



香港城市大學
City University of Hong Kong
Innovating into the Future





SDSC 5002 – Tutorial 3

First visualization using Tableau

LI Yanru

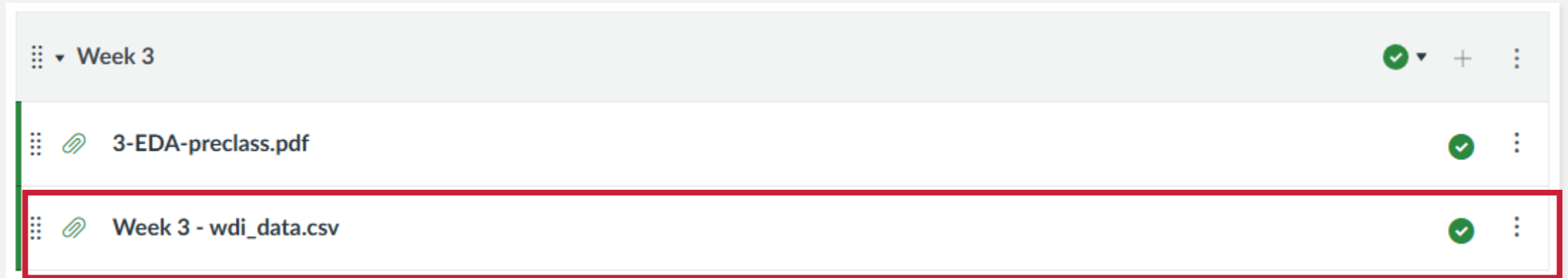
2025/09/17

Pre-tutorial

Week 1			✓	+	⋮
⋮		Quiz 1 Sep 3 2 pts	✓	⋮	
⋮		Week 1 - practice dataset.zip	✓	⋮	
⋮		1-Introduction.pdf	✓	⋮	
⋮		Tutorial 1 - Installing Tableau.pdf	✓	⋮	

Learning Objectives

- Learn basic Tableau conceptions (data types, file type, etc.)
- Use Tableau to draw worksheets



What is Tableau?

What is Tableau?

Tableau is a visual analytics platform transforming the way we use data to solve problems—empowering people and organizations to make the most of their data.

[Explore our Products](#)

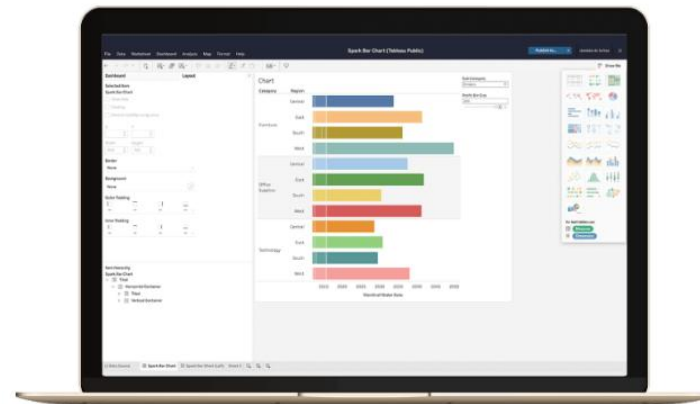









Tableau helps people and organizations be more data-driven

As the market-leading choice for modern business intelligence, our analytics platform makes it easier for people to explore and manage data, and faster to discover and share insights that can change businesses and the world.

Everything we do is driven by our mission to help people see and understand data, which is why our products are designed to put the user first—whether they're an analyst, data scientist, student, teacher, executive, or business user. From connection through collaboration, Tableau is the most powerful, secure, and flexible end-to-end analytics platform.

Data types in Tableau

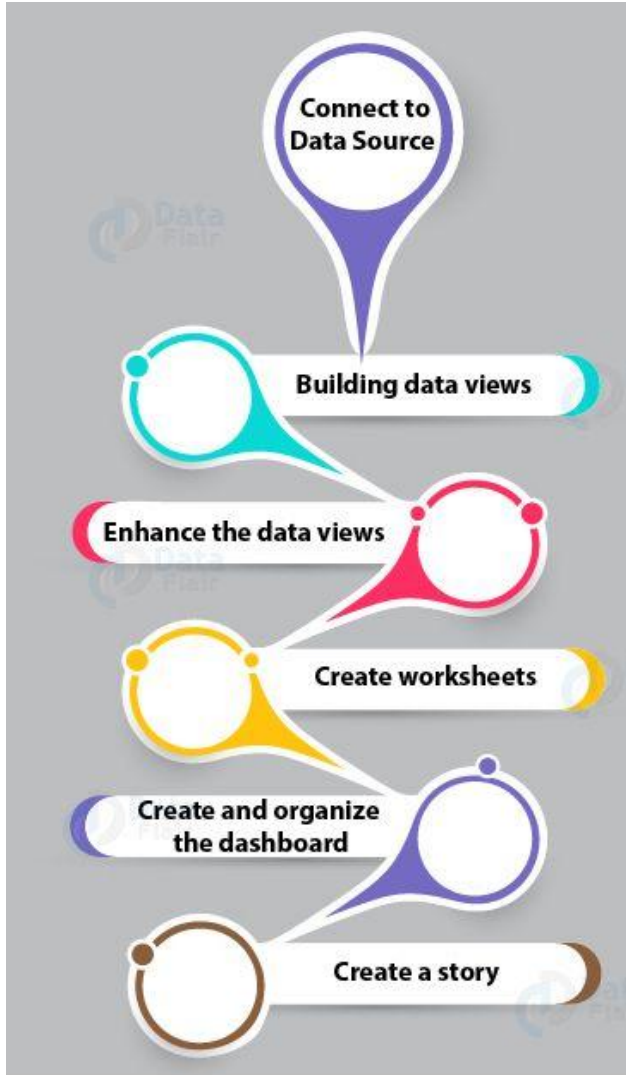
Icon	Data Type	Example
	Text (String) values	Name, Sport, Event “Eason” ‘Eason’
	Date values	30/09/2025 #1 October 2025
	Date & Time values	
	Numerical values	Weight, Height
	Boolean values	True or False
	Geographical values	City
	Cluster or Mixed values	

File types in Tableau

- .twb – Tableau Workbook
- .twbx – Tableau Packaged Workbook
- .tds – Tableau Data Source
- .tbm – Tableau Bookmark
- .tde – Tableau Data Extract
- .tdsx – Tableau Packaged Data Source
- .tps – Tableau Preferences

ref: [Tableau File Types and Folders - Tableau](#)

Design flow in Tableau



6 Key Steps

1. **Connect to Data Source**

Links to data sources via built-in connectors.

2. **Building Data Views**

Build custom views with drag-and-drop as base reports.

3. **Enhance the Data Views**

Improve views with filters, aggregations, axis labels, color formatting, and borders.

4. **Create Worksheets**

Make separate worksheets for different views (same/different data).

5. **Create and Organize the Dashboard**

Combine multiple interconnected worksheets, actions in any worksheet will update results in the dashboard.

6. **Create a Story**

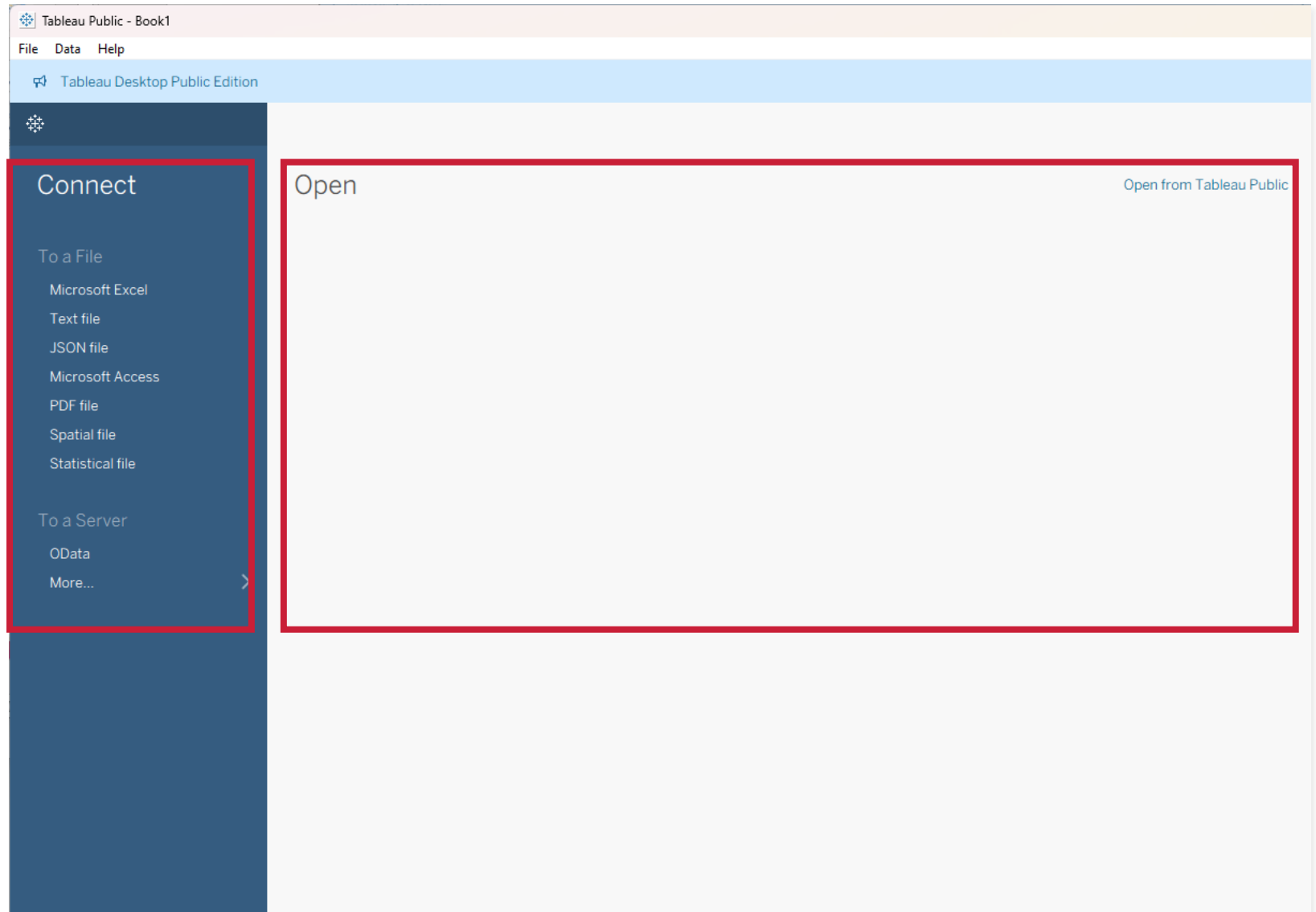
Use the created worksheets/dashboards to build stories that share context, connect facts, or support arguments.

ref: <https://data-flair.training/blogs/tableau-design-flow/>

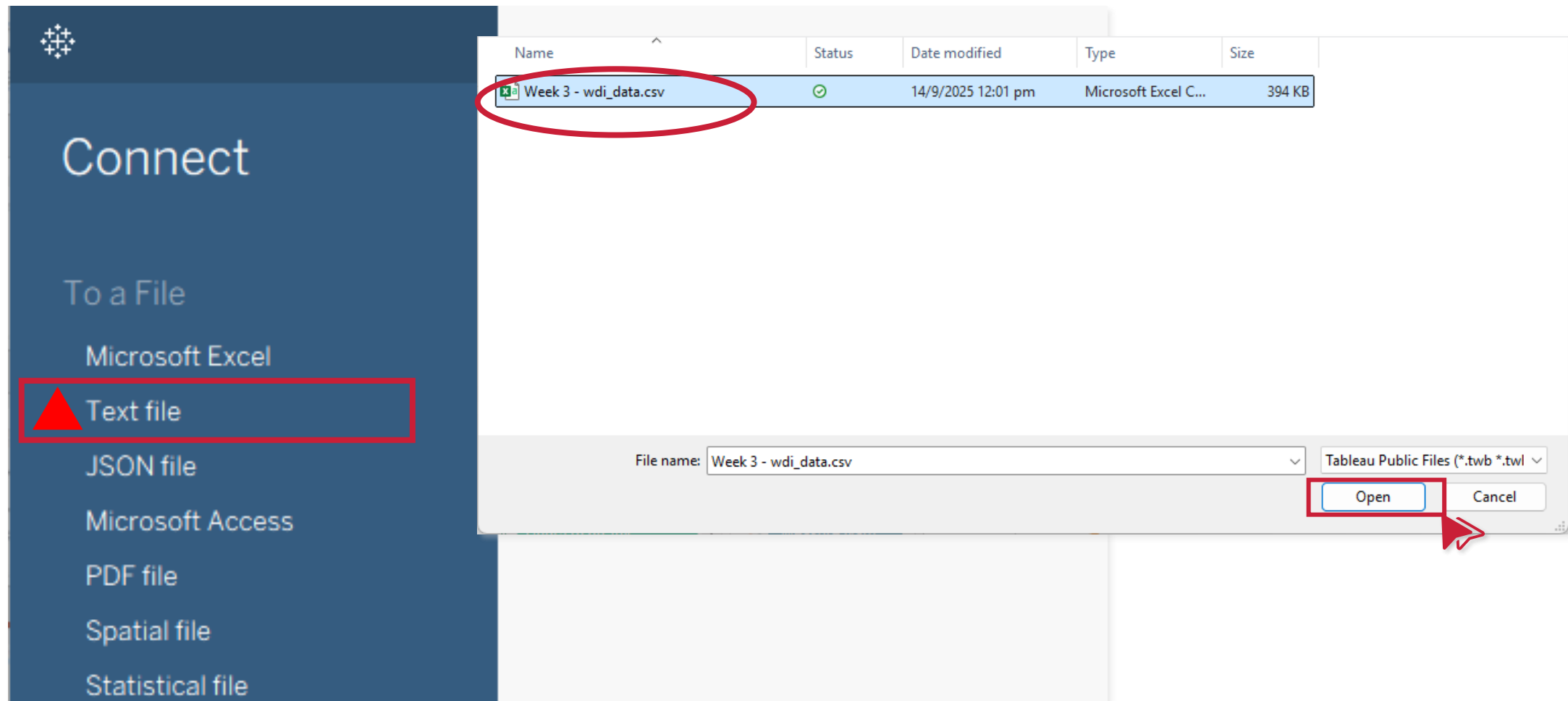
The first thing

Several options for connecting Tableau to your data:

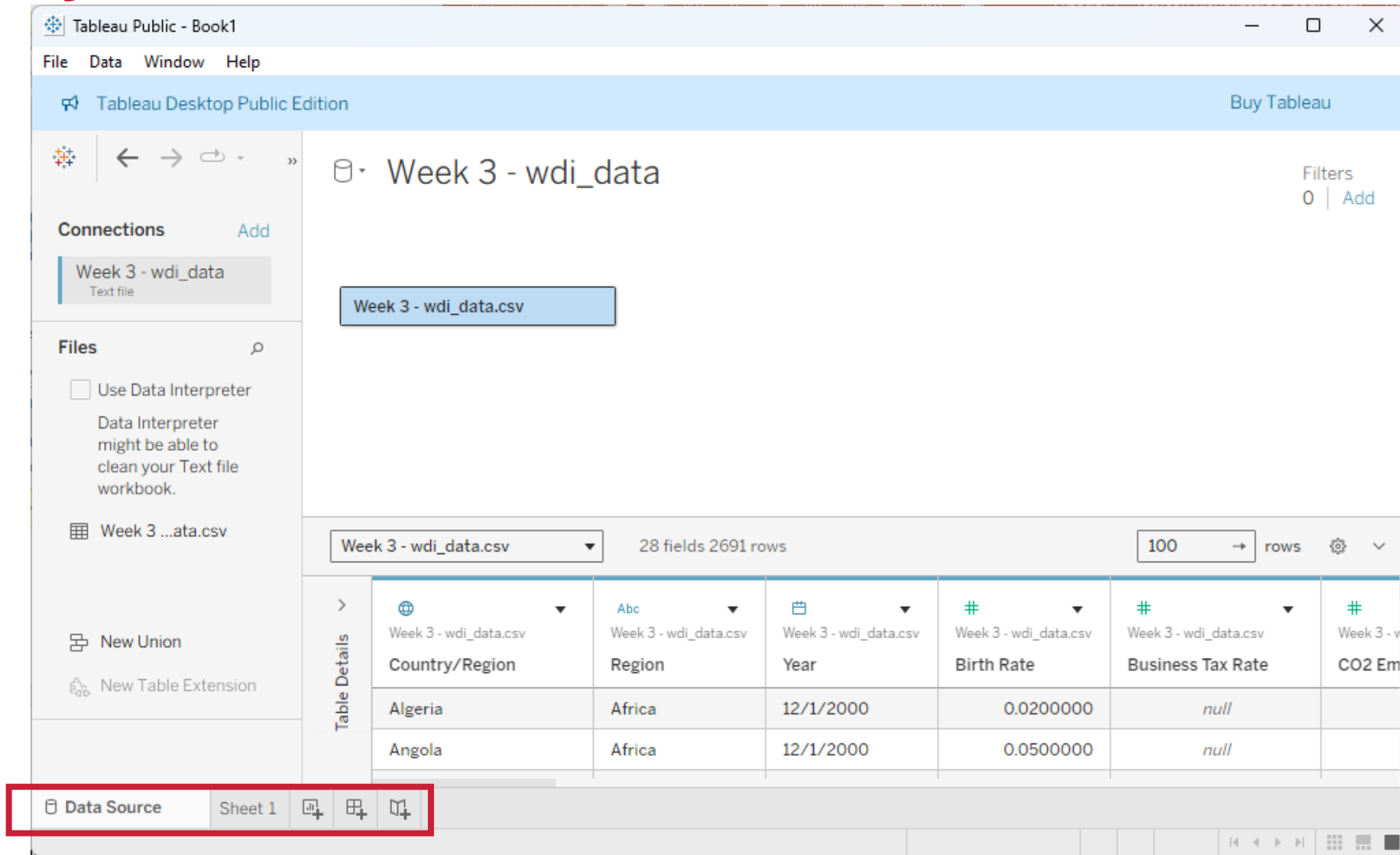
- to a file
- to a server



The simplest way to connect to your data



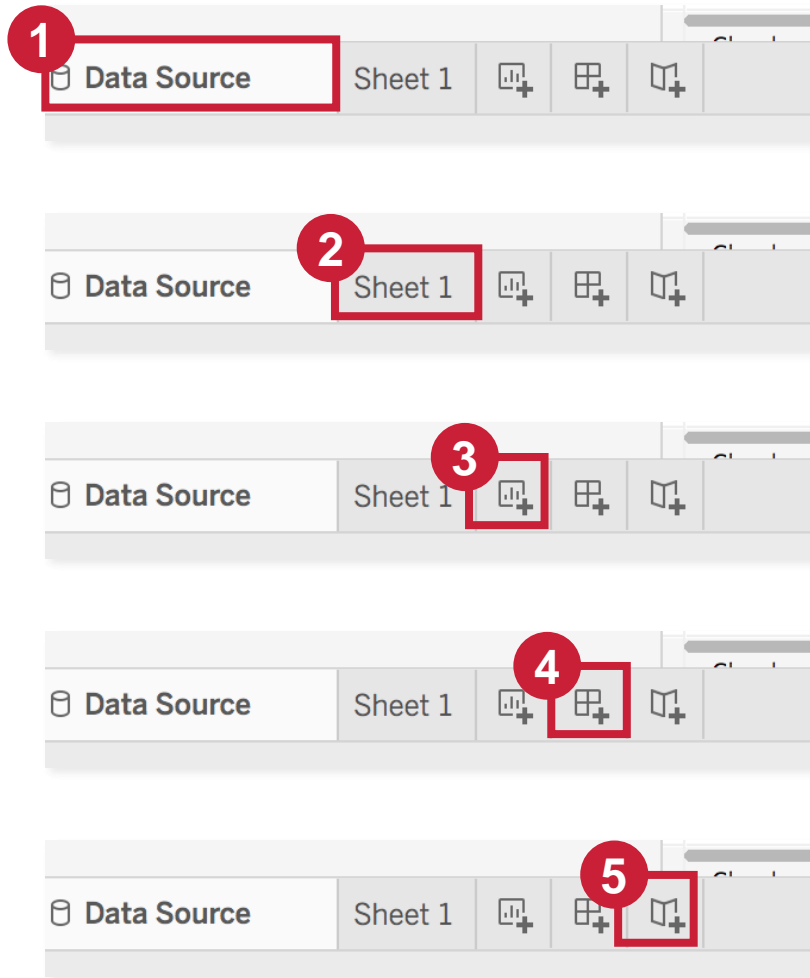
Start your first visualization



The screenshot shows the Tableau Public Desktop interface. The left sidebar contains the 'Connections' pane with 'Week 3 - wdi_data' (Text file) selected, and the 'Files' pane with 'Week 3 ...ata.csv' listed. The main workspace displays 'Week 3 - wdi_data' with a 'Filters' button. Below this, a table preview is shown for 'Week 3 - wdi_data.csv', indicating 28 fields and 2691 rows. The table has columns for Country/Region, Region, Year, Birth Rate, Business Tax Rate, and CO2 Em. The bottom status bar shows 'Data Source' selected, along with 'Sheet 1' and icons for visualization types.

Country/Region	Region	Year	Birth Rate	Business Tax Rate	CO2 Em
Algeria	Africa	12/1/2000	0.0200000	null	
Angola	Africa	12/1/2000	0.0500000	null	

Start your first visualization



- 1 Data Source: overview of the data
- 2 Worksheet : work place for data visualization
- 3 New Worksheet
- 4 New Dashboard
- 5 New Story

Data Source Overview

Week 3 - wdi_data.csv 28 fields 2691 rows 100 rows

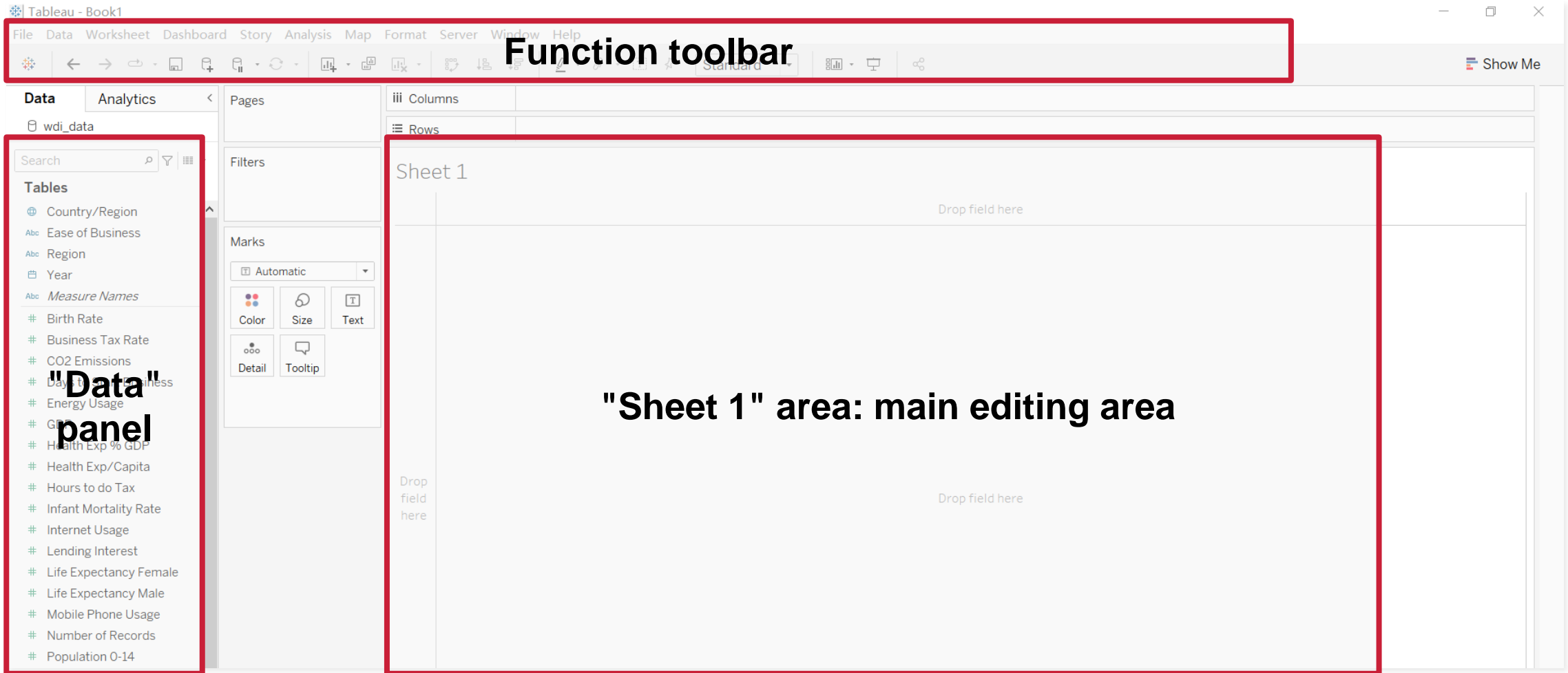
Country/Region	Region	Year	Birth Rate	Business Tax Rate
Algeria	Africa	12/1/2000	0.0200000	null
Angola	Africa	12/1/2000	0.0500000	null
Benin	Africa	12/1/2000	0.0430000	null
Botswana	Africa	12/1/2000	0.0270000	null
Burkina Faso	Africa	12/1/2000	0.0460000	null
Burundi	Africa	12/1/2000	0.0420000	null
Cameroon	Africa	12/1/2000	0.0410000	null
Central African Republic	Africa	12/1/2000	0.0390000	null
Chad	Africa	12/1/2000	0.0510000	null
Comoros	Africa	12/1/2000	0.0200000	null

Changing data type

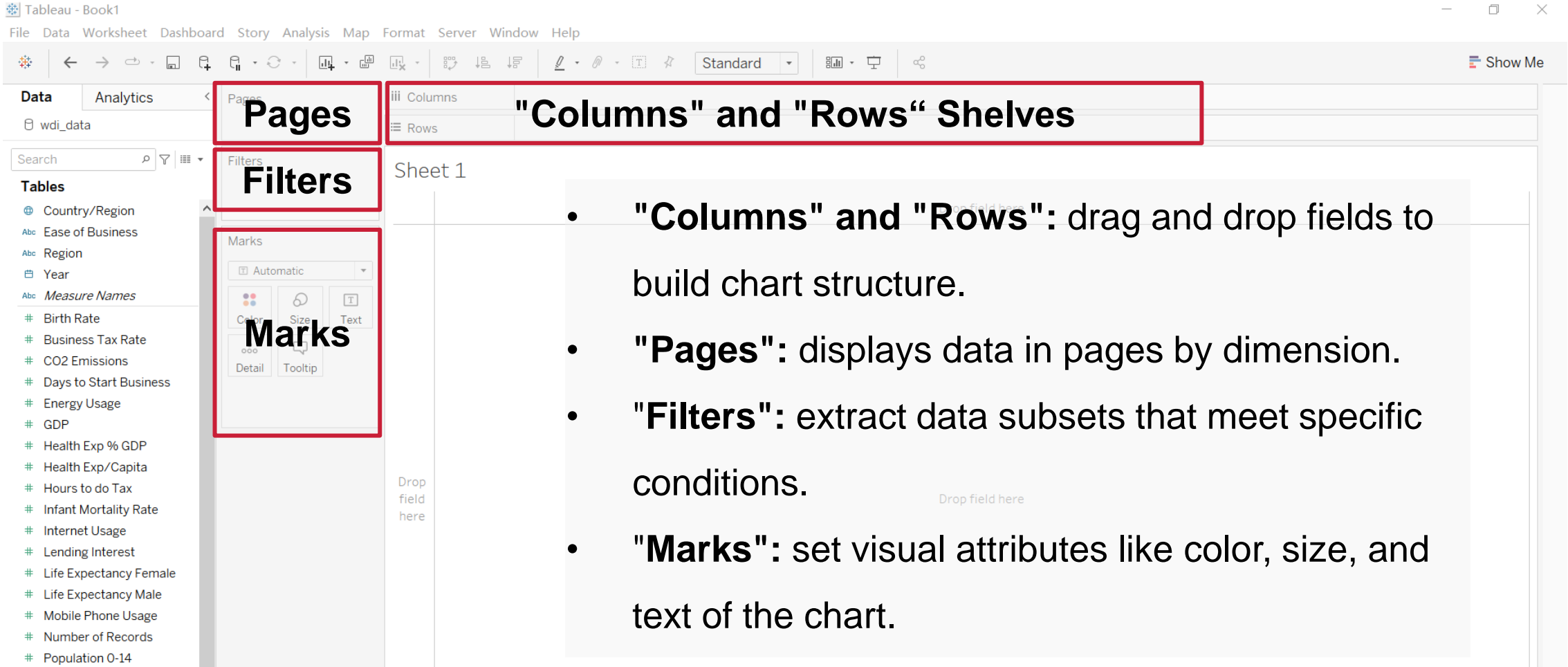
The screenshot shows a data management interface with a table titled "Week 3 - wdi_data.csv" containing 28 fields and 2691 rows. A dropdown menu is open, showing options for changing the data type of a selected field. The options are: Number (decimal), Number (whole), Date & Time, Date, String (checked), Boolean, Default (checked), Geographic Role, and Image Role. The "Data Source" tab is selected in the bottom left corner.

Field	Year	Birth Rate	Business Tax Rate
Week 3 - wdi_data.csv	12/1/2000	0.0200000	null
Week 3 - wdi_data.csv	12/1/2000	0.0500000	null
Week 3 - wdi_data.csv	12/1/2000	0.0430000	null
Week 3 - wdi_data.csv	12/1/2000	0.0270000	null
Week 3 - wdi_data.csv	12/1/2000	0.0460000	null
Week 3 - wdi_data.csv	12/1/2000	0.0420000	null
Week 3 - wdi_data.csv	12/1/2000	0.0410000	null

Worksheet interface



Worksheet interface



The screenshot shows the Tableau interface with the following components highlighted:

- Pages**: Located at the top left, below the menu bar.
- Filters**: Located below the Pages shelf.
- Marks**: Located below the Filters shelf.
- "Columns" and "Rows" Shelves**: Located at the top right, below the toolbar.

The main workspace shows a blank chart area with the text "Drop field here" and a "Sheet 1" tab.

- **"Columns" and "Rows"**: drag and drop fields to build chart structure.
- **"Pages"**: displays data in pages by dimension.
- **"Filters"**: extract data subsets that meet specific conditions.
- **"Marks"**: set visual attributes like color, size, and text of the chart.

Drag and drop

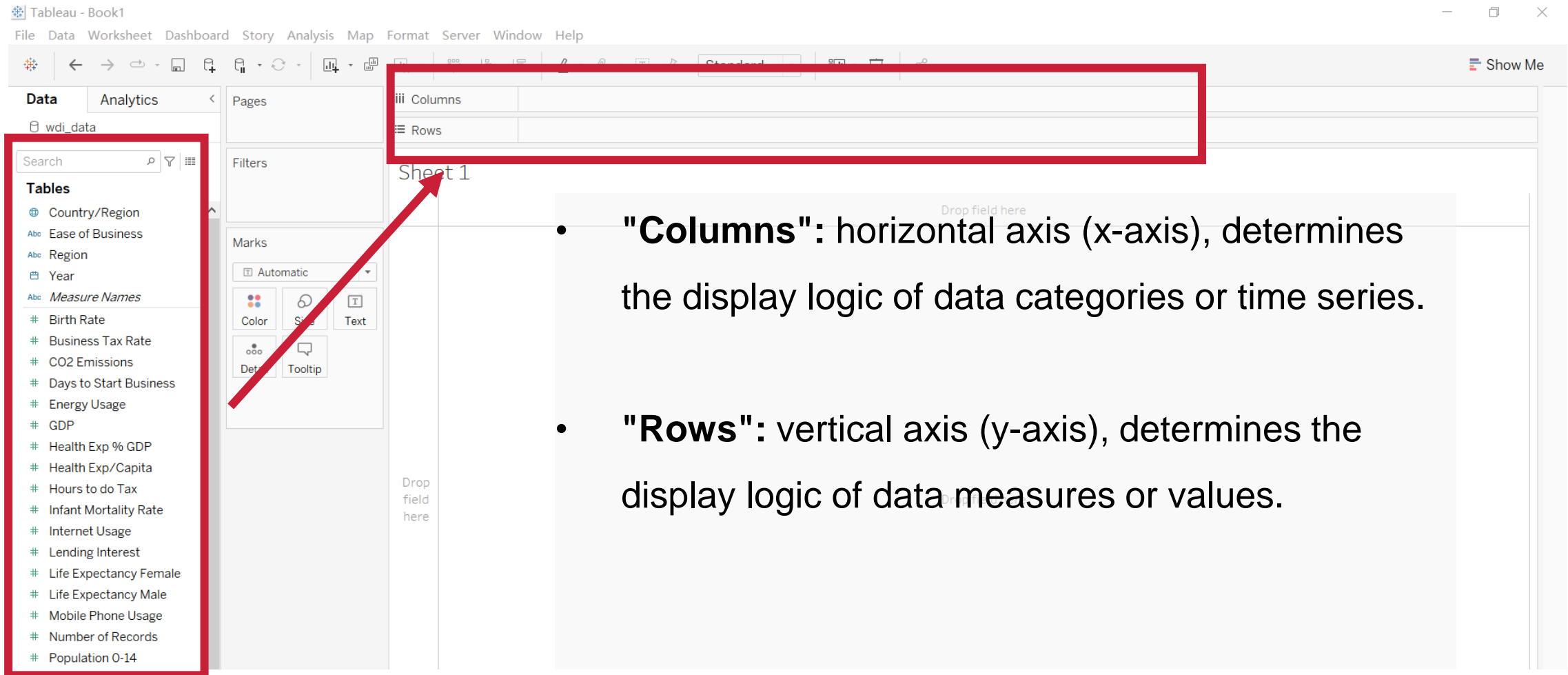


Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Columns

Rows

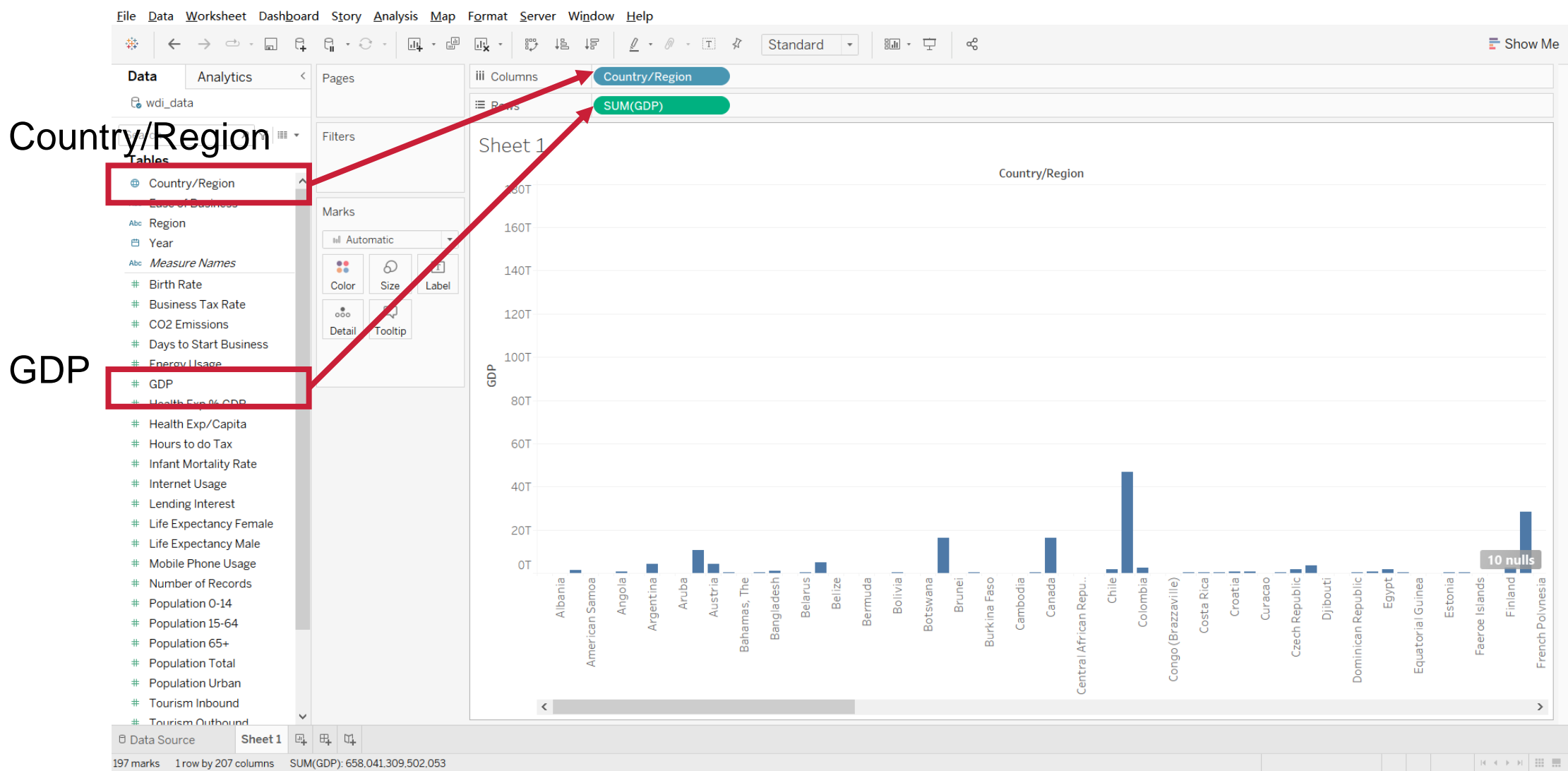
Sheet 1

Drop field here

Drop field here

- **"Columns"**: horizontal axis (x-axis), determines the display logic of data categories or time series.
- **"Rows"**: vertical axis (y-axis), determines the display logic of data measures or values.

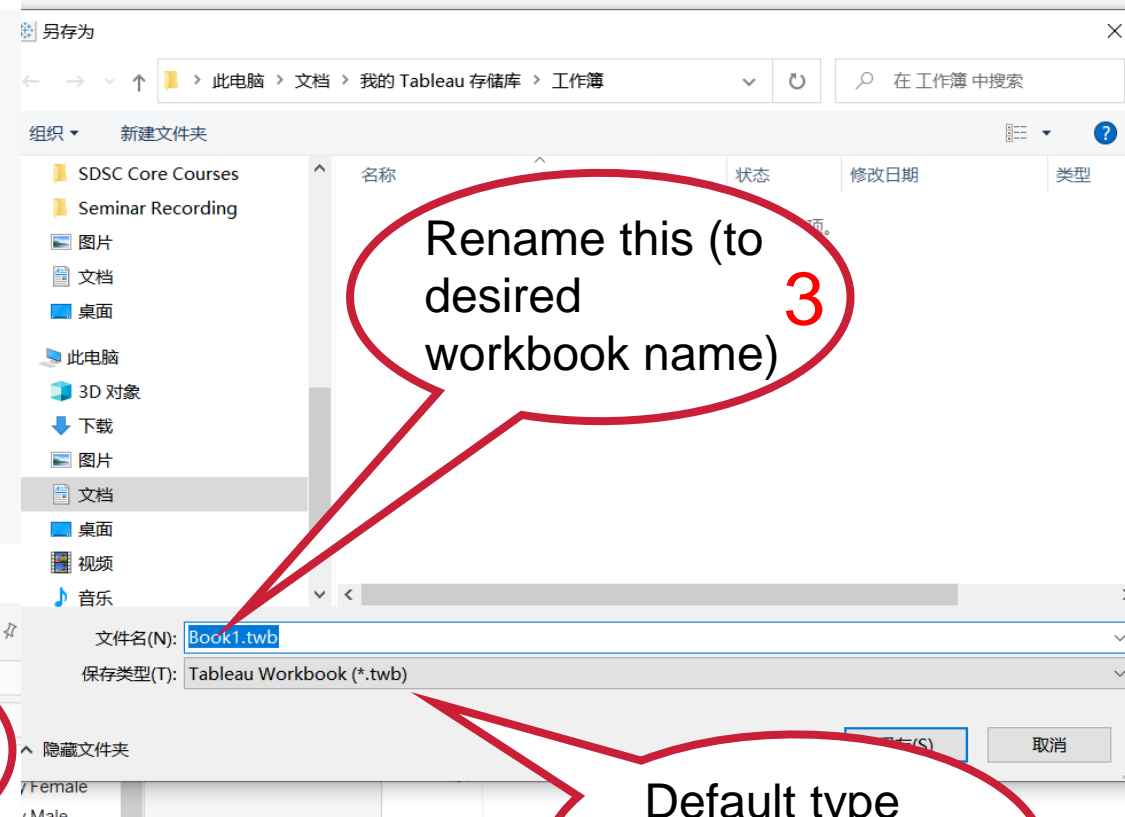
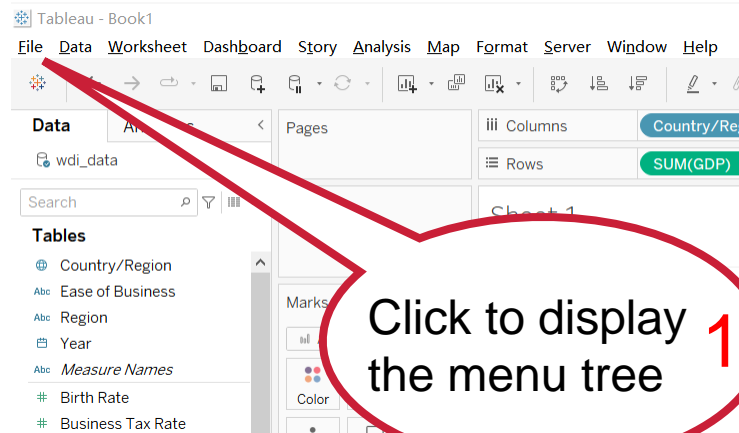
Drag and drop



Changing data type

The screenshot displays the Tableau Desktop interface. On the left, the 'Tables' pane lists various data sources. The 'Region' field is highlighted, and its data type dropdown menu is open, showing options like 'Number (decimal)', 'Number (whole)', 'Date & Time', 'Date', 'String' (which is selected), 'Spatial', 'Boolean', and 'Default' (which is checked). Below these, the 'Geographic Role' option is visible. The main workspace shows 'Sheet 1' with 'Drop field here' prompts. The bottom status bar indicates 'Data Source' and 'Sheet 1'.

Save your workbook



.twbx format
saves both
data and
Tableau
workbooks.

Start Building a Visualization in Tableau

Using World Development Indicators (WDI) data (wdi_data.csv)

Data description

	Number	Description
Row	2692 (one for the header)	Each row corresponds to a country status at the recording year
Column	27	Country/Region, Region, Year, Birth Rate, Business Tax Rate, CO2 Emissions, Days to Start Business, Ease of Business, Energy Usage, GDP, Health Exp % GDP, Health Exp/Capita, Hours to do Tax, Infant Mortality Rate, Internet Usage, Lending Interest, Life Expectancy Female, Life Expectancy Male, Mobile Phone Usage, Number of Records, Population 0-14, Population 15-64, Population 65+, Population Total, Population Urban, Tourism Inbound, Tourism Outbound

Questions

Given: WDI data

Objective:

Using Tableau to answer questions with simple graphs and some descriptive data

Questions:

1. What is the trend of global GDP from 2000 to 2012?
2. What is the relationship of GDP and CO2 from 2000 to 2012 for each country?

Extension:

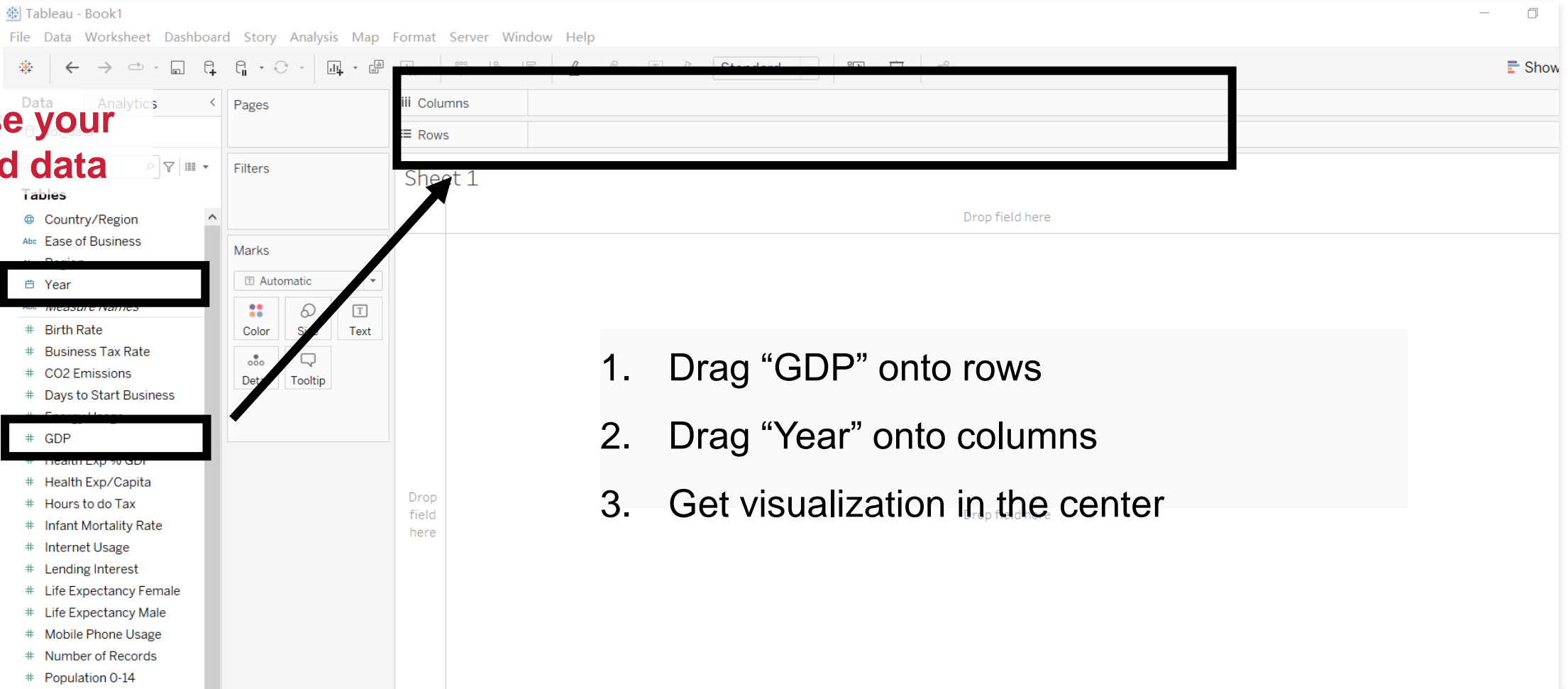
1. Distribution of variables.
2. Trends of GDP and CO2 emissions over different years.

Q1: What is the trend of global GDP from 2000 to 2012?

Choose your desired data

Year

GDP

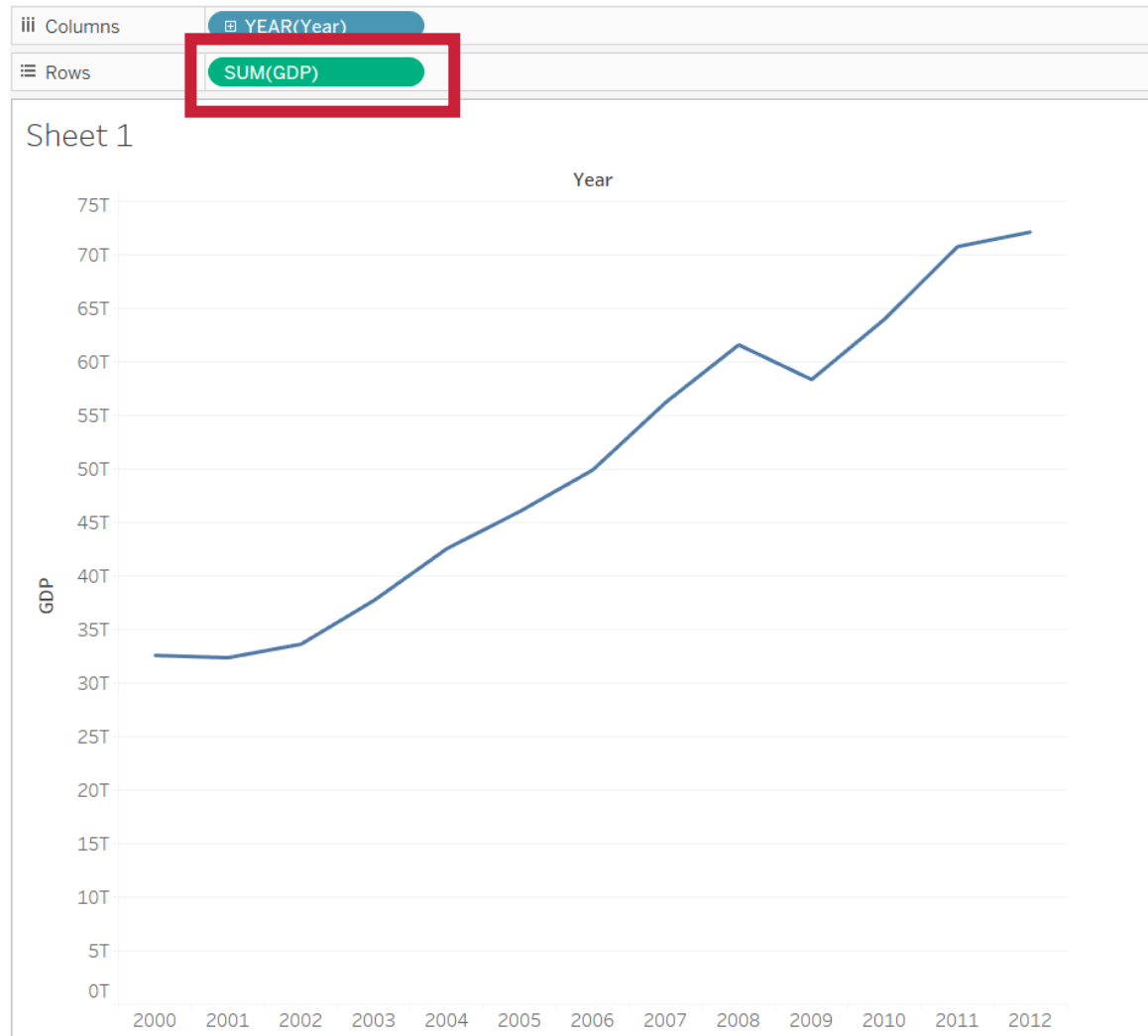


1. Drag “GDP” onto rows

2. Drag “Year” onto columns

3. Get visualization in the center

Q1: What is the trend of global GDP from 2000 to 2012?

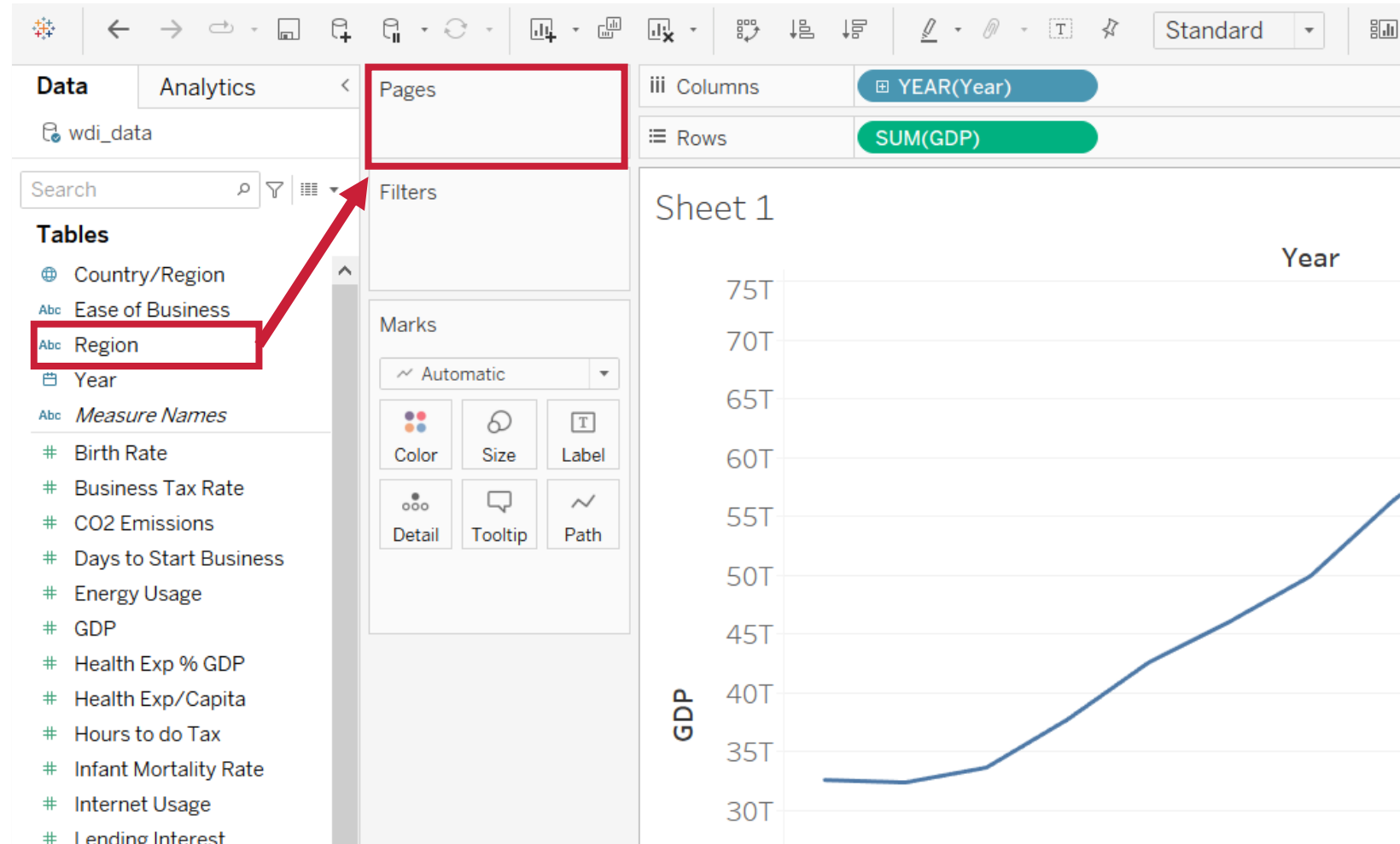


- What “SUM” means?
- What if we want the GDP data for a specific region?

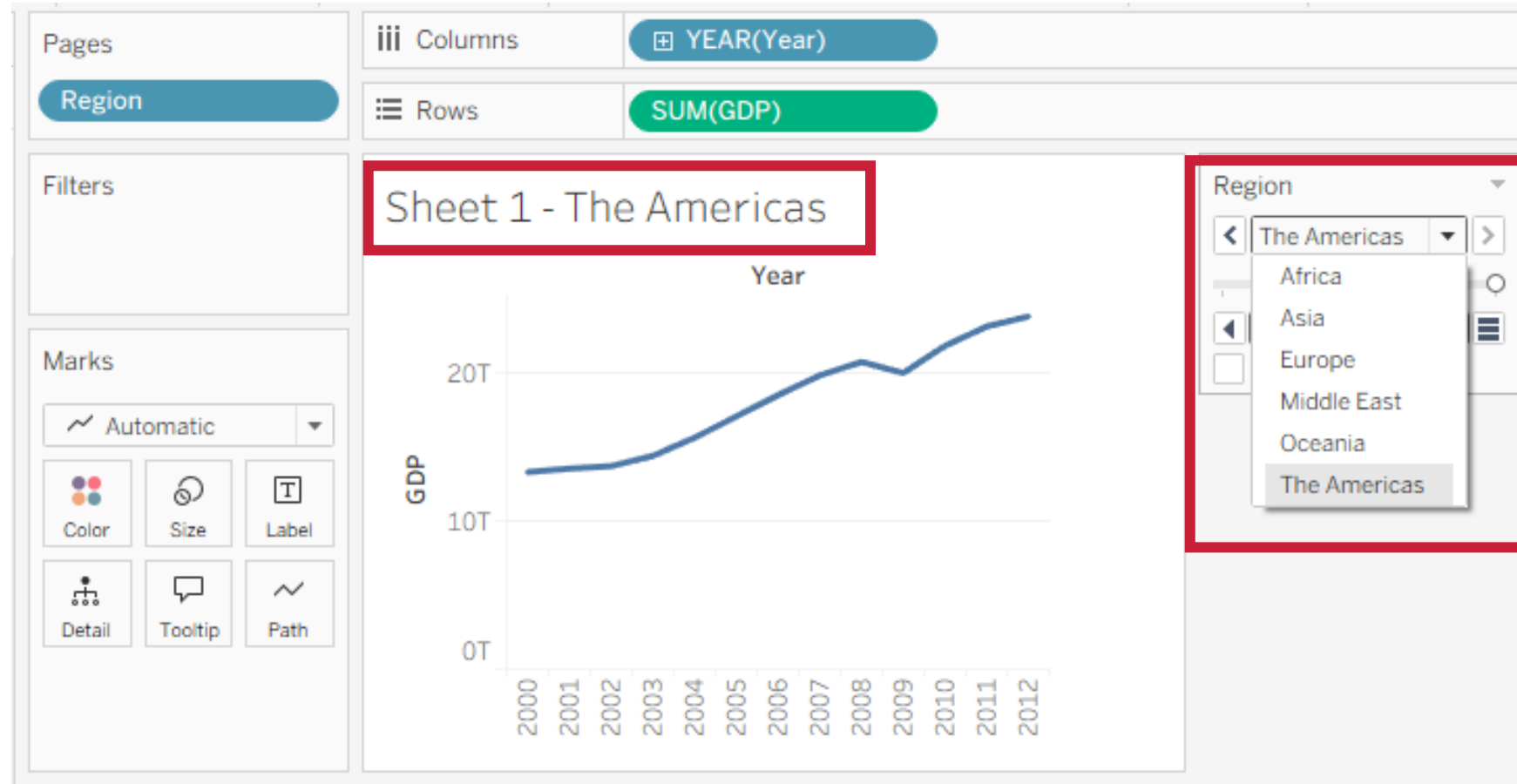
Q1: What is the trend of global GDP from 2000 to 2012?

- **Page Function:** provides sequential visualizations of data subsets based on different dimension values

Region



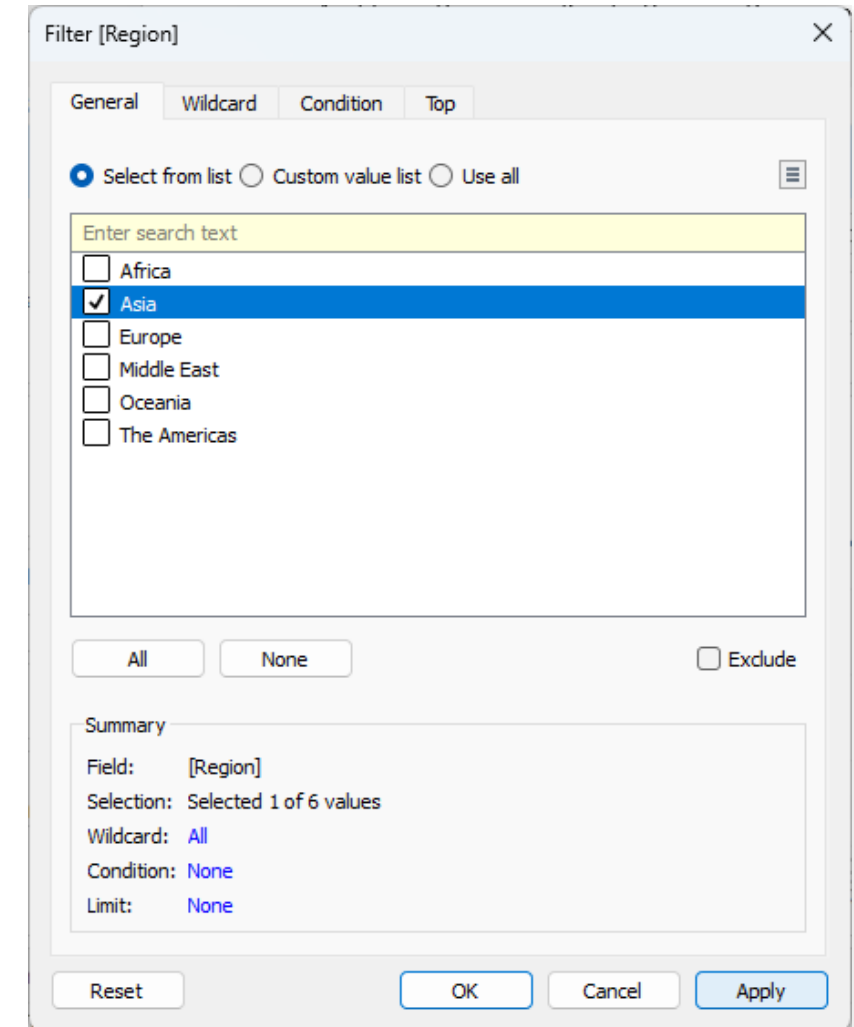
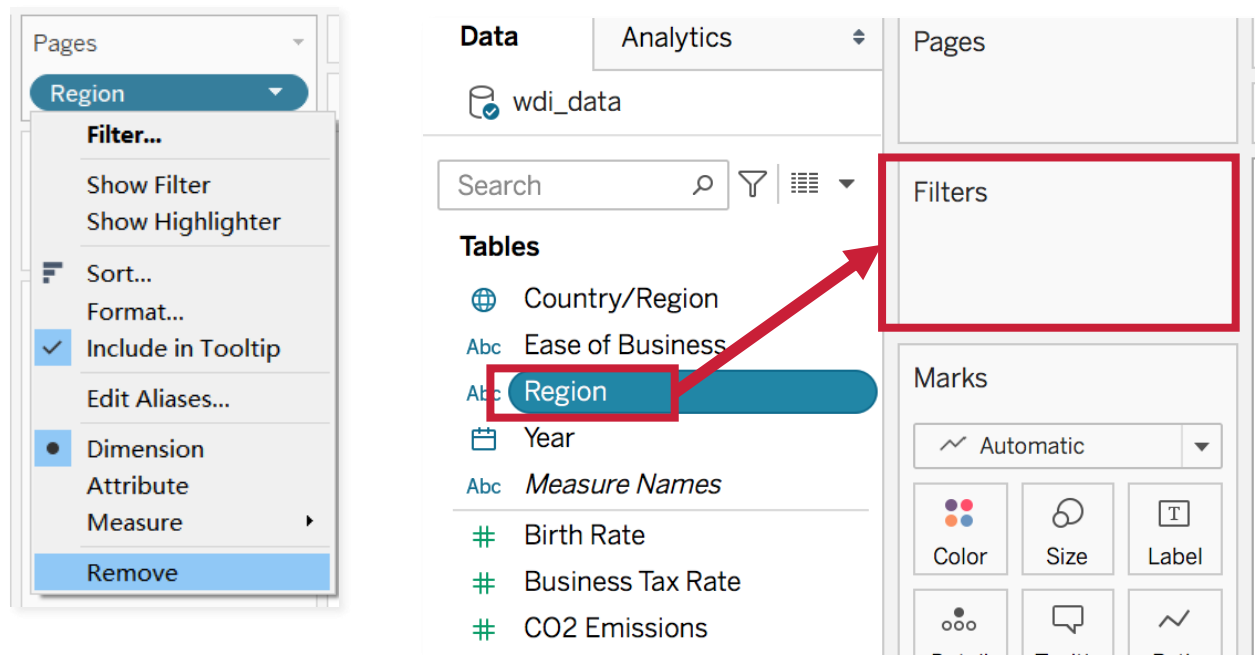
Q1: What is the trend of global GDP from 2000 to 2012?



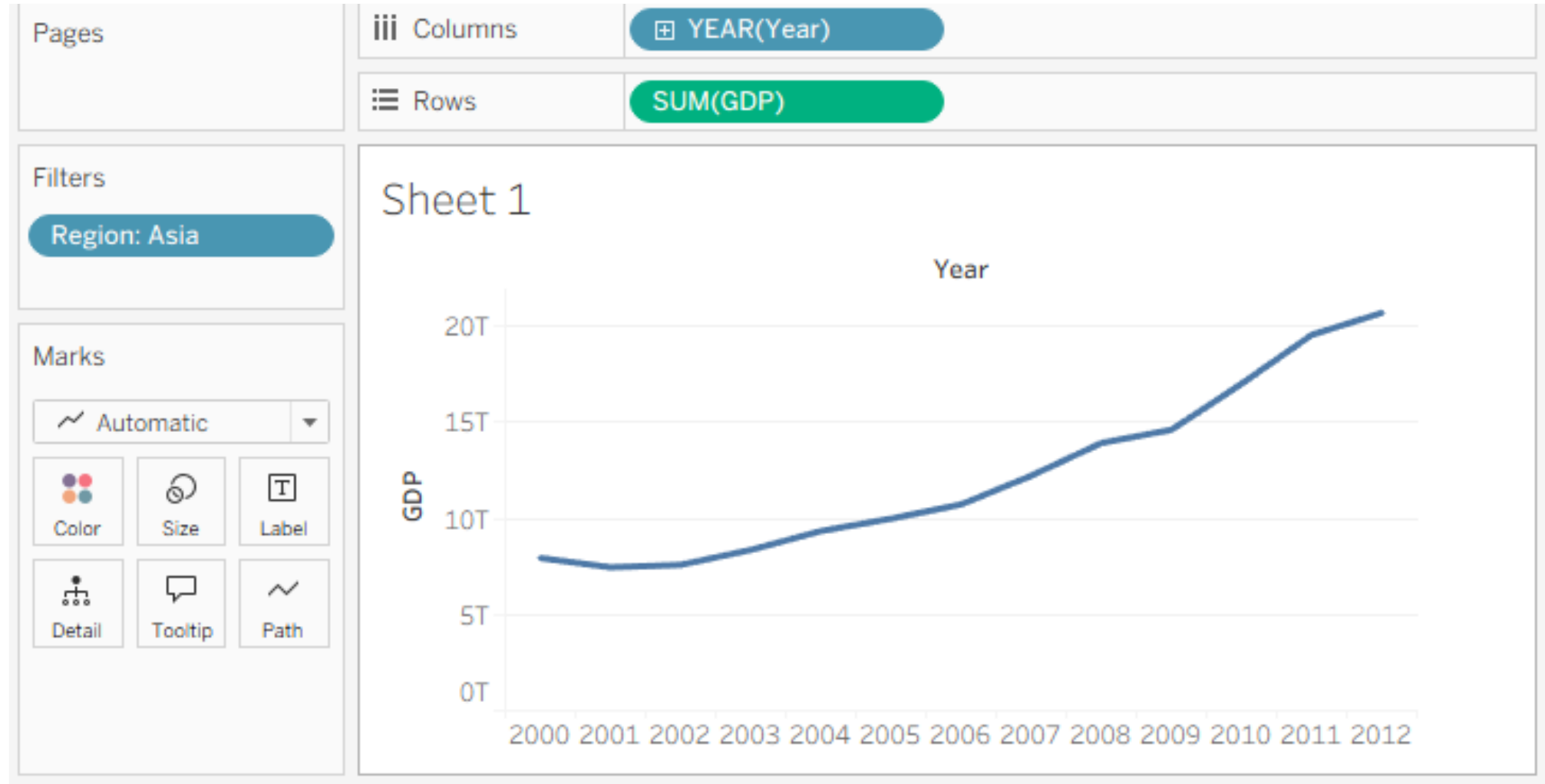
What if we want the GDP data for some regions (not all)?

Q1: What is the trend of global GDP from 2000 to 2012?

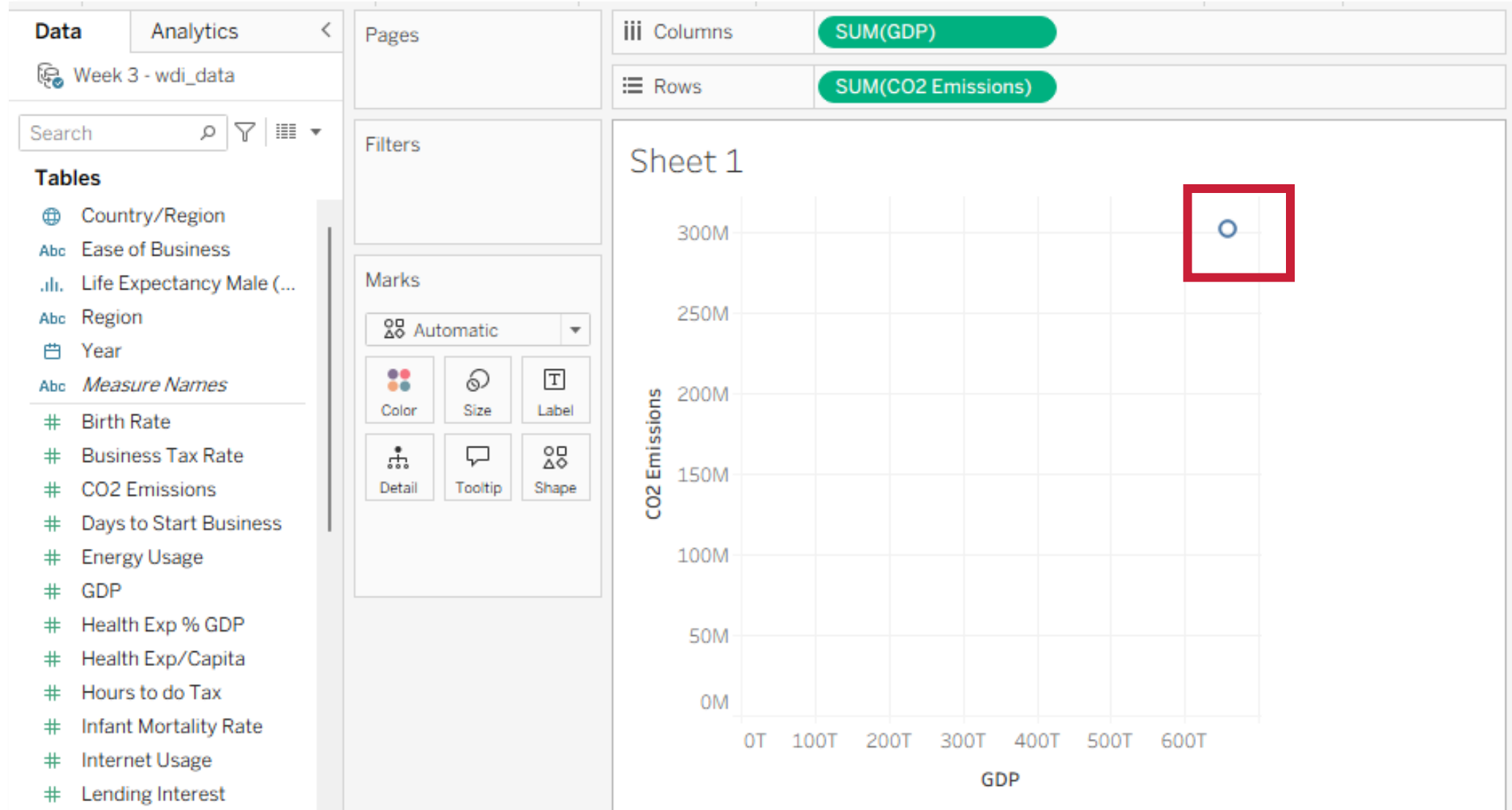
- What if we want the GDP data for some regions (not all)?
➤ **Filters**



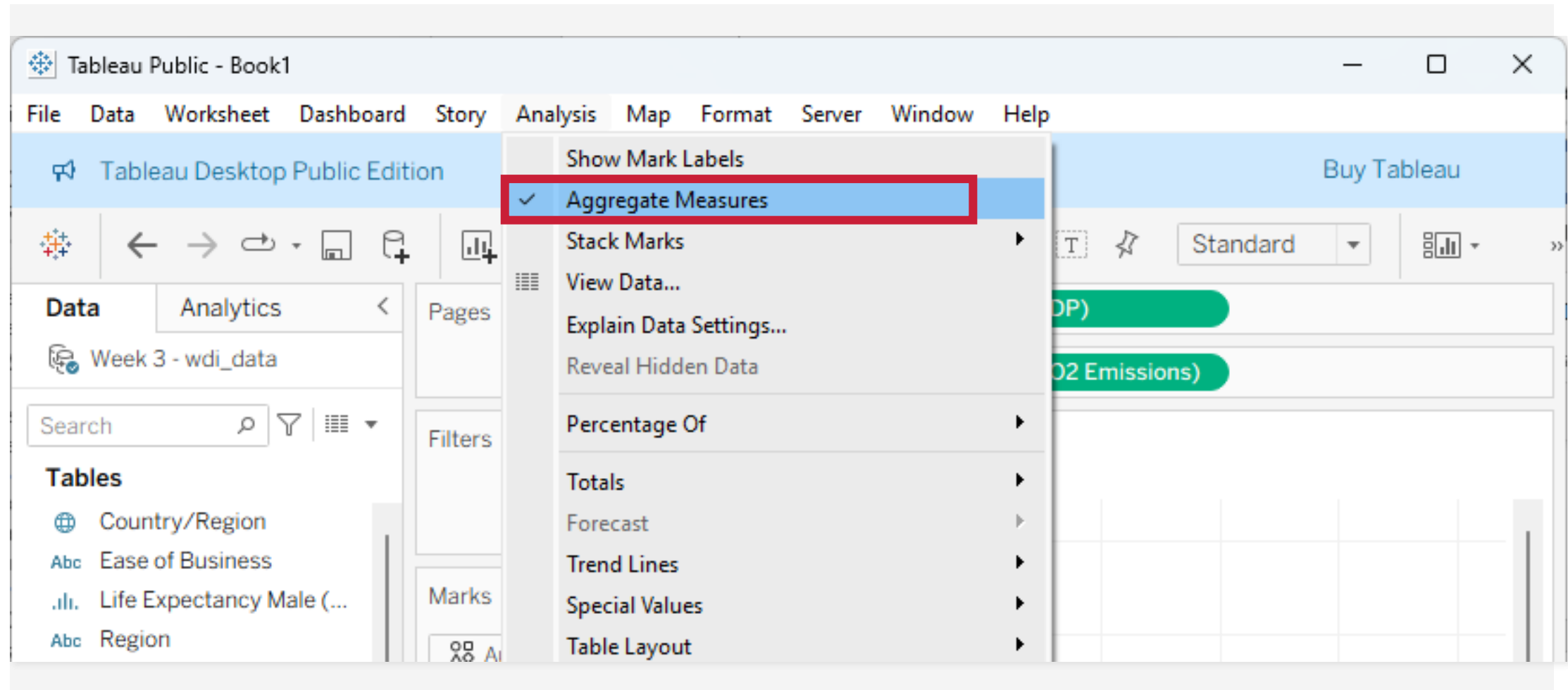
Q1: What is the trend of global GDP from 2000 to 2012?



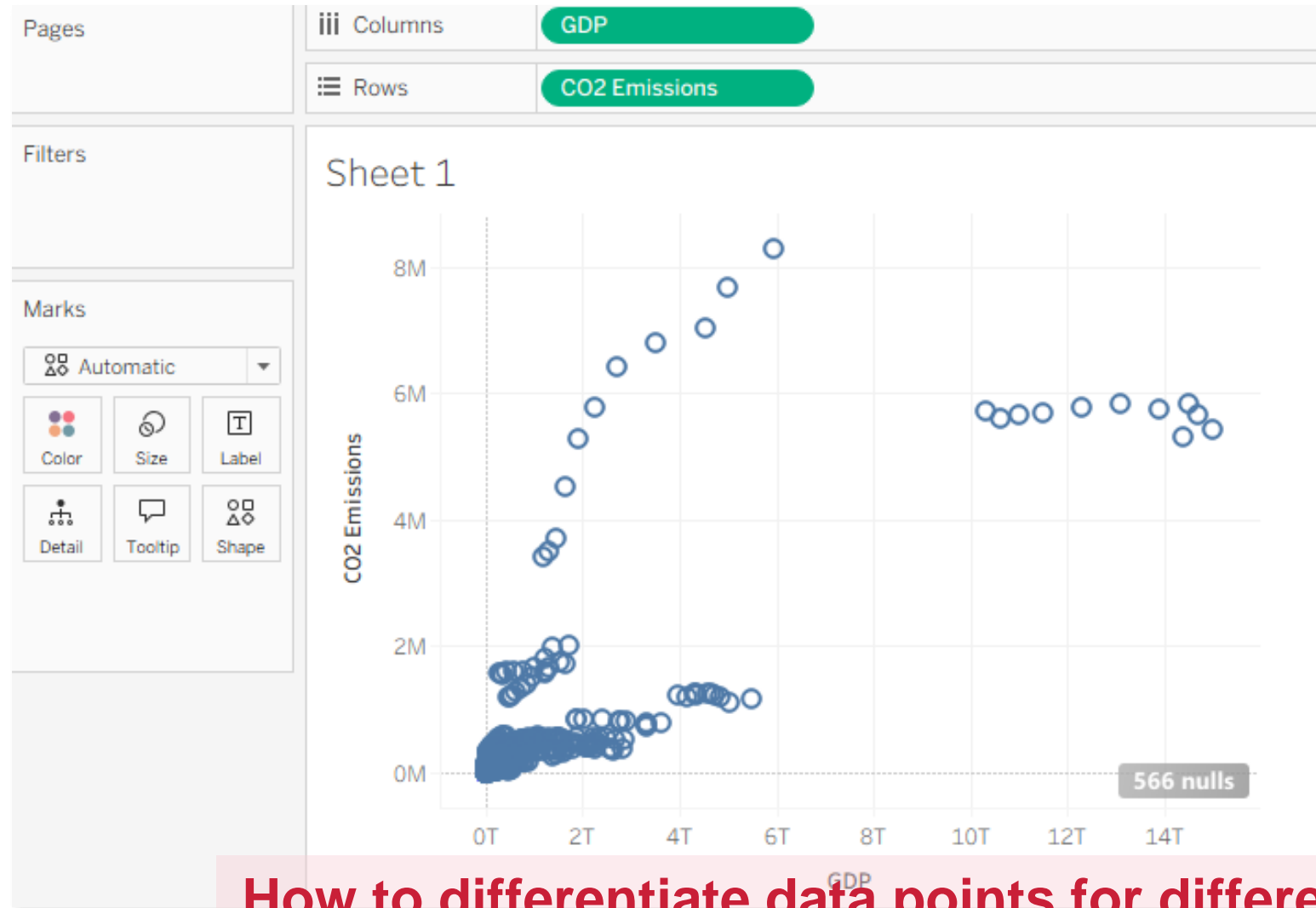
Q2: What is the relationship of GDP and CO2 from 2000 to 2012 for each country?



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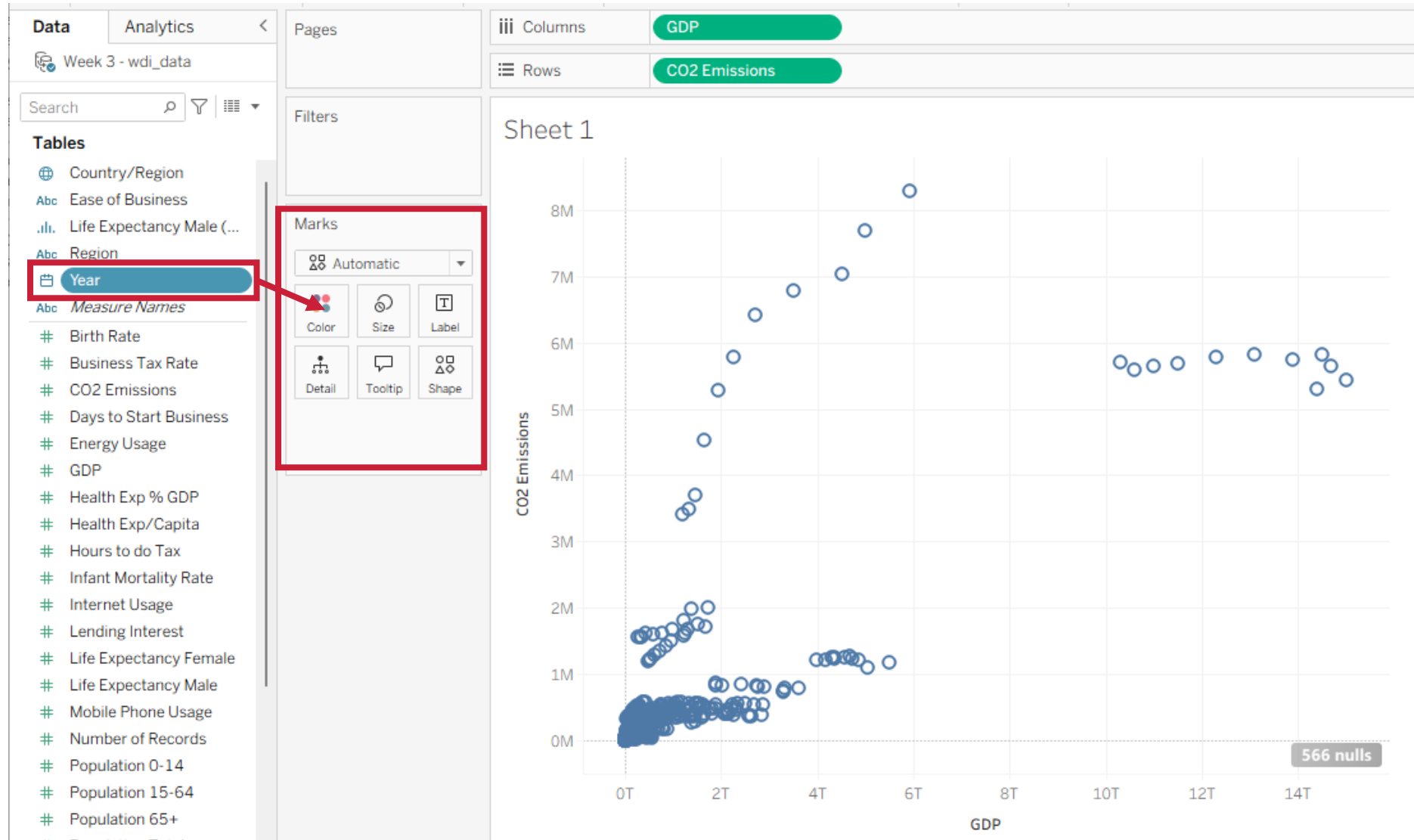


Q2: What is the relationship of GDP and CO2 from 2000 to 2012 for each country?

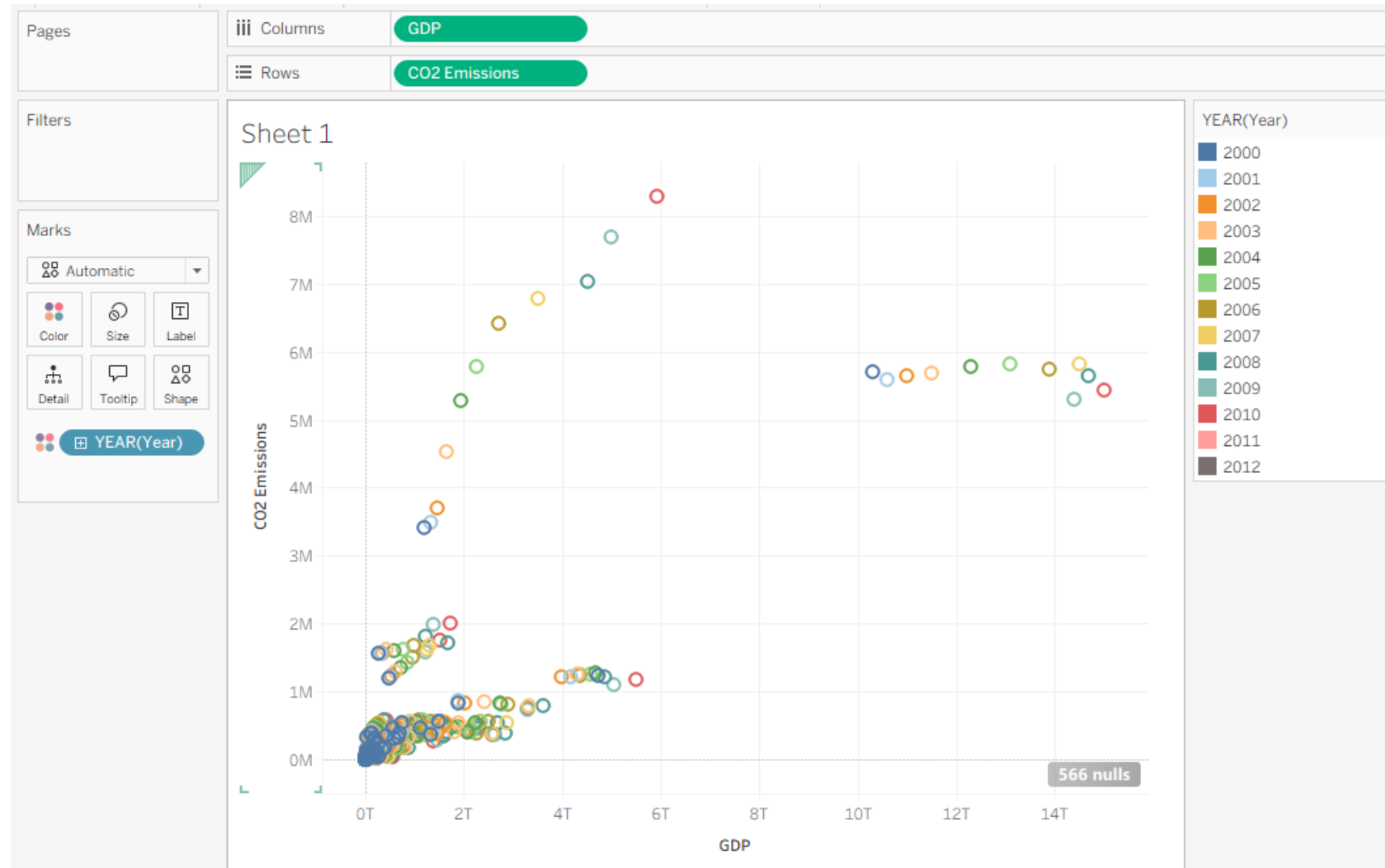


How to differentiate data points for different years or countries?

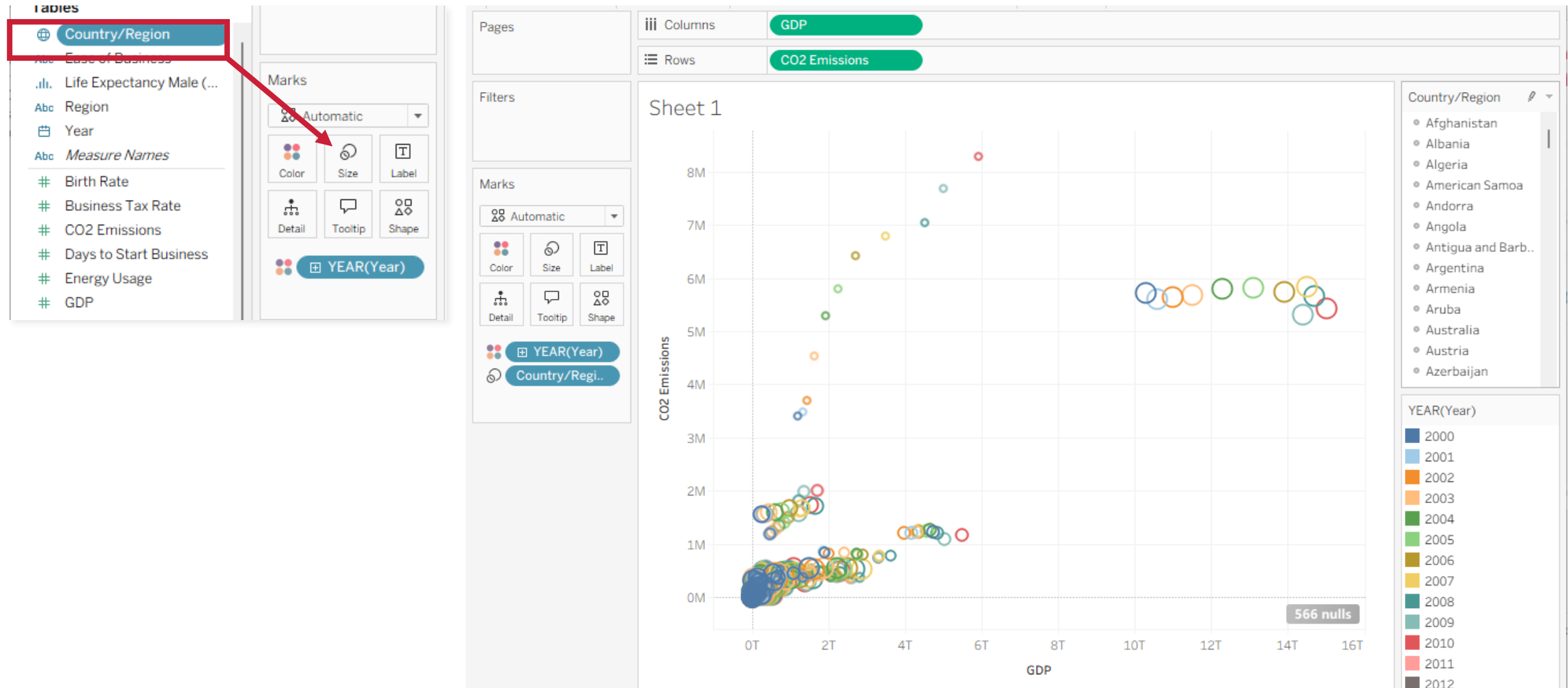
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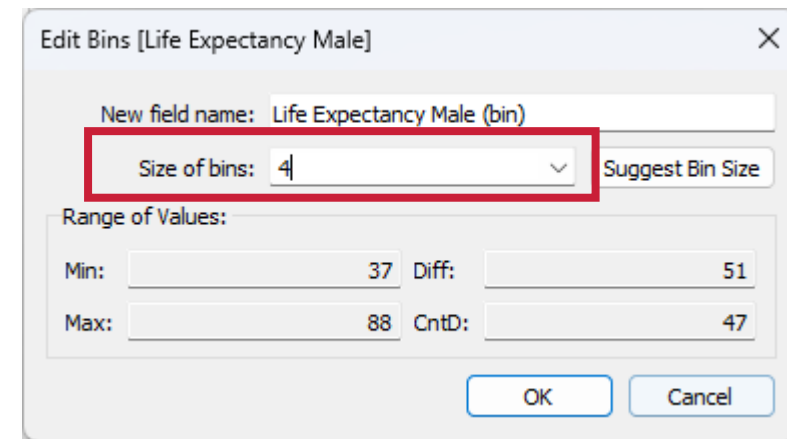
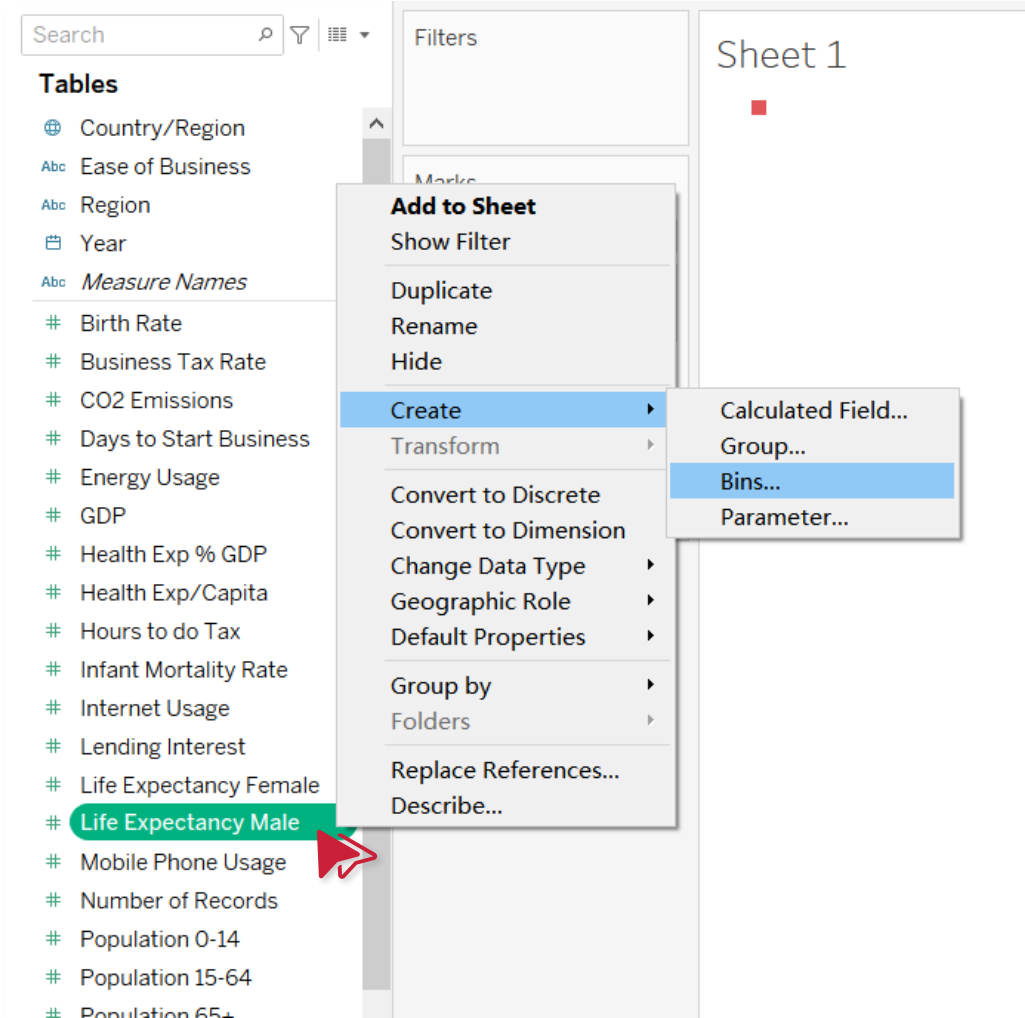


Q2: What is the relationship of GDP and CO2 from 2000 to 2012 for each country?

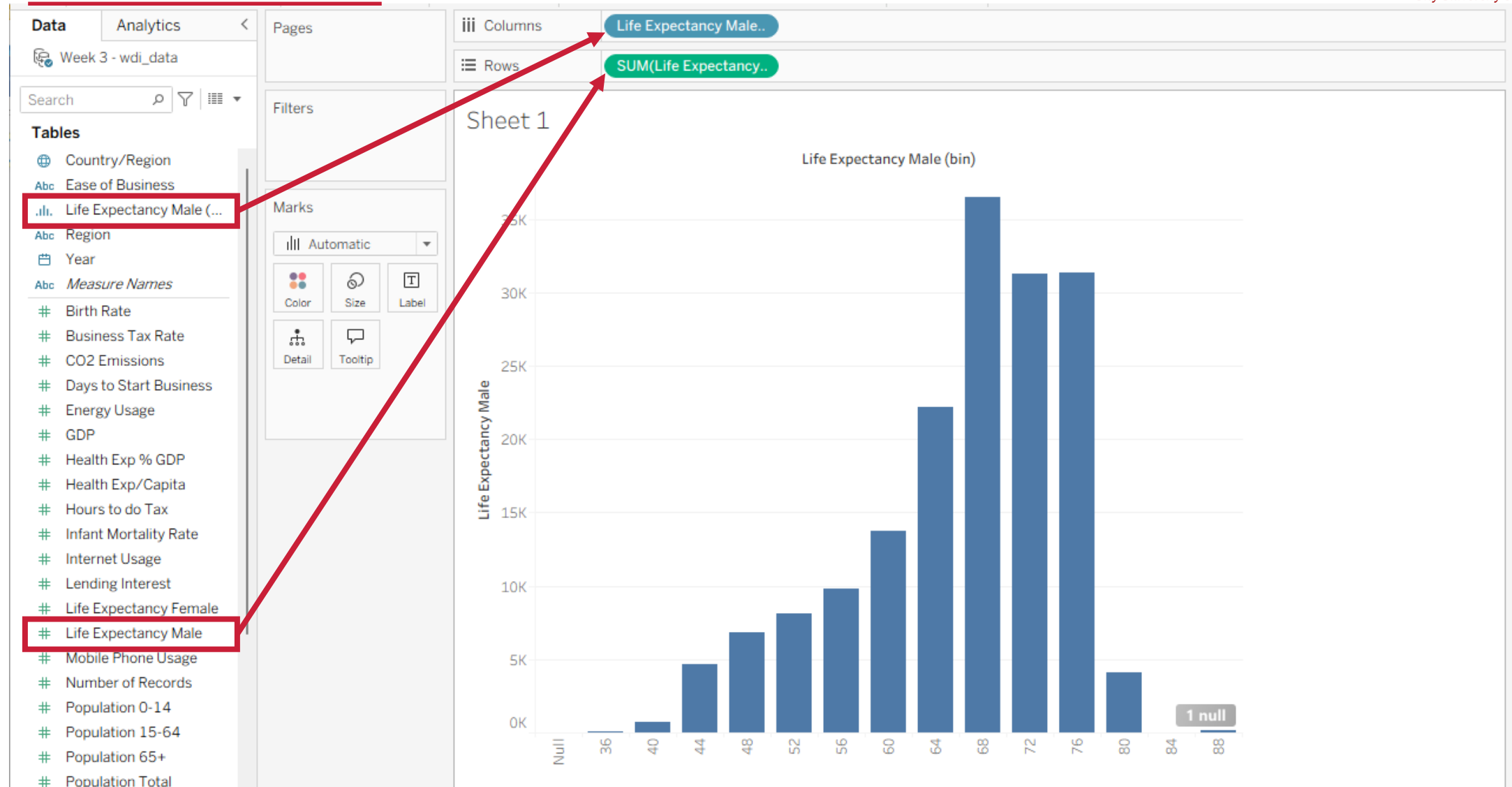


Extension 1: Distribution of variables

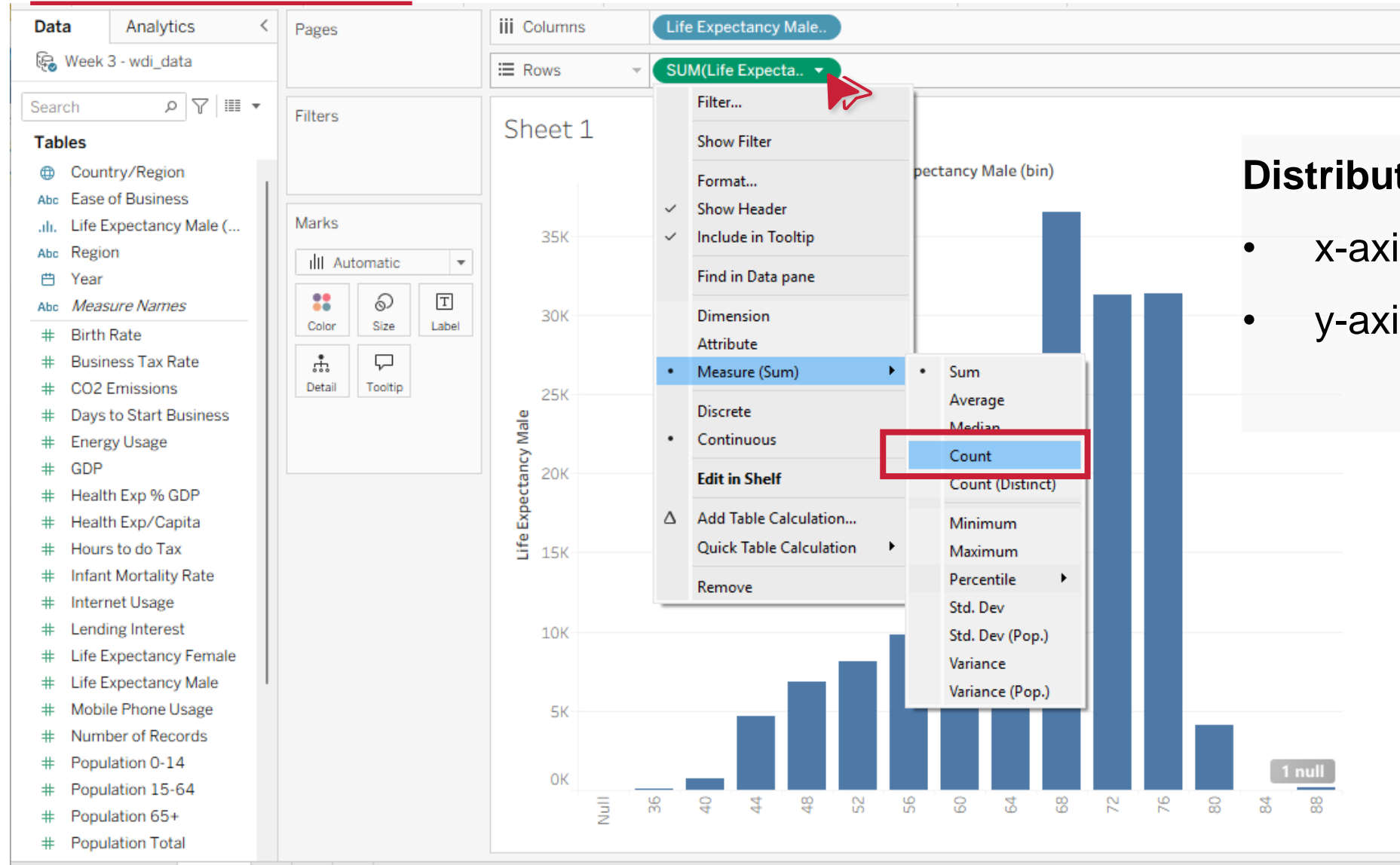
• Using Life expectancy Male as an example



Extension 1: Distribution of variables



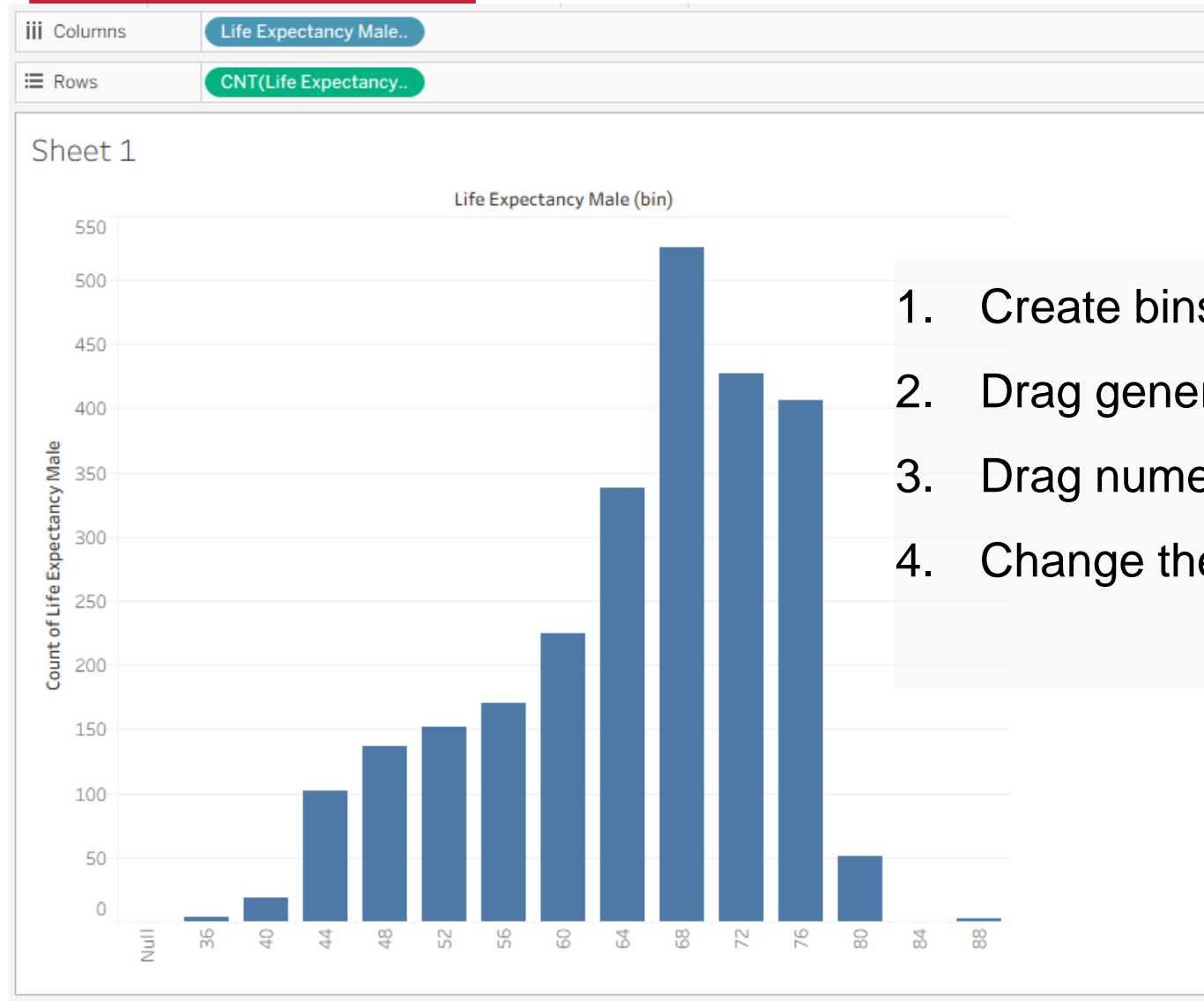
Extension 1: Distribution of variables



Distribution Histogram

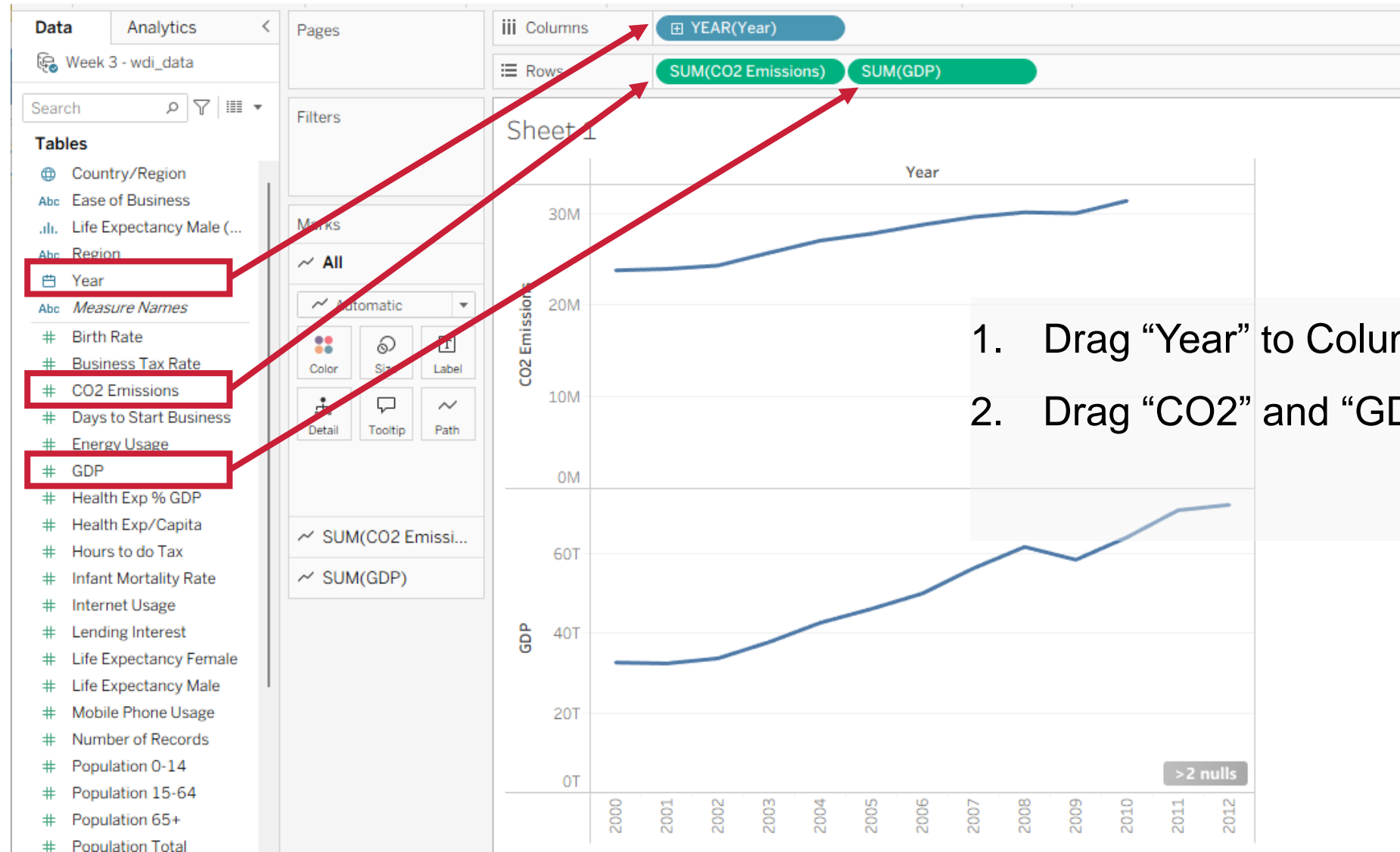
- x-axis: different bins
- y-axis: count of bins

Extension 1: Distribution of variables



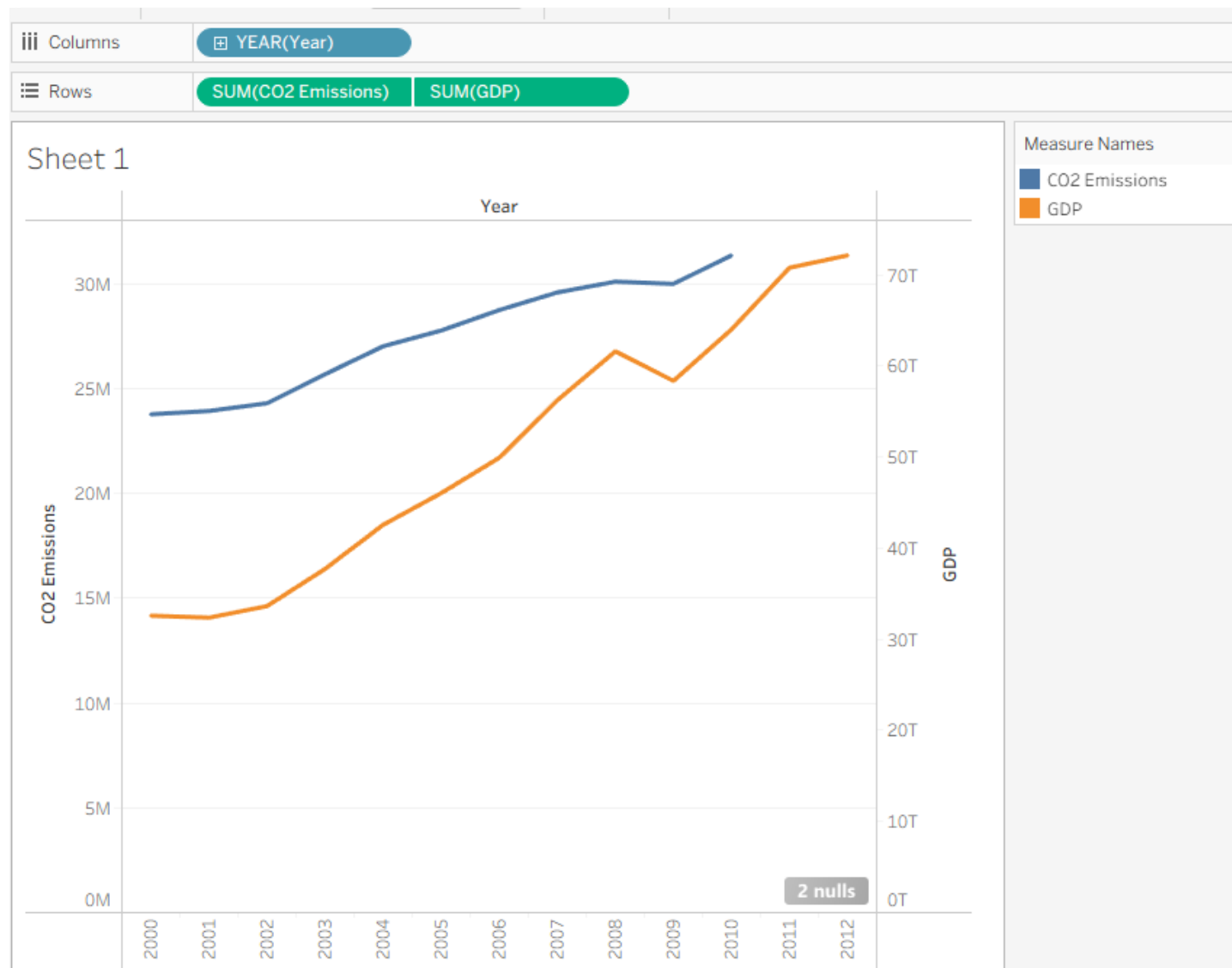
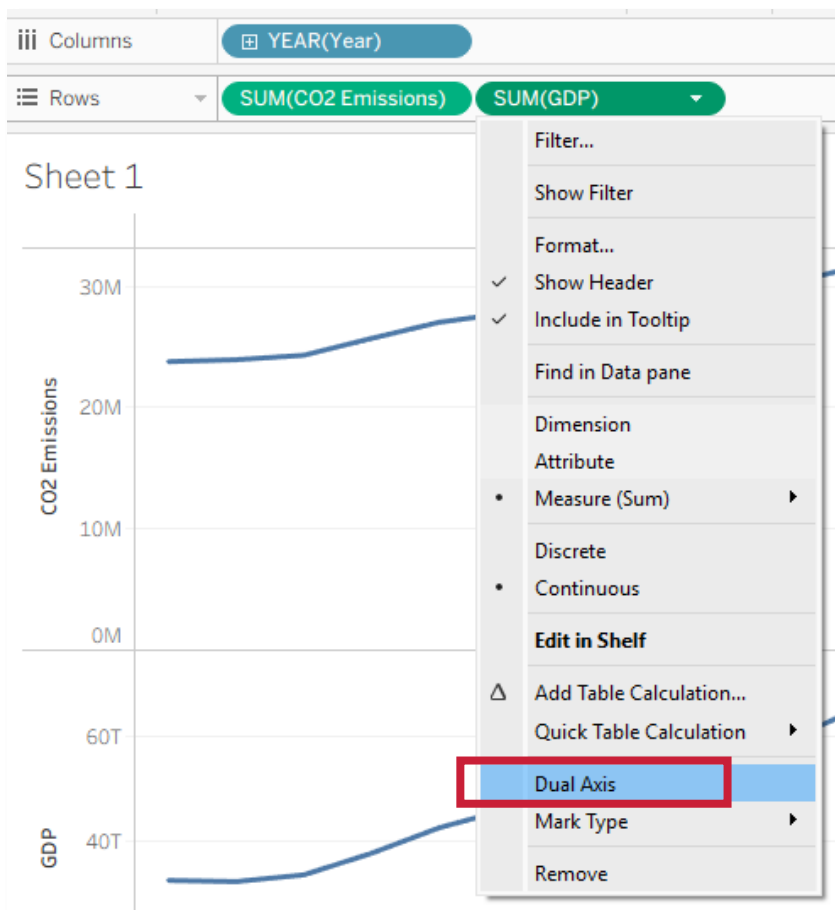
1. Create bins and set proper size
2. Drag generated bins to Columns
3. Drag numerical fields to Rows
4. Change the measure from SUM to Count

Extension 2: Trends of GDP and CO2 emissions

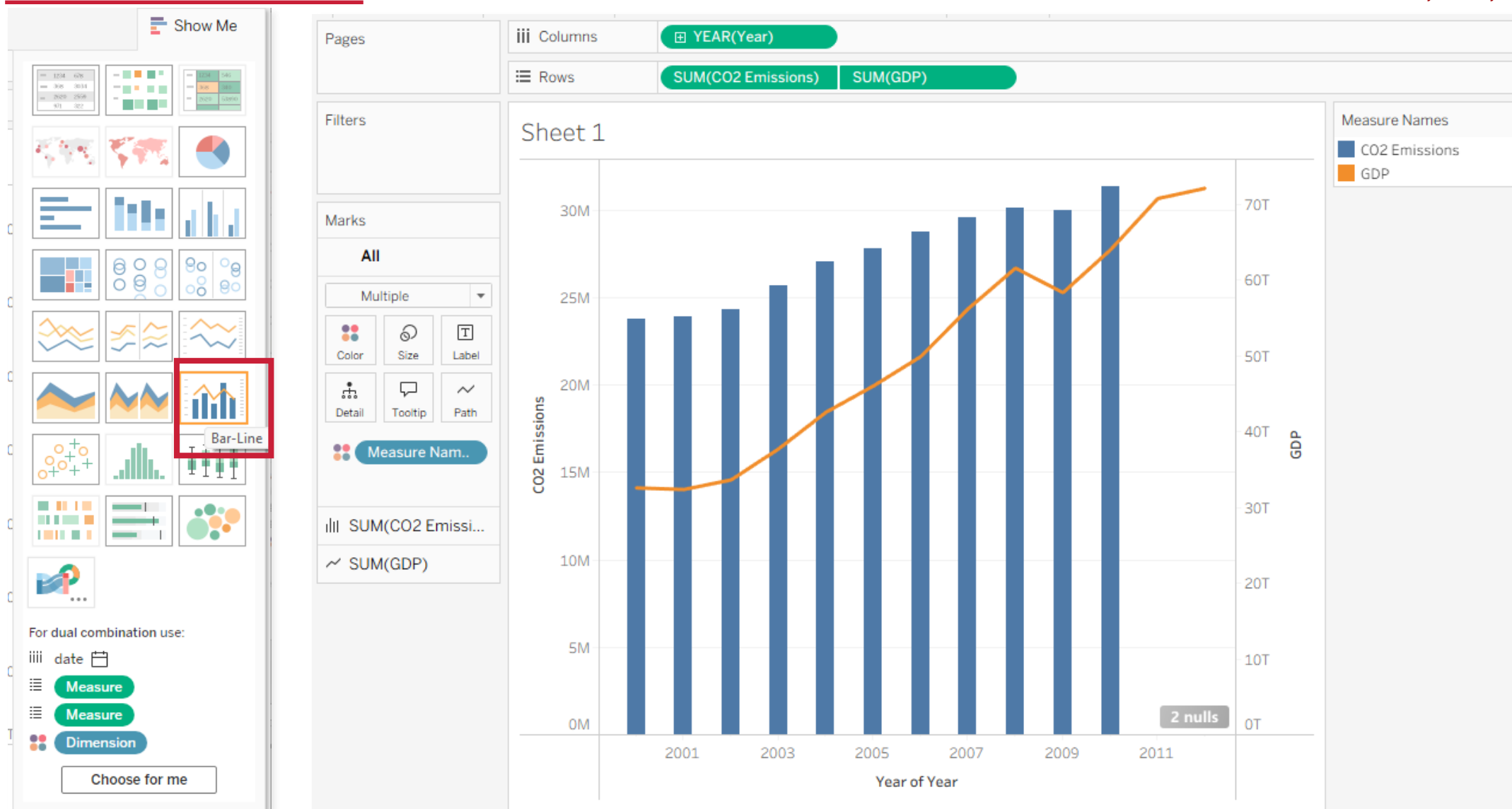


1. Drag "Year" to Columns
2. Drag "CO2" and "GDP" to Rows

Extension 2: Trends of GDP and CO2 emissions



Extension 2: Trends of GDP and CO2 emissions



Extension 2: Trends of GDP and CO2 emissions



Extension 2: Trends of GDP and CO2 emissions

Analysis Map Format Server Window Help

- Show Mark Labels
- ✓ Aggregate Measures
- Stack Marks
- View Data...
- Explain Data Settings...
- Reveal Hidden Data
- Percentage Of
- Totals
- Forecast
- Trend Lines**
 - Show All Trend Lines
 - Edit All Trend Lines...
 - Describe Trend Models...
- Special Values
- Table Layout
- Legends
- Filters
- Highlighters
- Parameters
- Create Calculated Field...
- Edit Calculated Field
- Infer Properties from Missing Values
- Cycle Fields
- Swap Rows and Columns Ctrl+W



Other Learning Materials for Reference

➤ Interesting Coursera Courses:

- Fundamentals of Visualization with Tableau
<https://www.coursera.org/learn/data-visualization-tableau>
- Data Visualization with Tableau Specialization
<https://www.coursera.org/courses?query=tableau>
- Data Visualization and Communication with Tableau
<https://www.coursera.org/learn/analytics-tableau>
- Creating Dashboards and Storytelling with Tableau
<https://www.coursera.org/learn/dataviz-dashboards>
- Visualizing Citibike Trips with Tableau
<https://www.coursera.org/projects/visualizing-citibike-trips-tableau>
- Analyse City Data Using R and Tableau
<https://www.coursera.org/projects/analyze-city-data-r-tableau>

Practice Time

Thanks!