



# Introduction to *Tableau* for Data Visualization

If you do not have Tableau Desktop, please go to this link and click “Sign In” to create a free account:  
<https://public.tableau.com/app/discover>

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# Why Data Visualization?

- Growing importance of science communication and using data for strategic decision-making
- General lack of understanding of statistics and data among the public
- Key skill (if not the most valuable) in applied data jobs
- “Dangerous” activity (omitted variables, misleading scales, etc.)
- Modern technologies allow for interactive dashboards

# 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.

SEE HOW TABLEAU WORKS 

## 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.



# Getting Started

- Tableau Desktop one-year FREE for academics:  
<https://www.tableau.com/academic/students>
- Tableau Public to share your visualizations (for free):  
<https://public.tableau.com/en-us/s/>
  - Includes free read-only desktop app:  
<https://www.tableau.com/products/public/download>
  - Limited abilities to create and edit visualizations on Tableau Public web interface
- Tableau certifications: <https://www.tableau.com/learn/certification>



# Tableau Desktop Specialist Topics

- Connecting to & Preparing Data
- Exploring & Analyzing Data
- Sharing Insights
- Other Tableau Concepts



# Connecting to & Preparing Data

- Connection Options:
  - To a File: Excel (.xlsx), text (.csv), Tableau packages (.twbx)
  - To a Server: MySQL, Cloudera Hadoop, Azure, etc... and Google Sheets!
- Prepare Your Dataset:
  - $N \times P$  data matrix: one header row, one row per person, one column per variable
  - [https://www.kaggle.com/rhuebner/human-resources-dataset?select=HRDataset\\_v14.csv](https://www.kaggle.com/rhuebner/human-resources-dataset?select=HRDataset_v14.csv)



# Connecting to & Preparing Data

- Data Source Screen
  - Connections on the left (add connections to *join* or *blend* data, which will be discussed later)
  - Data Source in the center (with a preview on the bottom half)
  - Note “Live” or “Extract” in the top right (Desktop only)
  - Note “Filters” in the top right



# Connecting to & Preparing Data

- Data Properties
  - Number (decimal or whole)
  - Date & Time
  - String
  - Boolean
  - Geography





# Exploring & Analyzing Data

- Worksheet screen layout
  - Data on the left (divided into Dimensions and Measures)
    - Usually based on string vs. number format, but sometimes Tableau is smart enough to recognize number IDs as dimensions
  - Worksheet in the center
  - Variables go in the top section (columns x rows)
  - Filters on the left
  - Marks on the left
  - “Show Me” on the top right



# Exploring & Analyzing Data

- Creating basic charts
  - Bar chart: how many absences by employment status?
  - Line chart: how many terminations by quarter?
  - Scatterplot: relationship between satisfaction and absences?
    - Add a “trend line”
    - What about only active employees?
  - Map: how many employees per state, and what’s their average engagement?
  - Crosstab: employee name with key metrics



# Exploring & Analyzing Data

- A little bit more complicated...
  - Employee satisfaction based on position level (grouped into Director, Manager, Executive, and Other)
  - Salary group (in quartiles) as a moderator of the engagement-absence relationship
  - Histogram of absences in bins of 5
  - Change in salary over time (of hire)



# Sharing Insights

- Dashboard layout
  - Sheets on left
  - Objects on bottom left
- Add sheets, then add filters for interactive elements
- Tooltips
- Actions
- Share to Tableau Public



## Other Tableau Concepts

- Aggregation and Level of Detail
  - Average number of employees *in each job position* across managers
  - Avoiding filters in calculations
- Joining and Blending Data
  - Primary Key and Foreign Key (SQL Terms)
- Parameters



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