

# Lessons from Tableau Training: Part II

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# Have you ever had trouble answering these?

- Why are some called dimensions and others called measures?
- Why are some blue and others green?
- What are the measure names and measure values? Those aren't in the data source...

Dimensions	
	Residency Country S...
	Residency Country S...
	Residency County
Abc	Residency County C...
Abc	Residency County C...
	Residency State
Abc	Residency State Cod...
	Residency State Cpe
Abc	Residency State Short
Abc	Residency Status
Abc	Residency Status Co...
Abc	Residency Status Co...
Abc	Residency Status Cpe
Abc	Resident Category
Abc	Student Id
Abc	Study Id Primary
Abc	Transfer University L...
Abc	Transfer University L...
Abc	Transfer University L...
Abc	Transfer University L...
Abc	Transfer University L...
	Transfer University L...
	Transfer University L...
Abc	Undergraduate Fall E...
Abc	Visa Type
Abc	Visa Type Code
Abc	Visa Type Code
Abc	Measure Names

Measures	
#	Maximum Act Comp...
#	Maximum Act Comp...
#	Maximum Act Comp...
#	Maximum Act Comp...
#	Maximum Act Comp...
#	Maximum Act Englis...
#	Maximum Act Math ...
#	Maximum Act Readin...
#	Maximum Act Scienc...
#	Maximum Sat Comp...
#	Maximum Sat Comp...
#	Maximum Sat Comp...
#	Maximum Sat Comp...
#	Maximum Sat Math ...
#	Maximum Sat Readin...
#	Maximum Sat Writin...
#	Sat To Act Score
	Latitude (generated)
	Longitude (generated)
#	Number of Records
#	Measure Values

## First Things First

- Each field in the connected data source has two attributes:
  - Either a dimension or measure (what it is)
  - Either discrete or continuous (how it is)
- Fields are assigned as dimensions or measures by Tableau
  - This may differ from what you consider the data to be
  - But that's okay... You can change them!

# Understanding Dimensions v. Measures

## Dimensions

- Tableau assigns categorical information as a dimension
  - Strings, booleans, dates
- Dimensions create buckets - they help divide the data

Degree Level Category Primary Cpe	Progression Classification Cpe
Undergraduate	Auditor
	Freshman
	High School
	Junior
	Senior
	Sophomore
	Undergraduate - Nondegree
Graduate	Doctor's Degree Professional Practice
	Doctor's Degree Professional Practice Nondegree
	Doctor's Degree Research/Scholarship (Coursework)
	Doctor's Degree Research/Scholarship (Dissertation)
	Graduate Nondegree
	Master's
	Post-Baccalaureate Certificate
	Post-Master's Certificate
Specialist's	
House Staff	House Staff
Post-Doctoral	Post-Doctoral

# Understanding Dimensions v. Measures

## Measures

- Tableau assigns quantitative numerical information as a measure
  - Numbers (integers, floats)\*
- Measures fill buckets - they are “math” data that help do calculations
- \*Disclaimer: not all numbers should be measures - think Student IDs and postal codes

Yes!

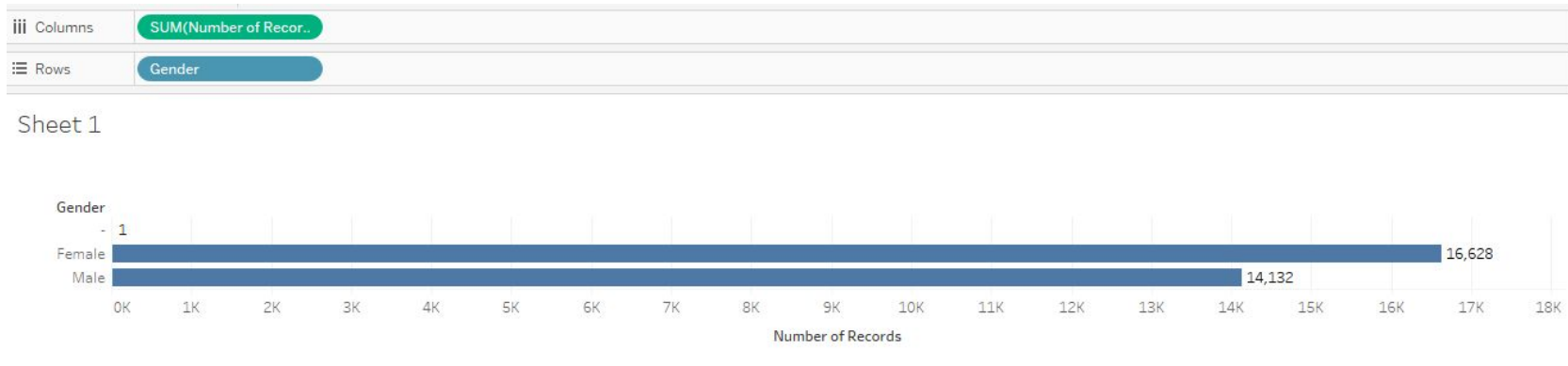
Credits Attempted Term Institutional
401,921

No!

Student Id
60000196
60000551
60000624
60000675

# Understanding Dimensions v. Measures Example

- Gender is a dimension
  - Divides the data into the possible gender options
- Number of Records is a measure
  - Summing the number of records shows us how many students are in each gender option



## Distinguishing Dimensions v. Measures on a Viz

- Measures will be aggregated using some sort of mathematical function
  - Wrapped in parentheses
- Dimensions will not
- Color **does not** distinguish dimensions & measures



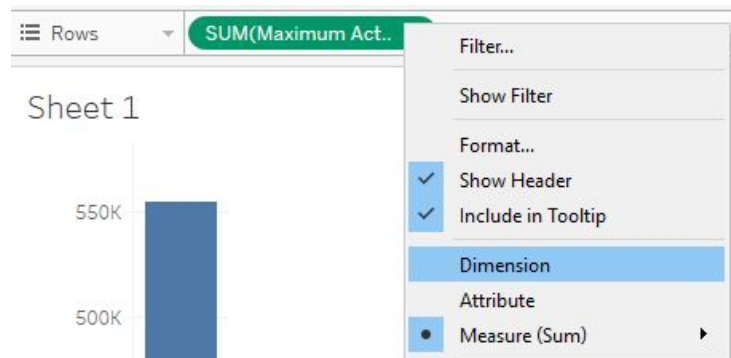
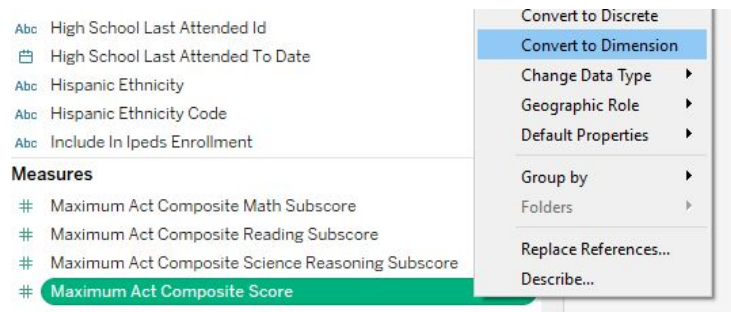
# Switching Dimensions and Measures

## Universally

- 1. Drag field from Dimensions shelf to Measures shelf (or vice versa) in data pane
- 2. Right-click on field in data pane and select **Convert to Dimension (Measure)**
  - It will now appear in Measure (Dimension) shelf

## One-time Only

- 3. On the viz, right-click and select **Dimension (Measure)**

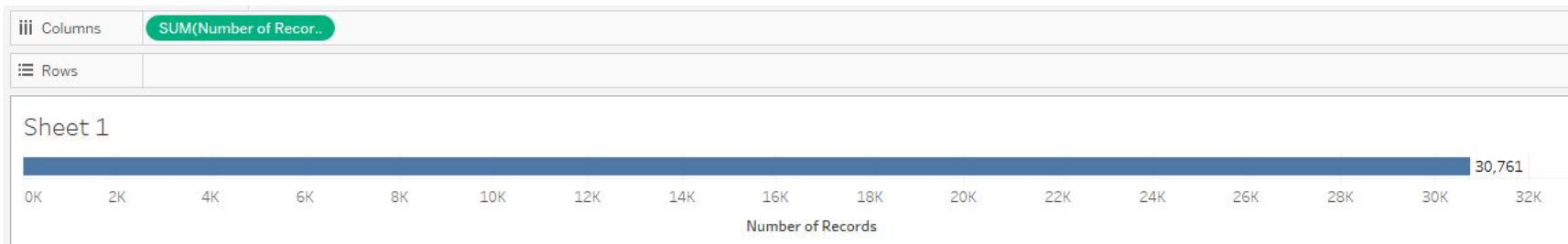




# Understanding Discrete v. Continuous

## Continuous

- “Forming an unbroken whole, without interruption”
- Placing a continuous value on **Rows** or **Columns** shelf creates an axis - shows actual and potential values
- Measures are assumed to be continuous



# Understanding Discrete v. Continuous

## Discrete

- “Individually separate and distinct”
- Placing a discrete value on **Rows** or **Columns** shelf creates headers
- Dimensions are assumed to be discrete

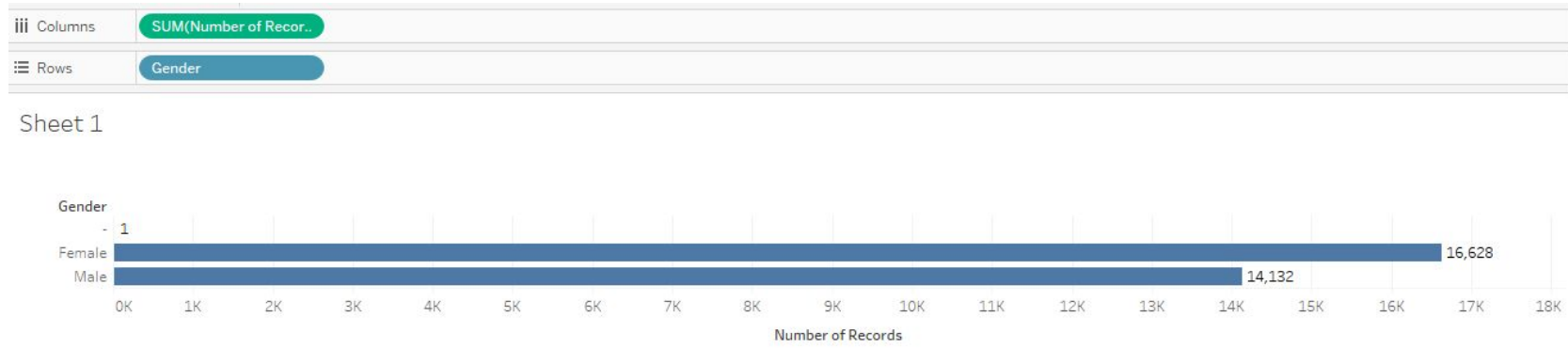
Degree Level Category Primary Cpe			
Graduate	House Staff	Post-Doctoral	Undergraduate
Abc	Abc	Abc	Abc

Column Headers




# Understanding Discrete v. Continuous Example

- Gender is discrete
  - Creates headers for the gender options
- Number of Records is continuous
  - Creates axis to measure the aggregation

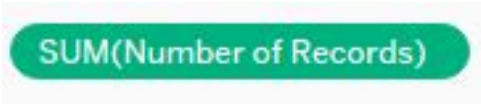


## Distinguishing Discrete v. Continuous on a Viz

- Discrete fields are blue
- Continuous fields are green



Gender



SUM(Number of Records)

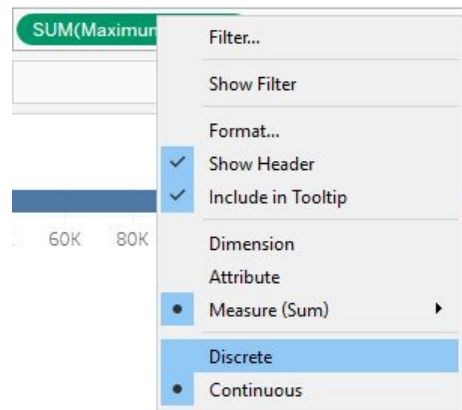
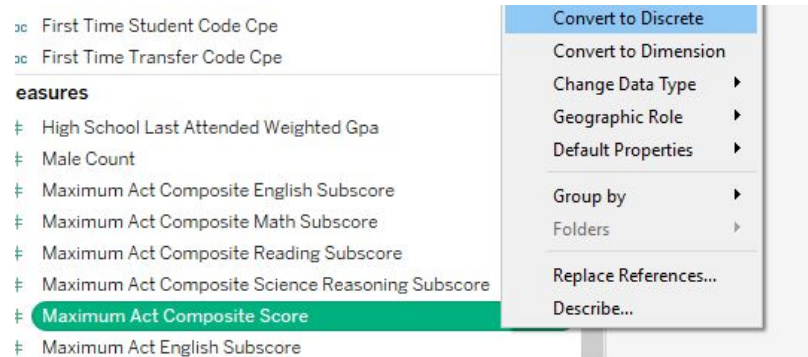
# Switching Discrete and Continuous

## Universally

- Right-click on field in data pane and select **Convert to Discrete (Continuous)**

## One-time Only

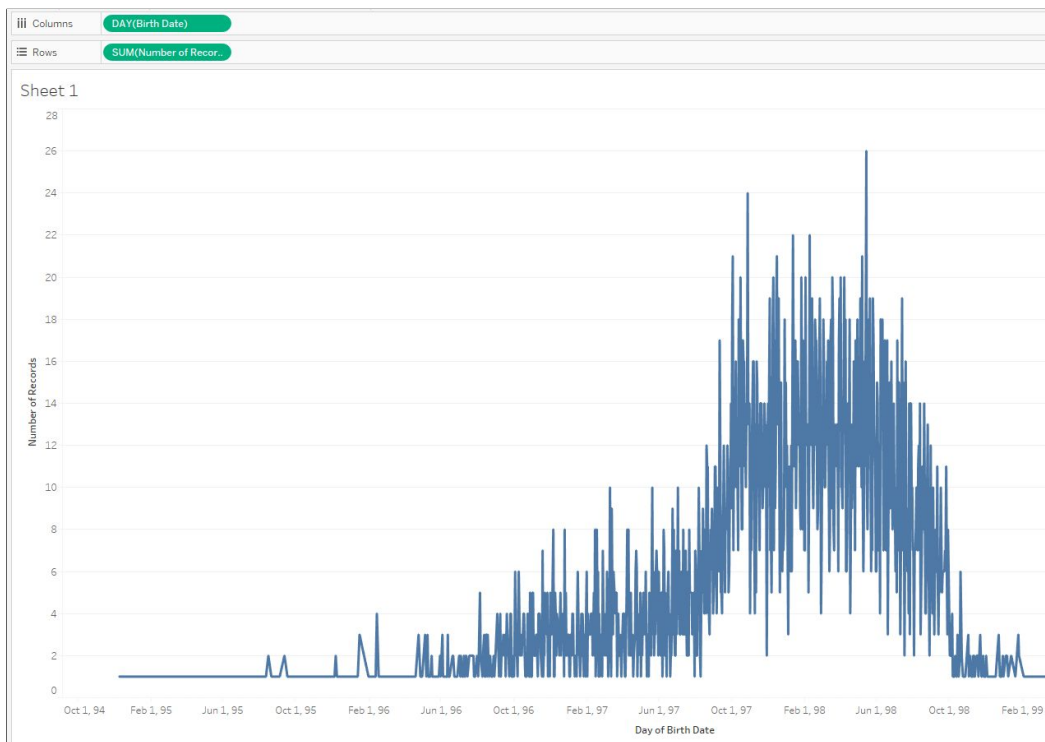
- Right-click on field on the viz and select **Discrete (Continuous)**



## Caution: Dates

- Dates can be either continuous or discrete
- **Continuous:** represent the chronological progression of time, axis acts as a timeline
  - Associates every part of date with a particular date
  - I.e. May 5th, 2017
- **Discrete:** represent the pieces of a date independently
  - I.e. May is the month, 5 is the day, 2017 is the year

# Continuous v. Discrete Dates Example



**Continuous**

iii Columns	
Rows DAY(Birth Date)	
Sheet 1	
Day of Birth..	
1	155
2	208
3	190
4	186
5	193
6	198
7	166
8	207
9	214
10	204
11	199
12	219
13	189
14	191
15	202
16	230
17	199
18	190
19	203
20	217
21	186
22	183
23	175
24	190
25	191
26	222
27	192
28	185
29	163
30	187
31	112

**Discrete**

# Switching Continuous and Discrete Dates

- Right-click on date field on viz
- Select appropriate date part and representation

Category	Date Part	Representation
Discrete	Year	2015
	Quarter	Q2
	Month	May
	Day	8
	More	▶
Continuous	Year	2015
	Quarter	Q2 2015
	Month	May 2015
	Week Number	Week 5, 2015
	Day	May 8, 2015
	More	▶

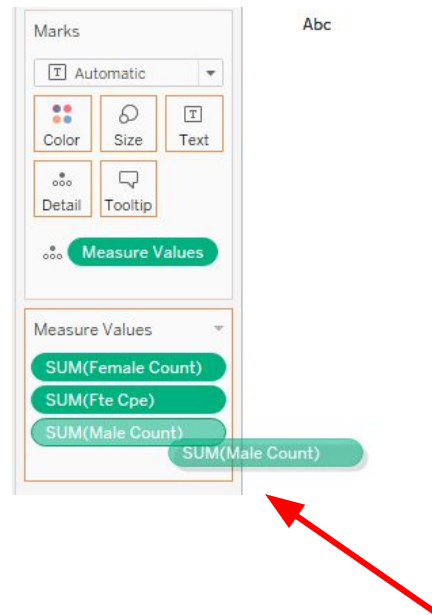
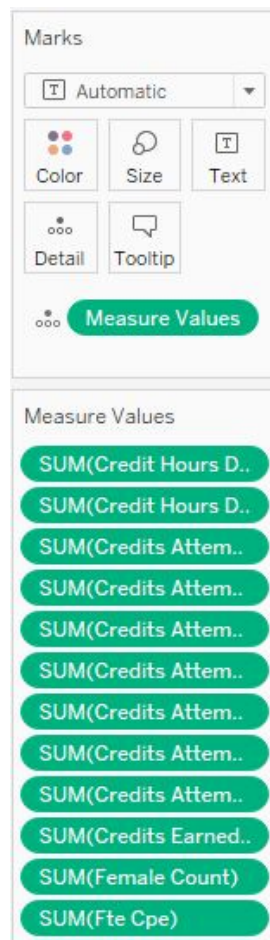


## Understanding Measure Names v. Measure Values

- Fields not in original data source, but provided by Tableau
- Allow you to create vizs with multiple measures
- **Measure Names:** a collection of all the names of the measures in one field
  - Housed under Dimensions since the values are strings
- **Measure Values:** a collection of all the values of the measures in one field
  - Housed under Measures since the values are measures themselves

## Utilizing Measure Values

- When adding Measure Values to a viz, a separate shelf appears below the **Marks** shelf with all the Measures in their default aggregation
- Remove or add Measures as necessary by dragging them off/on the shelf



# Utilizing Measure Names

- To display what the Measure Values indicate, Measure Names needs to be on the viz as well
- Otherwise, you'll get this...
  - Remember: Measure Names is a dimension and, thus, creates buckets to divide the data

3,500,000

The screenshot shows the Tableau interface with the following configuration:

- Columns:** Columns
- Rows:** Measure Names
- Filters:** Academic Term: Fall .., Data Source: Regula.., Measure Names
- Marks:** Automatic (dropdown), Color, Size, Text, Detail, Tooltip, Measure Values (button)
- Measure Values:** SUM(Credit Hours D...), SUM(Credit Hours D...), SUM(Credits Attem...), SUM(Credits Attem...), SUM(Credits Attem...), SUM(Credits Attem...), SUM(Credits Attem...), SUM(Credits Attem..)

The resulting pivot table in Sheet 1 is as follows:

Measure Name	Measure Value
Credit Hours Divisor Cpe Fte	412,722
Credit Hours Divisor Iped Fte	
Credits Attempted Term Institutional	401,921
Credits Attempted Term Institutional Adjusted	401,912
Credits Attempted Term Institutional Audit	514
Credits Attempted Term Institutional Audit Adjusted	514
Credits Attempted Term Institutional Without Audit	401,407

# Staying in Sync

- Once Measure Values is on the viz, Measure Names appears on the **Filter** shelf automatically
- The names chosen to display on Measure Names will stay in sync with the values in **Measure Values**
  - An action to add/remove in one will reflect in the other

The screenshot shows the Tableau interface with the following components:

- Filters shelf:** Contains three pills: "Academic Term: Fall ..", "Data Source: Regula..", and "Measure Names".
- Marks shelf:** Set to "Automatic". Includes buttons for Color, Size, Text, Detail, and Tooltip. A "Measure Values" pill is highlighted with a red box.
- Measure Values shelf:** Contains three pills: "SUM(Female Count)", "SUM(Fte Cpe)", and "SUM(Male Count)".
- Sheet 1:** Displays a table with the following data:
 

Female Count	16,628
Fte Cpe	28,768
Male Count	14,132
- Filter [Measure Names] dialog box:** Shows a list of measures with checkboxes. The checkboxes for "Female Count", "Fte Cpe", and "Male Count" are checked and highlighted with red boxes. Other measures include "Credits Attempted Term Institutional Without Audit Adjusted", "Credits Attempted Term Institutional Without Audit Cpe", "Credits Earned Transfer Work Term Institutional", "High School Last Attended Class Size", "High School Last Attended Ranking", "High School Last Attended Unweighted Gpa", "High School Last Attended Weighted Gpa", and "Maximum Act Composite English Subscore".

## Tip for Measure Values

- If using a data source with many Measures, but only needing to display a few:
  - Move one Measure to the text icon on the **Marks** shelf
  - Double-click on other Measures to send them to the **Marks** shelf
  - Measure Values will automatically appear once second Measure is added

Filters

- Academic Term: Fall ..
- Data Source: Regula...

Sheet 1

28,768

Marks

Automatic

Color Size Text

Detail Tooltip

SUM(Fte Cpe)

Filters

- Academic Term: Fall ..
- Data Source: Regula...
- Measure Names

Sheet 1

Female Count	16,628
Fte Cpe	28,768

Marks

Automatic

Color Size Text

Detail Tooltip

Measure Values

- SUM(Female Count)
- SUM(Fte Cpe)