Module 02

Data Visualization PowerBI

Data Science Developer

Purwadhika
Startup and Coding School

Outline

- Essential Data Visualization
- Step, and Type Data Visualization
- Introduction to visualization tools Power BI
- Data Visualization with power BI
- Creating simple dashboard report in power BI
- Interpretation dashboard with storytelling

Purwadhika
Startup and Coding School

Essential Data Visualization

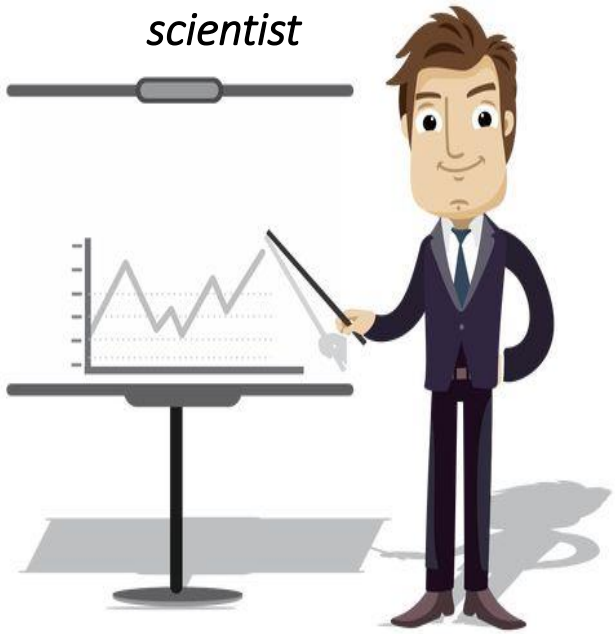
Data visualization is the presentation of data in a pictorial or graphical format.

Why is data visualization important?

Because of the way the human brain processes information using charts or graphs to visualize large amounts of complex data is **easier** than poring over spreadsheets or reports.

Quick and easy way to convey concepts in a universal manner can **experiment with different scenarios** by making slight adjustments.

To be a proper data scientist

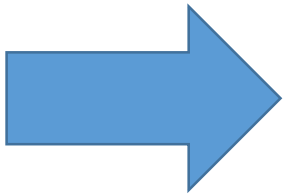


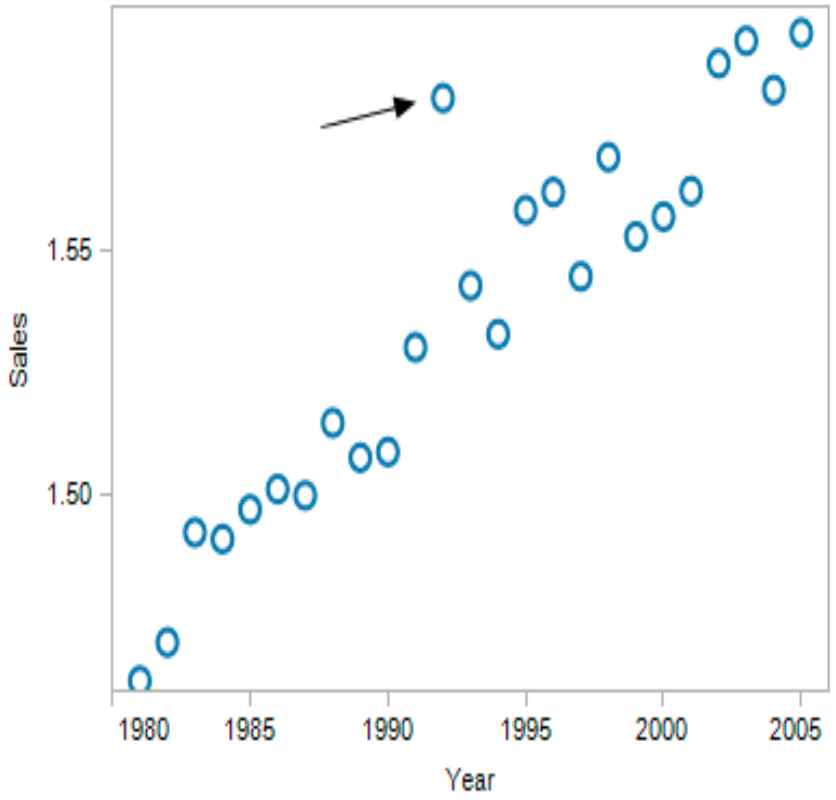
Purwadhika
Startup and Coding School

Illustration

Question : Search the outlier number of sales?

	A	B
1	Year	Sales
2	1981	1.4622
3	1982	1.47004
4	1983	1.49253
5	1984	1.49118
6	1985	1.49722
7	1986	1.50138
8	1987	1.50008
9	1988	1.51493
10	1989	1.50781
11	1990	1.50899
12	1991	1.53037
13	1992	1.58137
14	1993	1.54299
15	1994	1.53307
16	1995	1.55845
17	1996	1.56213
18	1997	1.54488
19	1998	1.56927
20	1999	1.55305
21	2000	1.5571
22	2001	1.56235
23	2002	1.58847
24	2003	1.59309
25	2004	1.58303
26	2005	1.5947



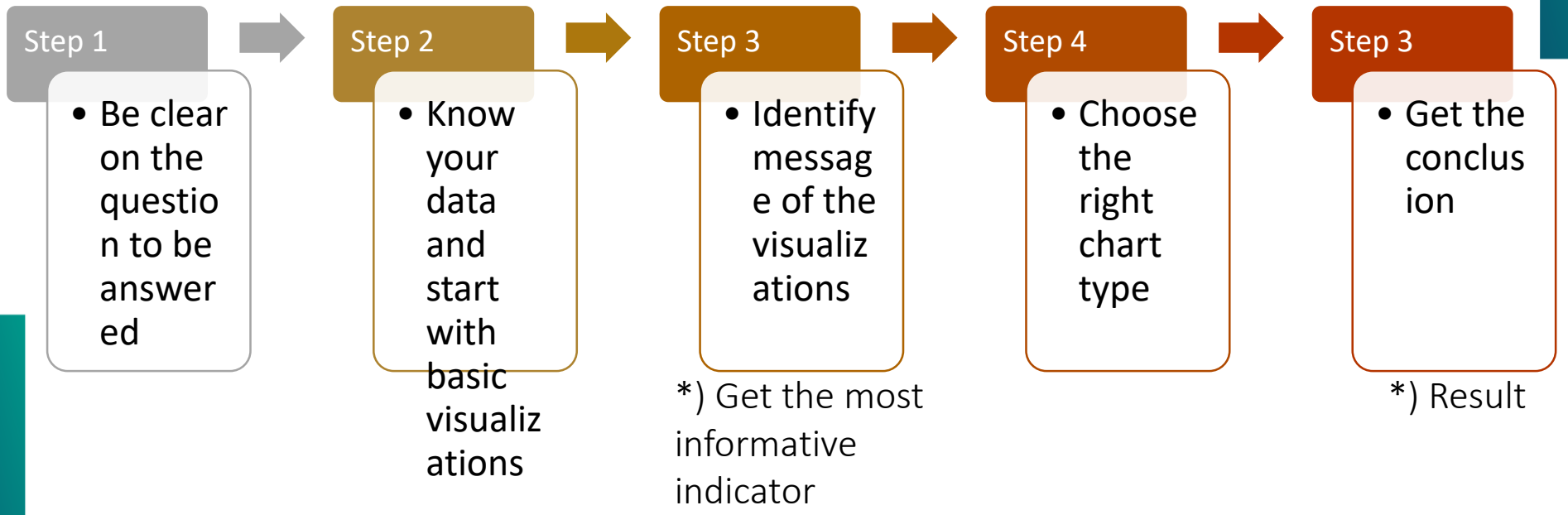


Much Faster, Isn't it?

Key : Knowing visualization with chart more faster, because our brains process visual information so efficiently

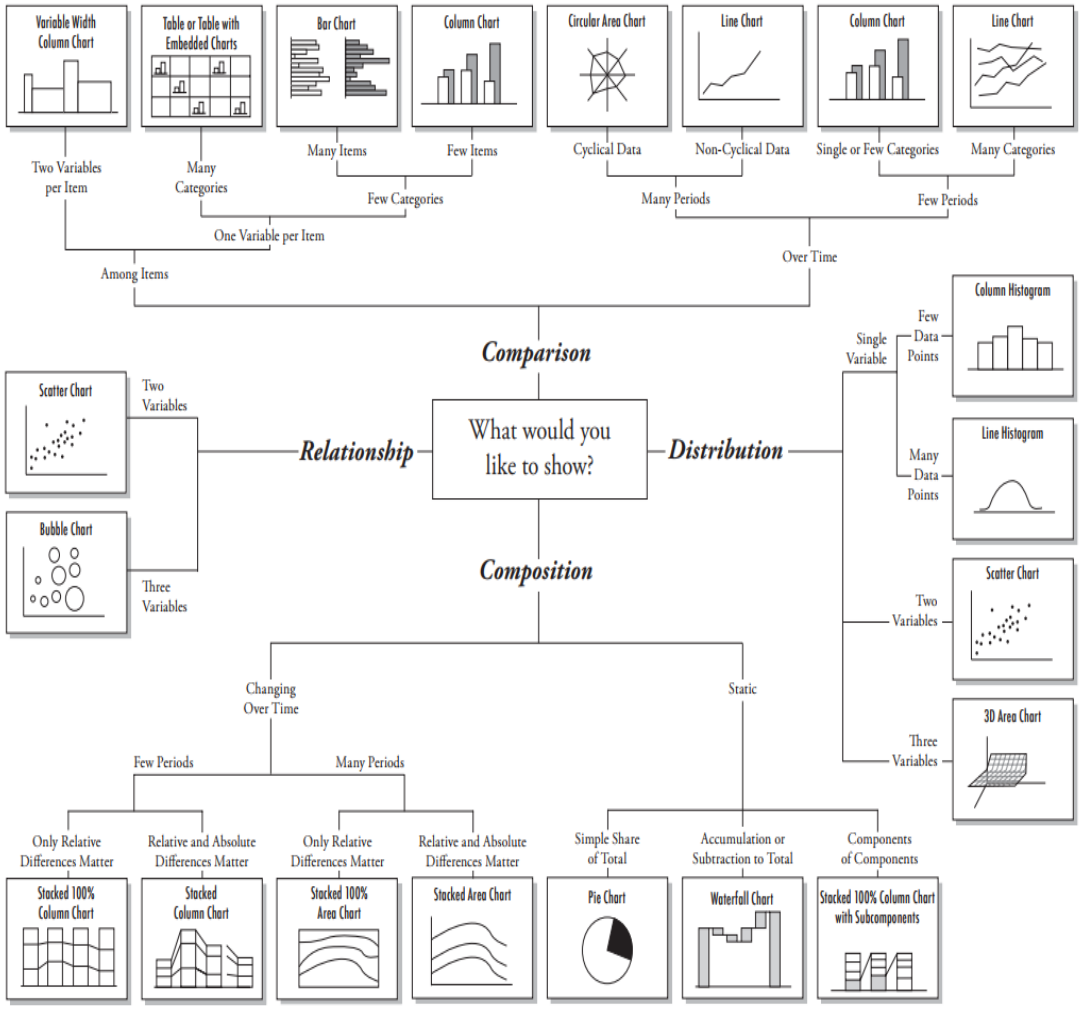
Purwadhika
Startup and Coding School

Step Data Visualization



Purwadhika
Startup and Coding School

Chart Suggestion - A Thought Starter

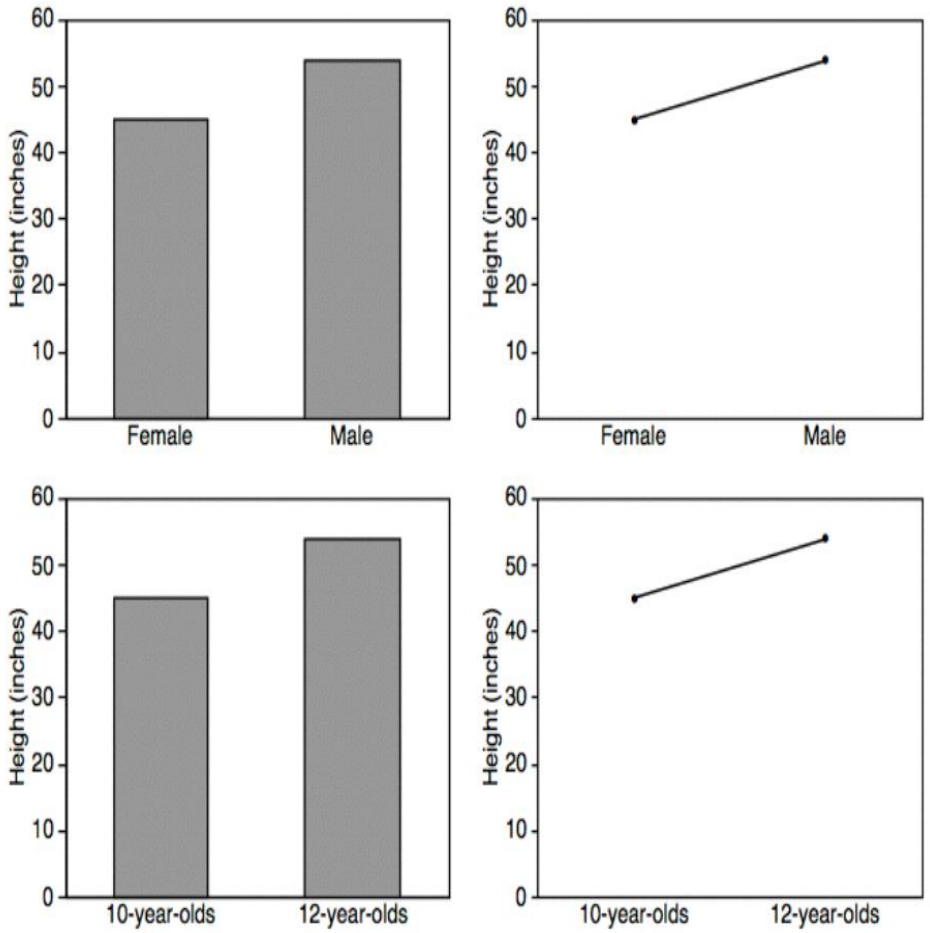


© 2006 A. Abela — a.v.abela@gmail.com

Comparison - Bar Chart

Bottles per person per week

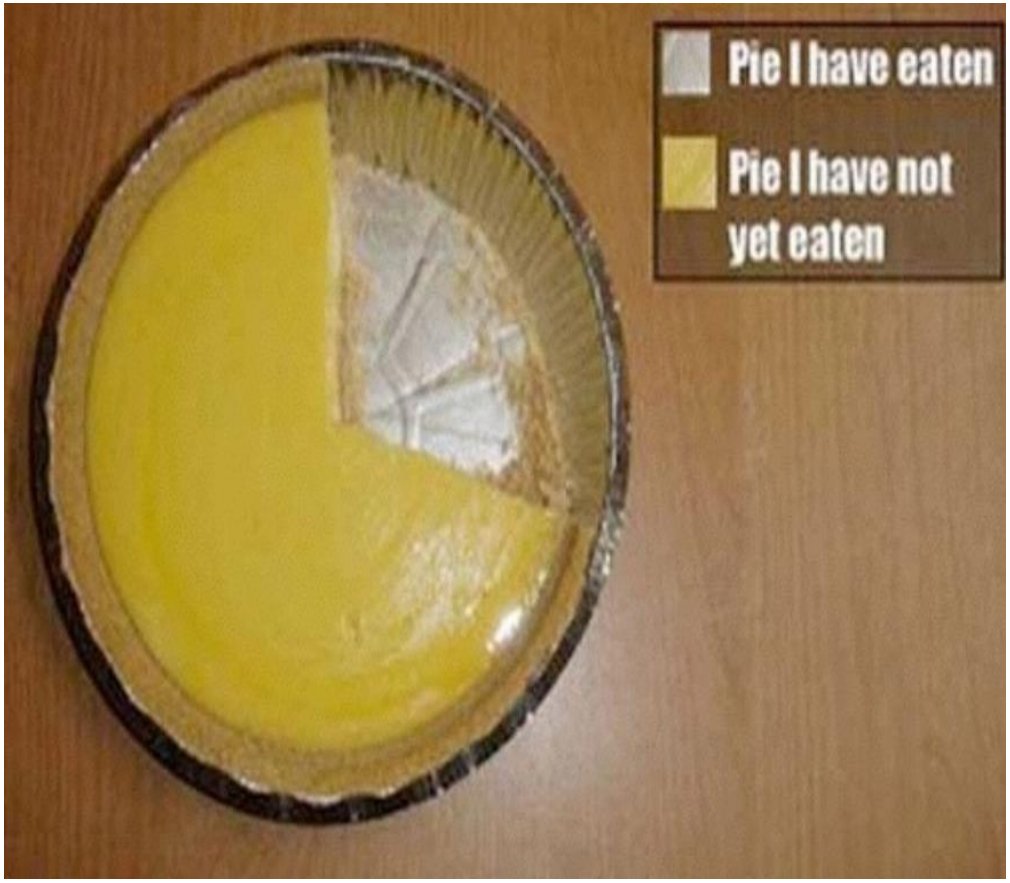
Bar vs Line


60
50
40
30
20
10
0
Height (inches)
Female
Male
10-year-olds
12-year-olds

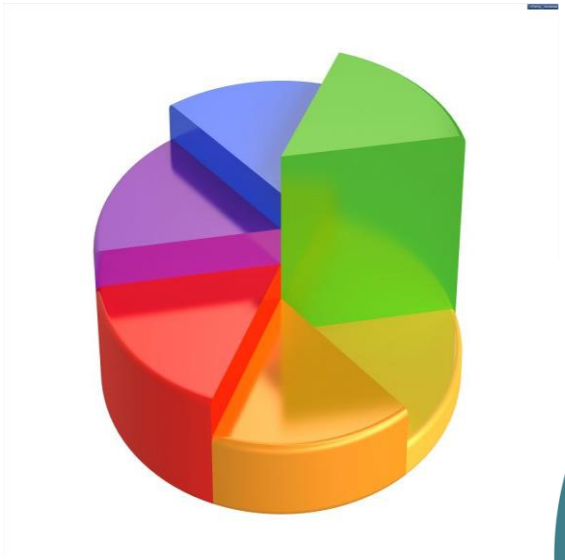
Trends

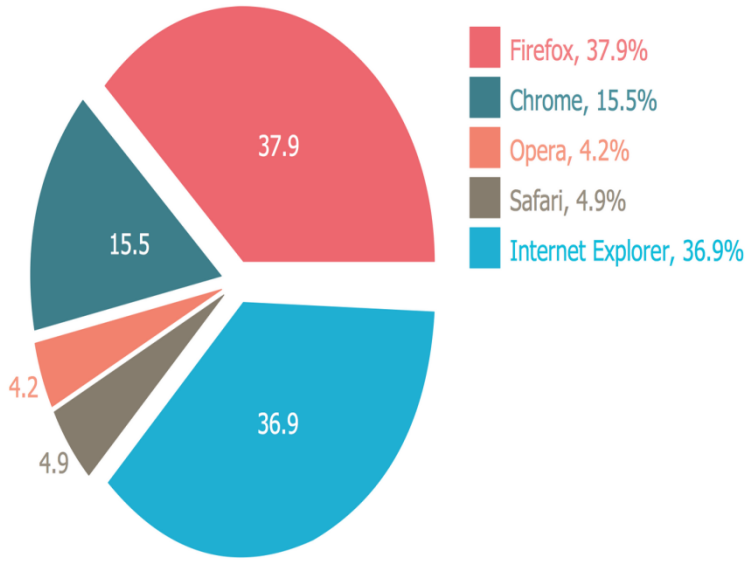
Dow Jones Industrial Average (^DJI) 21,807.64 +54.33 (0.25%) As of 4:56PM EDT. Market closed.
Add Indicator
Comparison
1y
Line
Settings
Reset
^DJI 21807.64
^IXIC 6393.31
Open 21815.76
Close 21807.64
Low 21794.07
High 21849.24
Vol 318.76M
% Chg 18.01%
25.00%
21.56%
20.00%
18.01%
15.00%
10.00%
5.00%
0.00%
318.76M
-5.00%
YAHOO! FINANCE
Dec 1 '16
Mar 1 '17
Jun 1 '17
Sep 1 '17

Proportions - Pie Charts

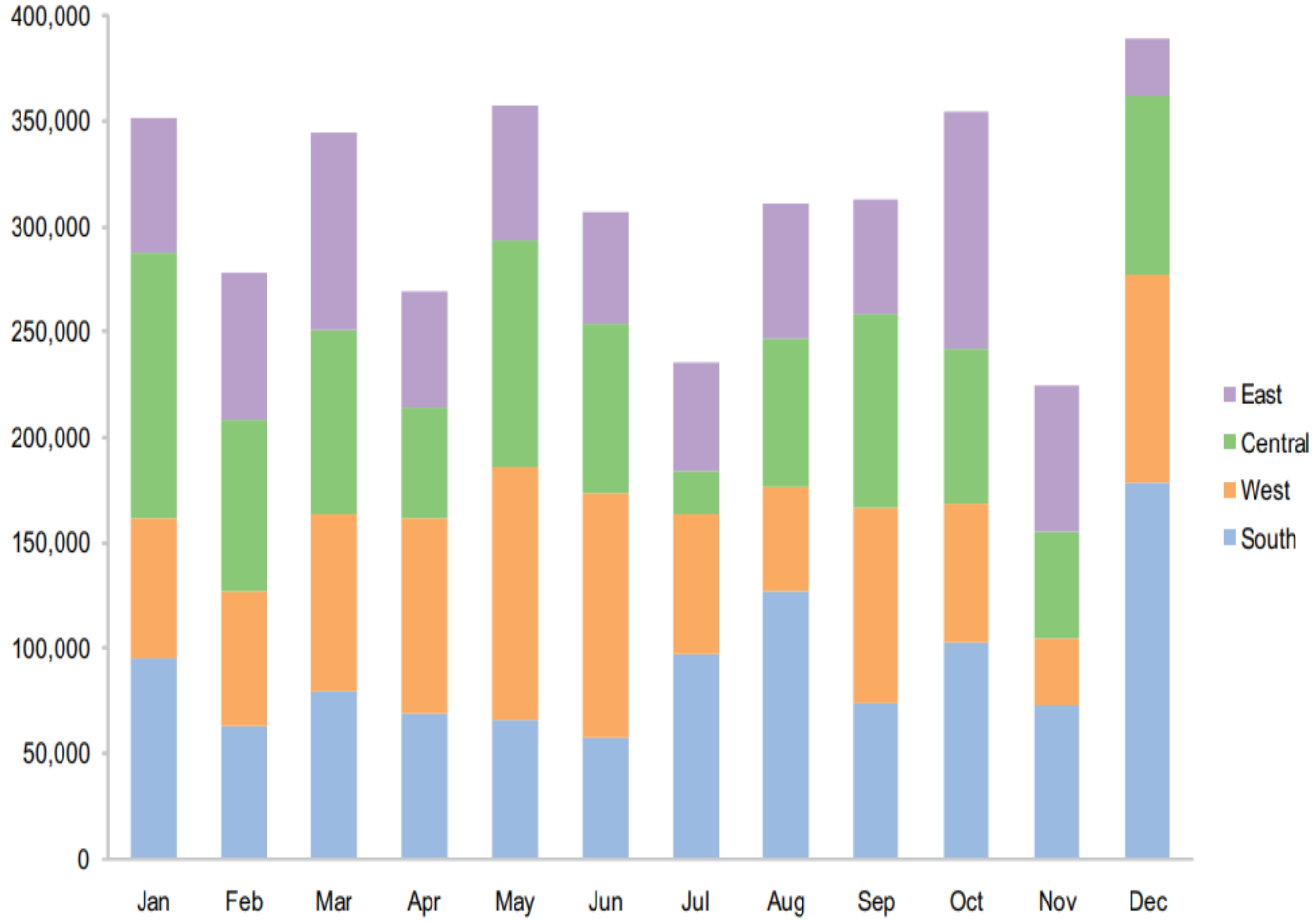


Proportions - Pie Charts

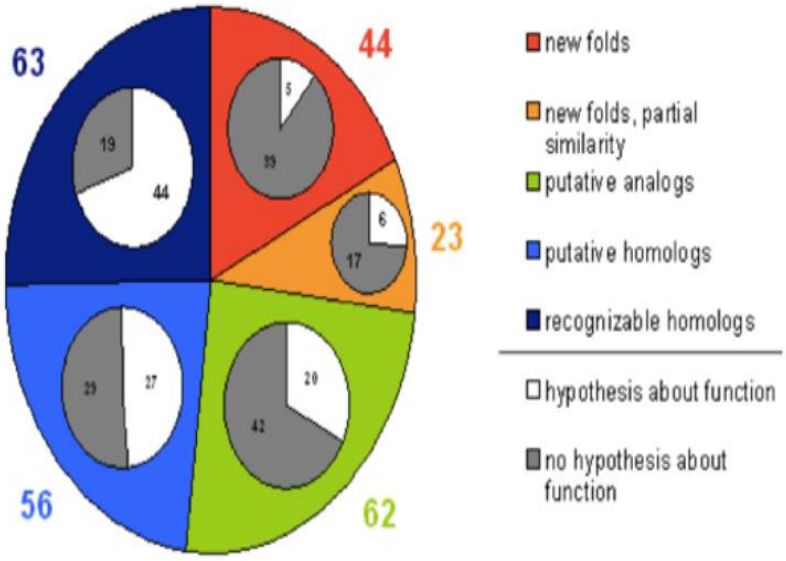


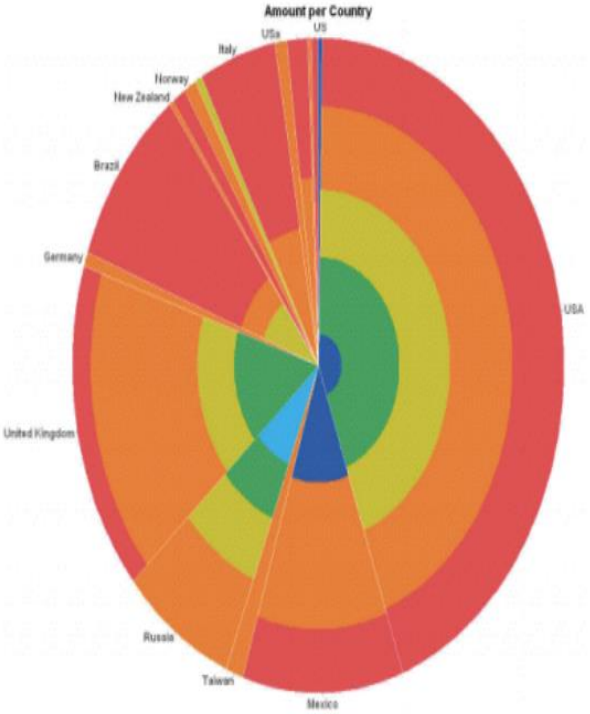


Proportions - Stacked Bar Chart

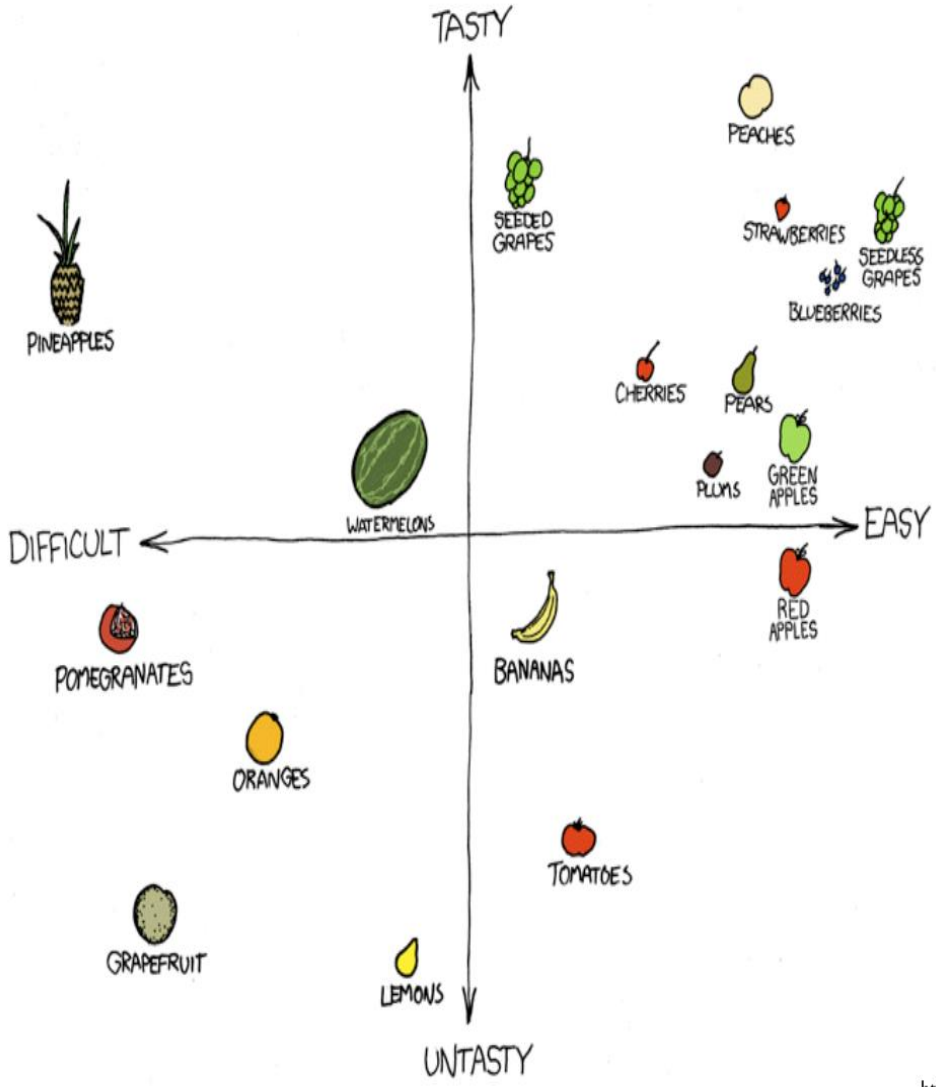


Don’t


63
44
23
56
62
19
44
5
39
6
17
29
27
20
42
new folds
new folds, partial similarity
putative analogs
putative homologs
recognizable homologs
hypothesis about function
no hypothesis about function

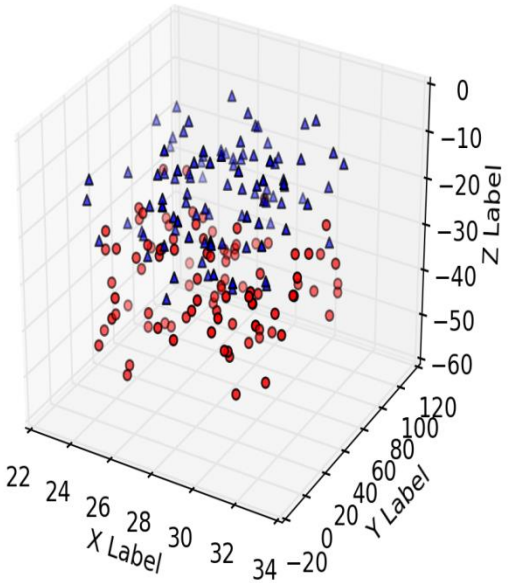

Amount per Country
USa
US
Italy
Norway
New Zealand
Brazil
Germany
USA
United Kingdom
Russia
Taiwan
Mexico

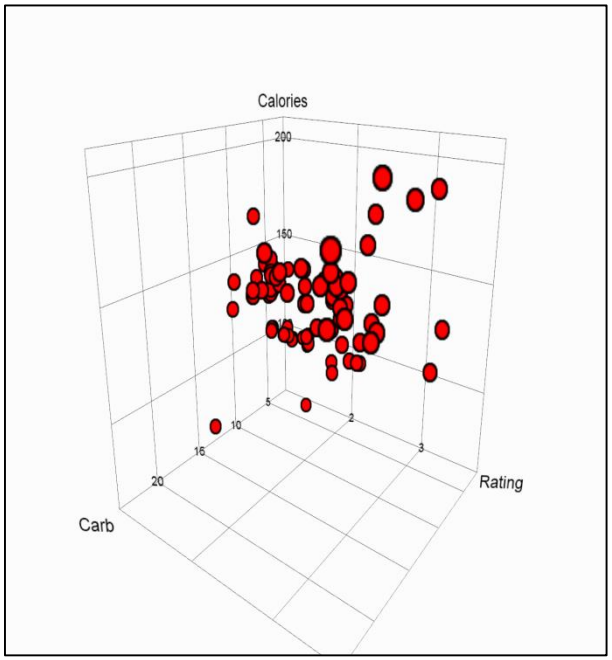
Correlation - Scatter Plot

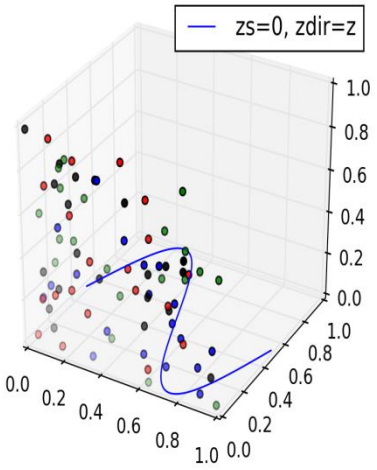


http://xkcd.com/388/

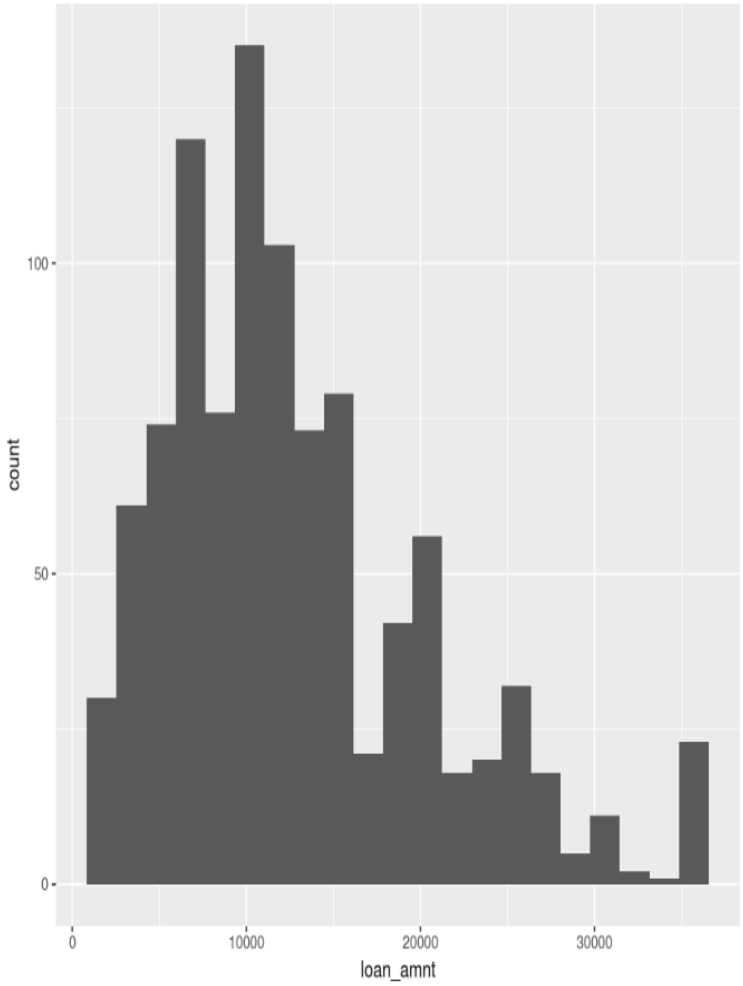
Don’t



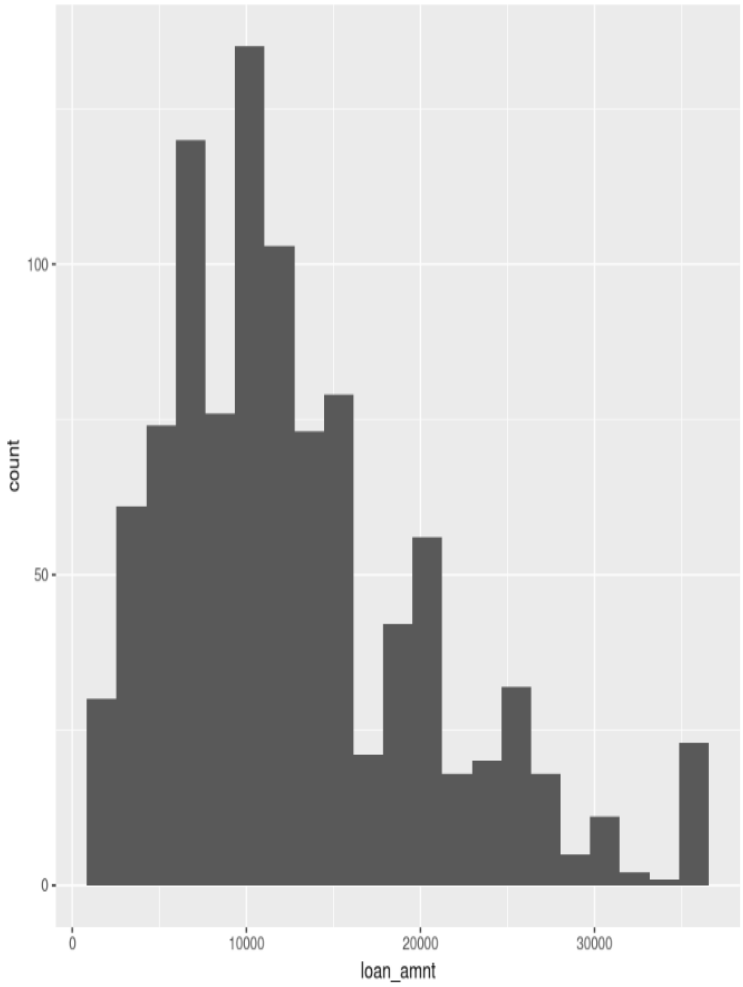


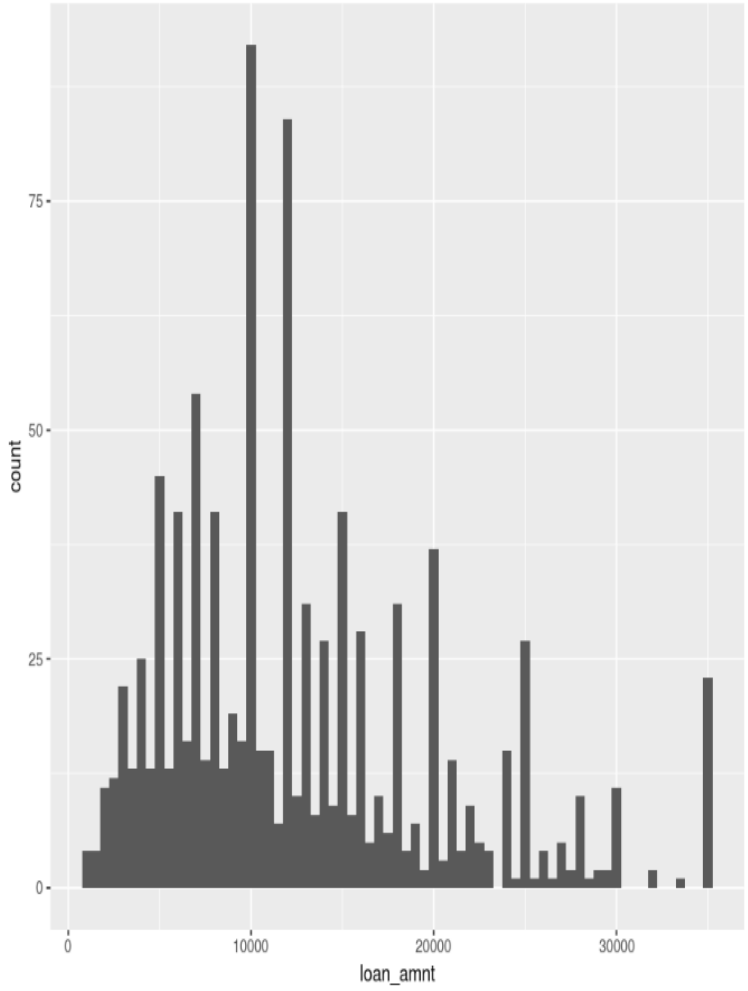


Distributions - Histogram

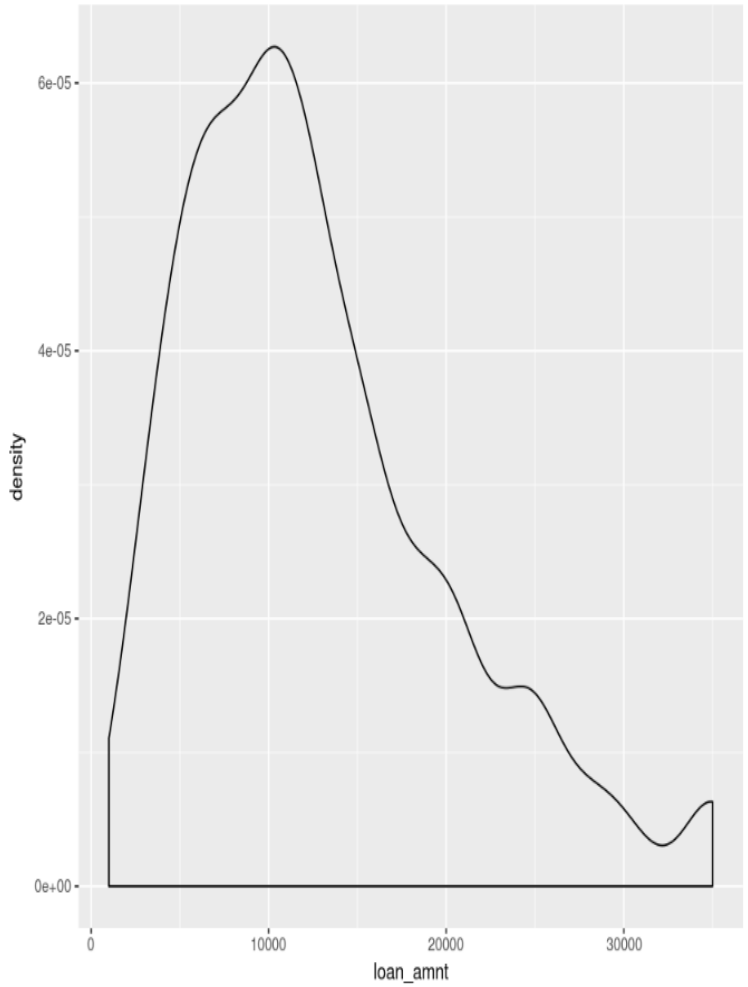


Distributions - Histogram - Binwidth





Distributions - Density



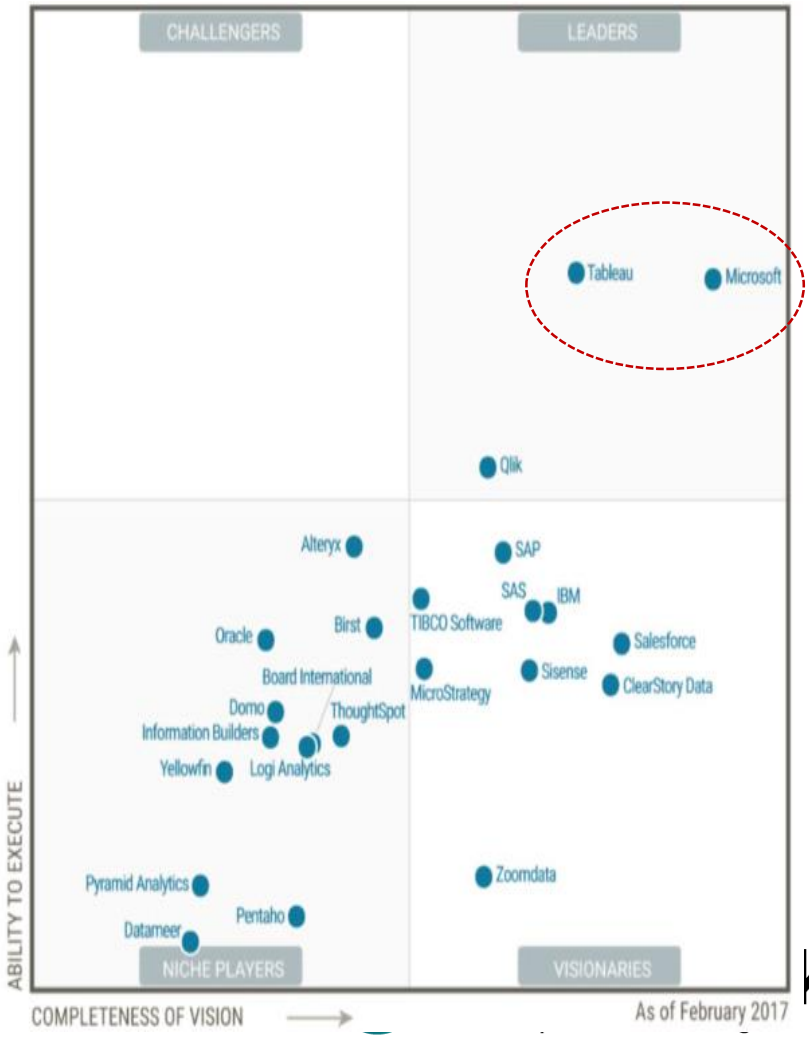
Data Visualization Tools

Some of python data visualization libraries can be used :

- Matplotlib → First python data visualization library
- Seaborn, Ggplot, Bokeh, Pygal, Etc….

Tools

- *Power BI (our focus this session)*
- Tableau
- Microstrategy
- Qlik
- Etc



*) Source : Gartner (February 2017)

Introduction to Power BI

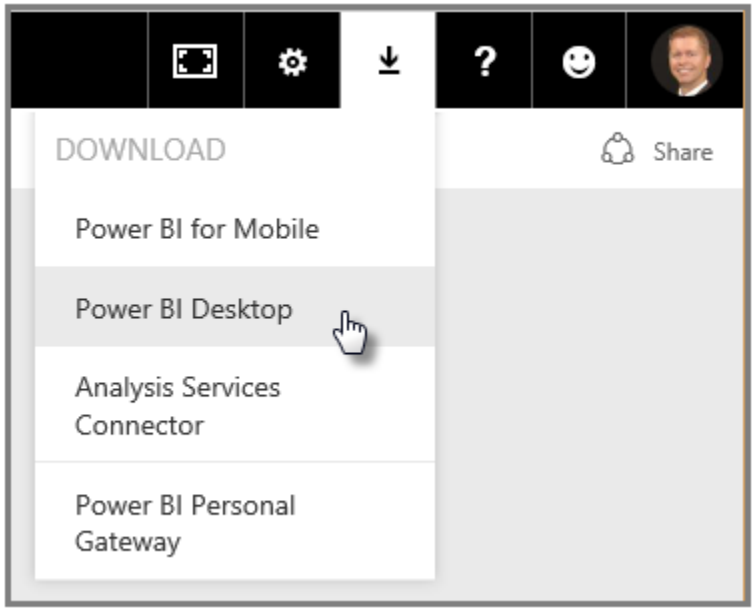
- Data Visualization tools from Microsoft
- Data established in 2013
- Cloud-based analytics and BI platform
- Best use cases for creating dashboard
- Connecting to another Microsoft tools such as office 365
- Integrated with Apps in mobile phone

Purwadhika
Startup and Coding School

Introduction to Power BI

Install Power BI Desktop

You can download Power BI Desktop from the **Power BI** service, by selecting the **gear** icon, then select **Power BI Desktop**

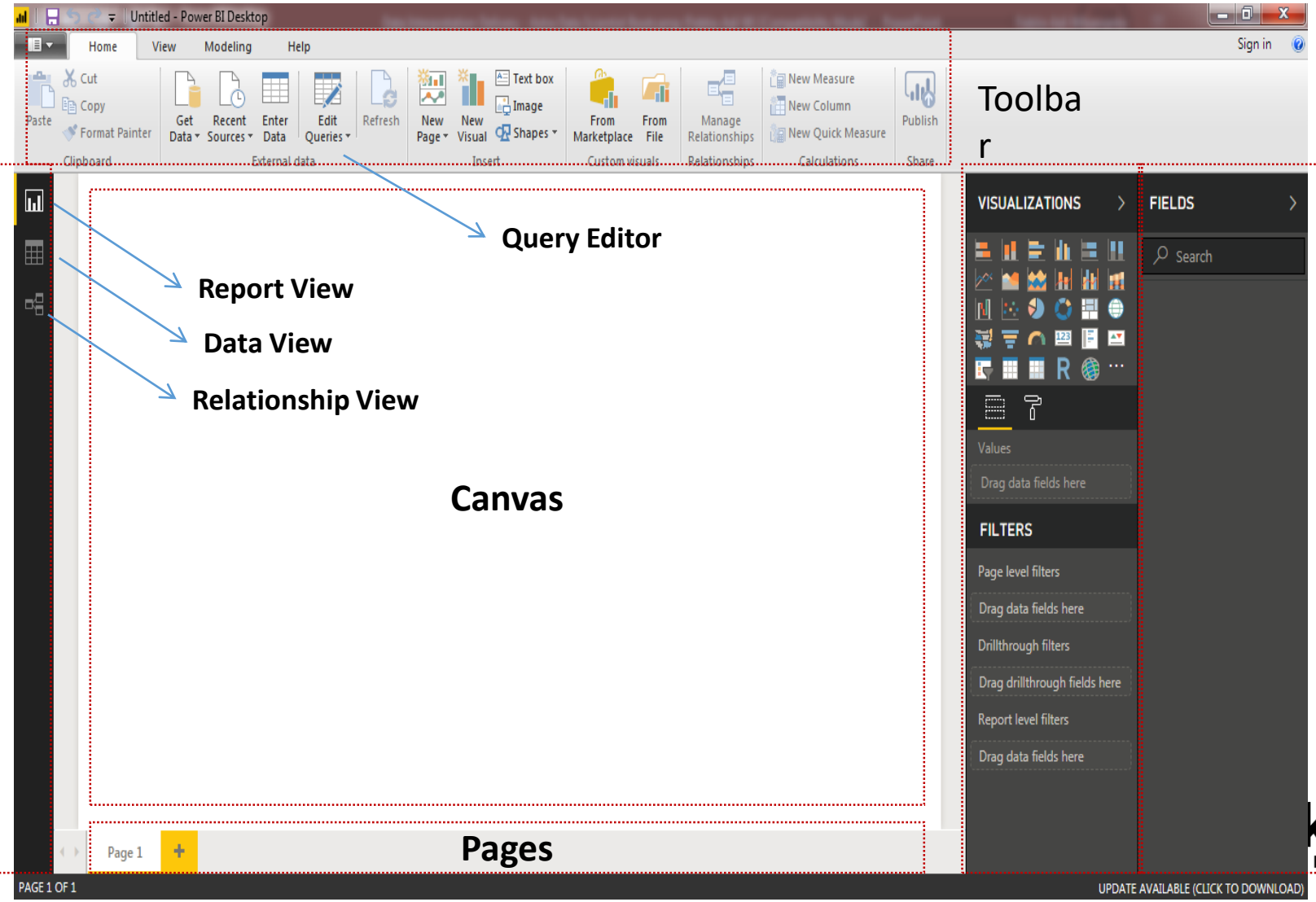


Power BI Desktop is installed as an application, and runs on your desktop

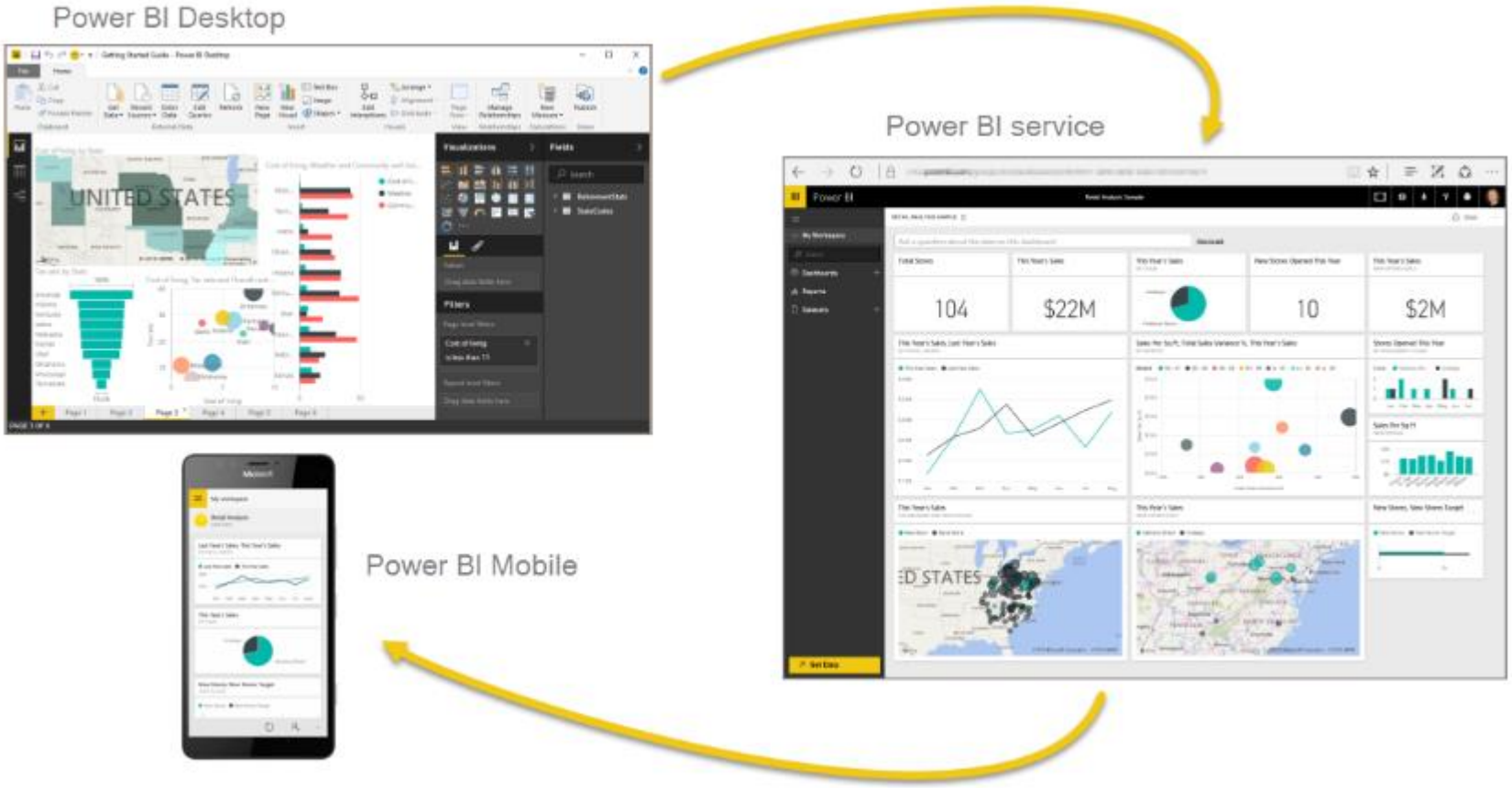
Purwadhika
Startup and Coding School

Introduction to Power BI

Power BI Features

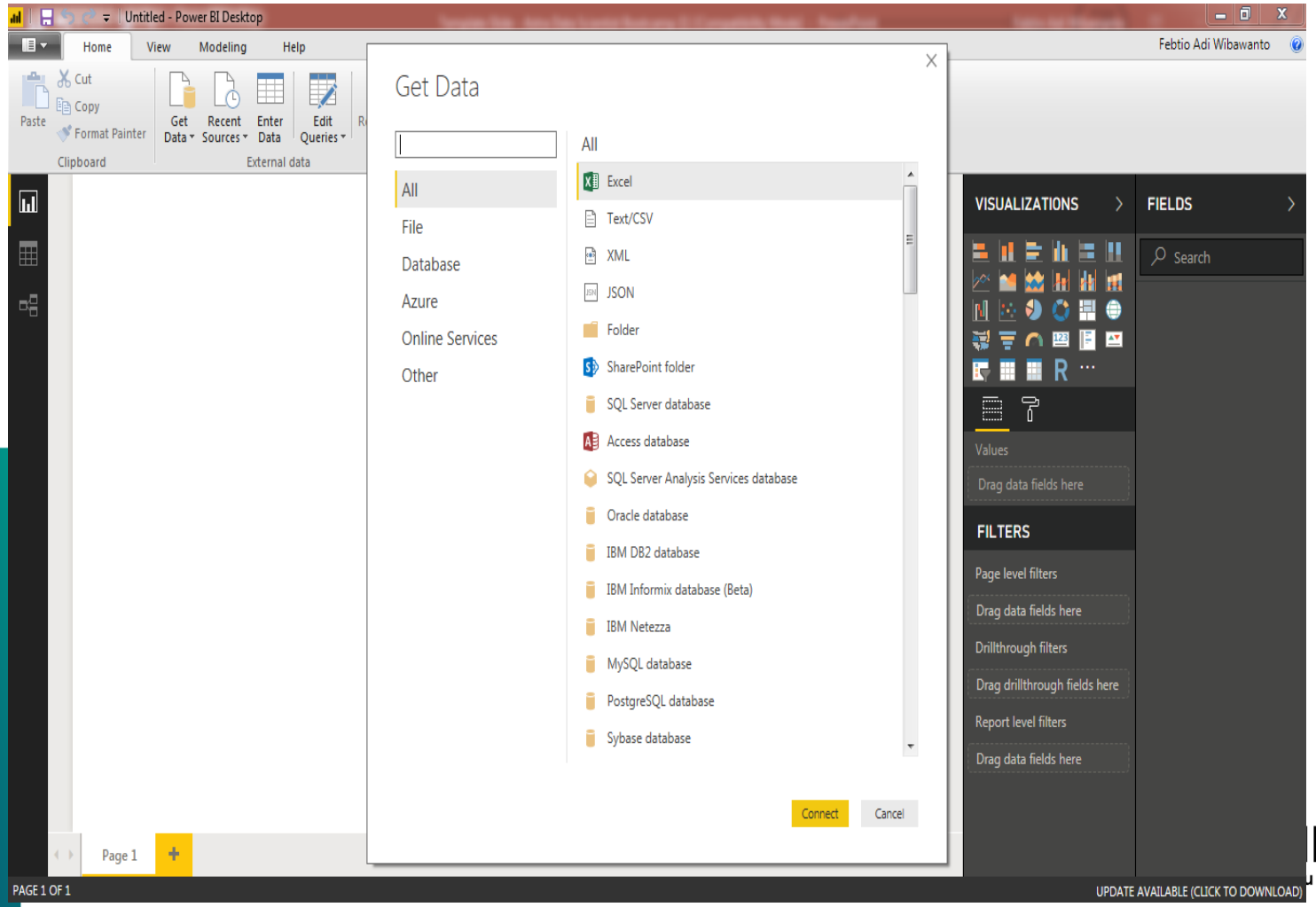


Power BI Platform



Purwadhika
Startup and Coding School

Connecting the Data in Power BI



- very capable of connecting to users external sources including SAP HANA, JSON, MySQL, and more
- Microsoft Azure databases
- Online services like Salesforce and Google Analytics

Connect data to Web Services

Select **Get Data > Web** and paste the address:
http://www.bankrate.com/finance/retirement/best-places-retire-how-state-ranks.aspx

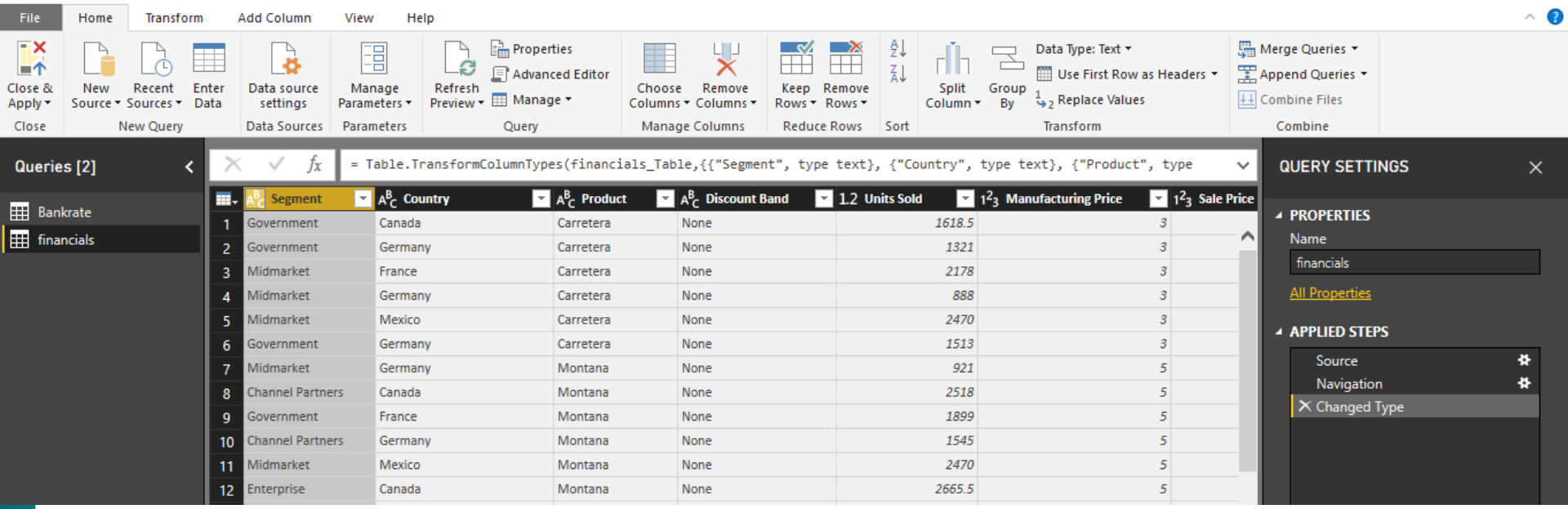
When you select **OK**, the **Query** functionality of Power BI Desktop goes to work

Then, when we select **Edit**, Query Editor launches and a representative view of the table is presented.

Purwadhika
Startup and Coding School

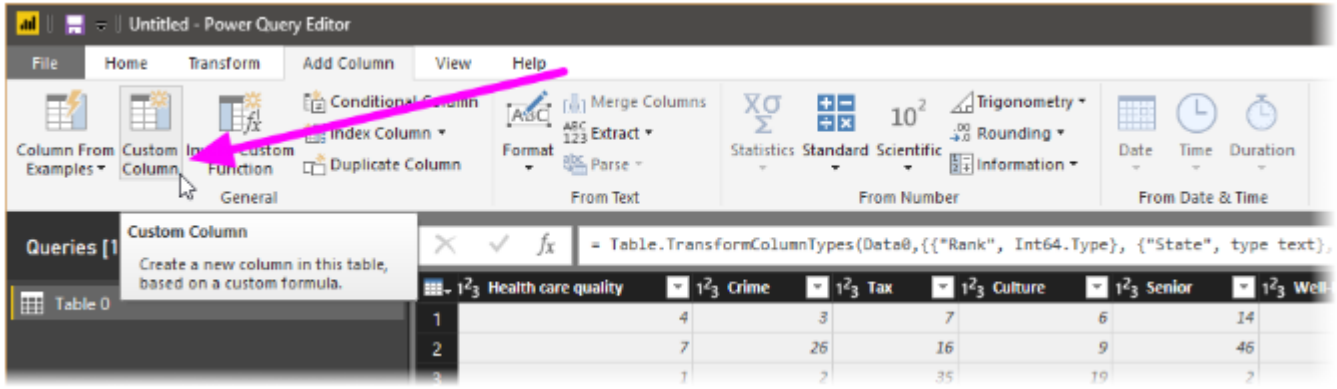
Clean and Transform data in Query Editor

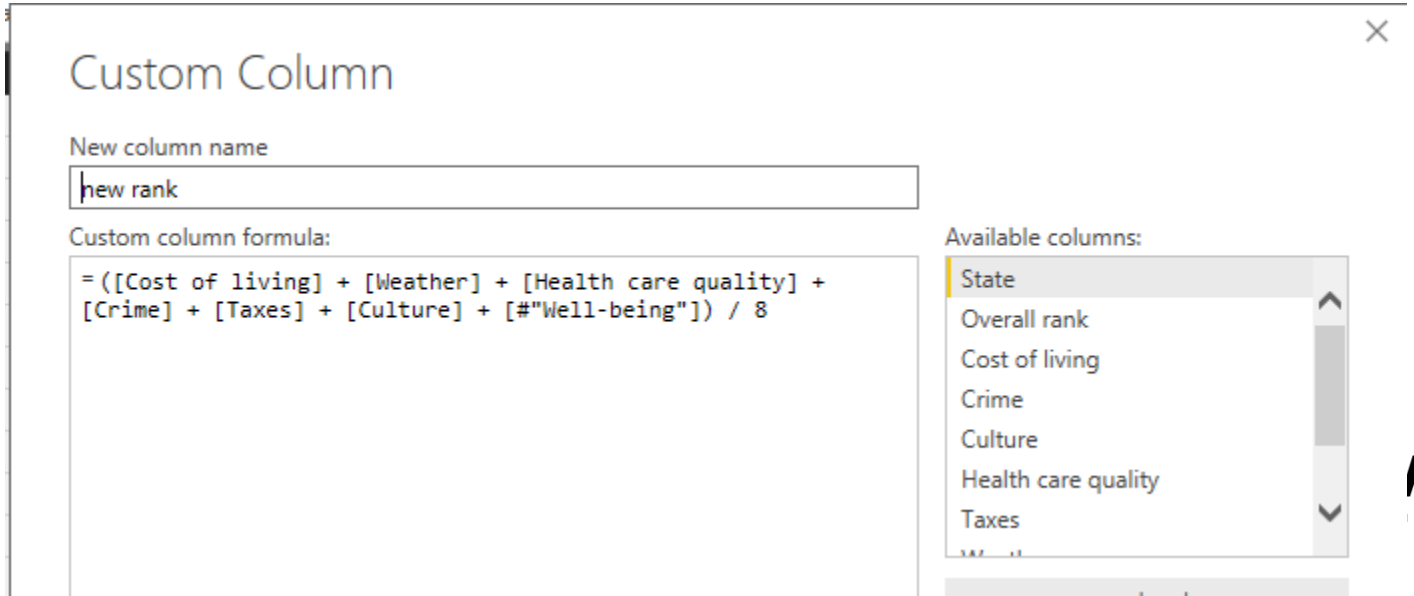
1. **In the ribbon**, many buttons are now active to interact with the data in the query
2. **In the left pane**, queries (one for each table, or entity) are listed and available for selection, viewing, and shaping
3. **In the center pane**, data from the selected query is displayed and available for shaping
4. **The Query Settings window appears**, listing the query's properties and applied steps



Purwadhika
Startup and Coding School

Shape data





wadhika
nd Coding School

Combine and shape data

- Get data from: http://en.wikipedia.org/wiki/List_of_U.S._state_abbreviations
- ***Remove the top two rows***

  Home ribbon, select **Reduce Rows > Remove Rows > Remove Top Rows**
- ***Filter out Washington DC***

  Select the drop-down arrow beside the Region Status column, then clear the checkbox beside **Federal district**
- ***Remove a few unneeded columns***

  select **Remove Columns > Remove Columns**.
- ***Rename the columns, and the table itself*** – Let's rename them to *State Name* and *State Code*.
- Merge to *RetirementStats*. Then select **Combine > Merge Queries** from the **Home**t ab on the ribbon. Select state code.

Purwadhika
Startup and Coding School

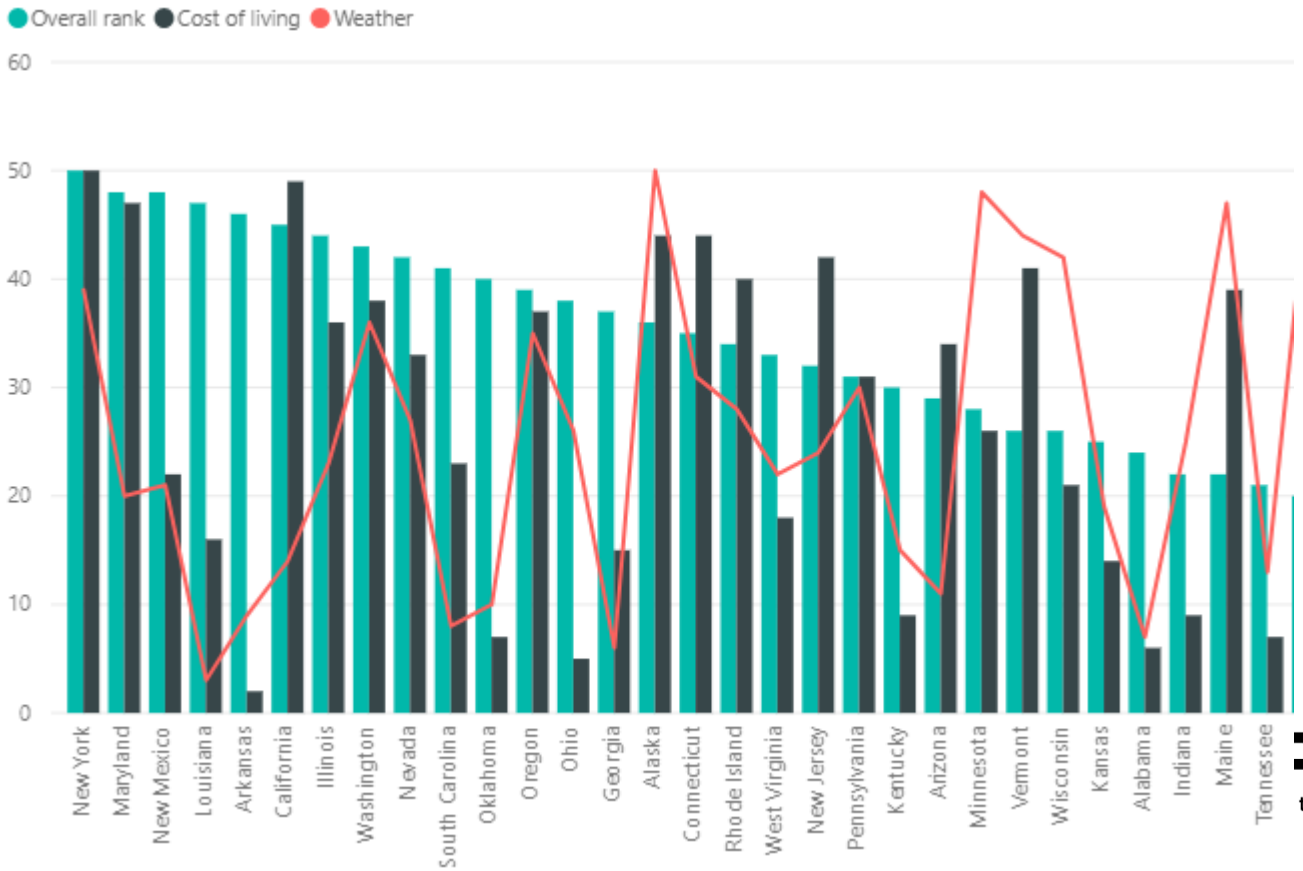
Build a Reports

- Use **Filled Map chart** for Column **State**

Purwadhika
Startup and Coding School

Build a reports

Cost of living, overall rank, and weather by state



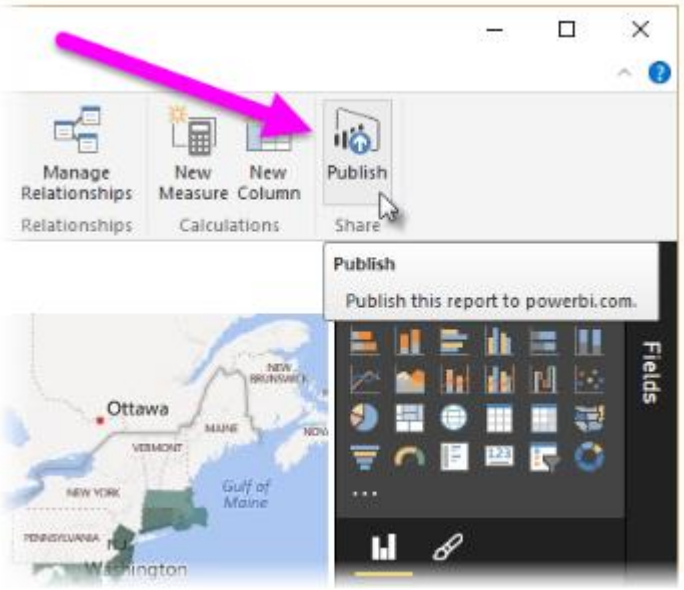
Purwadhika
tartup and Coding School

Build a reports

Continue for other visualization

rwadhika
Startup and Coding School

Share your work



Purwadhika
Startup and Coding School

Introduction Storytelling

Data Interpretation

- act of analyzing data with the objective to gain useful information from it. It is done to draw conclusions from the given data. Different statistical tools are used to represent the data in organized structures

Data Storytelling

- the fundamentals of data visualization and how to communicate effectively with data

Purwadhika
Startup and Coding School

Introduction Storytelling

- Communicate information clearly and efficiently to users
- Visualization could be quick tools as simulation to user play around

Purwadhika
Startup and Coding School

Storytelling data visualization

Understand the importance of context and audience

Determine the appropriate type of graph for your situation

Recognize and eliminate the clutter clouding your information

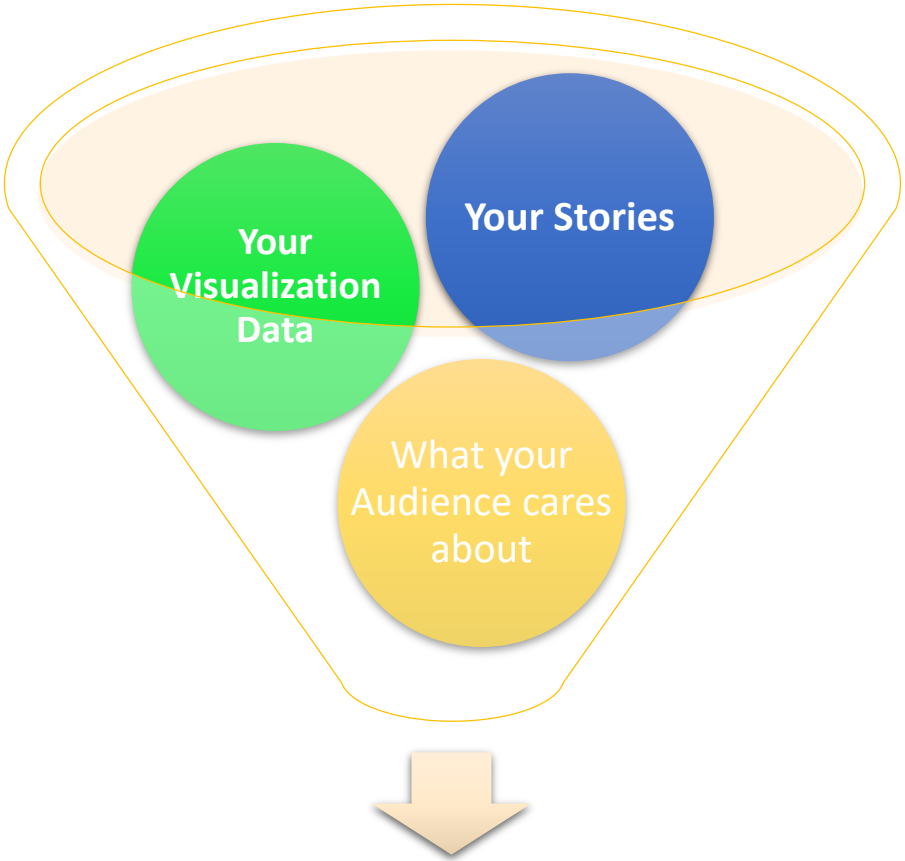
Direct your audience's attention to the most important parts of your data

Think like a designer and utilize concepts of design in data visualization

Leverage the power of storytelling to help your message resonate with your audience

dhika
Startup and Coding School

Data Storytelling

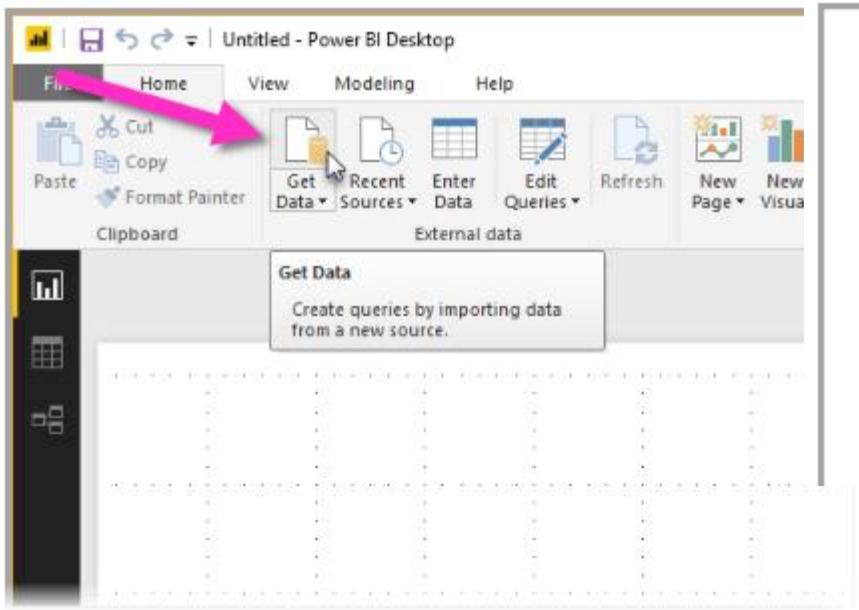


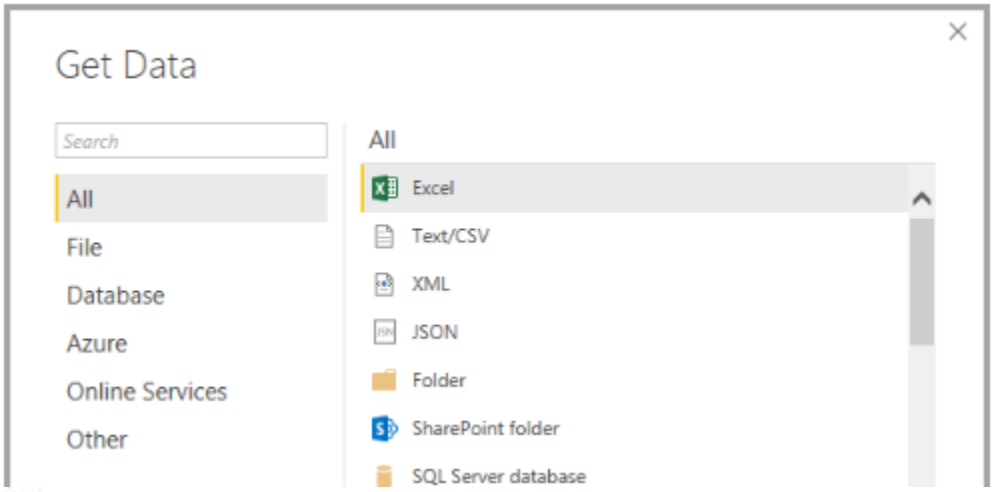
“Data storytelling sweet spot”

Purwadhika
Startup and Coding School

Hands On : Simple Dashboard

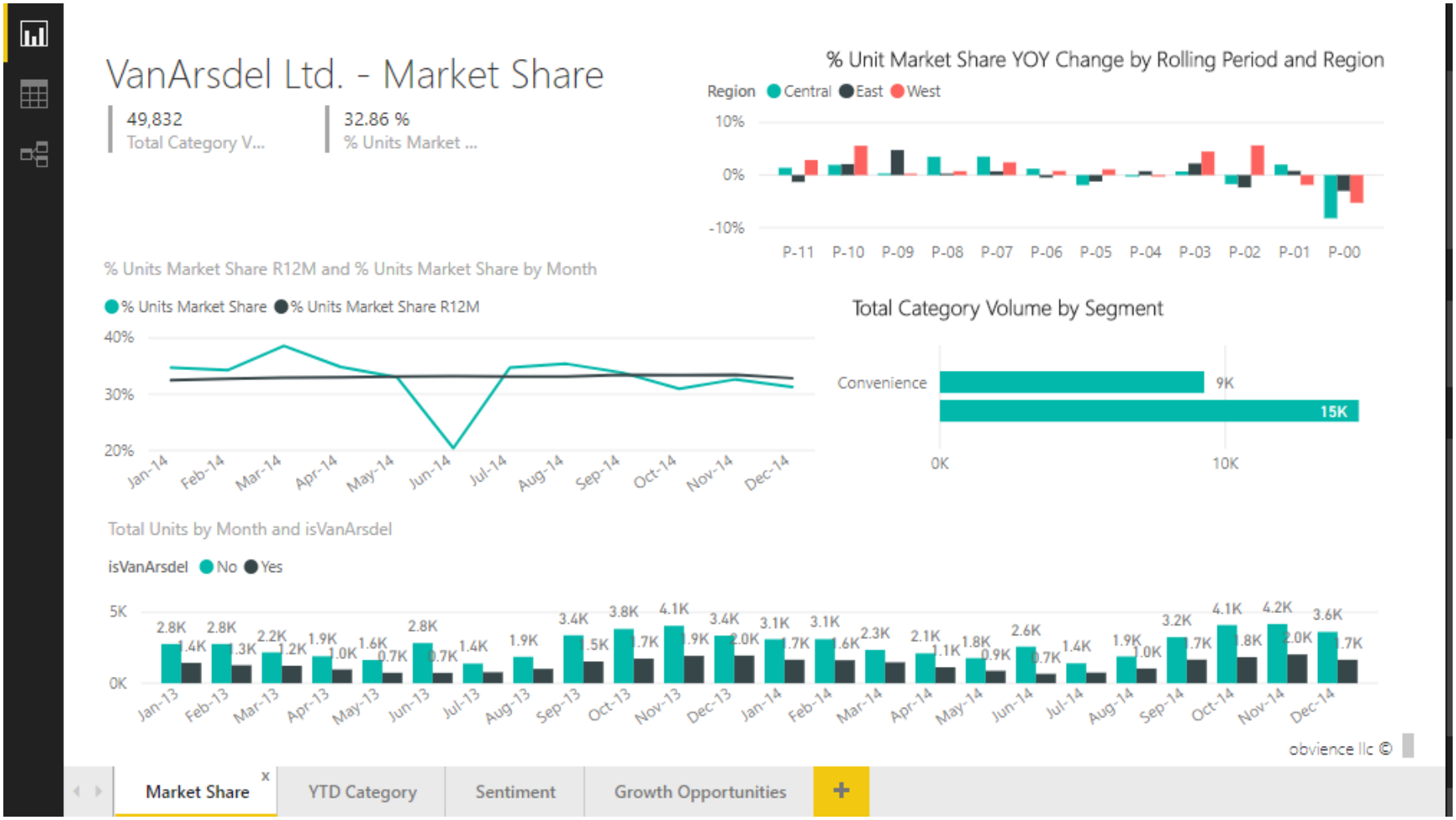
- Create simple dashboard in power BI with dataset sales and Marketing





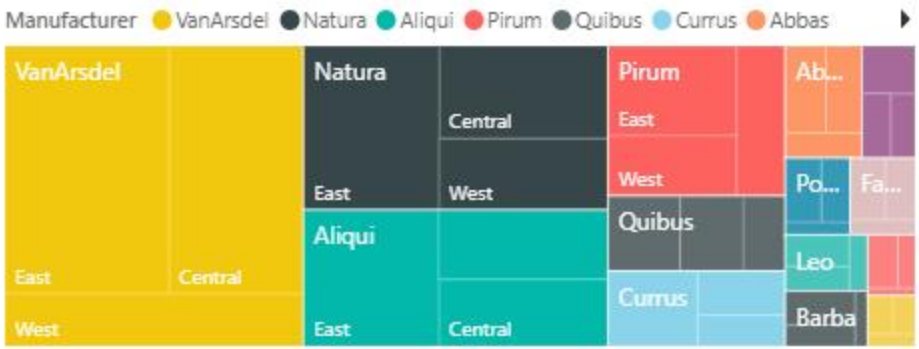
Purwadhika
Startup and Coding School

Make simple dashboard

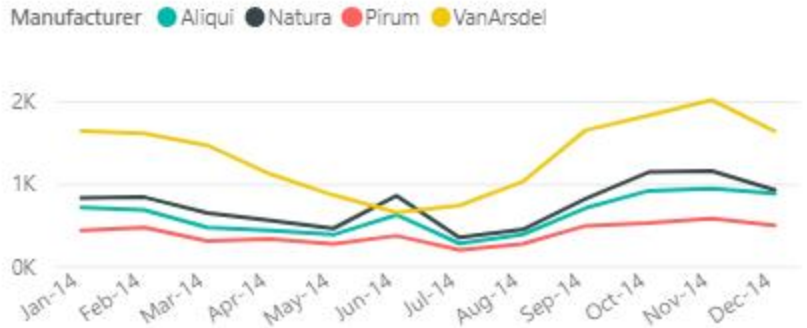


YTD Category Trend Analysis

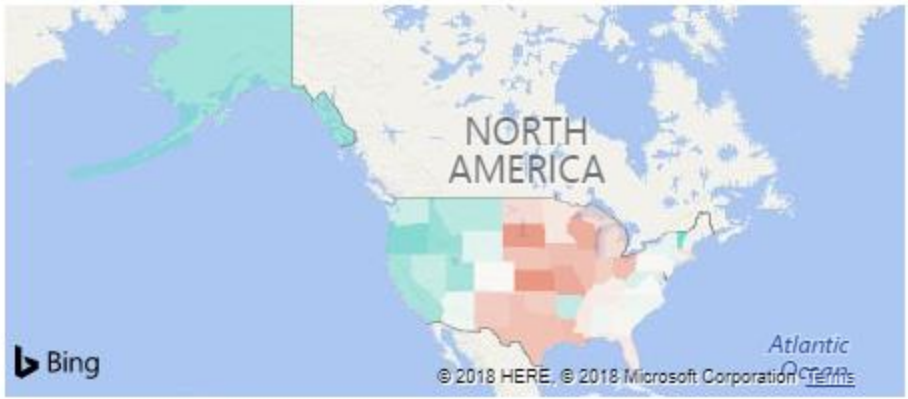
Total Units YTD by Manufacturer and Region



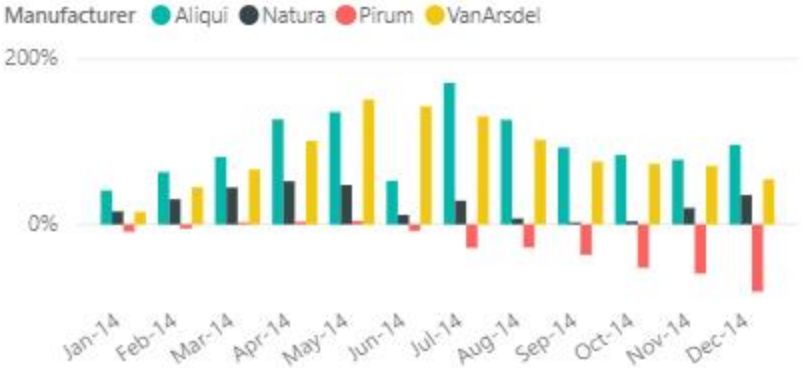
Total Units by Month and Manufacturer



% Units Market Share by State



Total Units YTD Var % by Month and Manufacturer



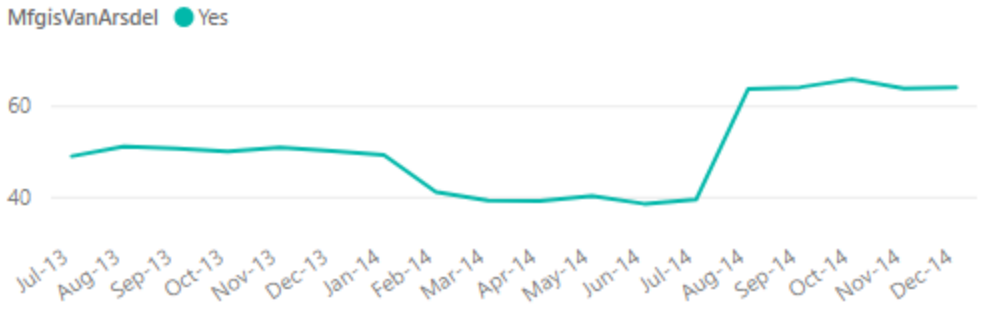
obvience llc ©

Sentiment Analysis

68
Sentiment

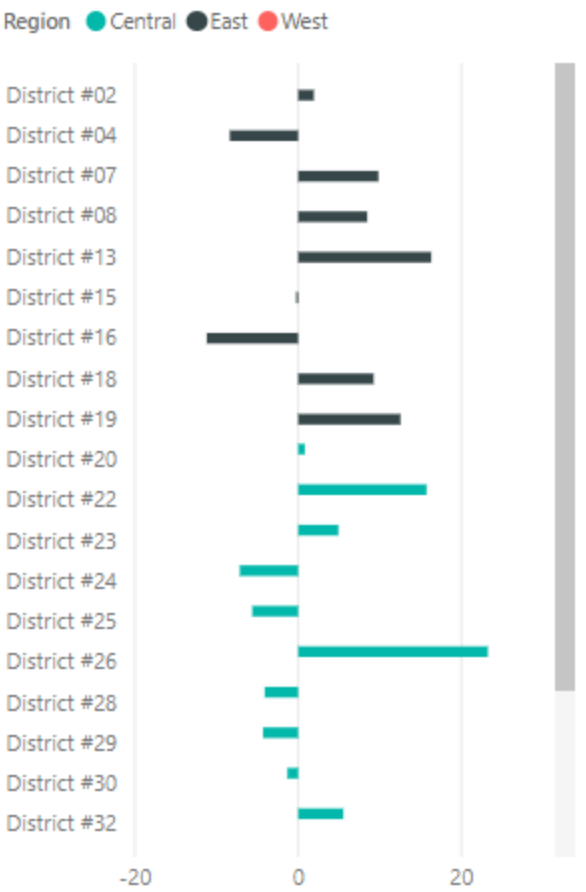
4
Sentiment Gap

VanArsdel - Sentiment by Month



Industry Sentiment by Month

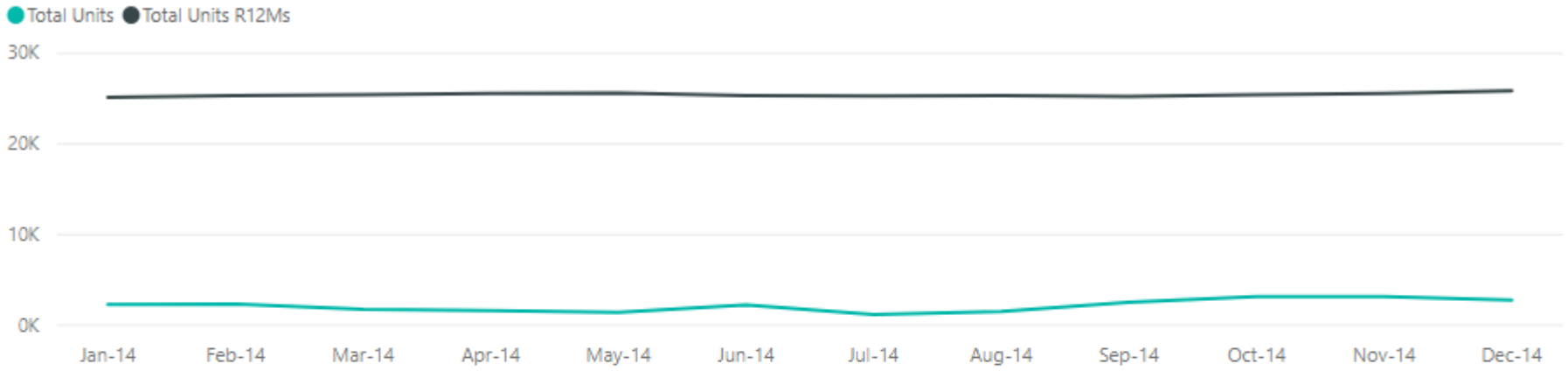
Sentiment Gap by District and Region



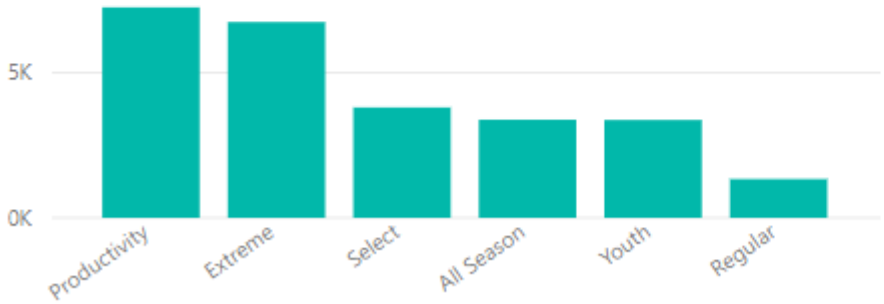
obvience llc ©

Growth Opportunities

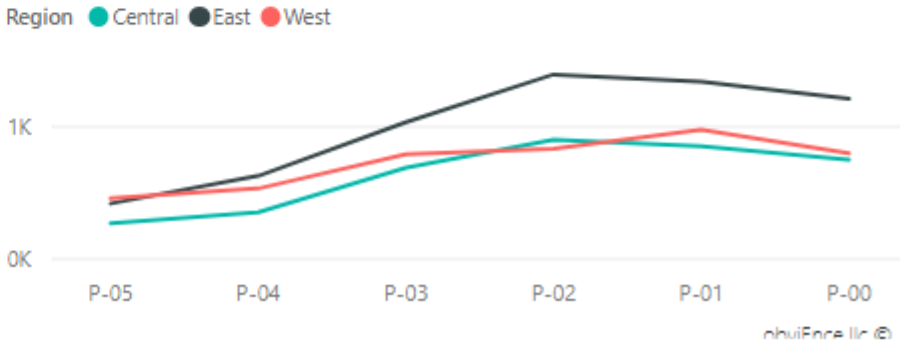
Total Units and Total Units R12Ms by Month



Total Units by Segment



Total Units by Rolling Period and Region



obviEnce llc ©

Answer this question

- **Which segments drive our sales? Does it match the industry trend?**
- **What does total unit market share look like for category (versus region)?**

And get this fact

- The number tiles down the left column show industry sales volume this past year (50K), market share (32.86%), sales volume (16K), sentiment score (68), sentiment gap (4), and total units sold (1M).
- The top line chart shows how our market share fluctuates over time. Our market share really drops in June. Also, our R12M (Rolling 12 Months) share which was increasing for a while, is starting to stall.
- Our biggest competitor is Aliqui (evident in the middle column chart tile.)
- Most of our business is in the East and Central regions.
- The line chart at the bottom shows that our dip in June is not seasonal – none of our competitors show the same trend.
- The two “Total Units” tiles show units sold, by segment and by region/manufacturer. The largest market segment for our industry are **Productivity** and **Convenience**.

Purwadhika
Startup and Coding School

Summary

- Data Visualization and Storytelling important to deliver information about data what you have
- Many other BI tools can help your visualization, example : power BI and Tableau
- Power BI get best use cased for dashboard report
- If you failed to deliver information, don’t be shy, just train and learn more again

Purwadhika
Startup and Coding School

Thank you

Purwadhika
Startup and Coding School