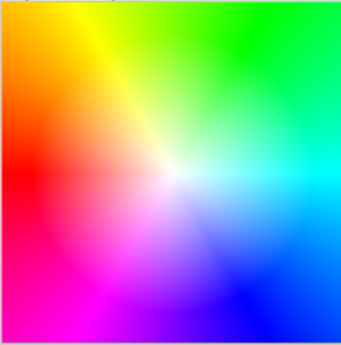


# Visualizations

^ Data colors

Grand total men (EF2018A All students Undergraduate total)

Grand total women (EF2018A All students Undergraduate total)



[Revert to default](#)

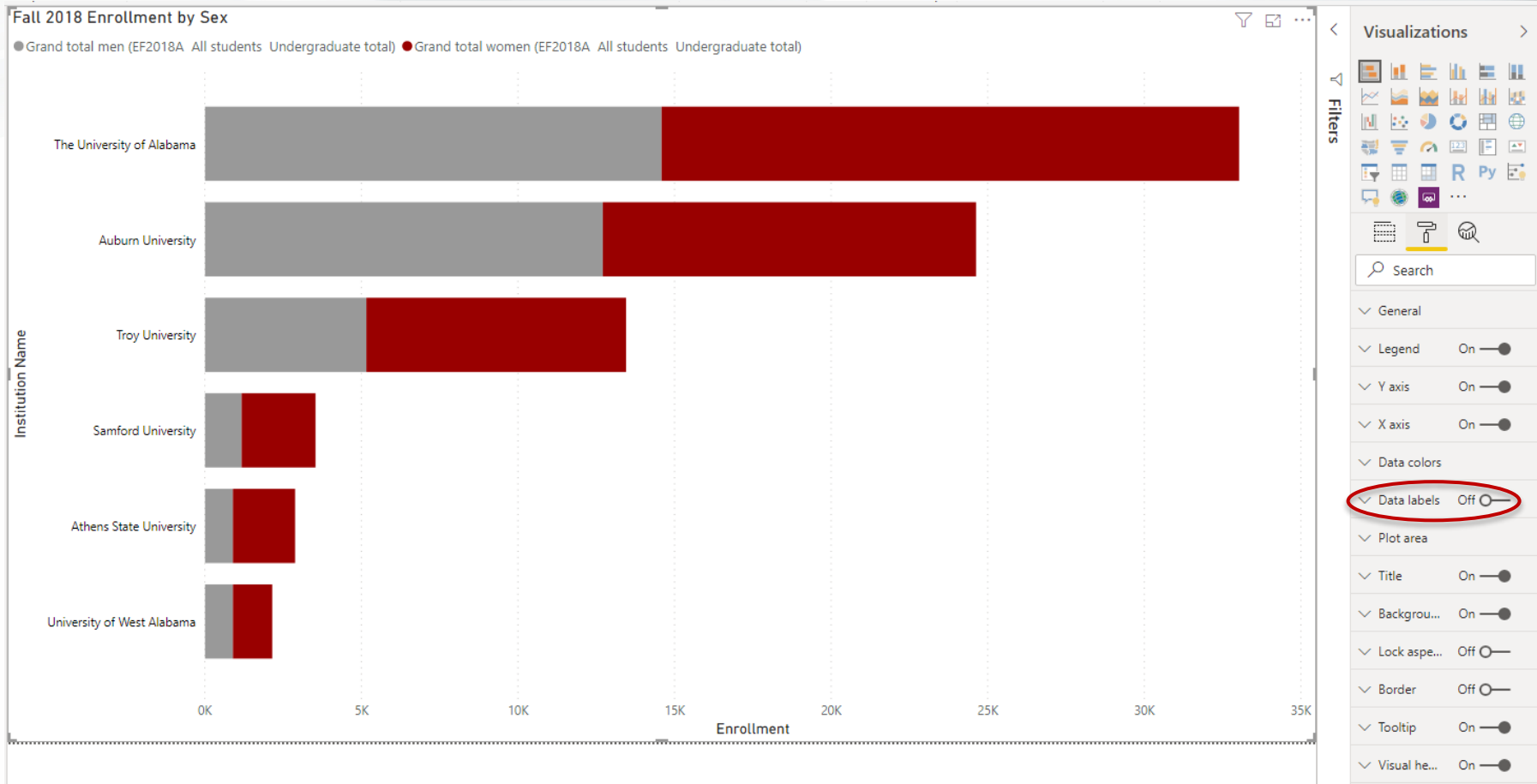
Off ☐

On ☒

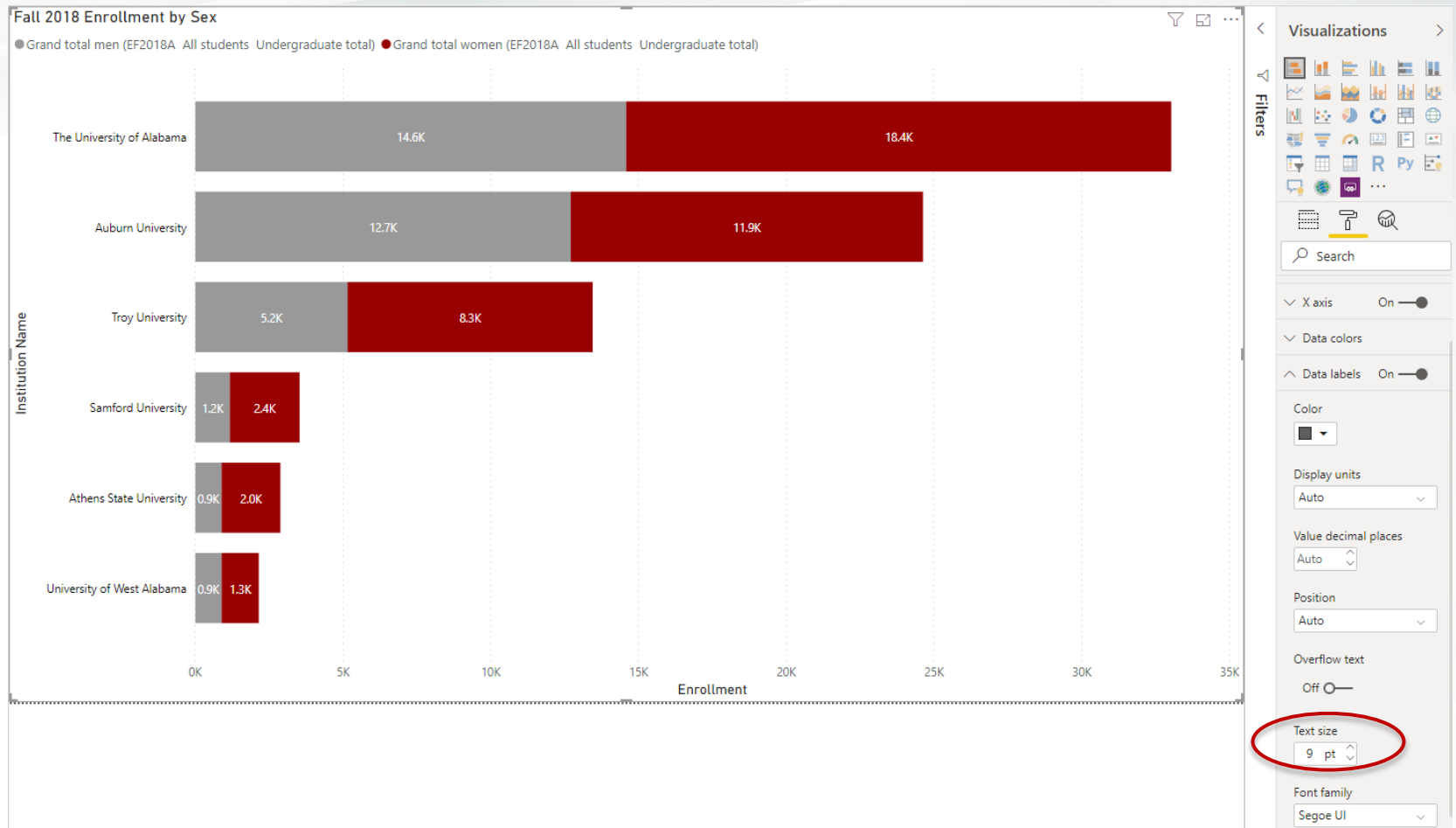
On ☒

#

# Visualizations

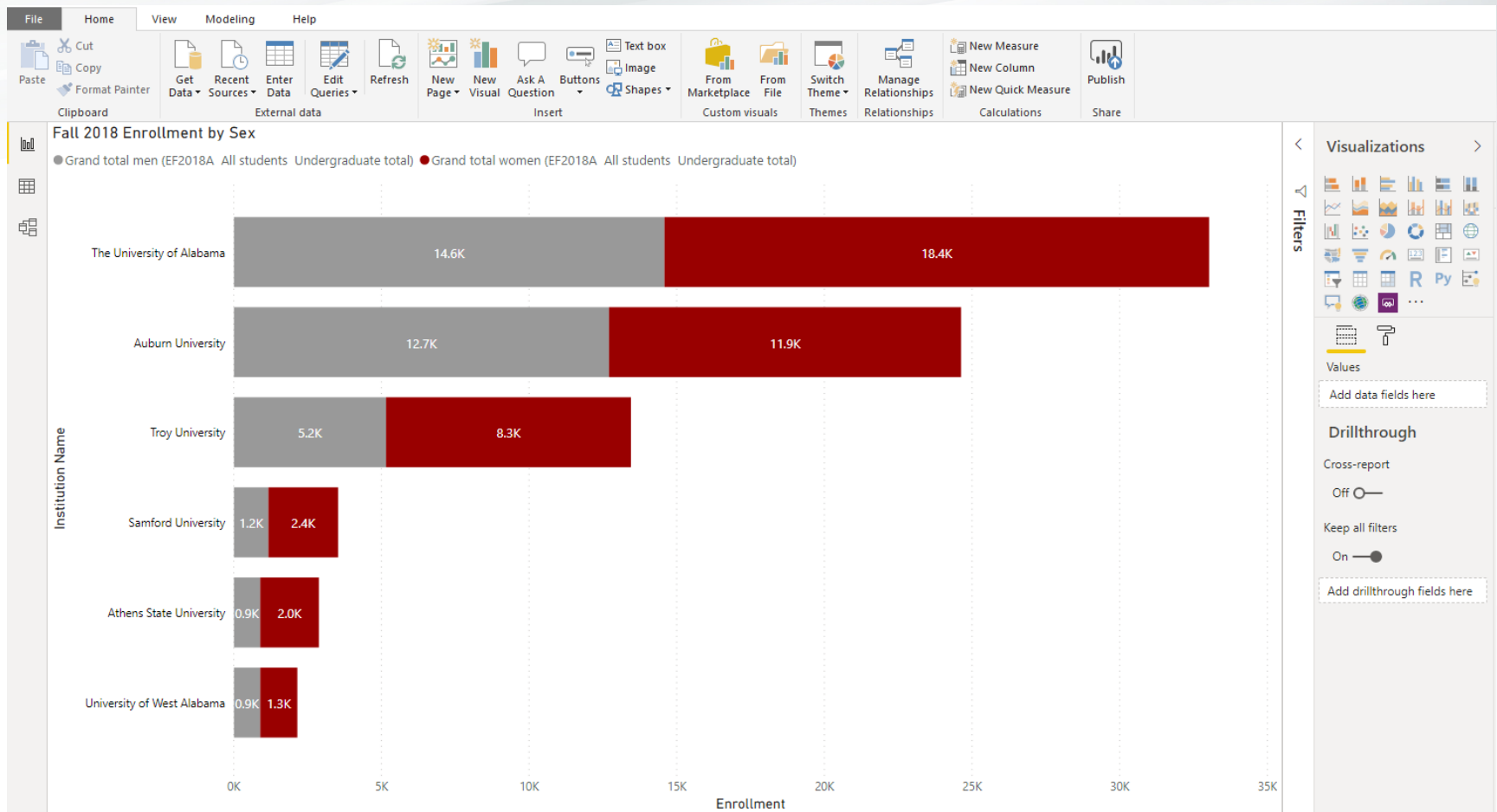


# Visualizations

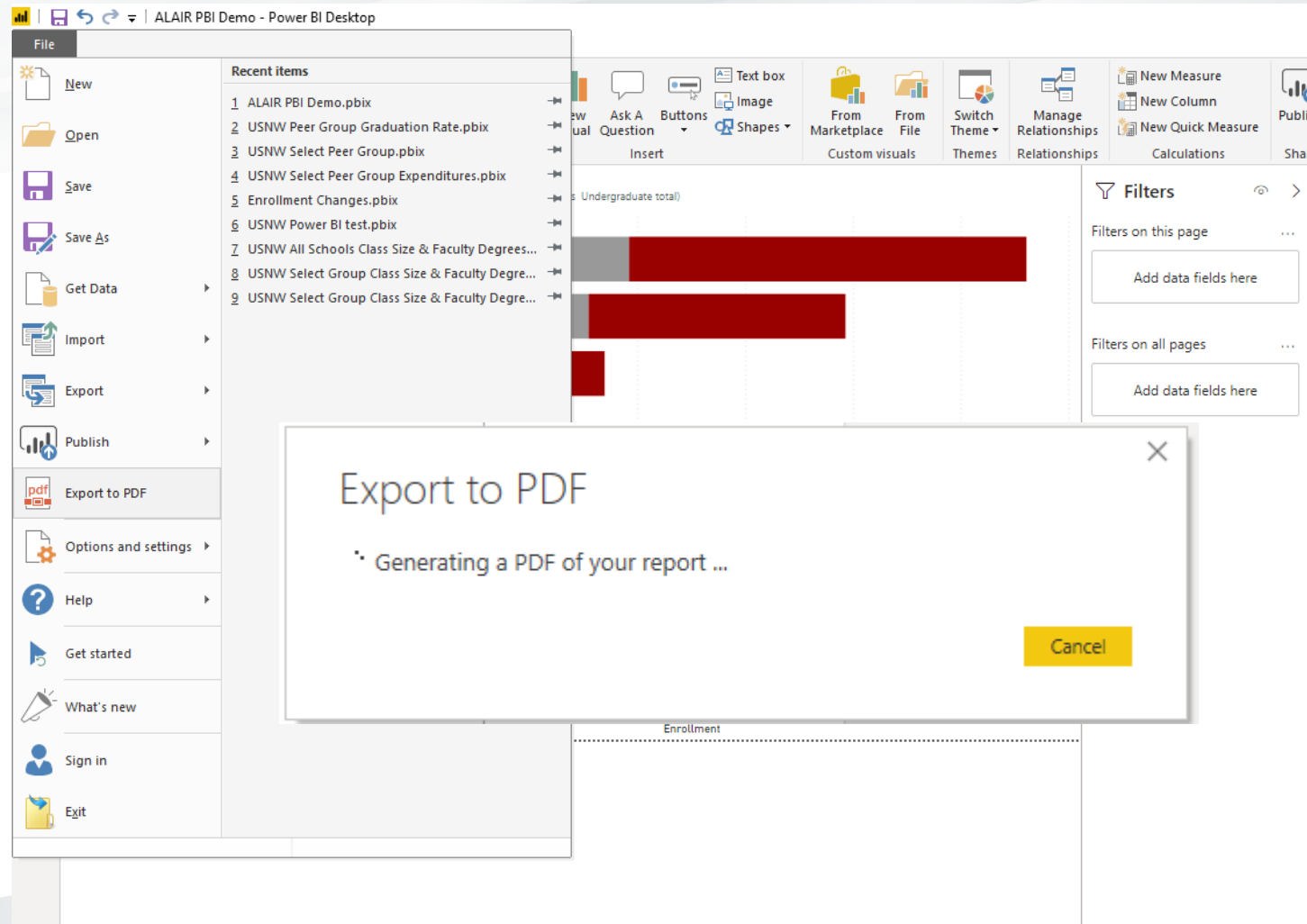




# Visualizations



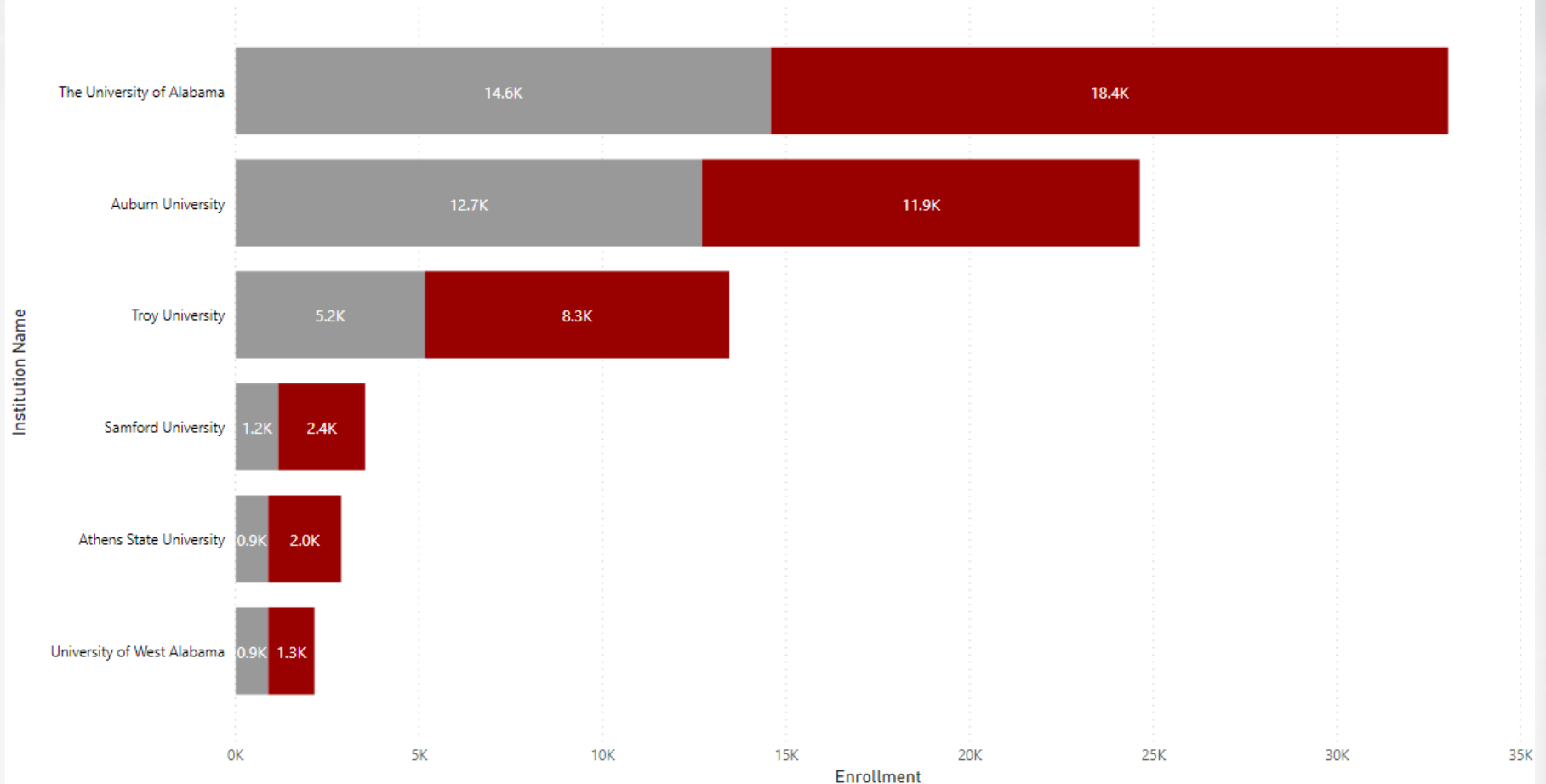
# Visualizations



# All done!

## Fall 2018 Enrollment by Sex

● Grand total men (EF2018A All students Undergraduate total) ● Grand total women (EF2018A All students Undergraduate total)



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THE UNIVERSITY OF ALABAMA

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- Power BI Desktop
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  - Can upgrade to Power BI Pro (\$10/month)
- Power BI Service
  - Power BI Premium (~\$5,000/month)
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- Power BI Mobile Apps
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