

# Introduction to Tableau Desktop

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# Outline

- Introduction to Tableau
- Generic Installation Process
- Loading and processing data
- Visualization: from charts to dashboards
- Data Storytelling



# Introduction to Tableau

# What is Tableau

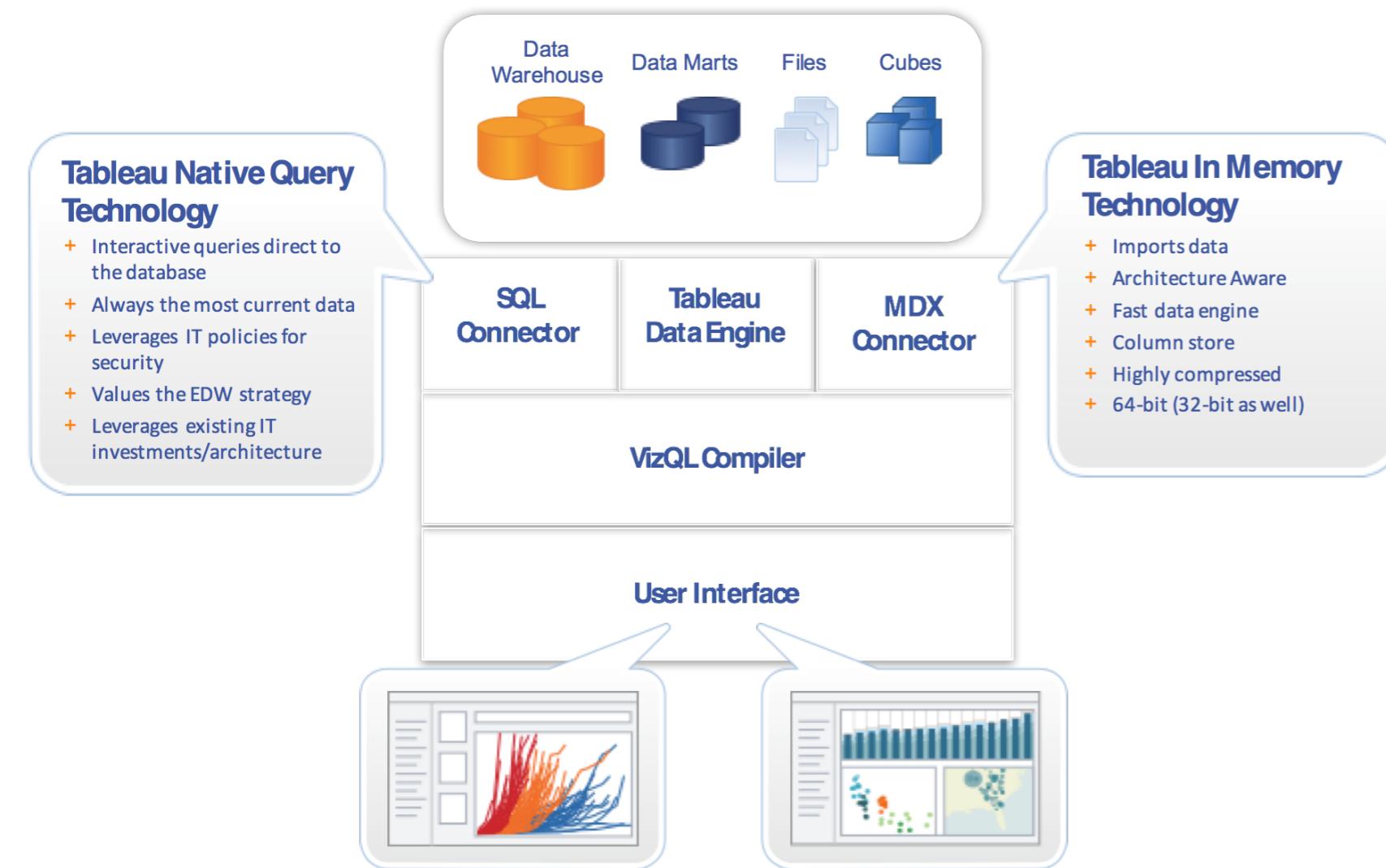
- 
- Visual Analytics tool
  - In-memory capabilities
  - Multiple connectors
  - Embedded BI
  - Multi-device

# Approach



- User-friendly
- Business-ready
- Embedded data visualisation principles
- Advanced visual capabilities
  - Exploratory Data Analysis
  - Dashboards
  - Data Storytelling
- Minimal capabilities: data preparation

# Architecture (for companies)



We are going to use only Tableau Desktop

- One Corporate Server
- Three desktop tools:
  - Tableau Desktop (developer)
  - Tableau Public (open data)
  - Tableau reader (data consumer)

# Can I install Tableau Desktop?

## Windows

- Windows 7 or newer (64 bit)
- Intel Pentium 4 or AMD Opteron processor or newer
- 2 GB memory
- 1.5 GM minimum free disk space

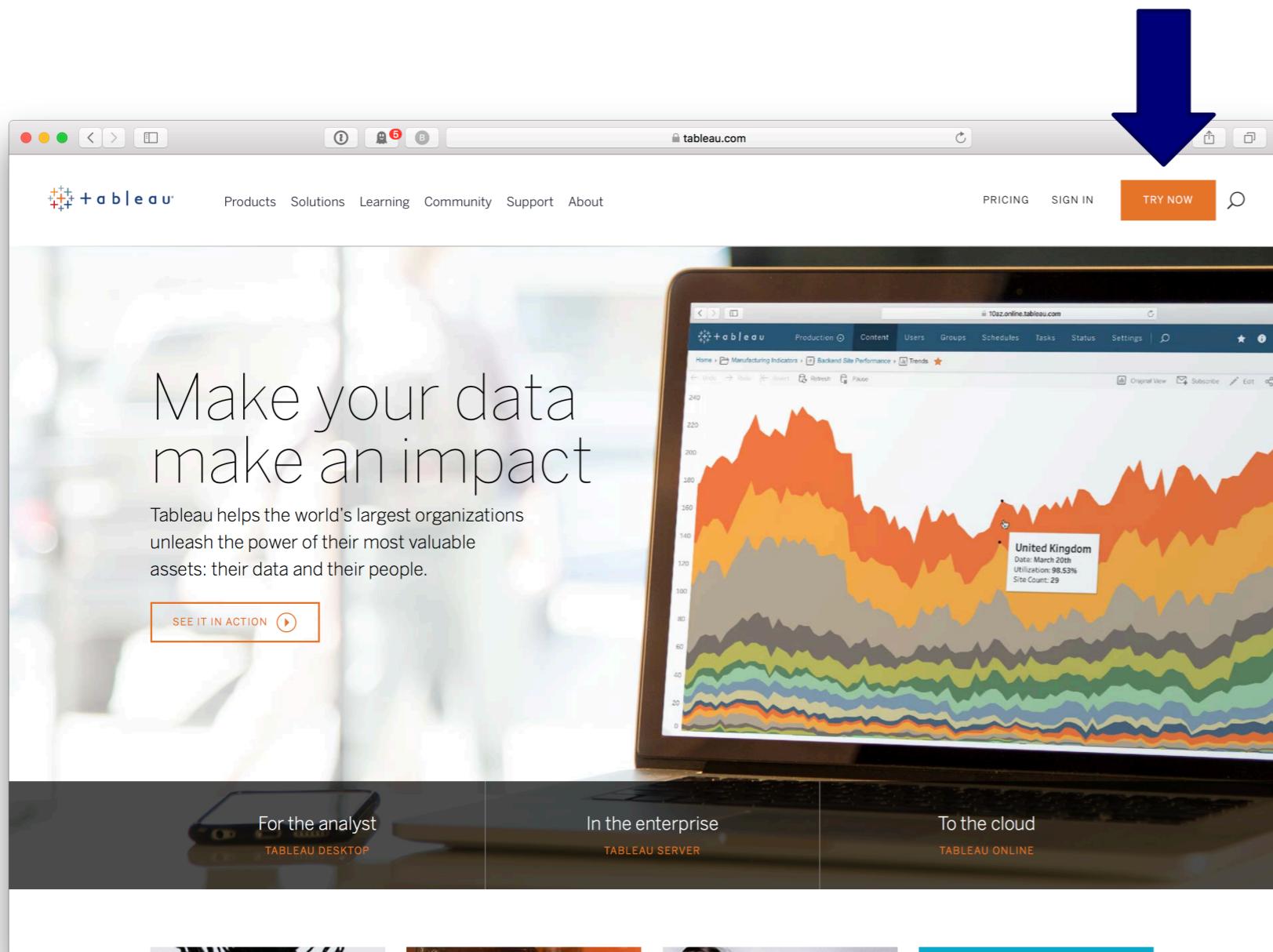
## Mac

- iMac/MacBook computers 2009 or newer
- OSX 10.10 or newer
- 1.5 GM minimum free disk space

If you are not able to install Tableau Desktop, contact the professor

# Generic Installation Process

# Installation Process (I)



- Go to: <https://www.tableau.com>
- Press **Try Me**

Note: web page may appear different. Not required for the students of this course

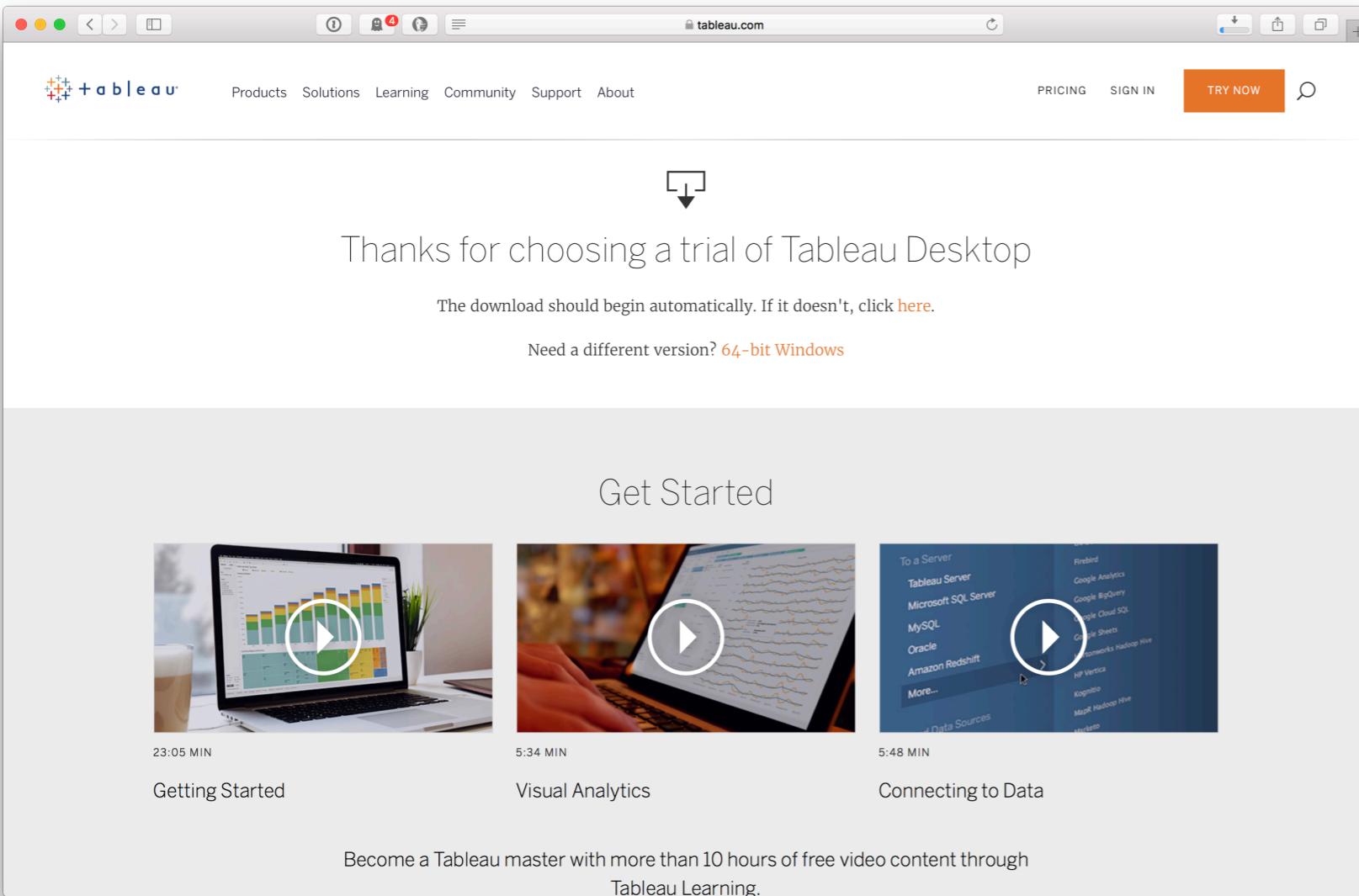
# Installation Process (II)

The screenshot shows the Tableau website at <https://www.tableau.com/products/trial>. The page features a large call-to-action button labeled "TRY NOW". Below it, there's a section for "Tableau Desktop: Start your free 14-day trial" with a "Business E-mail" input field and a "DOWNLOAD FREE TRIAL" button. A note below the button says "WE RESPECT YOUR PRIVACY | HAVING TROUBLE?". To the right, there's a preview of the Tableau desktop interface showing a complex data visualization. Below the preview, text reads "Extend your Tableau trial experience". At the bottom, there are sections for "Tableau Online: Take it to the Cloud" and "Tableau Server: Share at your enterprise".

- At: <https://www.tableau.com/products/trial>
- Complete student email and press **DOWNLOAD FREE TRIAL**

Note: web page may appear different. Not required for the students of this course

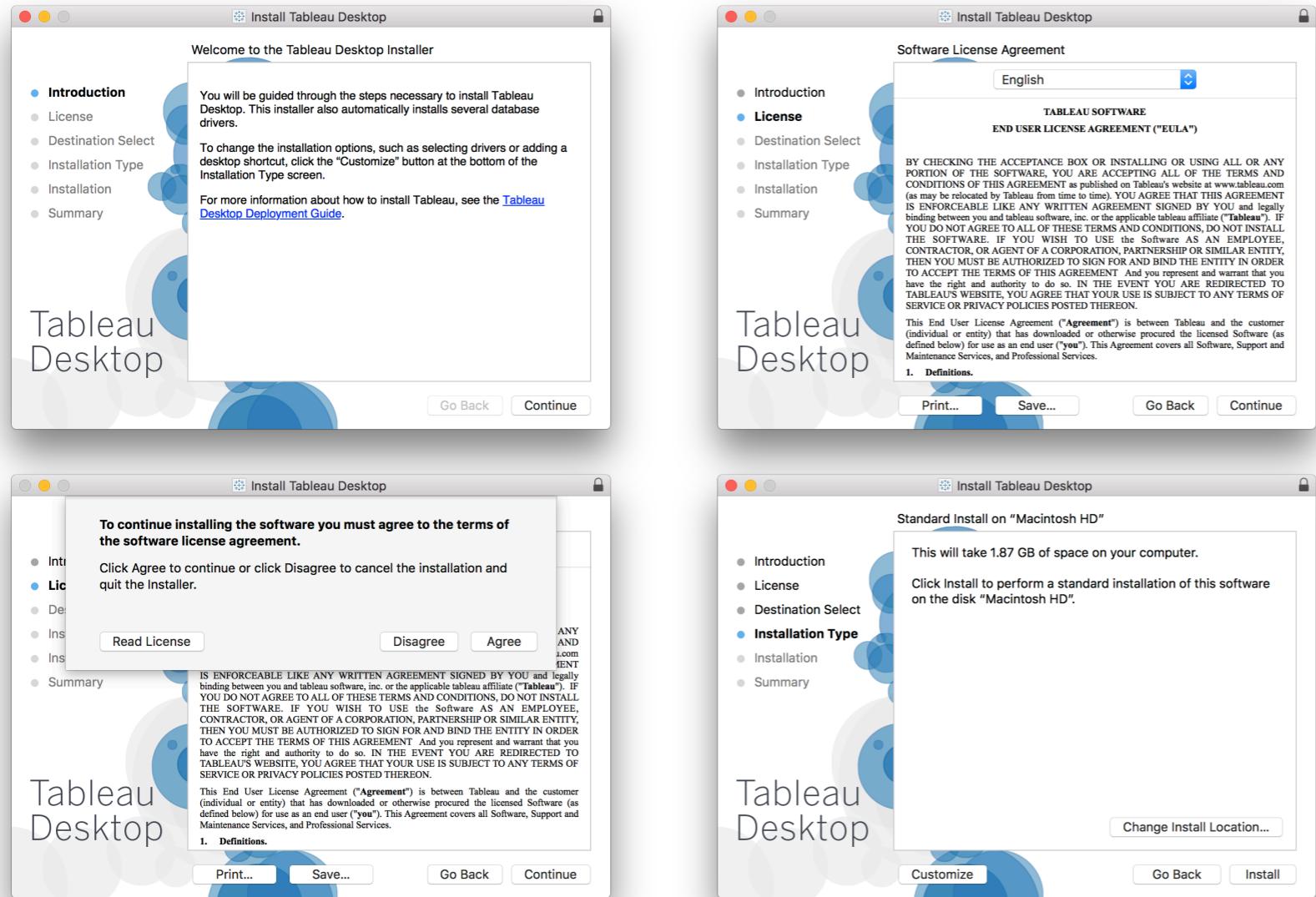
# Installation Process (III)



- Download process must start automatically
- It will be more or less faster depending on your internet connection

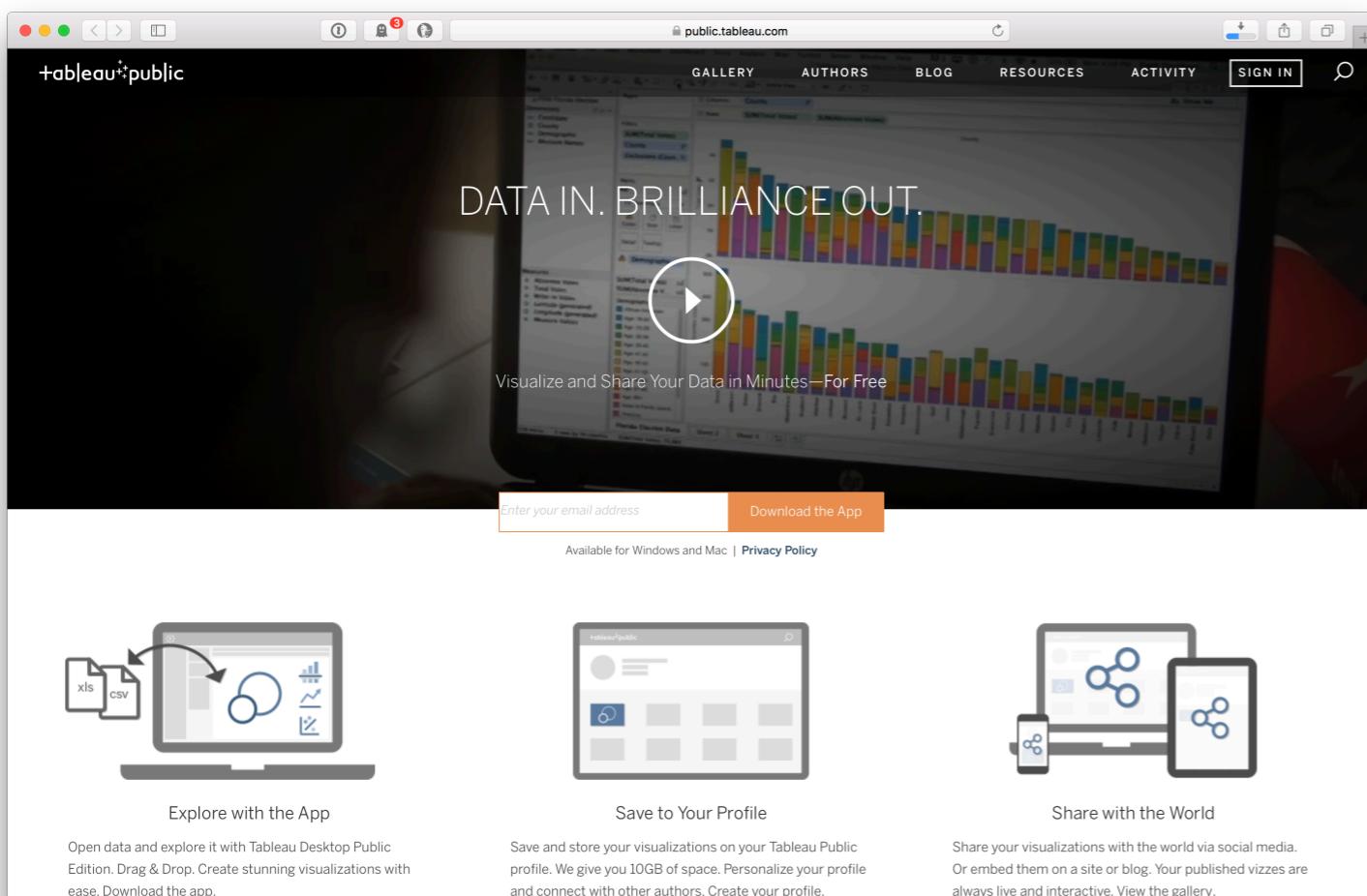
Note: web page may appear different. Not required for the students of this course

# Installation Process (IV)



- When we install the program we have 14 days trial period
- Later we will use our academic license
- Just follow the different steps on the screen

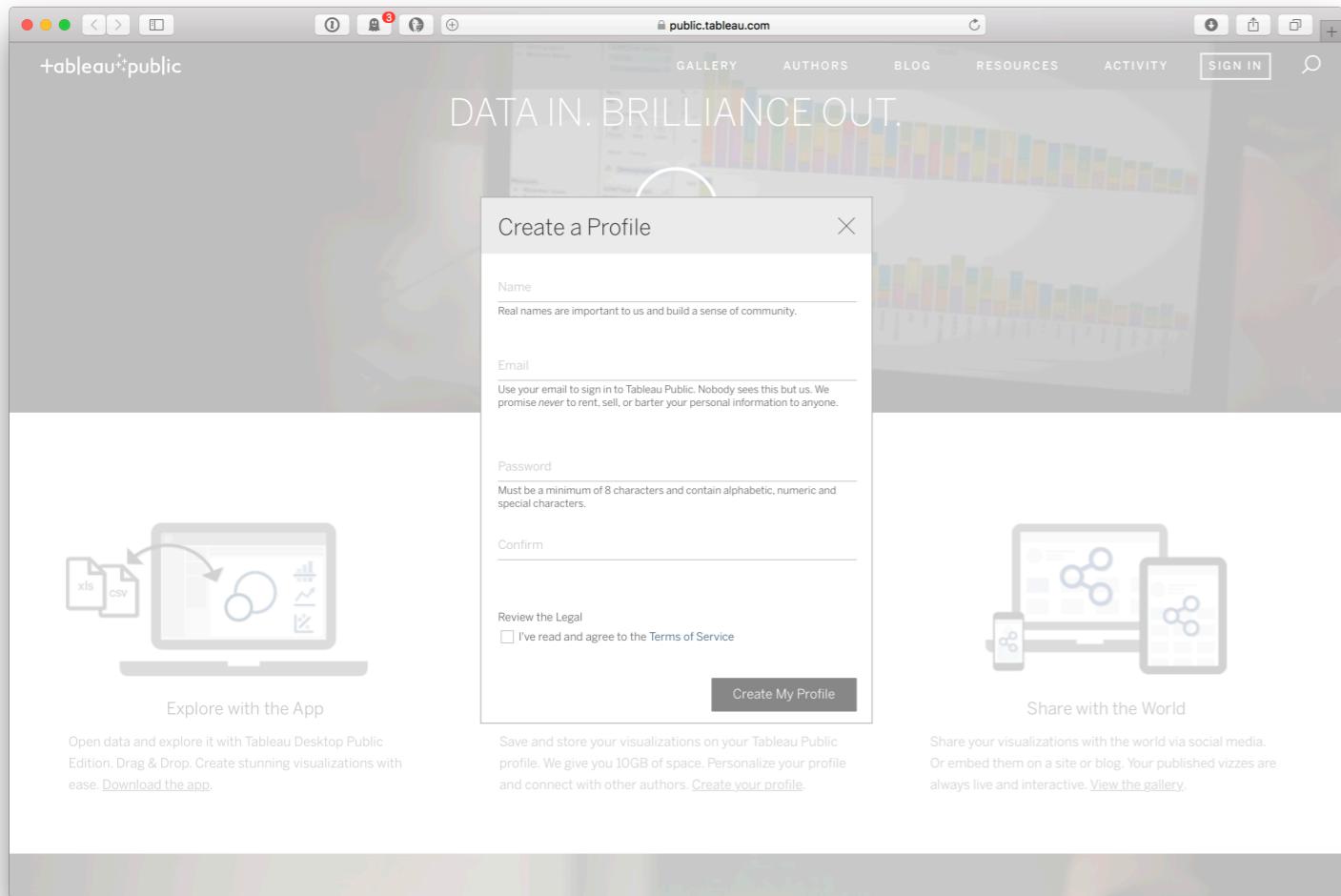
# Other: Tableau Public (I)



- Go to <https://public.tableau.com/s/>
- Complete your email and press **Download App**
- Follow the installation process (no trial, data and analysis stored in a public cloud)

Note: web page may appear different.

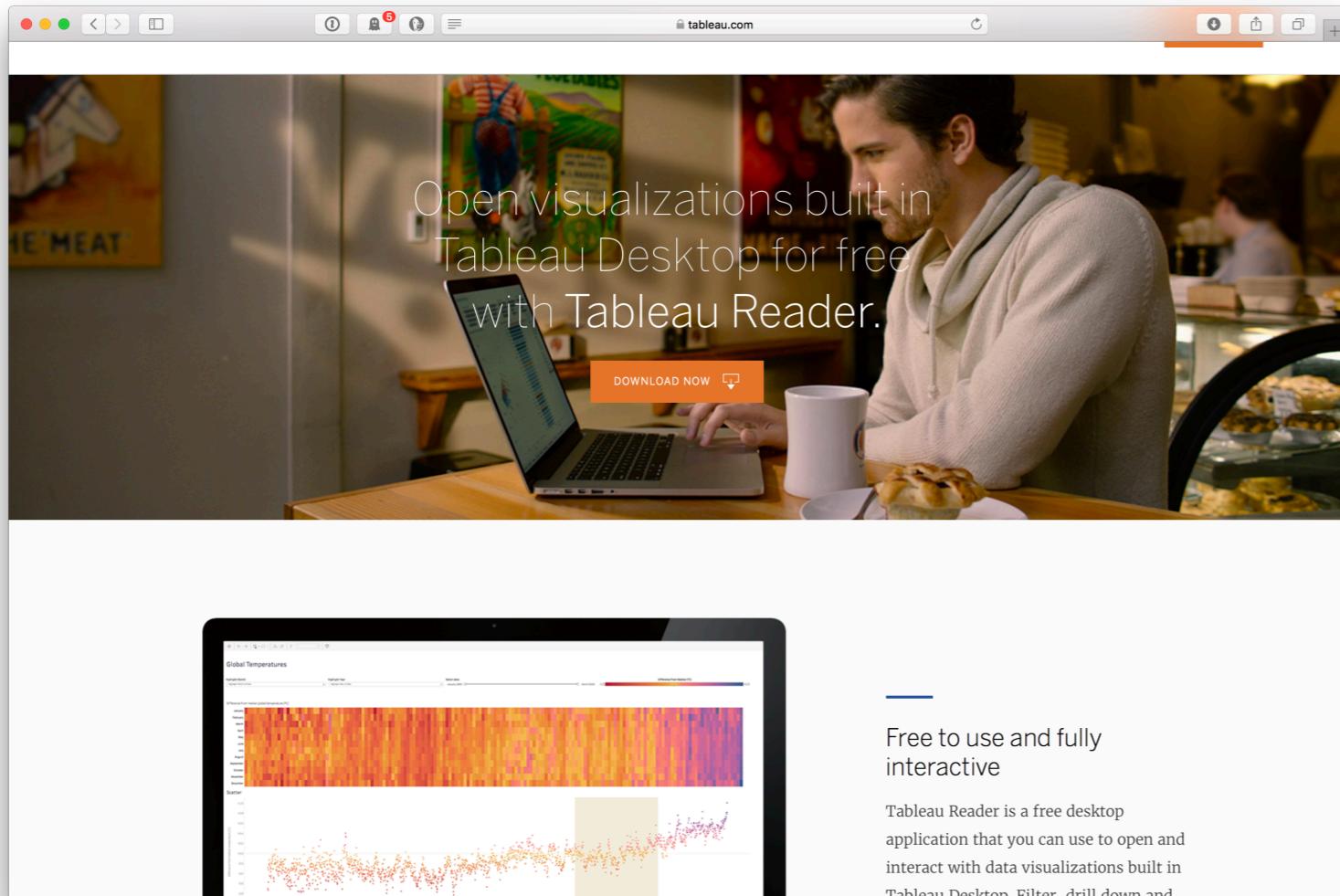
# Other: Tableau Public (II)



- We can create workbooks, but we need to store them in the cloud (Tableau Public)
- To use **Tableau Public** we need to create a profile

Note: web page may appear different.

# Other: Tableau Reader

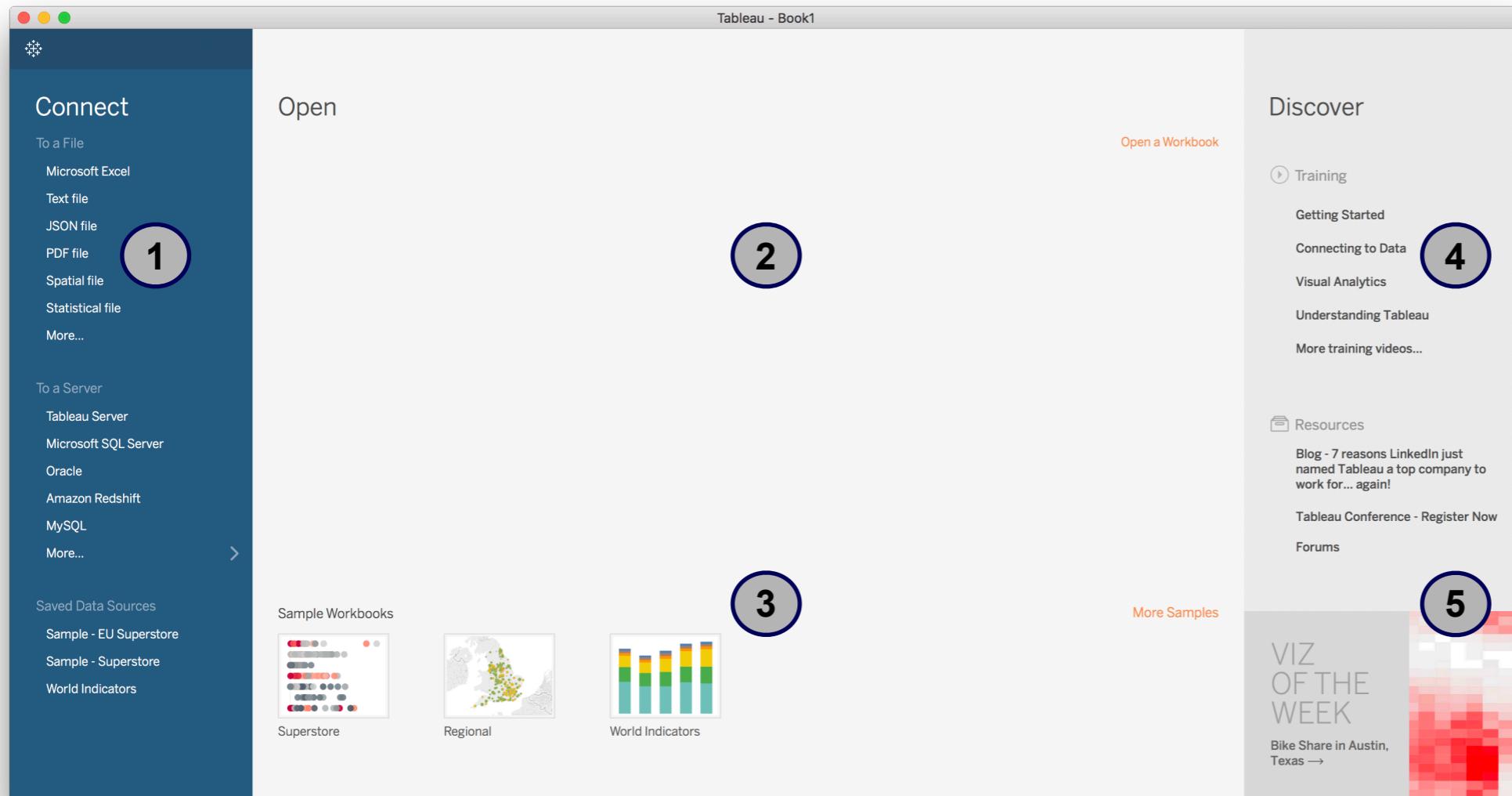


- Go to: <https://www.tableau.com/products/reader>
- Read-only tool
- **No edition capabilities**

Note: web page may appear different.

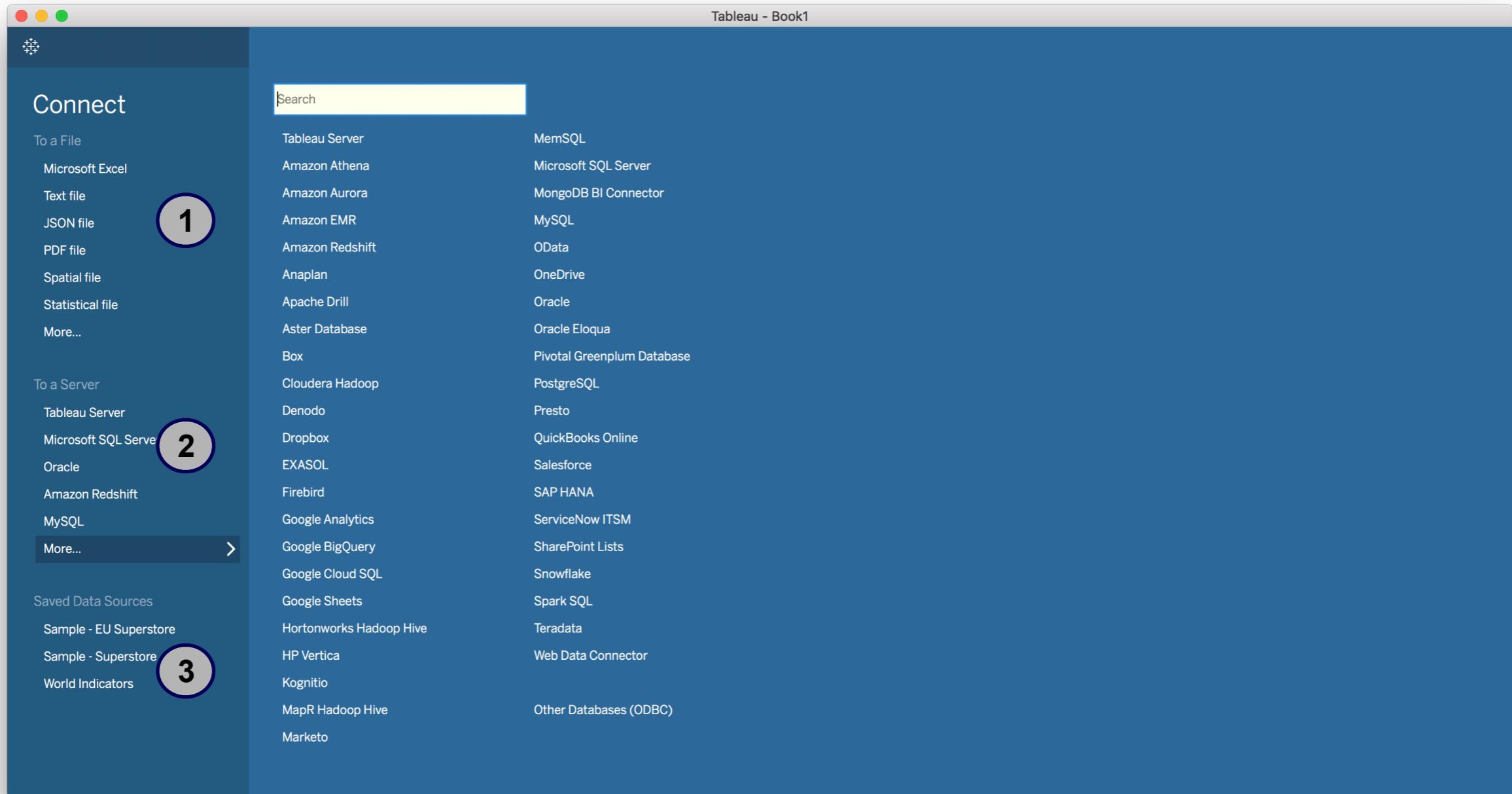
# Loading and processing data

# Tableau interface



- 1 Connections**
- 2 Previous workbooks**
- 3 Samples**
- 4 Training resources**
- 5 Announcements**

# Data Connectors



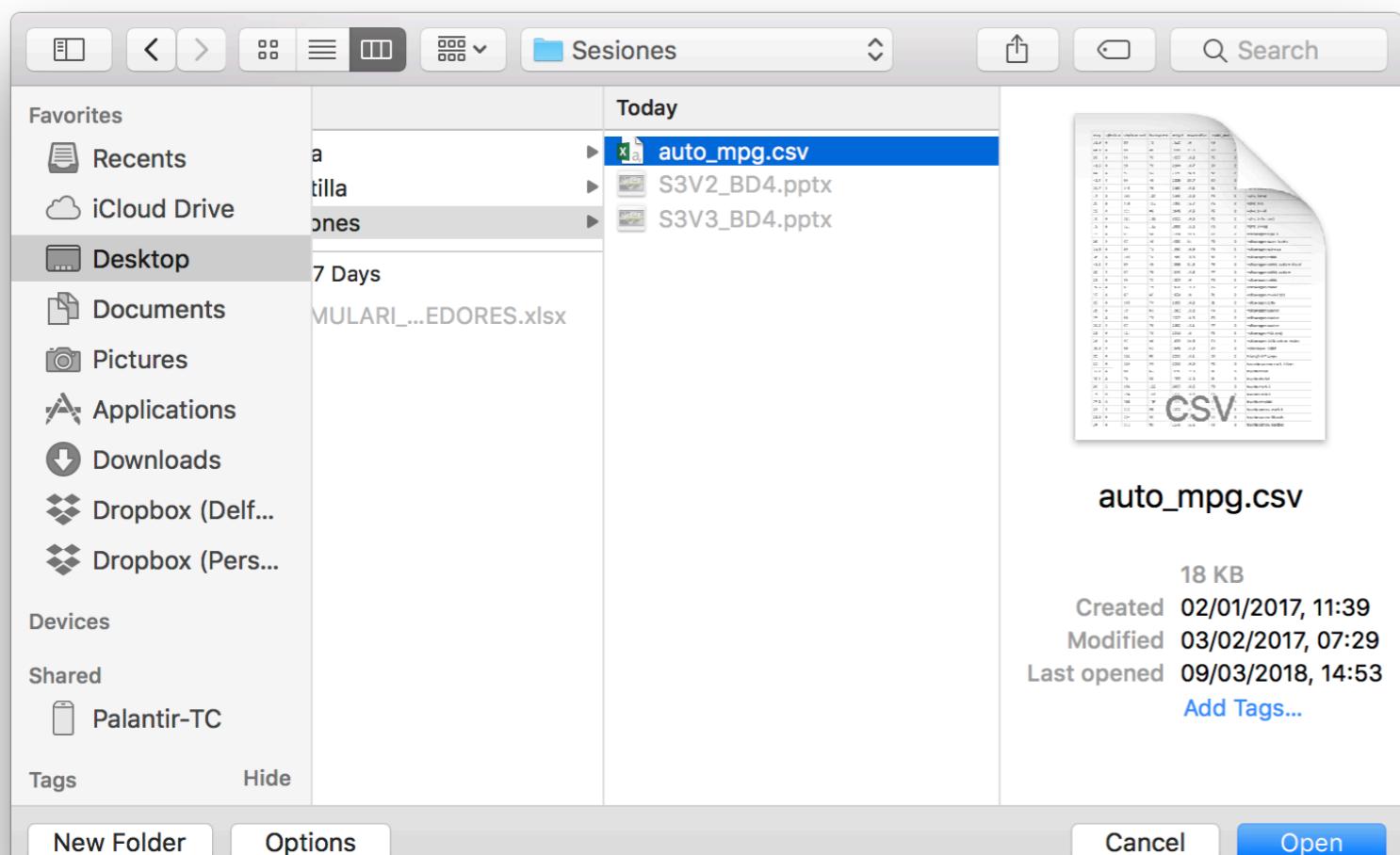
Types of  
connectors:

1 Files

2 Databases & Servers

3 Tableau data files (tde/hyper)

# Data Access & Extraction (I)



We will discuss an example.

- We select the **text file connector**
- We select the file **auto\_mpg.csv**

# Data Access & Extraction (II)

The screenshot shows the Tableau Data Source interface for the 'auto\_mpg' dataset. The interface is divided into several sections:

- Connections:** Shows one connection named 'auto\_mpg' (Text File). A circled '1' is placed here.
- Files:** Shows the file 'auto\_mpg.csv'. A circled '2' is placed here.
- New Union:** Shows the union of the 'auto\_mpg.csv' file. A circled '3' is placed here.
- Filters:** Shows 0 filters. A circled '4' is placed here.
- Data View:** Displays the data in a grid format. The columns are: #, Mpg, Cylinders, Displacement, Horsepower, Weight, Acceleration, Model Year, Origin, and Car Name. A circled '5' is placed over the 'Horsepower' column header.

After the data  
is loaded:

1 Connection

2 Files & Data Interpreter

3 Connection type

4 Filters

5 Data

# Data Processing (I)

The diagram illustrates the combination of two tables. On the left, a blue-bordered table has columns A, B, and C, containing rows for John, Mike, Lisa, Pat, and Linda. To its right is a green-bordered table with columns D, E, and F, containing rows for John, Mike, and Lisa. An arrow points to the right, leading to a larger table with columns A, B, C, E, and F. This resulting table contains all the rows from both original tables, with column E being a copy of column D.

A	B	C	D	E	F
John			John		
Mike			Mike		
Lisa			Lisa		
Pat				Pat	
Linda				Linda	

Combination

The diagram illustrates the union of two tables. On the left, a blue-bordered table has columns A, B, and C, containing rows for John, Mike, Lisa, Pat, and Linda. To its right is a green-bordered table with columns A, B, and C, containing rows for Pat and Linda. An arrow points to the right, leading to a larger table with columns A, B, and C. This resulting table contains all the rows from both original tables, with the rows from the second table appearing below those from the first.

A	B	C
John		
Mike		
Lisa		
Pat		
Linda		

Union

The diagram illustrates a pivot operation. On the left, a table with columns A, B, and C has rows for John, Mike, and Lisa. Column B is highlighted in yellow, and column C is highlighted in green. An arrow points to the right, leading to a new table with columns A, D, and E. Column A is yellow, column D is blue, and column E is green. The data is rearranged such that each row now has three entries: the first entry is from column A, the second from column D, and the third from column E. Specifically, the first row has John, B, and B; the second has Mike, B, and B; and the third has Lisa, B, and B.

A	B	C
John		
Mike		
Lisa		

A	D	E
John	B	B
Mike	B	B
Lisa	B	B
John	C	
Mike	C	
Lisa	C	

Pivot

The diagram illustrates an unpivot operation. On the left, a table with columns A, D, and E has rows for John, Mike, and Lisa. Column A is yellow, column D is blue, and column E is green. An arrow points to the right, leading to a new table with columns A, C, and B. Column A is yellow, column C is blue, and column B is green. The data is rearranged such that each row now has three entries: the first entry is from column A, the second from column C, and the third from column B. Specifically, the first row has John, B, and B; the second has Mike, B, and B; and the third has Lisa, B, and B. This results in three rows for each original row, effectively spreading the data across three columns.

A	D	E
John	B	B
Mike	B	B
Lisa	B	B
John	C	
Mike	C	
Lisa	C	

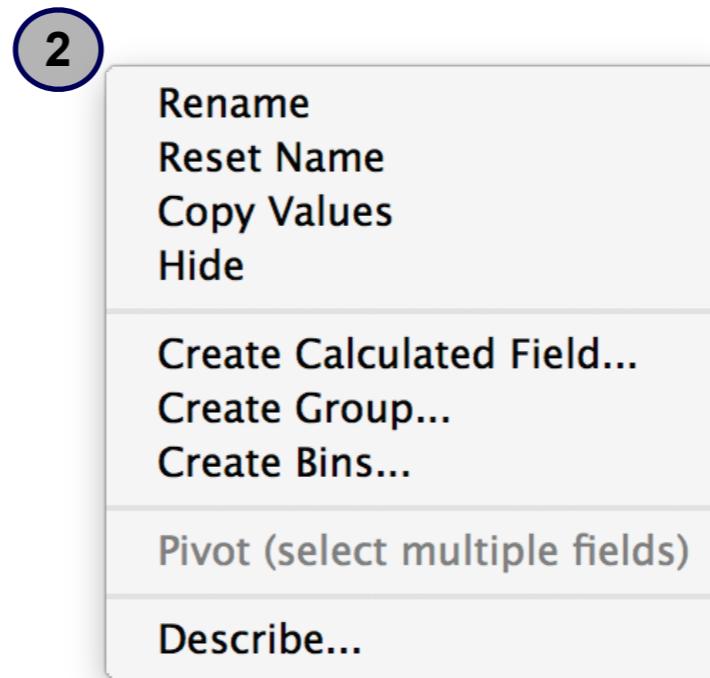
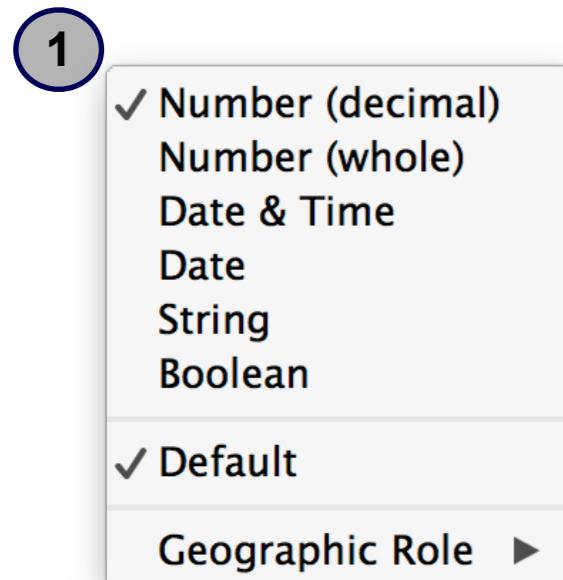
A	C	B
John	B	B
Mike	B	B
Lisa	B	B
John	C	
Mike	C	
Lisa	C	

Unpivot

Available options to combine data sources

# Data Processing (II)

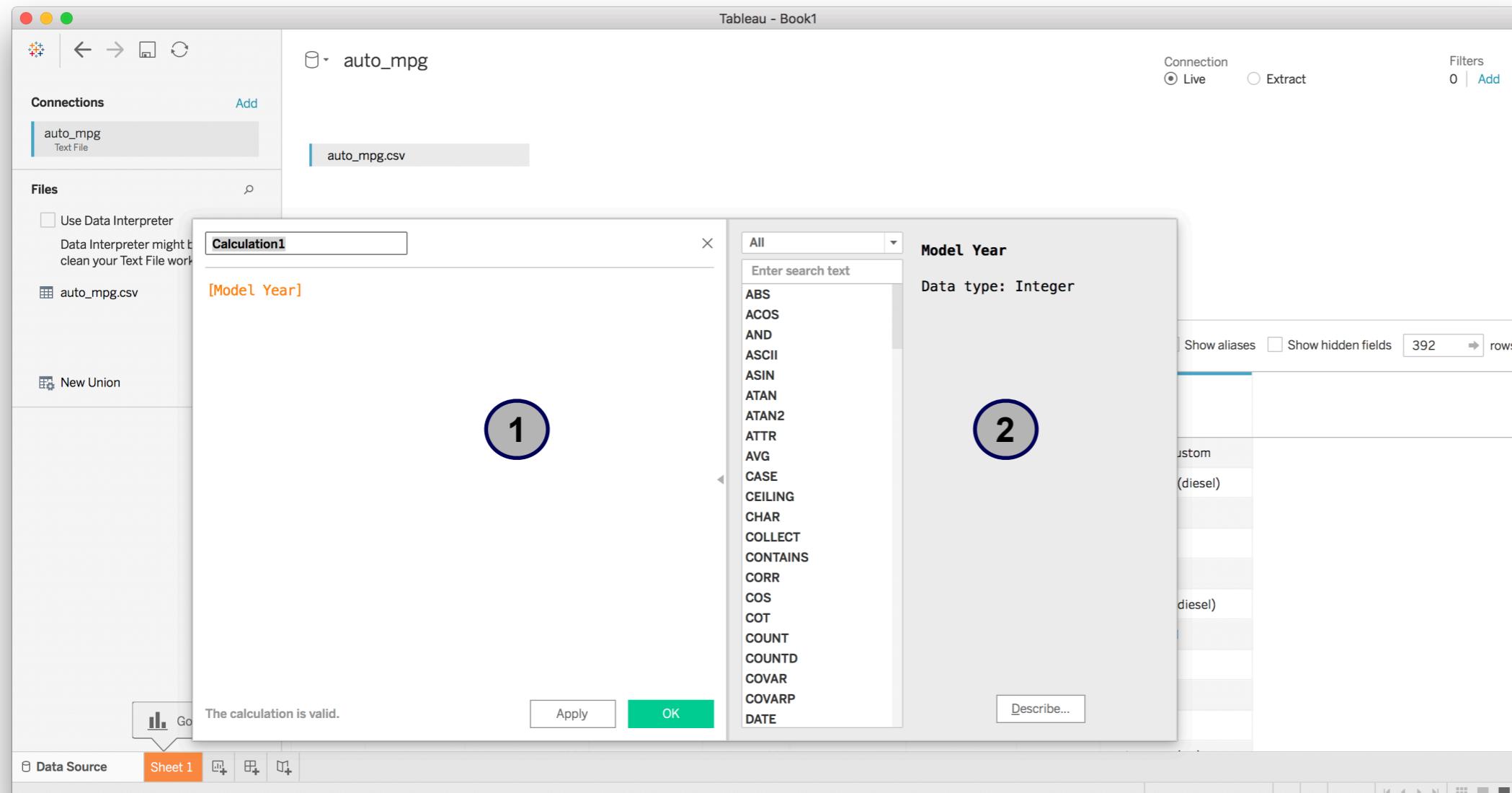
Every data column has two menus: data type and properties



1 **Changing the data type and, if it applies, the geographic role**

2 **Change metadata, create groups and bins, and create calculated fields**

# Data Processing (III)



**Calculated Field: let us create a new field**

**1 Working area**

**2 Help**

# Data Processing: example

- Access to **auto\_mpg.csv** using Tableau
- Generate "**Country of Origin**" creating a *calculated field* from origin:

```
IF [Origin]=1  
THEN 'US'  
ELSEIF [Origin]=2  
THEN 'Europe'  
ELSE 'Japan'  
END
```

- Create "**Year**" from "Model Year" using *calculated field*:  
  
**STR([Model Year] + 1900)**
- Create "**Brand**" applying *split* to "Car Name"
- Change *Geographic Role* > Country/Region to "**Country of Origin**" using data type menu

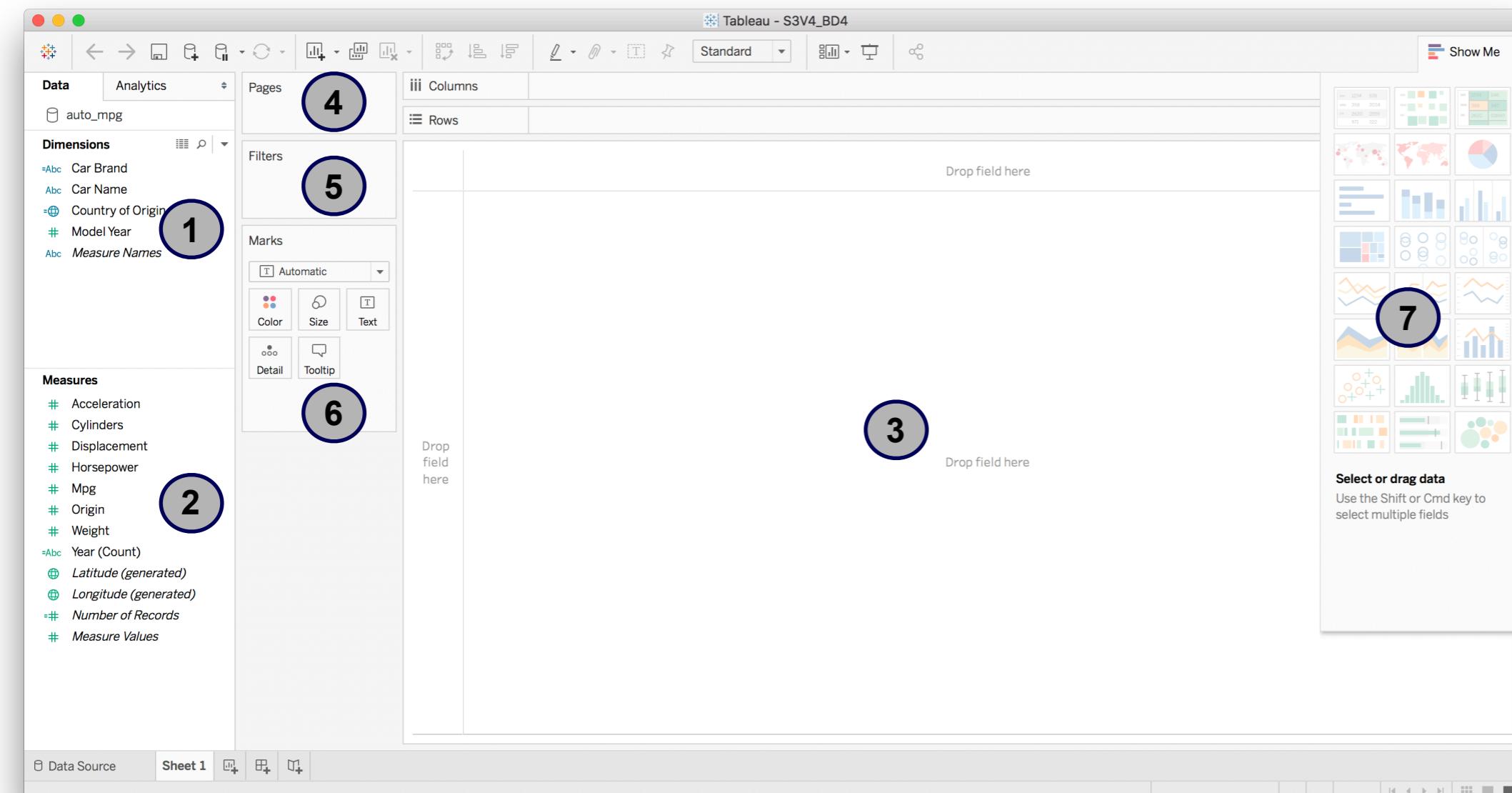
- Create "**Card Brand**" from **brand** using *calculated field*:  
  
**if ([Brand]='toyouta') THEN  
'toyota'  
ELSEIF ([Brand]='mercedes') THEN  
'mercedes benz'  
ELSEIF ([Brand]='mercedes-benz')  
THEN  
'mercedes benz'  
ELSEIF ([Brand]='maxda') THEN  
'mazda'  
ELSEIF ([Brand]='chevy') THEN  
'chevrolet'  
ELSEIF ([Brand]='chevroelt') THEN  
'chevrolet'  
ELSEIF ([Brand]='vw') THEN  
'volkswagen'  
ELSEIF ([Brand]='vokswagen') THEN  
'volkswagen'  
ELSEIF ([Brand]='capri') THEN  
'mercury'  
ELSE [Brand]  
END**

A calculated field is similar to a macro, check the help pdf for more information

# Visualization: from charts to dashboards

# EDA\* interface (I)

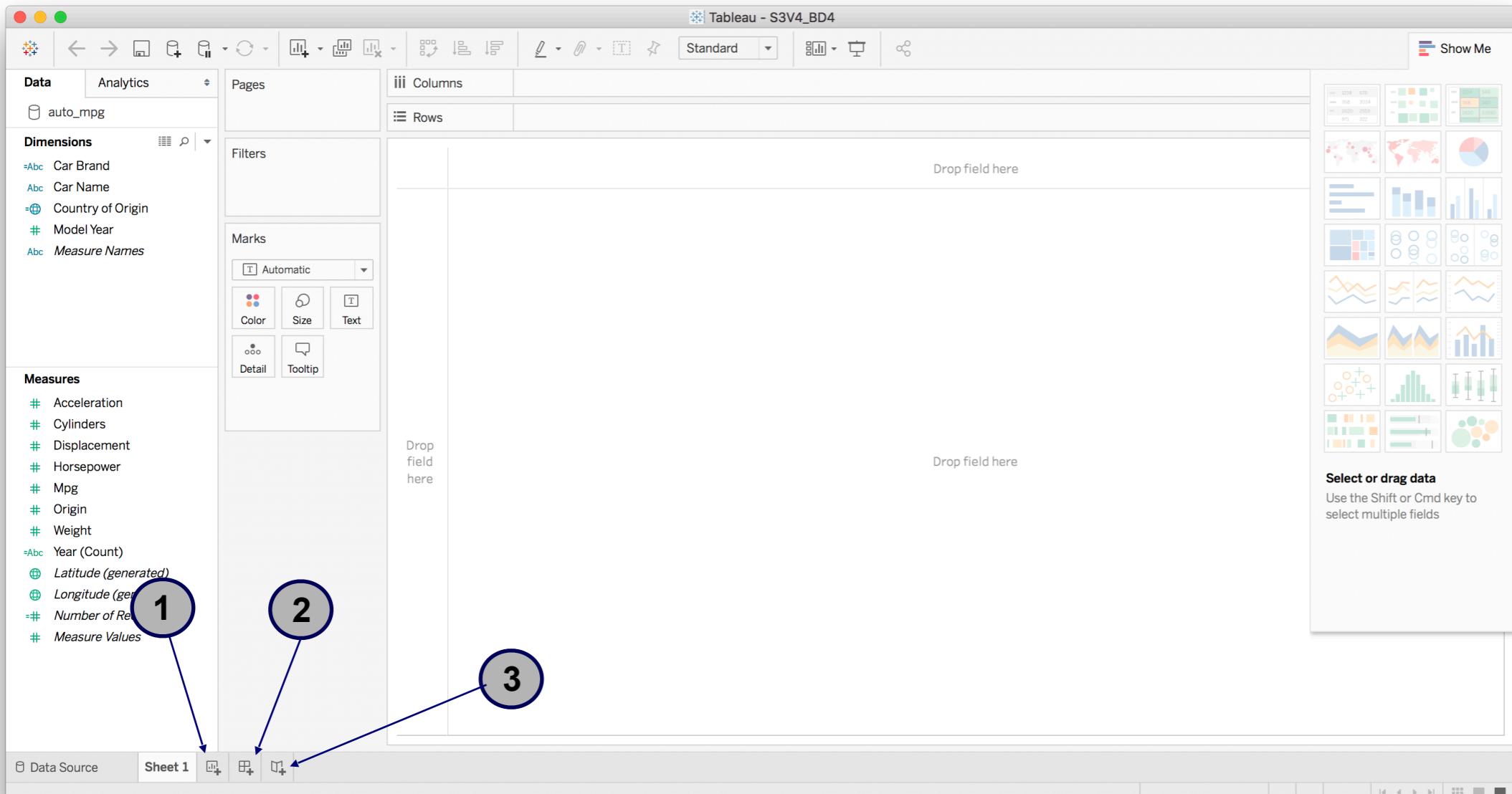
Main sections:



- 1 Dimensions
- 2 Metrics
- 3 Working area
- 4 Pagination
- 5 Filters
- 6 Marks
- 7 Show Me

\* EDA means Exploratory Data Analysis

# EDA interface (II)



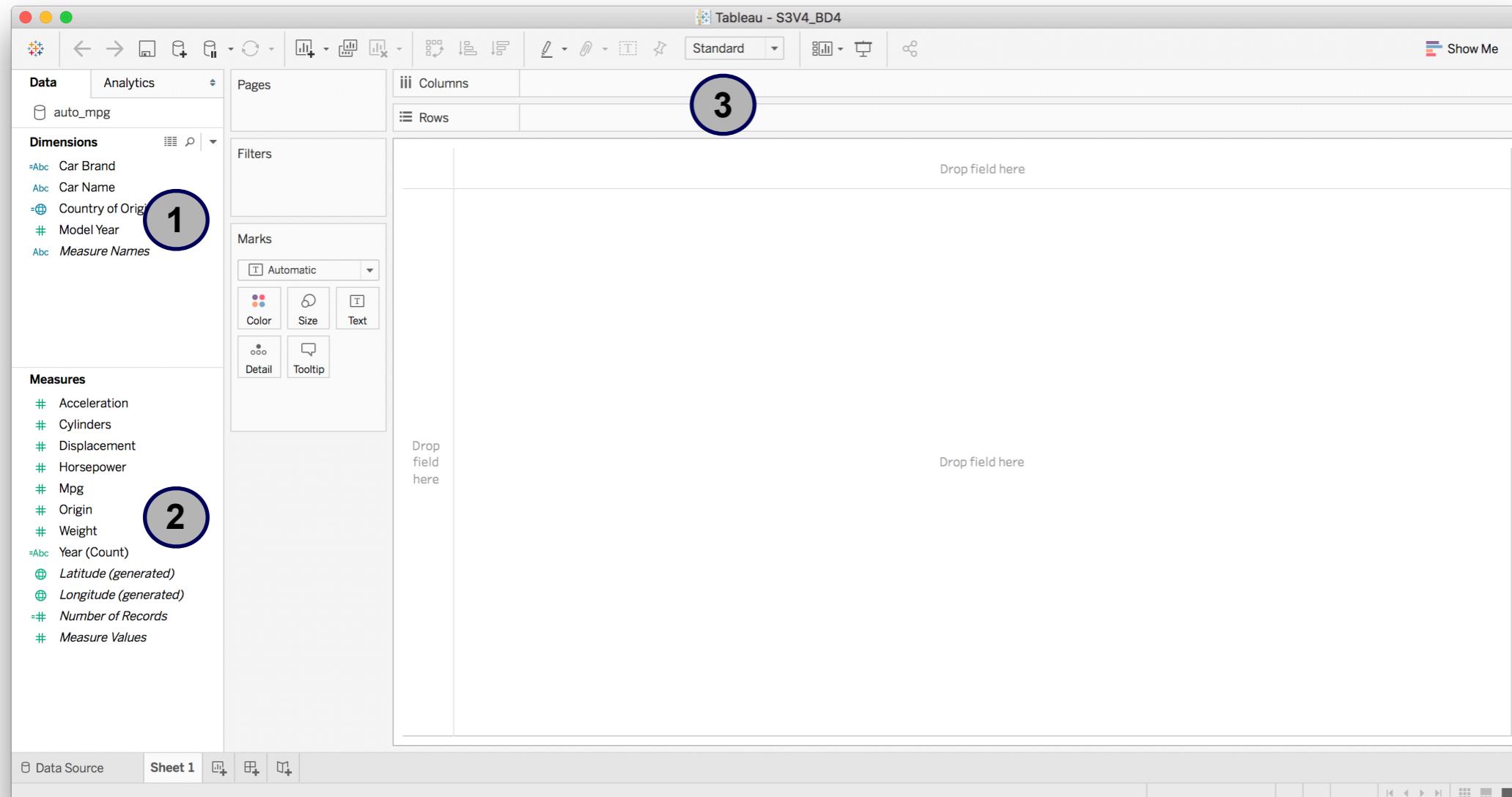
Creating  
New  
elements:

1 Worksheet

2 Dashboard

3 Data Story

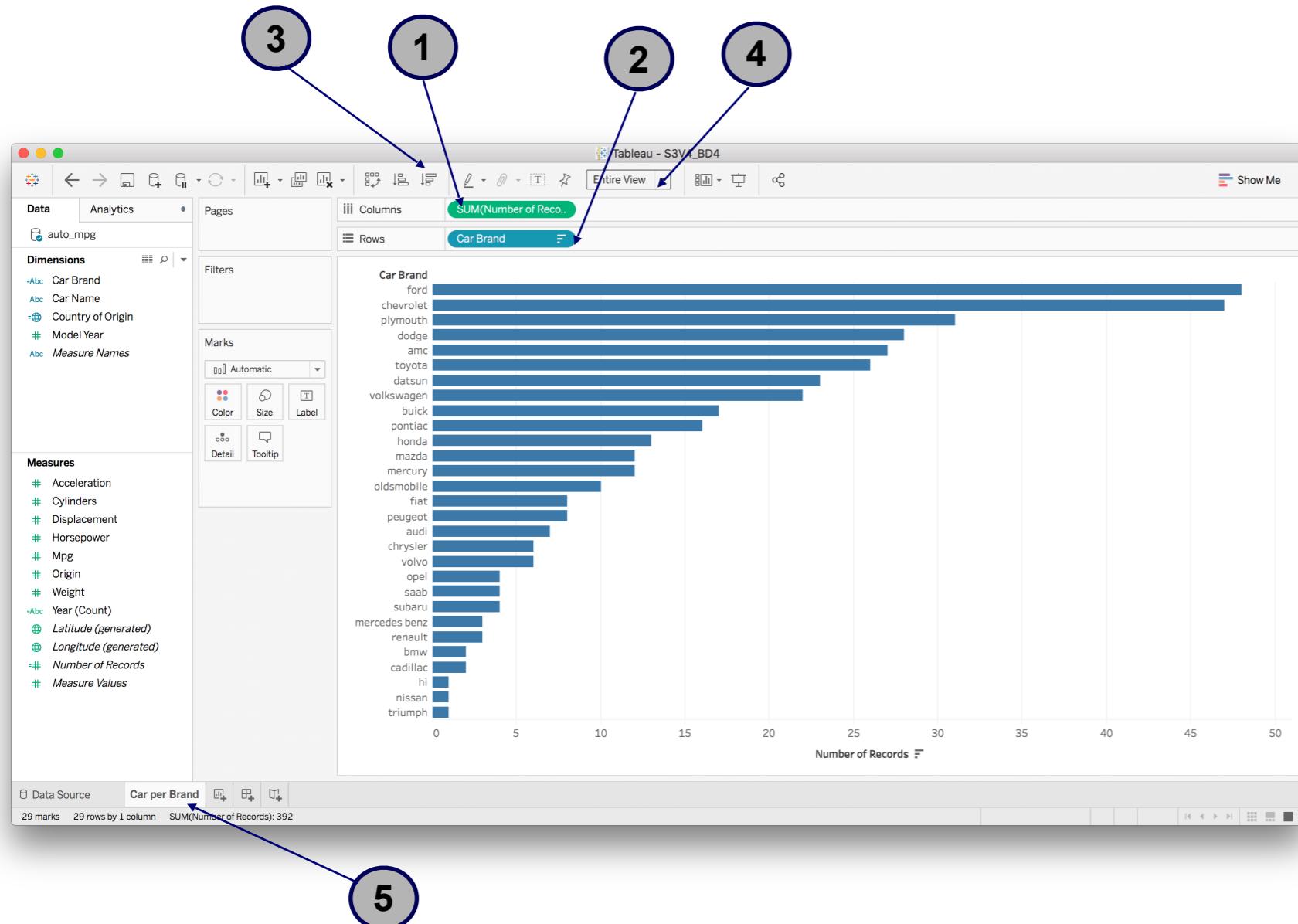
# EDA: cars by brand (I)



- 1 **Car Brand**
- 2 **Number of records**
- 3 **Selection of dimensions**

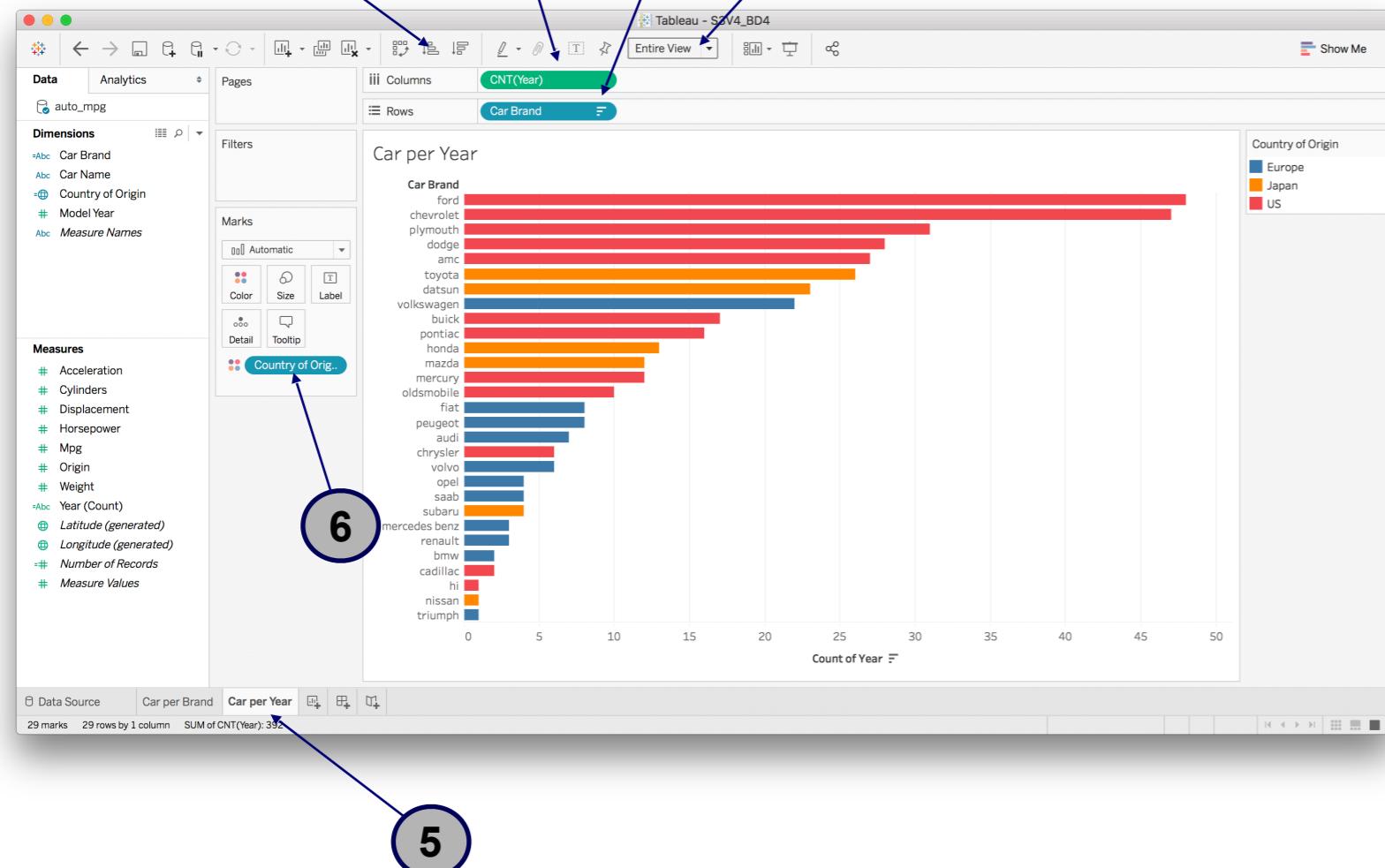
We will use one dimension and one metric and we will drag them into columns and rows.

# EDA: cars by brand (II)



- Drag number of records to columns
- Drag card brand to rows
- Sort values desc
- Adjust chart size to entire view
- Change worksheet title

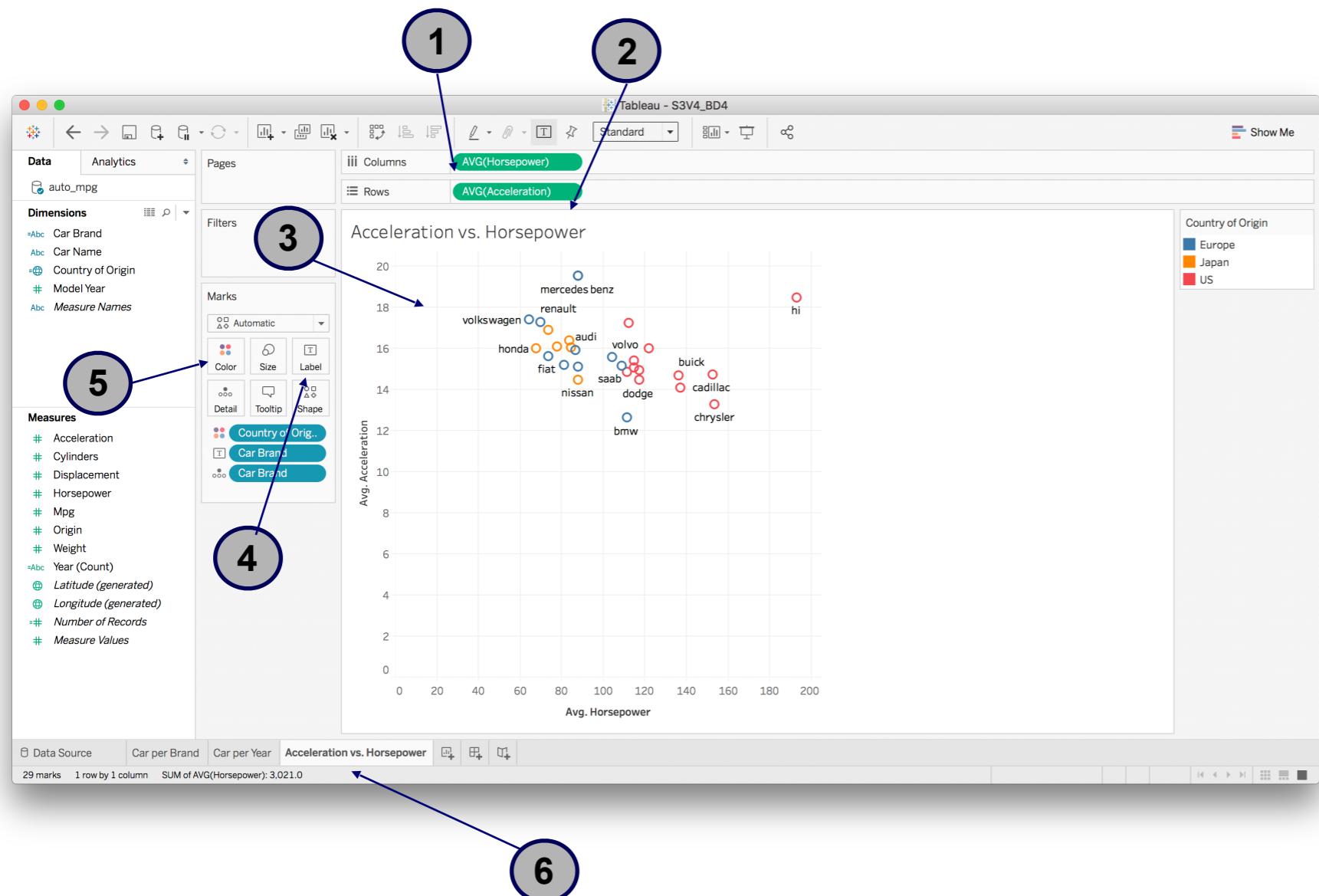
# EDA: cars by year



- Drag **year(count) records** to columns
- Drag **card brand** to files
- Sort values desc
- Adjust chart size to **entire view**
- Change worksheet title to **Car per Year**
- Drag Country of origin to **Marks > Color**

We will use one dimension and one metric and we will drag them into columns and rows.

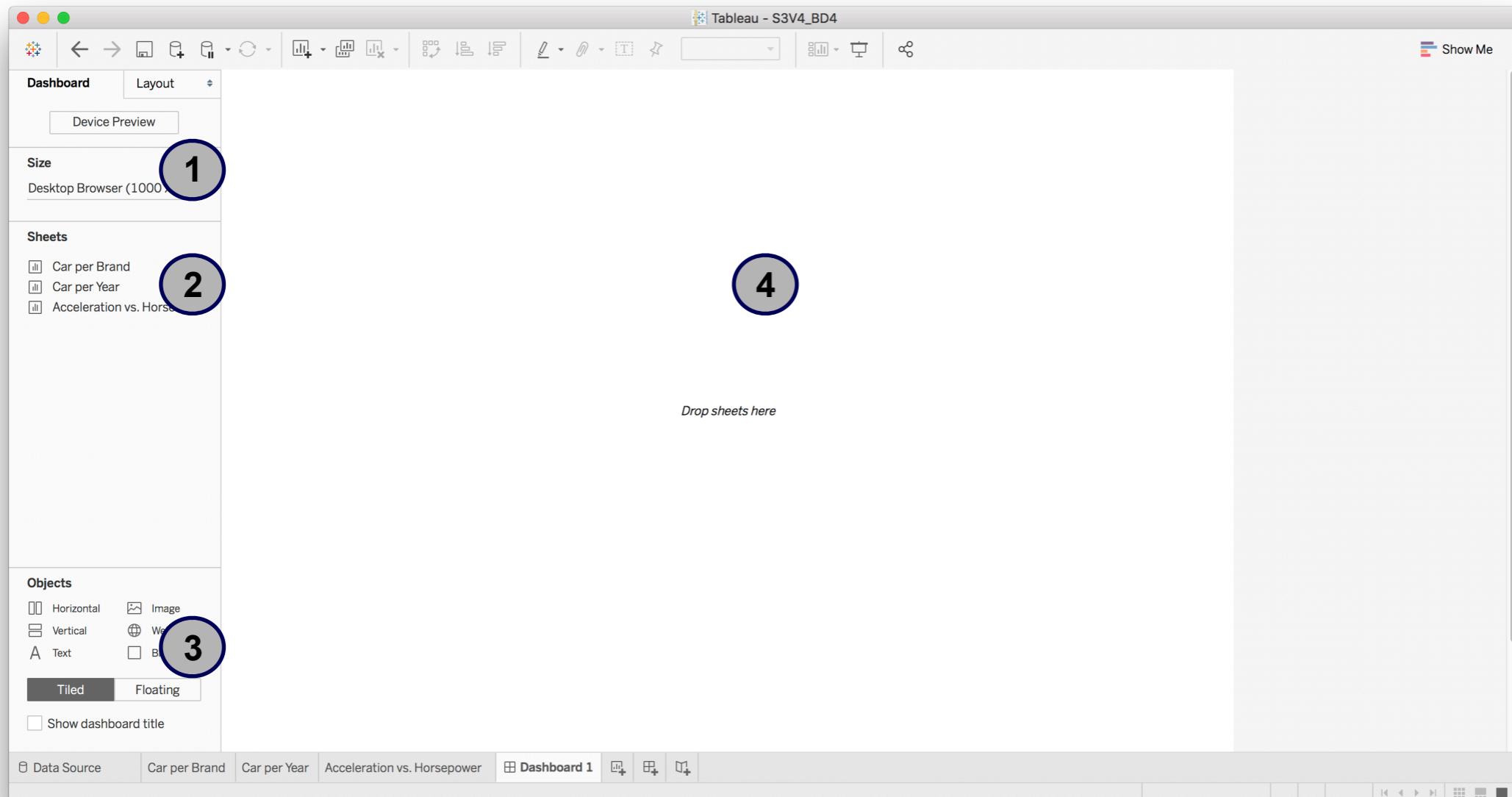
# EDA: Acceleration vs. Horsepower



- Drag **Horsepower** to columns and change measure to **AVG**
- **Drag Acceleration to files and change measure to AVG**
- Drag **car brand** to the centre of the chart
- Drag **car brand** to Marks > label
- Drag **Country of origin** to Marks > color
- Change **title** to **Acceleration vs. Horsepower**

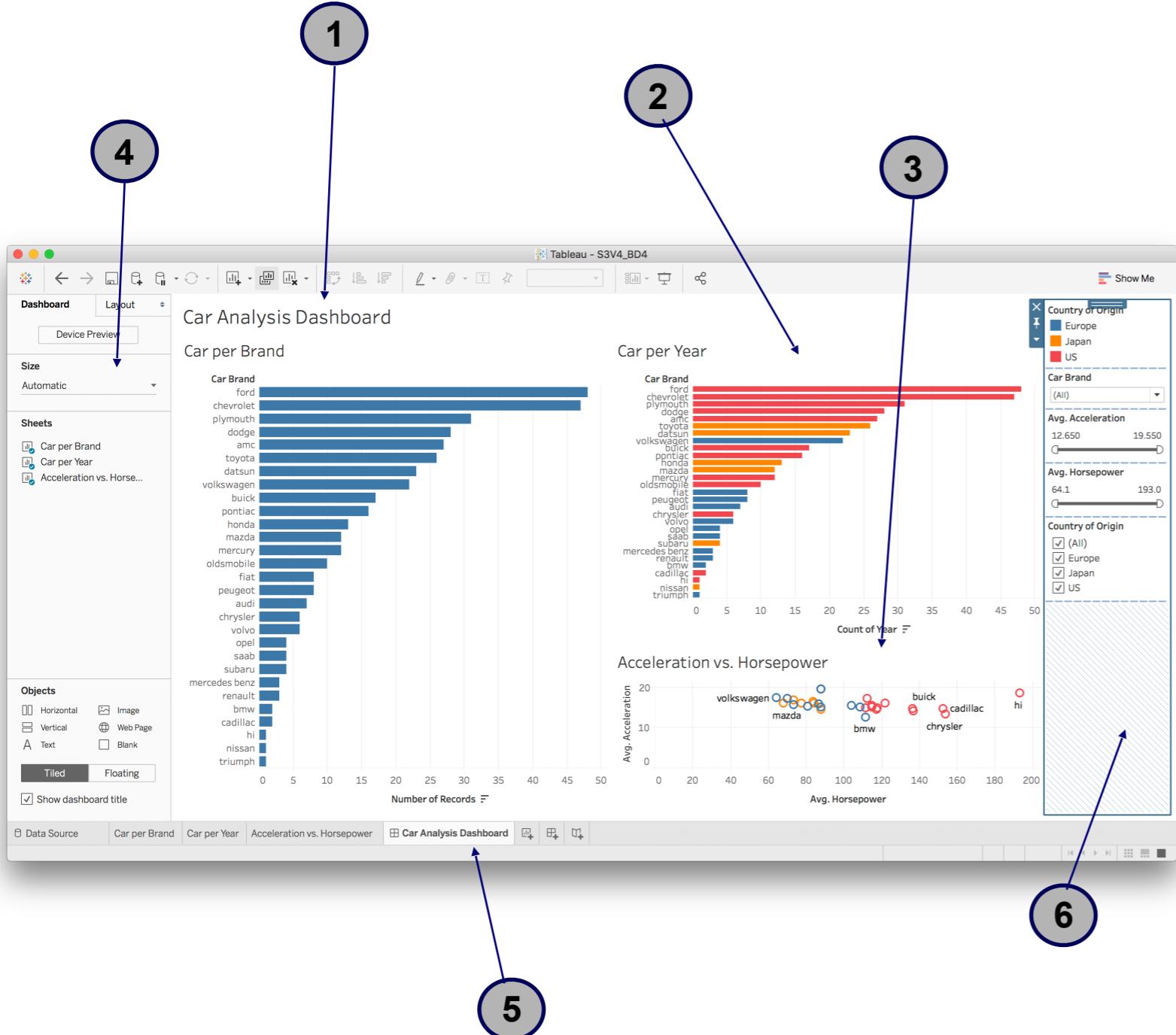
# Dashboard interface (I)

Main elements:



- 1** **Size**
- 2** **Available analysis**
- 3** **Elements**
- 4** **Work area**

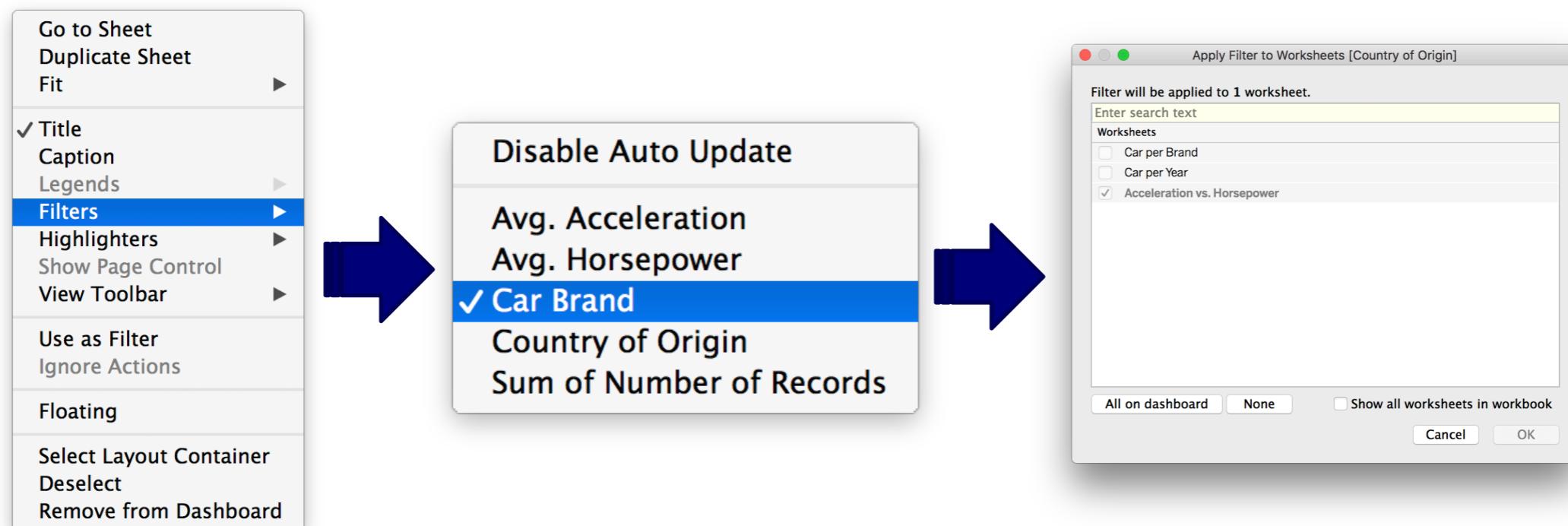
# Creating a dashboard (I): elements



- Drag **card per brand** to the work area (left)
- Drag **card per year** to the work area (right)
- Drag **Acceleration vs. Horsepower** to work area (left, bottom)
- Adjust size dashboard to automatic
- Change title to **Car Analysis Dashboard** and add
- Add filters

# Creating a dashboard (II): interaction

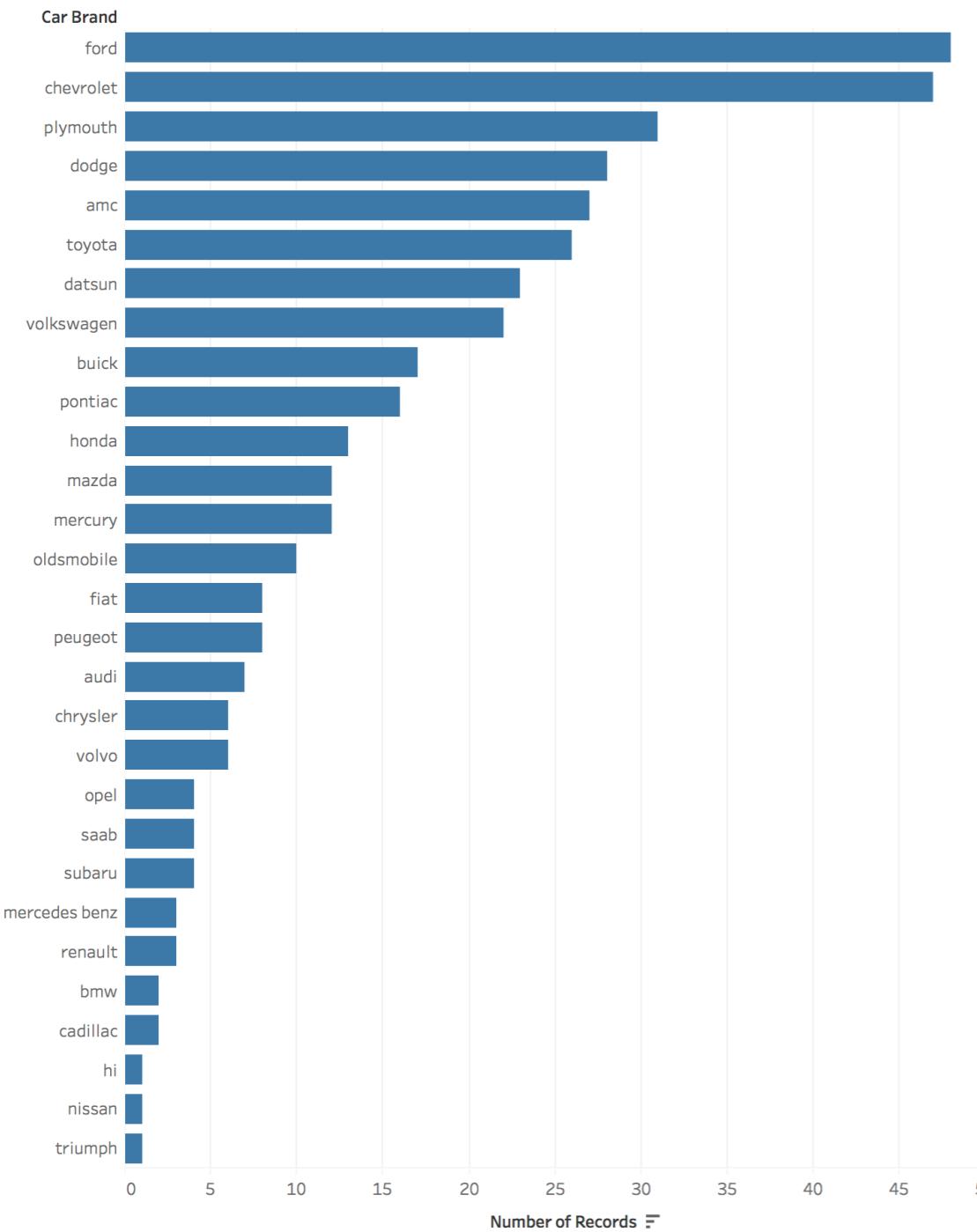
We can add **filters** based on attributes- The filters can be applied to a chart, some or all of them. We are choosing the level of interaction.



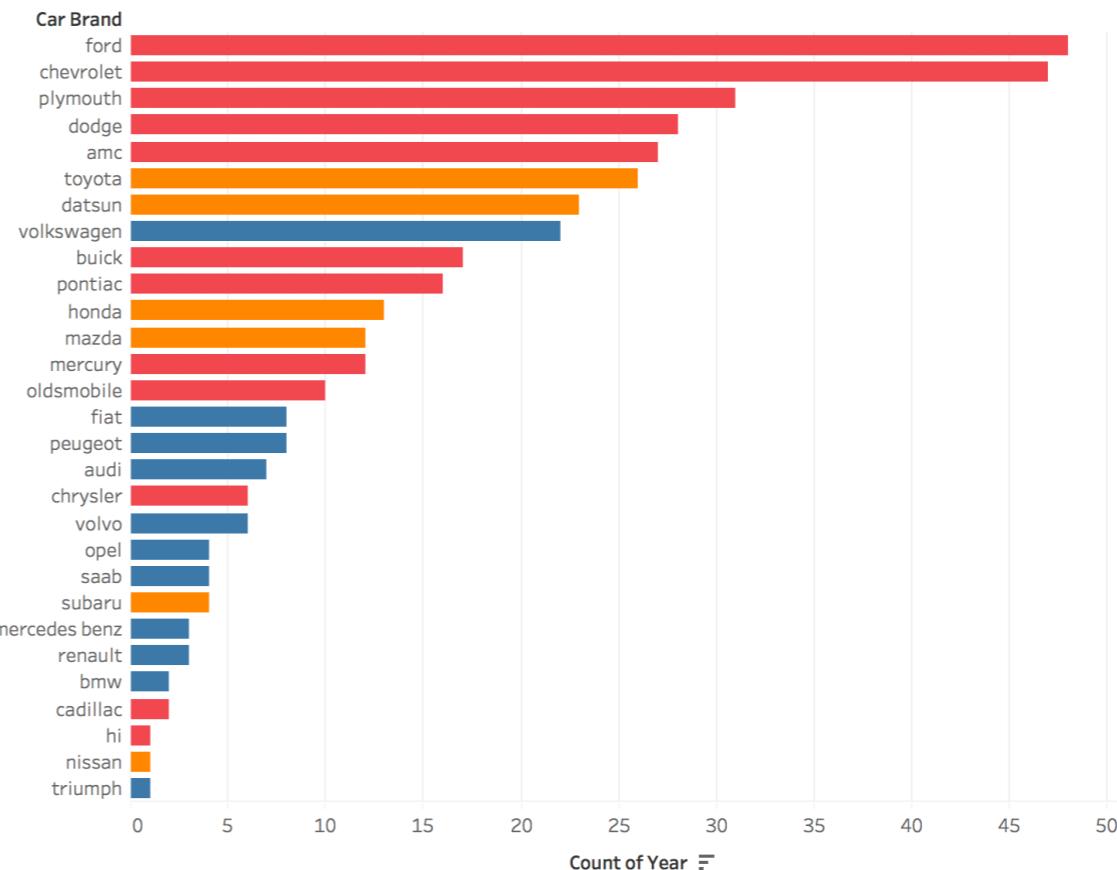
# Creating a dashboard (III): final composition

Car Analysis Dashboard

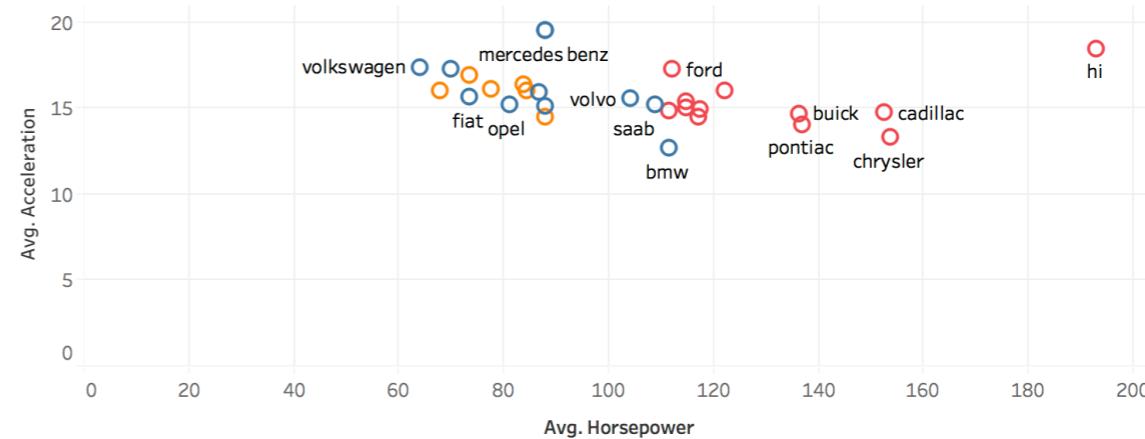
Car per Brand



Car per Year

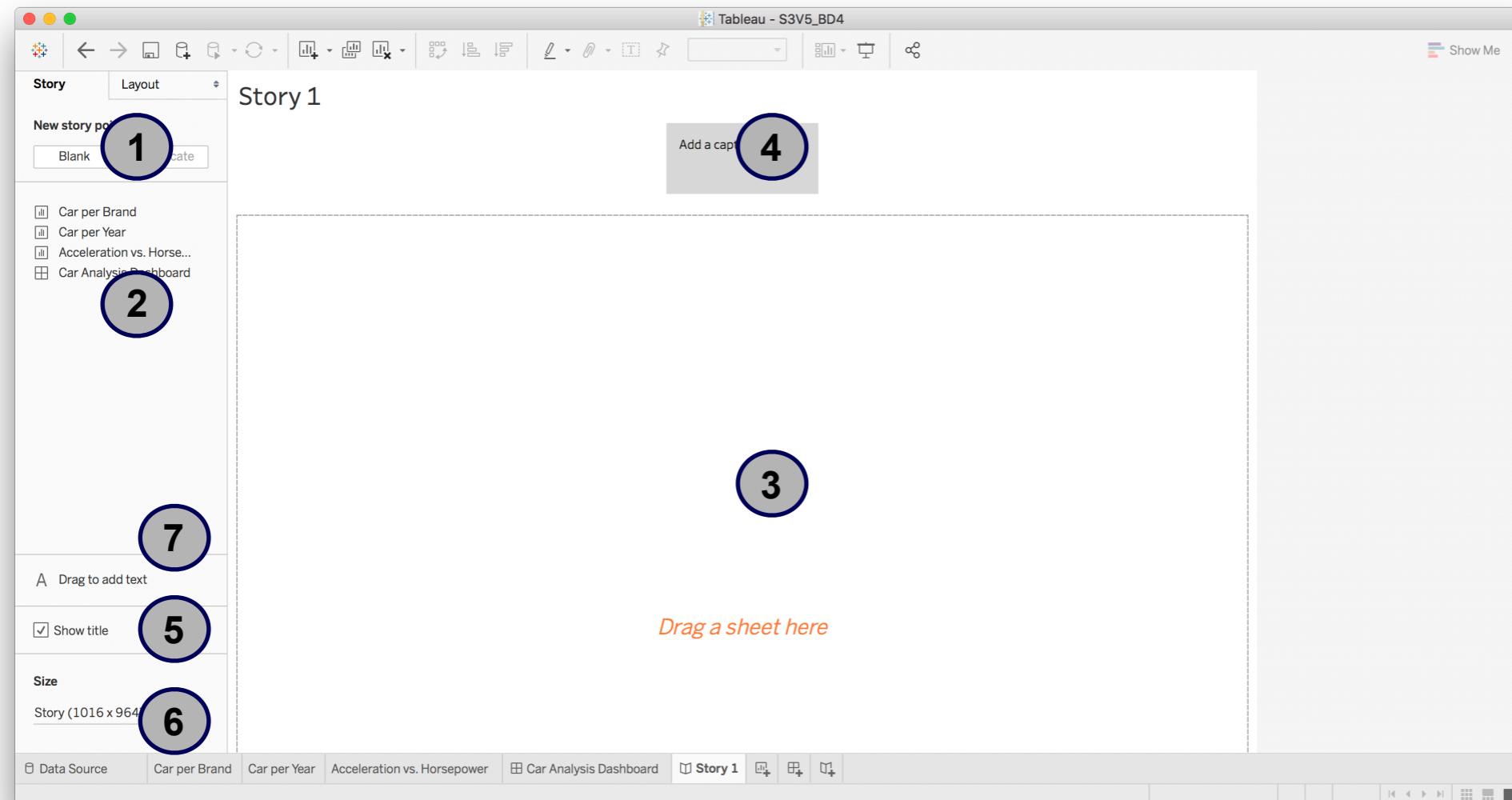


Acceleration vs. Horsepower



# Data Storytelling

# Data Stories Interface



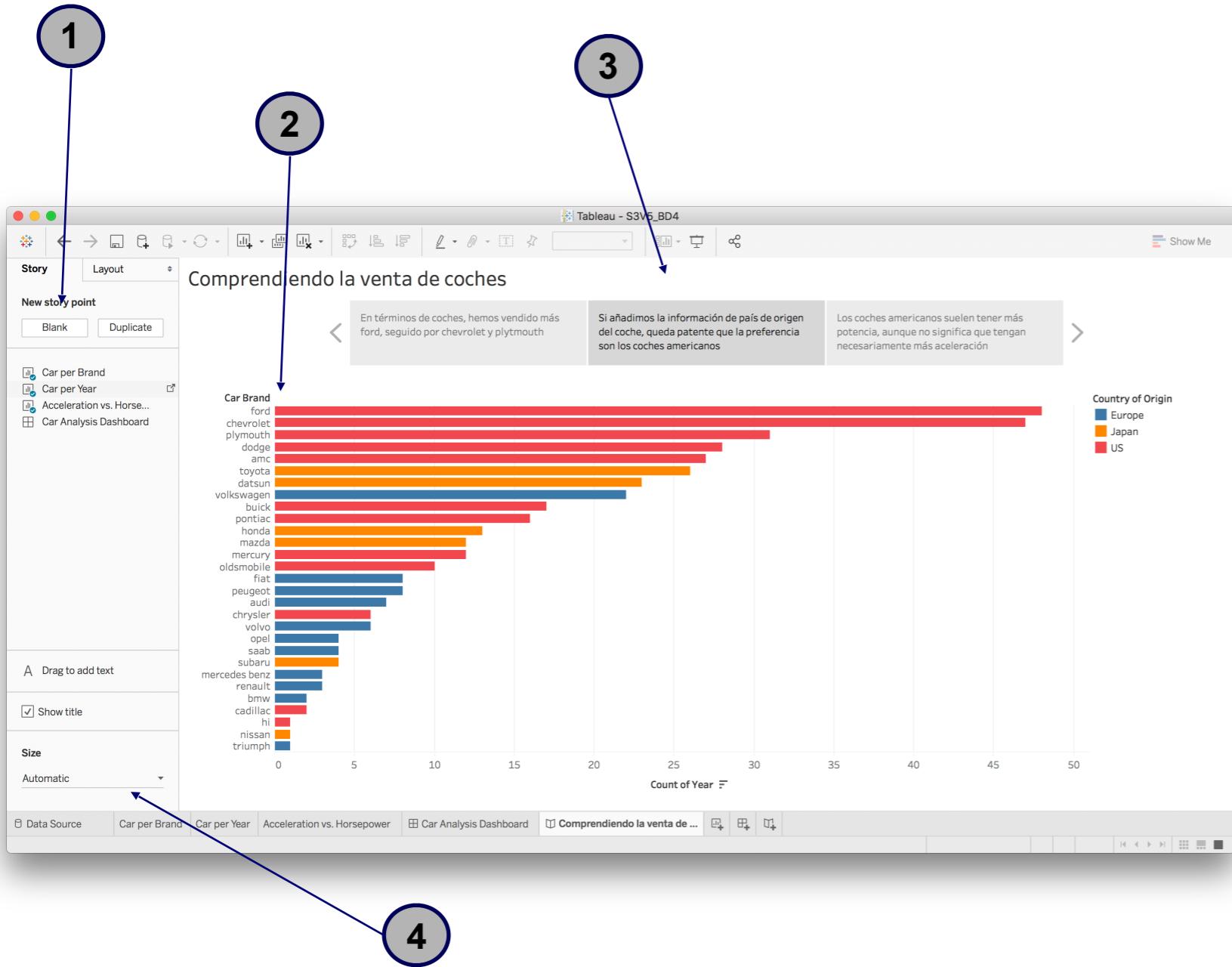
- 1 Story points
- 2 Available elements
- 3 Working area
- 4 Caption/Explanation
- 5 Title
- 6 Size
- 7 Text

# How to create a story (I)



- A story is a collection of data points
- Let's create the first data point!
- Drag **card per brand** to working area
- Change **caption** with the proper explanation
- Change size to **automatic**

# How to create a story (II)



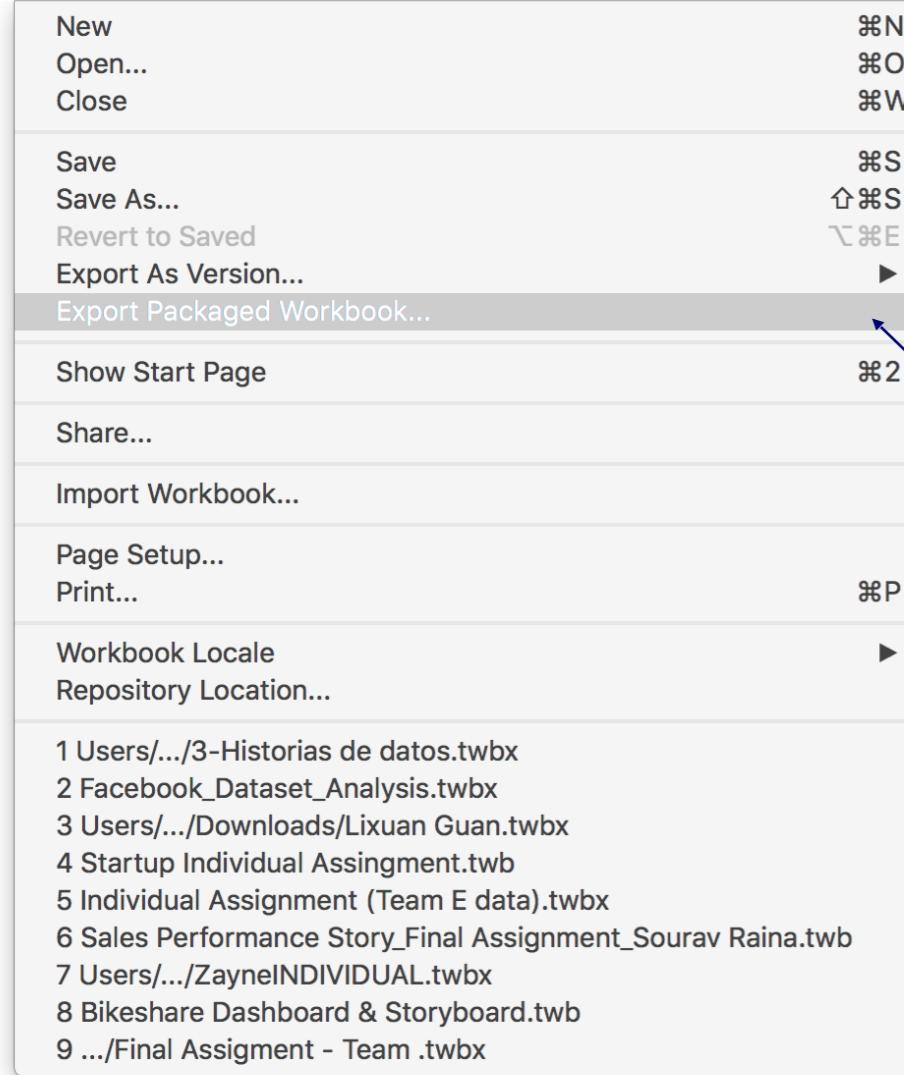
- Let's create the second data point
- Press **blank**
- Drag **card per year** to working area
- Change **caption** with the proper explanation
- Change size to **automatic**

# How to create a story (III)



- Let's create the third and final data point
- Press **blank**
- Drag **Acceleration vs. Horsepower** to working area
- Change **caption** with the proper explanation
- Change size to **automatic**
- Add **title**

# How to save our work



- In **File** menu we will find several options.
  1. **Export as Packaged Workbook**
  2. **Save**
  3. **Save as**
  4. **Others**

For the assignment, it is recommended to export as Packaged Workbook and extract the data (as hyper).



