

**La Guardia Community College**

# **DATA 203 DATA VISUALIZATION USING TABLEAU**

# LEARNING OBJECTIVES



What is Visualization?



What is Tableau -  
Anatomy of Tableau  
and learn some basic  
use



Create a Worksheet  
and Dashboard using  
Tableau



Parameters &  
Calculations



Data Visualization  
Best Practices



Data Storytelling



Final Project



# The Approach

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We will create basic worksheets, dashboards, etc.



You will learn to create parameters and calculations.



You will apply the principles of Visual Perception, Best Practices for Visualization and Data Storytelling to your Worksheets and Dashboard throughout the six weeks.

# FINAL PROJECT

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LIST OF QUESTIONS YOU ARE TRYING TO  
ANSWER BASED ON YOUR DATASET



CREATE A STORYBOARD INCORPORATING  
ALL THE CONCEPTS AND BEST PRACTICES  
YOU LEARNED FOR VISUALIZATION DURING  
THIS COURSE.



GIVE A 7-10 MIN PRESENTATION TO THE  
CLASS ON.

# DATA SOURCES



You can bring  
your own Data  
Set

Work  
Makeover  
Monday



Use a Data Set that is  
provided.



# MAKEOVER MONDAY

- [What is Makeover Monday?](#)
- [Access Makeover Monday](#)
- **If you could have access to any data set what would it be and why?**
- To access [datasets](#) used in Makeover Monday
- Create an account on [Data.World](#)



# WHAT IS VISUALIZATION?



Data Analytics helps us **DERIVE INFORMATION** from data



Data Visualization helps us **TRANSFORM INFORMATION** into a format that is easy to understand.

Numerical or quantitative information is converted into visual images.

- Charts, Maps, Pictures, Icons



Visualization is an effective medium for helping humans better understand concepts and complex issues.

# WHAT IS VISUALIZATION?

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A key step in unlocking the power of data visualization is a process of **VISUAL ENCODING**.



Assign **visual attributes** such as color or shape to different types of data.



This process translate data into a visual shorthand that people are good at decoding.


We can **detect and interpret patterns** and feature in data



# TOOLS FOR VISUALIZATION

- **WHAT IS TABLEAU?**
- Powerful data visualization tool that lets anyone see and understand your data.
- It allows you to work in a real time environment using drag and drop commands.
- **Tableau Desktop** - full version of Tableau
- [Tableau Public](#) - free version of limited Tableau.
- **Tableau Prep Build** - Clean and Prep data to create great visualizations.





# HOW DOES TABLEAU WORK?

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**When you launch Tableau, you are taken to the Welcome Screen**

- Connect
  - Source – File, Server
- Open
  - Projects you work on
- Discover
  - Instructional videos
  - Visualization of the Day
  - Blog dataset and other Resources

**Tableau logo – toggle between Welcome Screen and your projects**



# TABLEAU CONNECT

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Tableau connects and extracts data.



It can connect to virtually any data source, from .csv, .txt, .xlsx, to SQL servers and online public data bases.



Upload the **OfficeSupply** file to Tableau.

# TABLEAU CONNECT


LHS: Table Details which lists all the columns in the table

RHS: Grain of the data – what each row represent

Name

OfficeSupplies

Fields

Type	Field Name	Physical Table	Remote Fiel...
	Order Date	OfficeSupplies	OrderDate
Abc	Region	OfficeSupplies	Region
Abc	Rep	OfficeSupplies	Rep
Abc	Item	OfficeSupplies	Item
#	Units	OfficeSupplies	Units
#	Unit Price	OfficeSupplies	Unit Price
=#	Total Sales	Calculation	Calculation_...

OfficeSuppli...

Orde...

Abc  
OfficeSupplies  
Region

Abc  
OfficeSupplies  
Rep

Abc  
OfficeSupplies  
Item

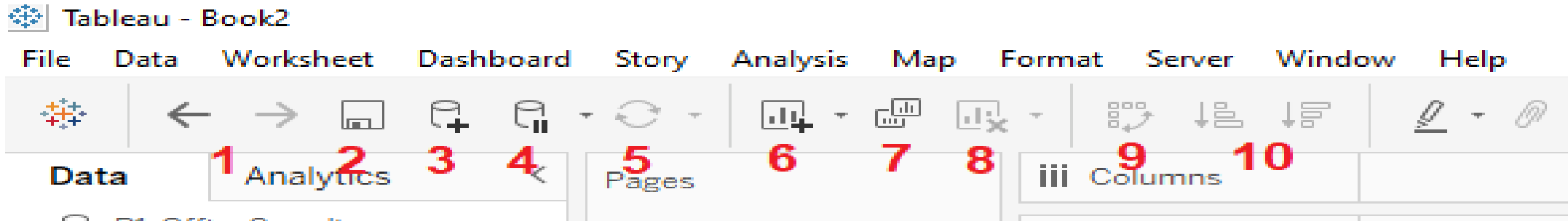
#  
OfficeS...  
U...

#  
OfficeSupplies  
Unit P...

=#  
Calculation  
Total...

7/4/2014	East	Richard	Pen Set	62	4.990	309.38
7/12/2014	East	Nick	Binder	29	1.990	57.71
7/21/2014	Central	Morgan	Pen Set	55	12.490	686.95
7/29/2014	East	Susan	Binder	81	19.990	1,619.19
8/7/2014	Central	Matthew	Pen Set	42	23.950	1,005.90
8/15/2014	East	Richard	Pencil	35	4.990	174.65
8/24/2014	West	James	Desk	3	275.000	825.00
9/1/2014	Central	Smith	Desk	2	125.000	250.00
9/10/2014	Central	Bill	Pencil	7	1.290	9.03
9/18/2014	East	Richard	Pen Set	16	15.990	255.84
9/27/2014	West	James	Pen	76	1.990	151.24

# ANATOMY OF WORKSHEET

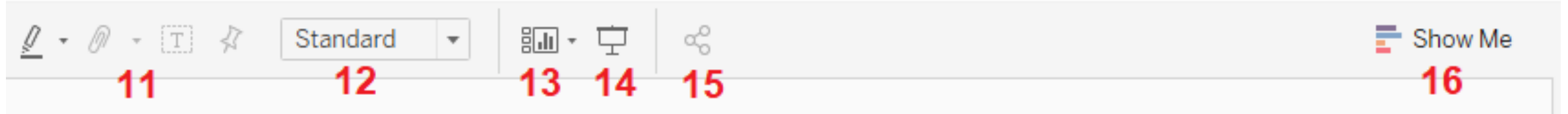


## Logo – take you the Welcome Screen

1. Undo and Redo
2. Save Icon
3. A new data source
4. Pause Auto updates
5. Run updates or Refresh the data

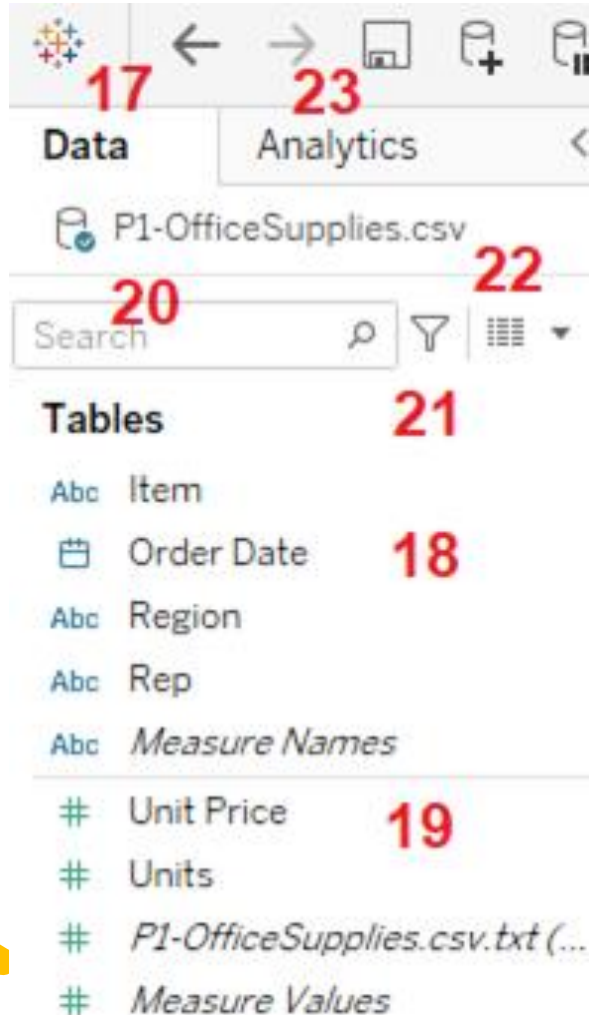
6. Add a new worksheet. Drop down arrow lets you add a new dashboard or story
7. Duplicate worksheets, dashboards or stories
8. Clear Sheet
9. Swap Rows and Columns
10. Sort

# ANATOMY OF WORKSHEET



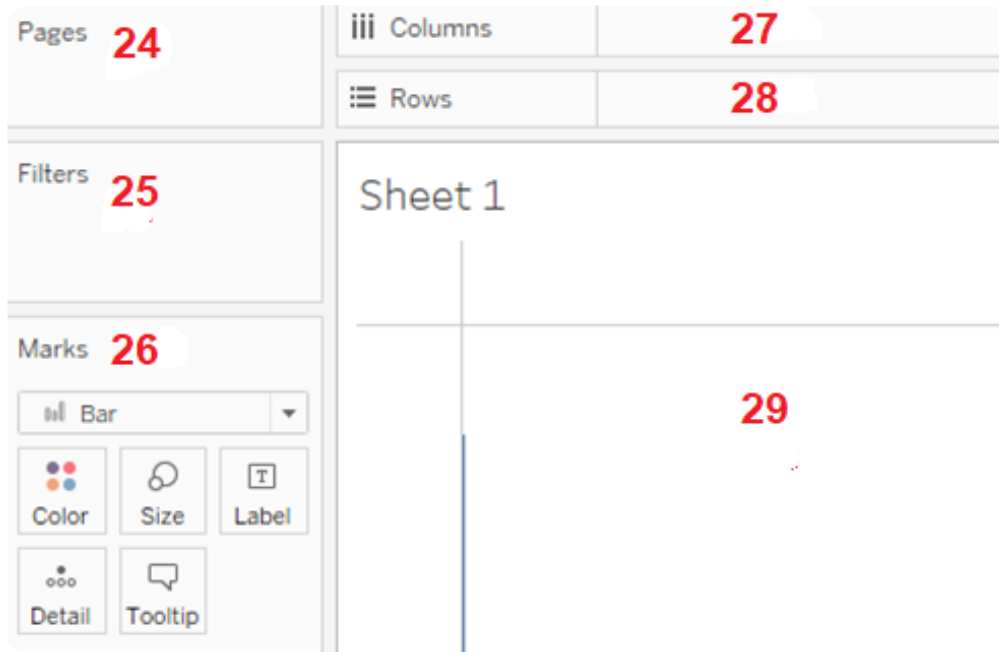
11. The next 4 icons – pen, paper clip, Text and dropdown– least used.
12. Adjusts the fit of your worksheet
  - Standard has no constraints.
  - Fit Width fit the width of your window.
  - Fit Height fits the height of your window
  - Entire View fits the width and height of your window.
13. Shows and Hides various fields available on the screen.
14. Presentation Mode – full screen option for your project
15. Share – share your project with others.
16. Show Me – visualization charts that you can create. There are more available besides these.

# ANATOMY OF WORKSHEET



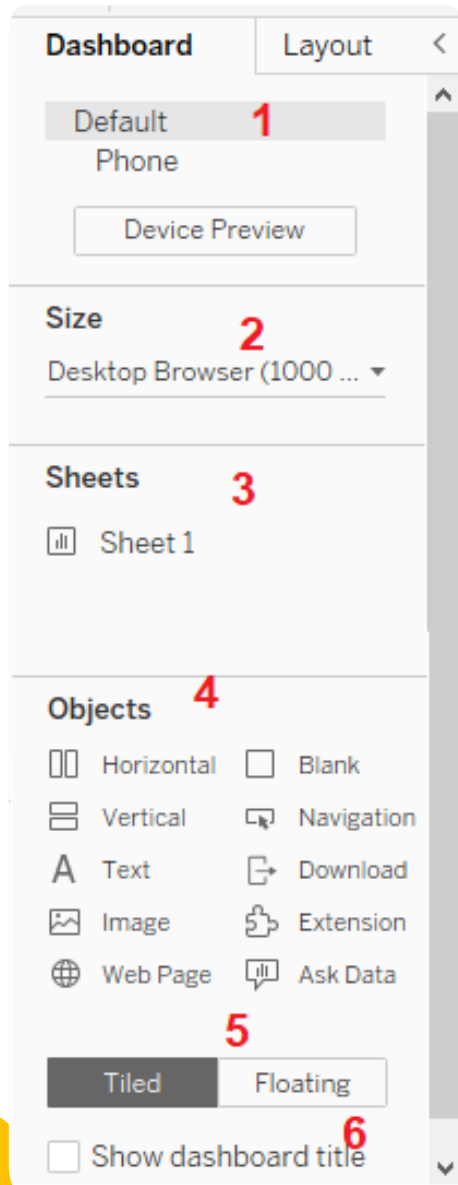
17. Data – data source you are connected too
18. Dimensions – non-numeric, descriptive data. Independent variable
  - Green - continuous data, Blue – discrete data
  - Measure Names – visualization not refereeing
19. Measures - numeric and calculated values. Dependent variable.
  - ID if numeric will appear here. You can move it to Dimensions.
  - Measure Values - visualization not referencing.
20. Search for fields within your Dimension and Measure
21. Filter your data
22. View data in a tabular format.
  - If you have calculated fields, they will show up in this view and not in raw data.

# ANATOMY OF WORKSHEET



- 24. Let's you break a view in a series of pages
- 25. Allows you to filter Dimensional categories
- 26. Marks is the powerhouse of Tableau
  - Dropdown lets you select the Mark Type.
  - Five buttons are clickable. You can move a field into different buttons.
  - All fields stack up at the bottom
  - You can edit fields - color, size, label, etc.
- 27. Columns – same as x axis. Goes across
- 28. Row – same as y axis. Goes down.
- 29. View – is where you see everything happen.





# ANATOMY OF DASHBOARD

1. **Device Preview.** allows you to see what your view look like on various devices; desktops, phones, and tablets, and rearrange things to best fit on each device.
2. **Size** - dashboard can be auto sized, fixed size or you can define a range of allowable sizes. Auto size is the best option.
3. **Sheets** – your worksheets will show here. When used you will see a blue check mark next to the name.
4. **Objects** - Horizontal and Vertical layouts, texts, images, or embedded a webpage. Add navigation buttons to the dashboard.
5. **Tiled/Floating** - worksheets are snapped to the dashboard or not.
6. **Dashboard Title** – default is the name of the sheet.

# ANATOMY OF DASHBOARD

**Selected item**  
Dashboard 1

☐ Show title **1**

☐ Floating **2**

Position

x y **3**

Size

w h **4**

1,000 800

Border

None **5**

Background

None **6**

Outer Padding

**7**

Inner Padding

**Item hierarchy 8**  
Dashboard 1

1. Show Dashboard Title if it has one
2. Make the title Floating if you wish.
3. Change the position of the object
4. Change the size of the object.
5. You can add borders to your objects.
6. Format the background color.
7. Padding - lets you add white space around the object
  - Inner & Outer is inside and outside the border of the object
  - Always good to have some white space around your objects.
8. Hierarchy – lists the hierarchy of your objects in the dashboard.

# BUILD A VISUALIZATION

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WORKSHEET – HAS ONE  
CHART



DASHBOARD - HAS  
MULTIPLE WORKSHEETS



STORY – HAS MULTIPLE  
DASHBOARDS

# BUILD A VISUALIZATION

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What question would your stakeholders ask when they view your visualization?



What questions do you want to address in the visualization you are building?

# BUILD A VISUALIZATION

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**What questions are we trying to answer?**

This is an important skill that you can apply elsewhere too.



## POTENTIAL QUESTIONS

What are the # of units and sales sold by region?

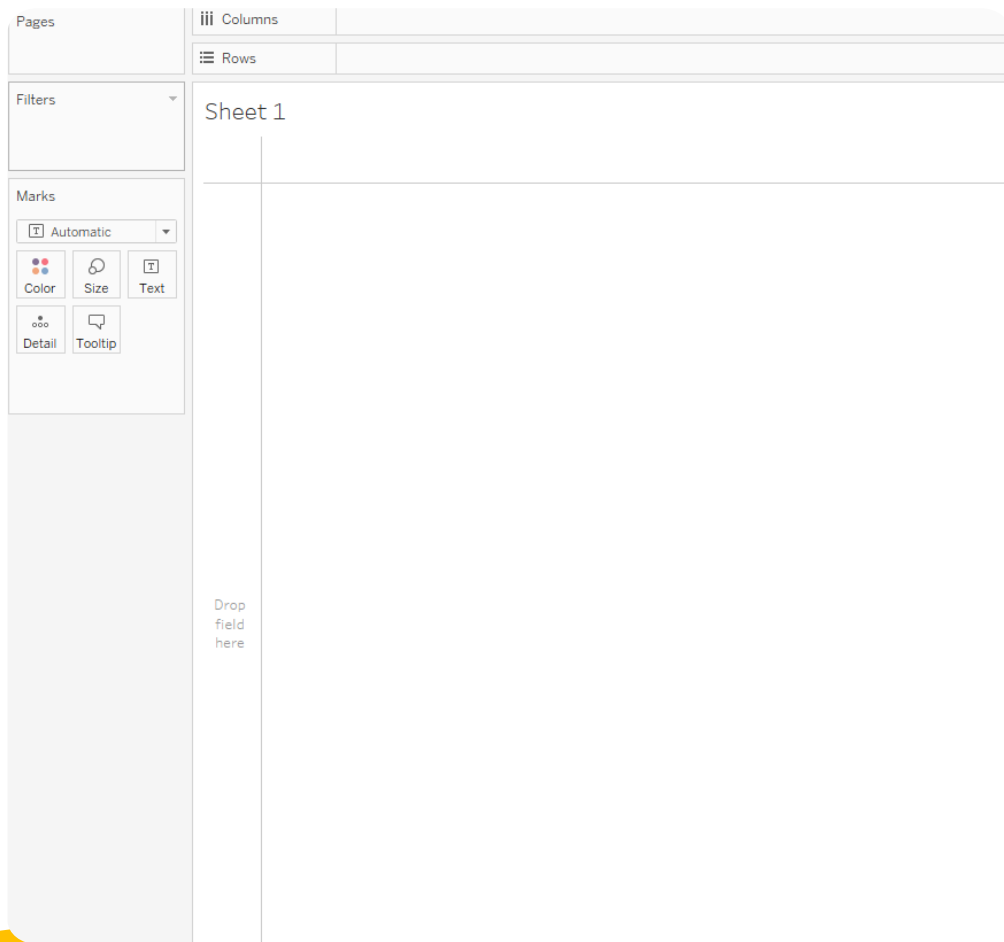
What are the # of units and sales sold by year?

Which rep sold the most in units and dollars by region?

Which rep sold the most in units and dollars by year?

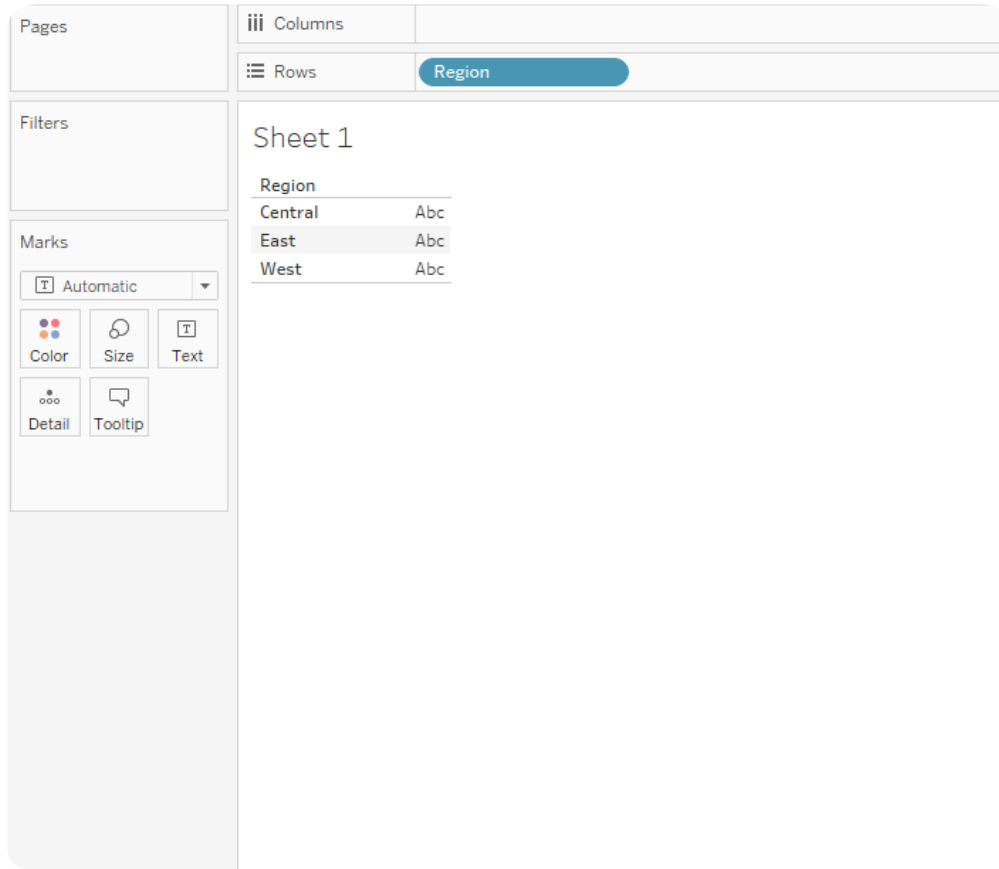
Which item sold the most by units and dollars by year?

Which item sold the most by units and dollars by region?



# BUILD A VISUALIZATION

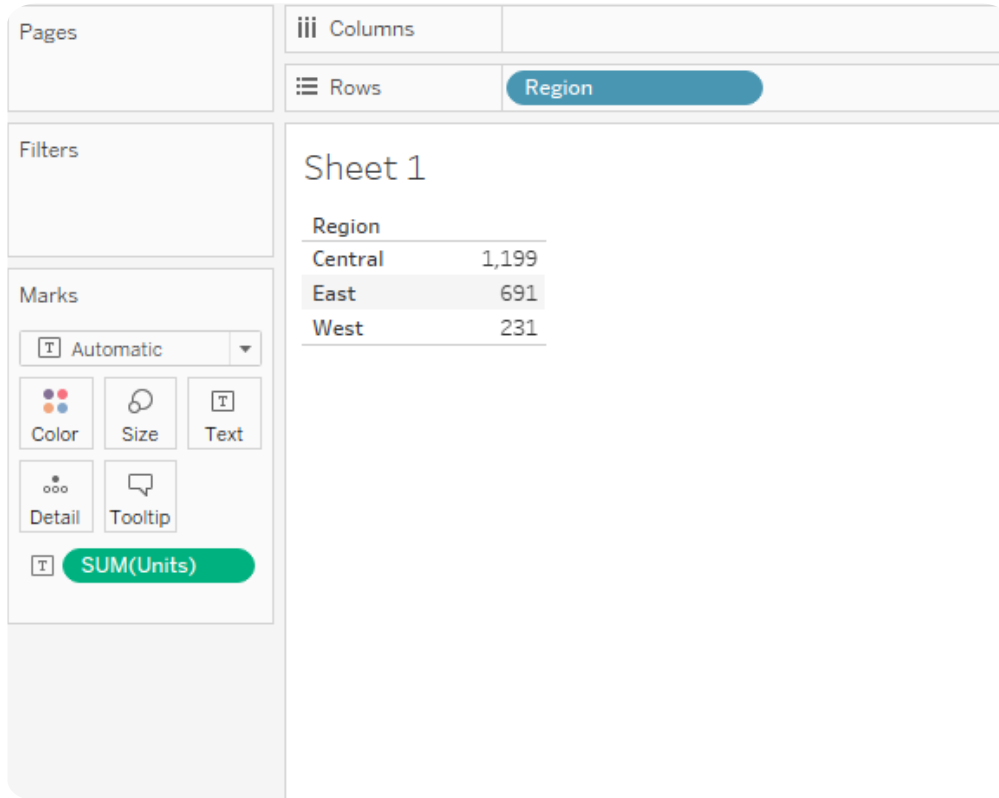
- Drag the region dimension into the center worksheet “drop field here”



# BUILD A VISUALIZATION

- Drag the **units** measure into the table

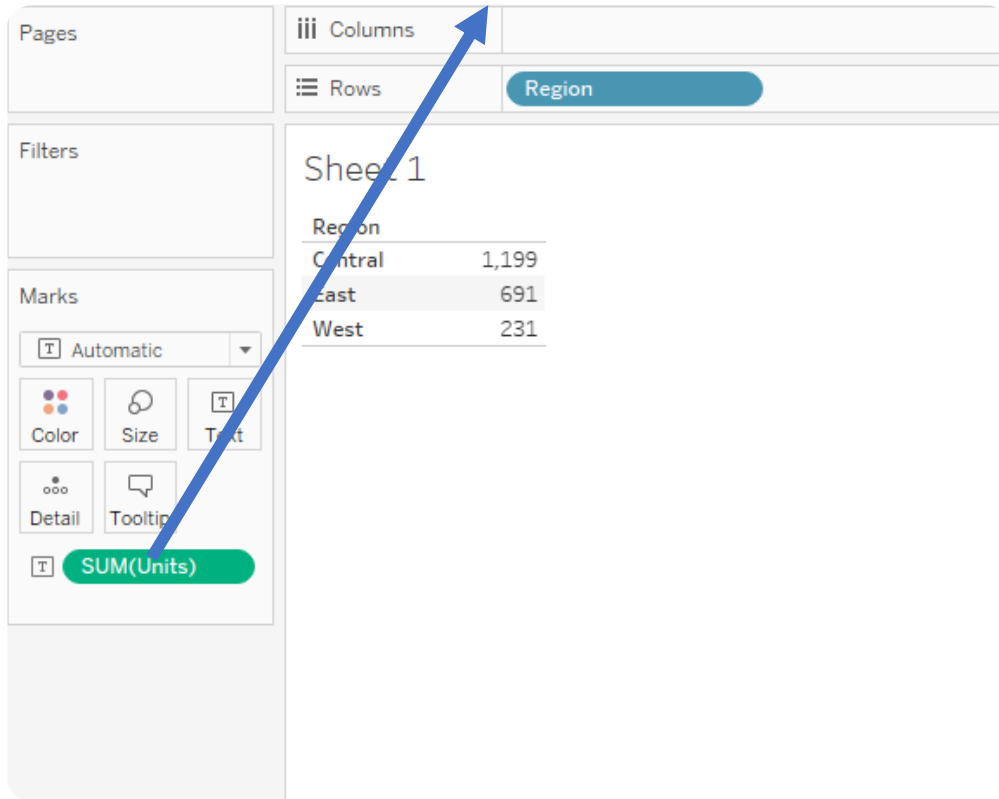
# BUILD A VISUALIZATION



- Drag the **units** measure into the table
- You can see that tableau has aggregated the data by region and is showing you how many units were sold for each region



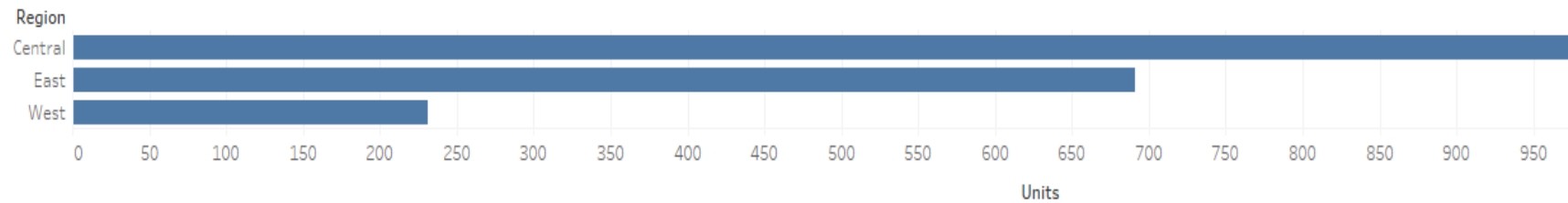
# BUILD A VISUALIZATION



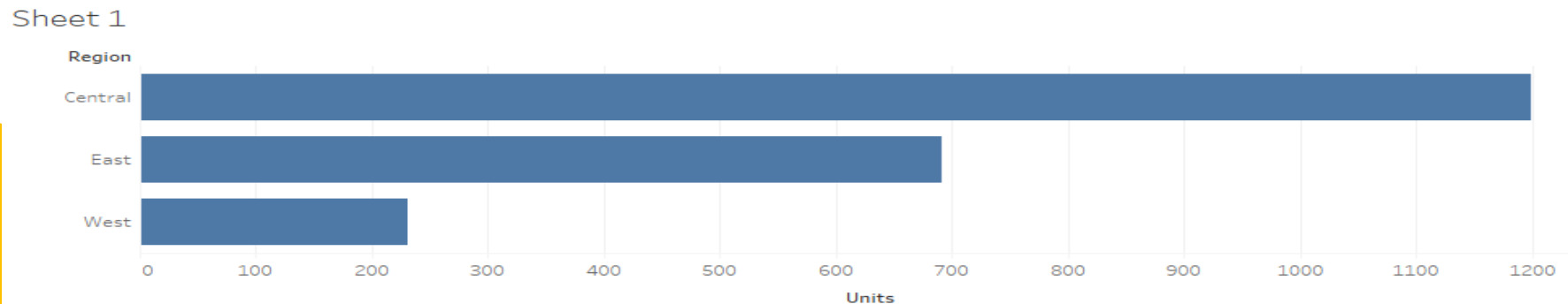
- Drag the **units** measure into the table
- You can see that tableau has aggregated the data by region and is showing you how many units were sold for each region

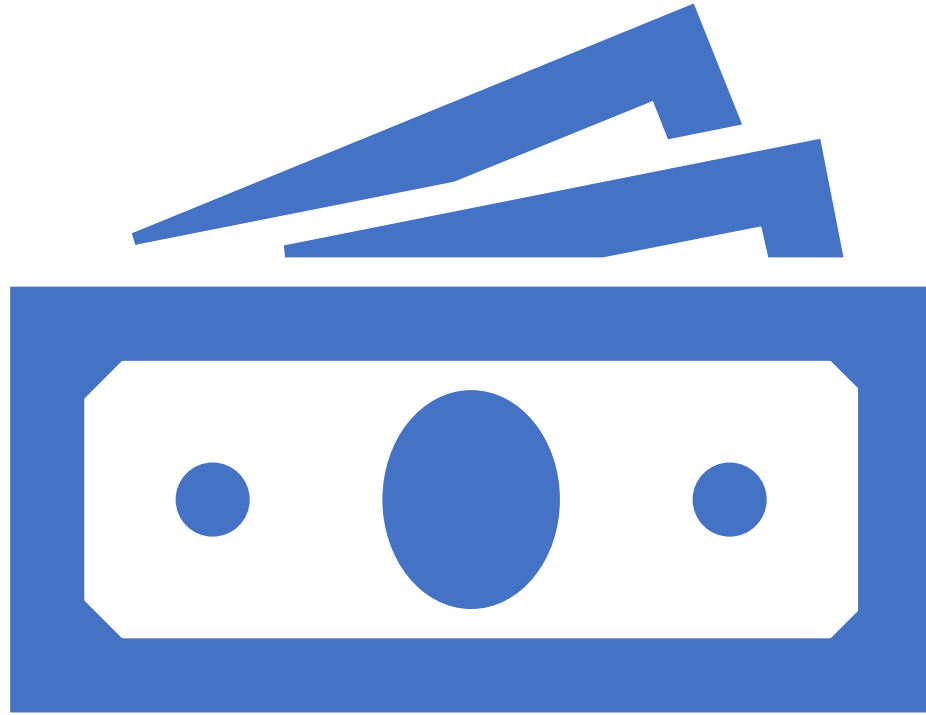
# BUILD A VISUALIZATION

- Tableau converts the tableau into a bar graph



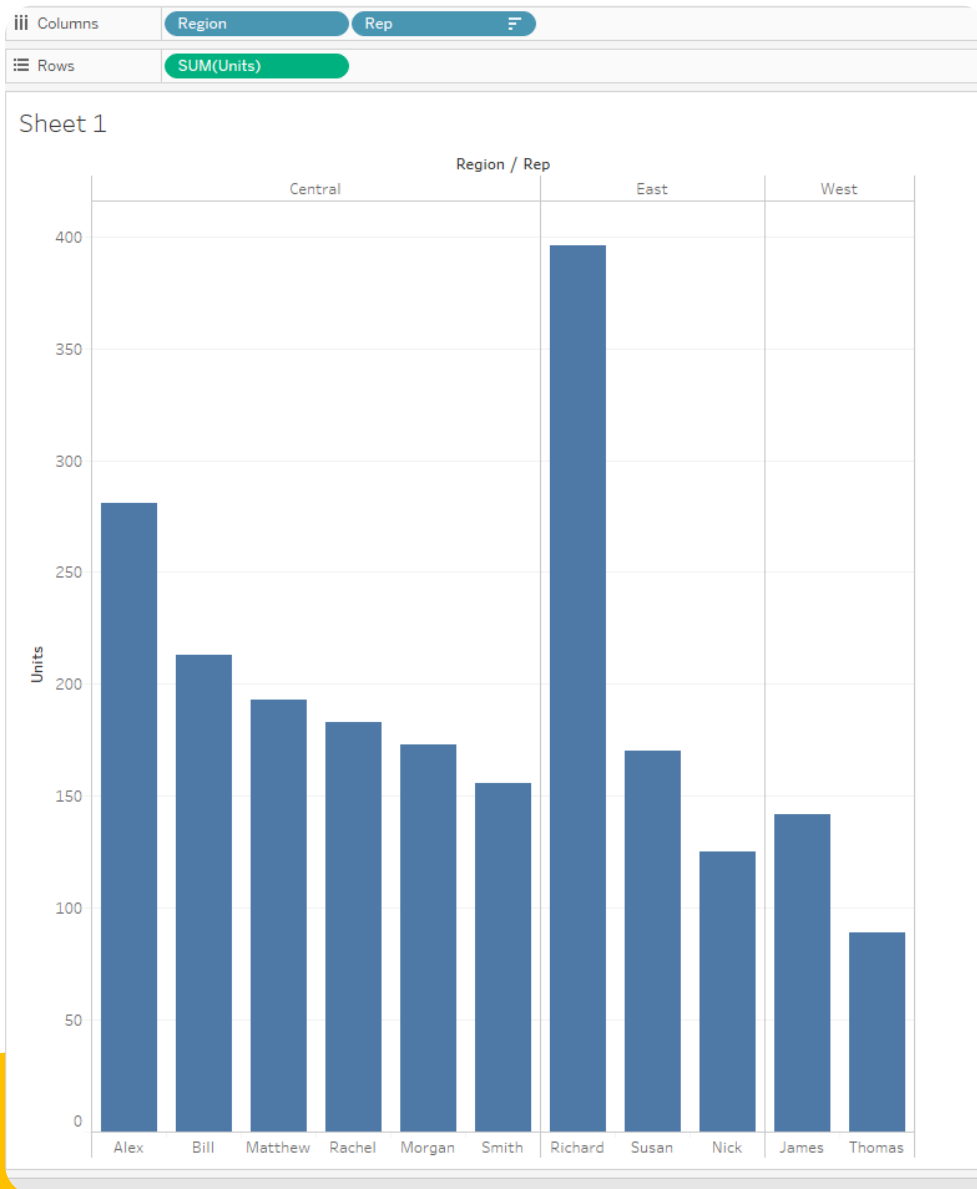
- We can also resize the graph by dragging the sides





# BONUS QUESTION

- It's the end of the work year and a company wants to hand out annual bonuses. The store operates in three regions and only the top performing employee in each region will qualify for a bonus.
- Which 3 employees are eligible to get a bonus for the year?
  - **Employees are measured on total sales in USD \$\$.**



# BONUS QUESTION

- Your solution might look like the following
- However, this does not show the total sales in \$\$ - rather, it shows the units!

# ASSIGNMENT - UNGRADED

- Watch the video [Designing Thinking for Data](#)
- Get familiar with the Anatomy of Tableau
- Visit Makeover Monday
- Visit Tableau Public

