



Introduction to Power BI

Douglas Bruce



Introduction

Education: Austin Peay and NSS (January 2024)

Current Role: TN Dept of Education

- Assessment and Accountability

Statistical Research Specialist

(Data Analyst)

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Introduction

Used at work:

Microsoft Sharepoint and Onedrive

Microsoft Teams

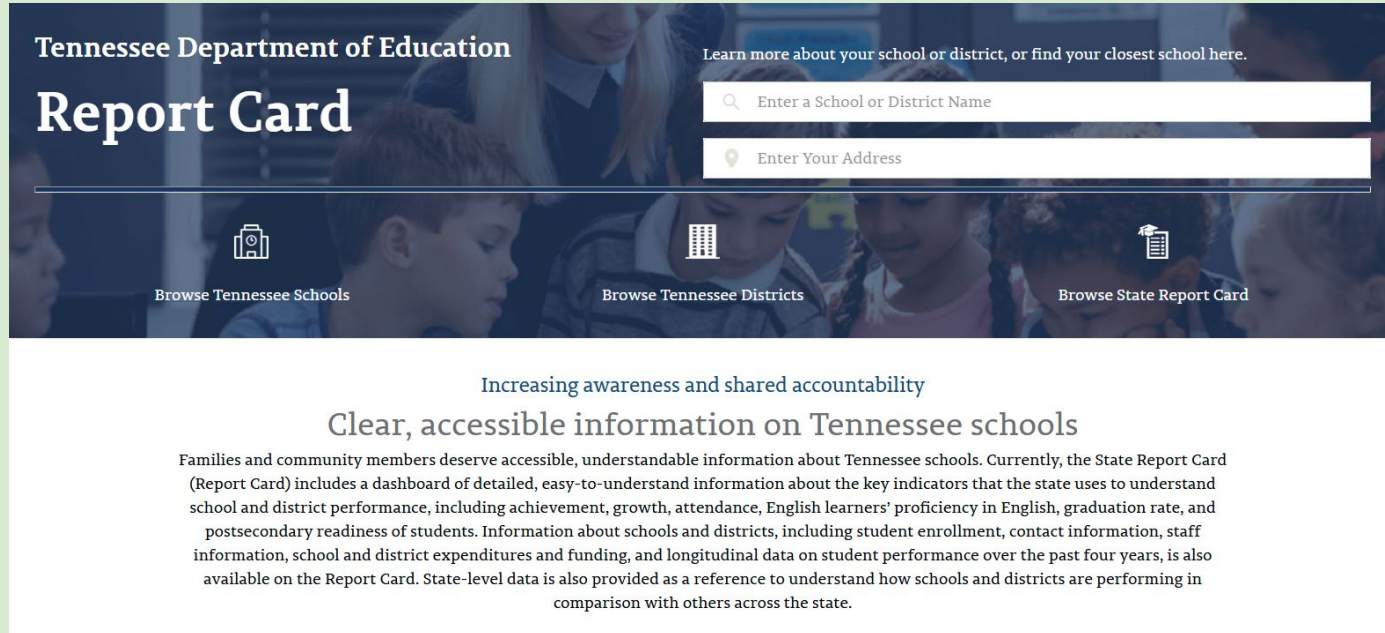
SQL

Microsoft Excel

R (dplyr package)

Data

<https://tdepublicschools.ondemand.sas.com/>



The screenshot shows the homepage of the Tennessee Department of Education's Report Card website. The header features the title "Tennessee Department of Education Report Card" on the left and a search prompt "Learn more about your school or district, or find your closest school here." on the right. Below the search prompt are two input fields: "Enter a School or District Name" and "Enter Your Address". A horizontal line separates the header from the main content area, which contains three icons and labels: "Browse Tennessee Schools", "Browse Tennessee Districts", and "Browse State Report Card". Below this is a section with the heading "Increasing awareness and shared accountability" and "Clear, accessible information on Tennessee schools". The main text describes the Report Card as a dashboard of detailed, easy-to-understand information about school and district performance, including achievement, growth, attendance, English learners' proficiency, graduation rate, and postsecondary readiness. It also mentions that information about schools and districts, including student enrollment, contact information, staff information, school and district expenditures and funding, and longitudinal data on student performance over the past four years, is available on the Report Card. State-level data is also provided as a reference to understand how schools and districts are performing in comparison with others across the state.


Tennessee Department of Education


Report Card


Learn more about your school or district, or find your closest school here.

Enter a School or District Name

Enter Your Address

 Browse Tennessee Schools

 Browse Tennessee Districts

 Browse State Report Card

Increasing awareness and shared accountability

Clear, accessible information on Tennessee schools

Families and community members deserve accessible, understandable information about Tennessee schools. Currently, the State Report Card (Report Card) includes a dashboard of detailed, easy-to-understand information about the key indicators that the state uses to understand school and district performance, including achievement, growth, attendance, English learners' proficiency in English, graduation rate, and postsecondary readiness of students. Information about schools and districts, including student enrollment, contact information, staff information, school and district expenditures and funding, and longitudinal data on student performance over the past four years, is also available on the Report Card. State-level data is also provided as a reference to understand how schools and districts are performing in comparison with others across the state.

CLARKSVILLE HIGH

District Website:

www.cmcss.net

Grades Served:

Grade 9 - Grade 12

College & Career Readiness
Based on Advanced Placement,
Dual Enrollment,
Industry Certifications,
Dual Credit, and
Other postsecondary opportunities

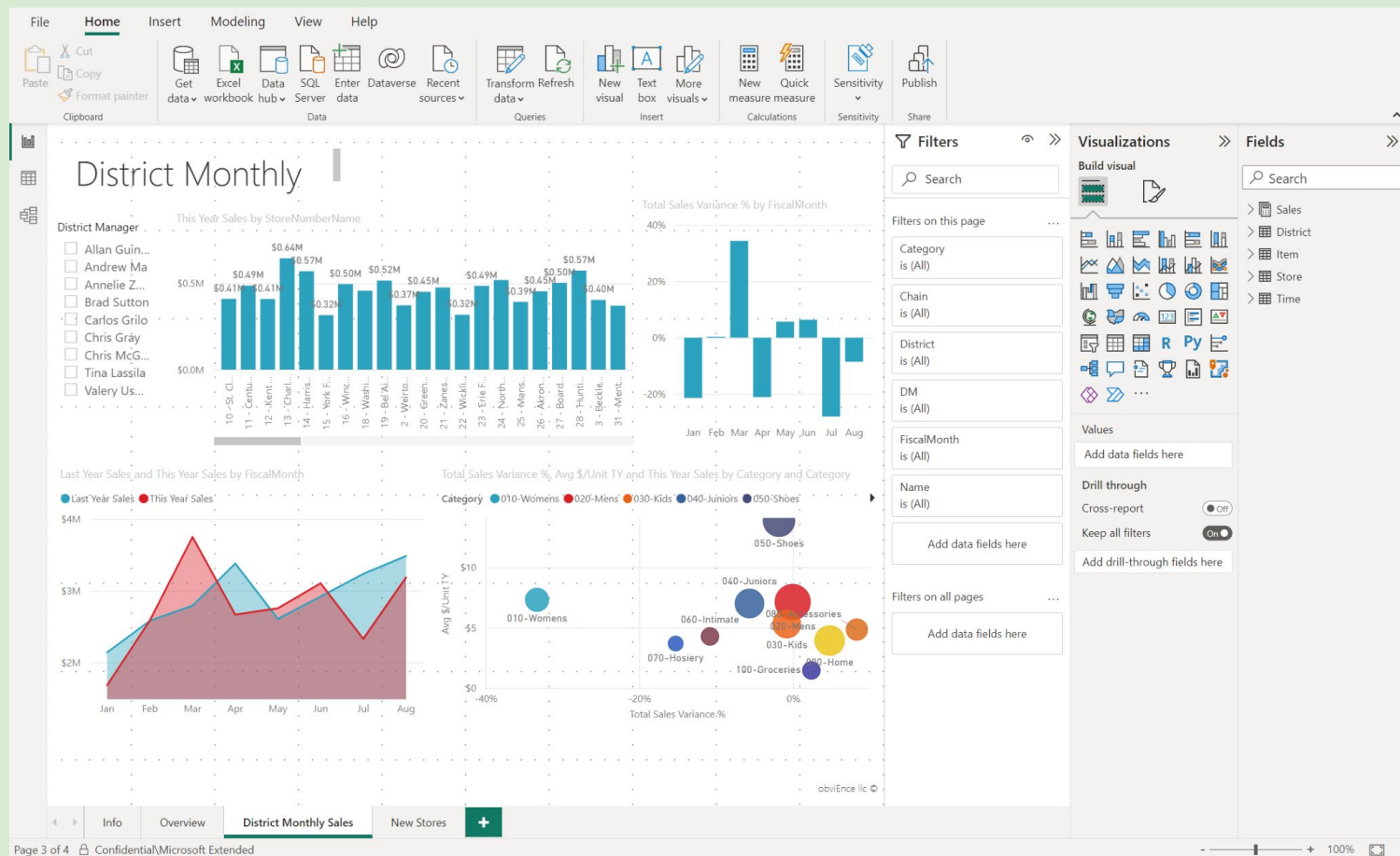
Indicator	▲ Level	Weight	Score
Achievement	5	50.0%	2.5
Growth	5	30.0%	1.5
Growth for Highest Need Students	4	10.0%	0.4
College & Career Readiness	4	10.0%	0.4

Total Score

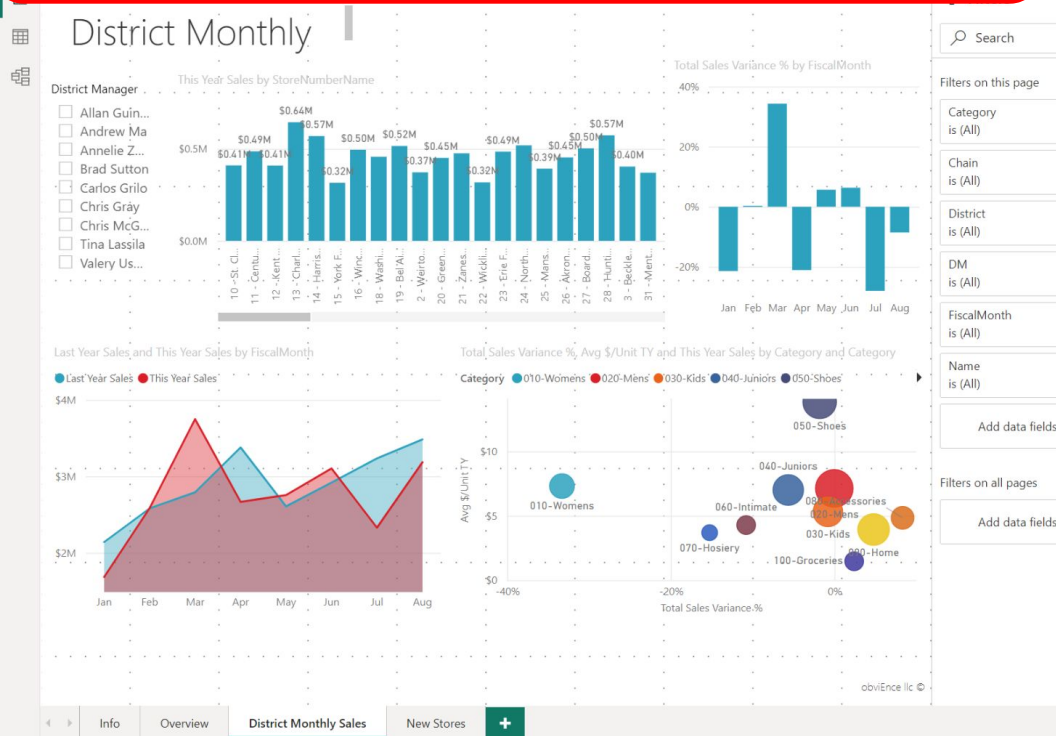
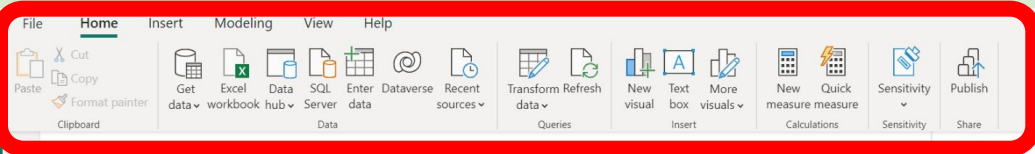
Calculation of School Letter
Grade

A

<https://learn.microsoft.com/en-us/power-bi/create-reports/service-the-report-editor-take-a-tour>



Ribbon



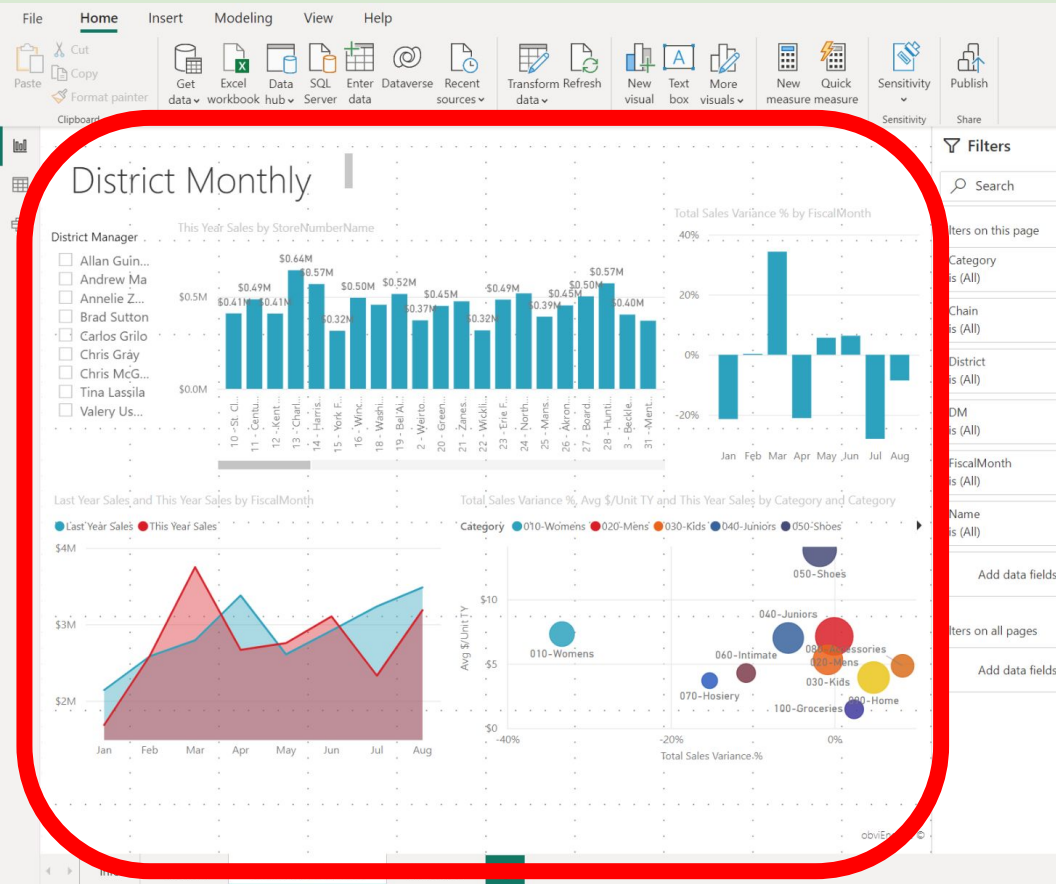
Similar to using Word or Excel

Many different actions under

Home
Get Data!

Insert
Modeling
View

Report Canvas



Similar to using Word or Excel

Analyze!

Visualize!

Create!

Fields

Check on the data in the report

Tables

Columns

Data Types

Measures

File Home Insert Modeling View Help

Sensitivity Publish

Visualizations

Build visual

Fields

Search

Sales

District

Item

Store

Time

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Filters

Search

Filters on this page

Category is (All)

Chain is (All)

District is (All)

DM is (All)

FiscalMonth is (All)

Name is (All)

Add data fields here

Filters on all pages

Add data fields here

Page 3 of 4 Confidential\Microsoft Extended

Visualizations

Choose

Bar charts

Line charts

Scatter charts

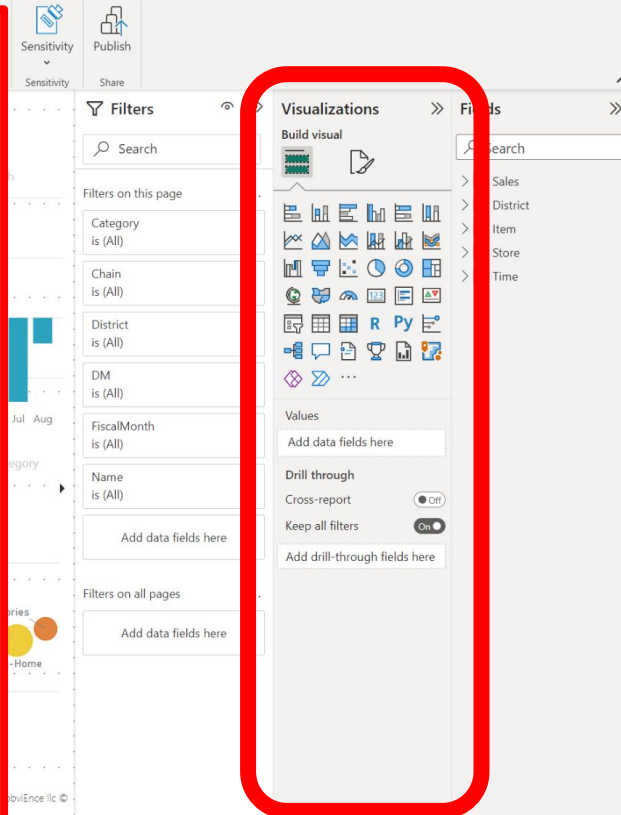
Slicers

Maps

Choose data

Format appearance

Further analysis



Filters

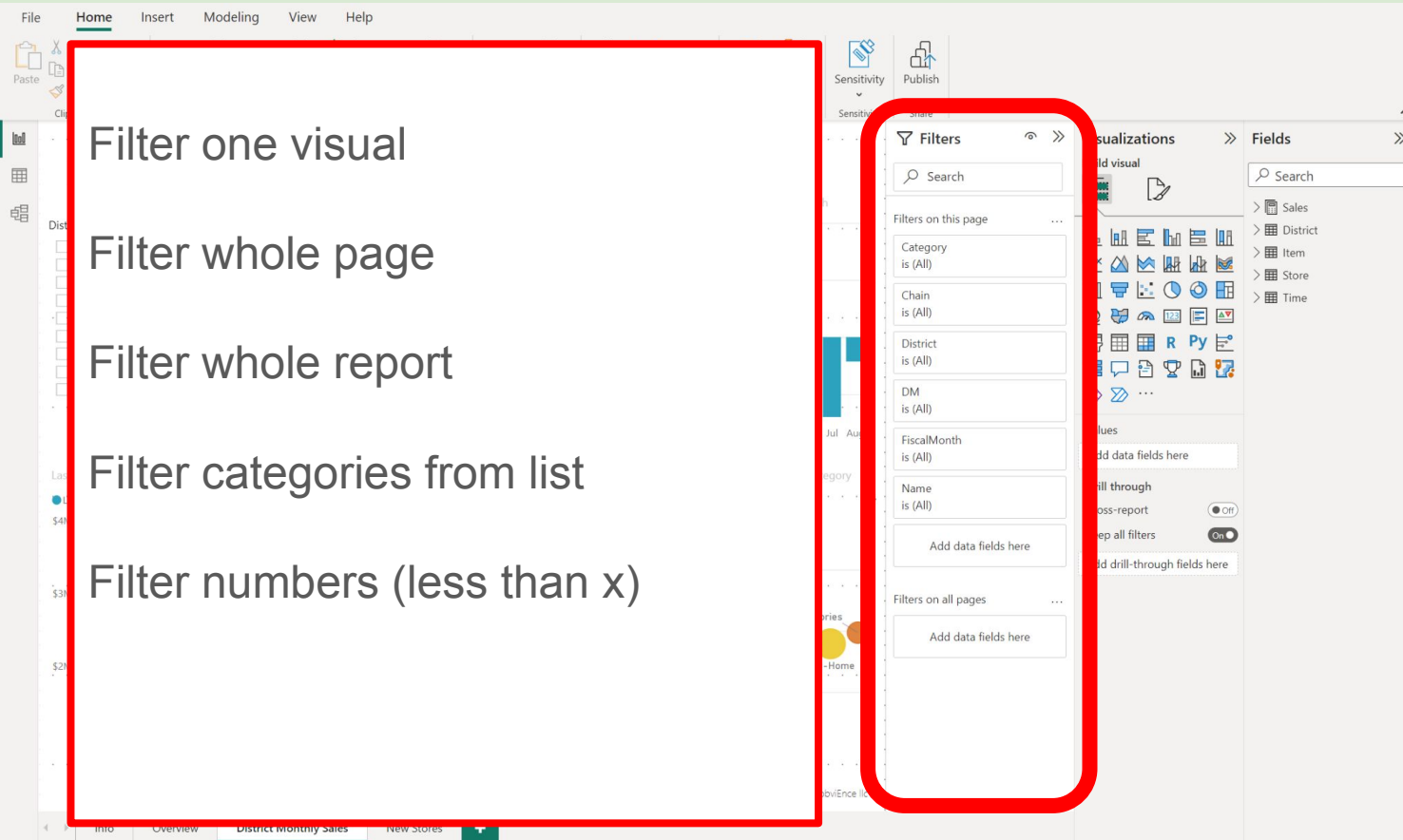
Filter one visual

Filter whole page

Filter whole report

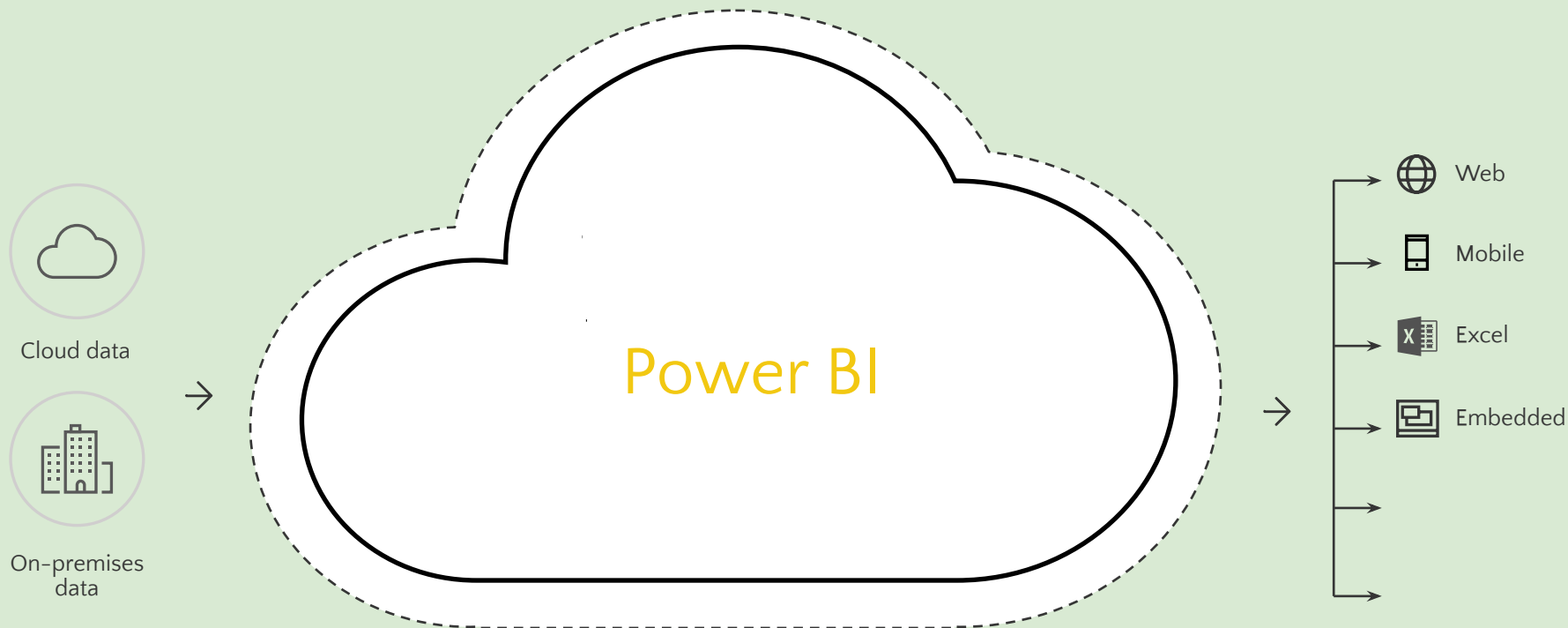
Filter categories from list

Filter numbers (less than x)



Power BI: experience your data

Any data, any way, anywhere



Clean and mash-up your DATA

Prepare



Explore



Visualize

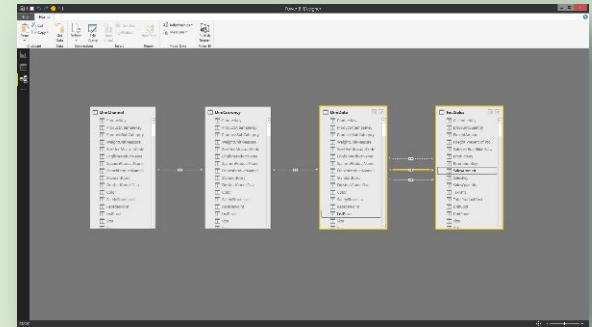


Share & collaborate



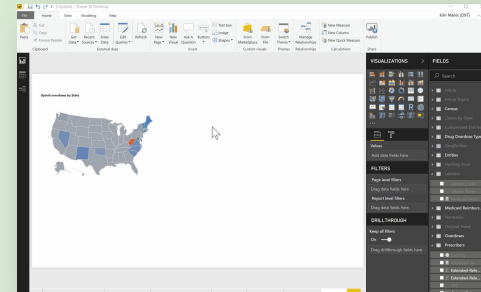
- Consolidate data from a broad range of sources
 - Merge or append queries to combine data from multiple queries into a single query
- Transform data to fit your needs using intuitive UI
 - Select data for inclusion
 - Cleanse data and remove errors
- Define calculations to generate new fields for use in reports
- Develop advanced analytics using a combination of measures and relationships
 - Uncover correlations, highlight exceptions and understand business outcomes

	ProductID	Date	Zip	Units	Revenue	Country
1	883	1/15/1999	76108	3	797.9475	United States
2	837	1/15/1999	33436	2	813.6975	United States
3	837	1/15/1999	76531	2	813.6975	United States
4	888	1/15/1999	29526	3	984.4475	United States
5	888	1/15/1999	33584	2	944.9475	United States
6	838	1/15/1999	33947	2	944.9475	United States



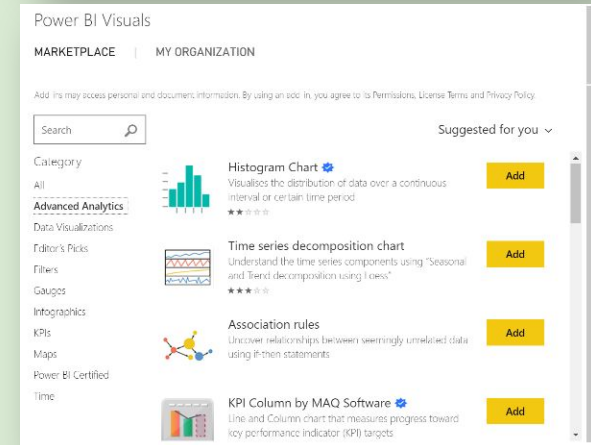
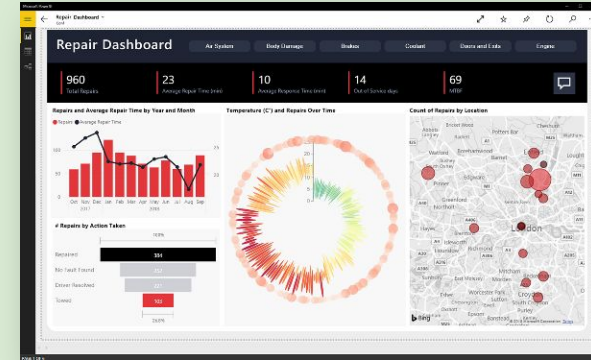
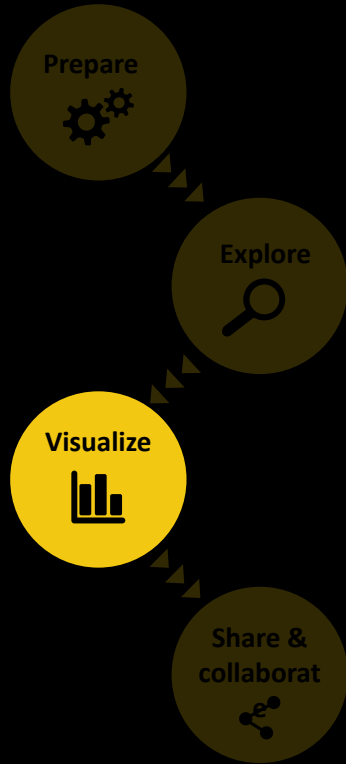
Explore your DATA

- Explore data in a variety of ways and across multiple visualizations using drag and drop canvas
- Dig deeper into your reports
 - Drill-down in your hierarchical data
 - Filter, sort, hover over and highlight data
- Leverage Quick Insights to find insights in your data
- Ask questions of your data in natural language with Q&A
 - Type questions in plain language
 - Q&A intelligently filters, sorts, aggregates, groups and displays data based on the question



Visualize your DATA

- Visualize data in a variety of ways
- Growing number of visualization types
 - Donuts, basic area, waterfall, filled maps, tree maps, funnel, gauges combo charts and more
 - Custom visuals available from Power BI Visuals Marketplace
 - Tools to develop, test, package new custom visuals
- Visualizations on report page are connected – select value in one visualization to change other visualizations
- Full screen pop out mode for report visuals to show additional details



Bring your story to life with DATA

Prepare



Explore



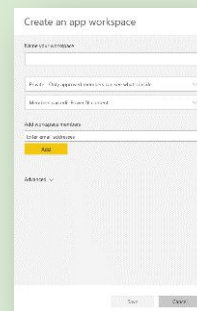
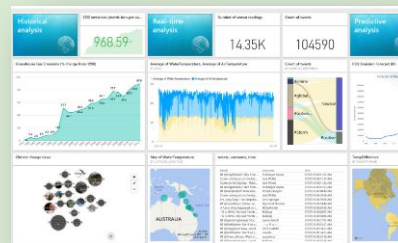
Visualize



Share & collaborate



- Save Power BI Desktop report files and easily publish them to powerbi.com
- Access dashboards using native mobile apps for Windows, iOS and Android
- Share as appropriate with other Power BI users in your organization
- Package your reports in apps for easy consumption and control
- Easily embed interactive Power BI visualizations in blog posts, websites, through emails or social media With Power BI Publish to web



Terminology

Dimension - descriptive

- City, state, gender, fiscal year

Measure - quantity (something to sum or avg)

- Sales in dollars,
- Weight in pounds,
- Distance in miles

Terminology

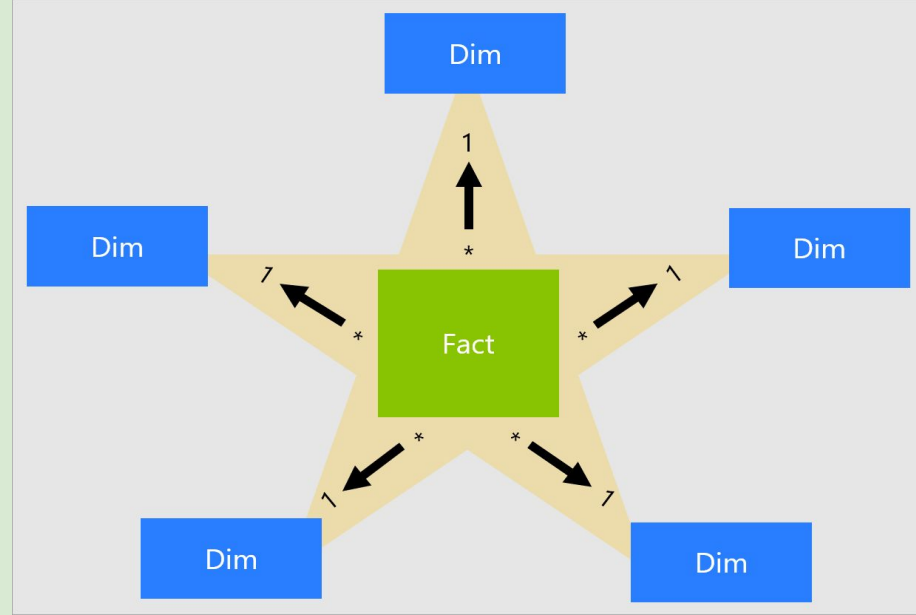
DAX

- Data Analysis Expressions
- Used for Measures and Calculated Columns
- Formulas similar to Excel
- SUM, COUNT, AVERAGE

Terminology

Star Schema

- Widely adopted modeling approach
- **Fact tables**
 - Hold observations or events
- **Dimension tables**
 - Descriptive info about the things in the fact table



Student	District	Course	Course Name	Score
A	1	G10H12	DC Personal Finance	62
B	2	G10H12	Personal Finance - DC	100
C	1	G10H12	DC Personal Finance S1	99
D	2	G10H12	BUSN	68
E	1	G10H12	Pers Finan	85
F	2	G10H12	LDC Person Fin	84

Are these the same class?

How many students have passing scores?



District	Course	Course Name	Cut Score
1	G10H12	Personal Finance	60
2	G10H12	Personal Finance	70

Student	District	Course	Course Name	Score
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Are these the same class?

How many students have passing scores?



District	Course	Course Name	Cut Score
1	G10H12	Personal Finance	60
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Tell a Story with Data

- **Who** is in the data? **Who** is it for?
- **What** is in this data? **What** will they ask?
- **When** is this data about? **When** will I share it?
- **Where** is this data about? **Where** will people see it?
- **Why** was the data collected? **Why** is it being analyzed?
- **How** was the data collected? **How** will the data be used?

Visualization

- **Exploration**
- Analyze
- Strategize
- Investigate
- Brainstorm



Visualization

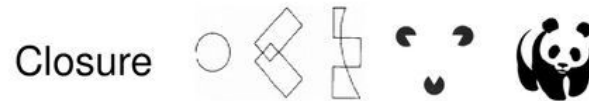
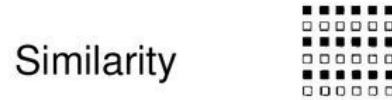
- **Explanation**
- Summarize
- Question and Answer
- Monitor
- Maintain
- Make a decision



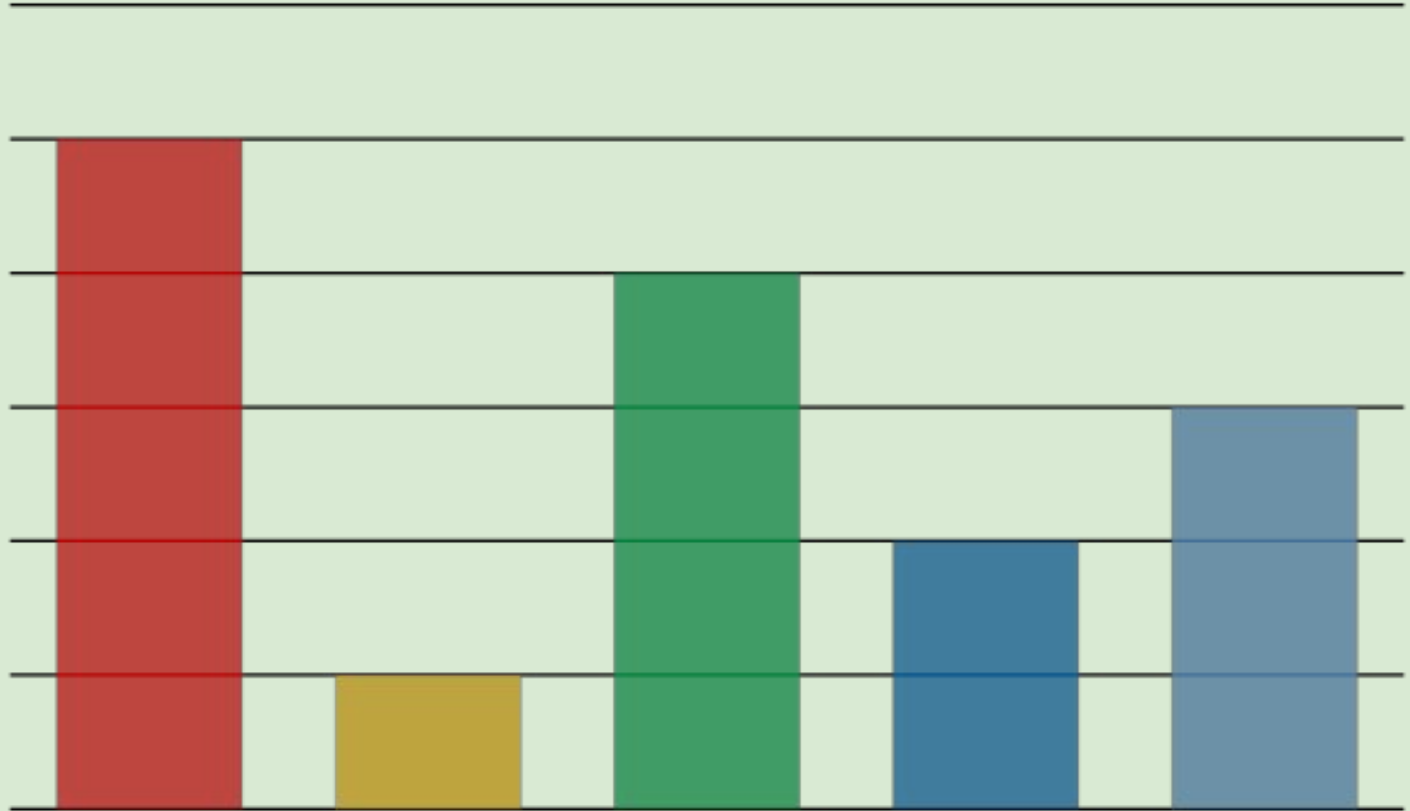
**“We shall now commence
throwing money at the problem.”**

Design

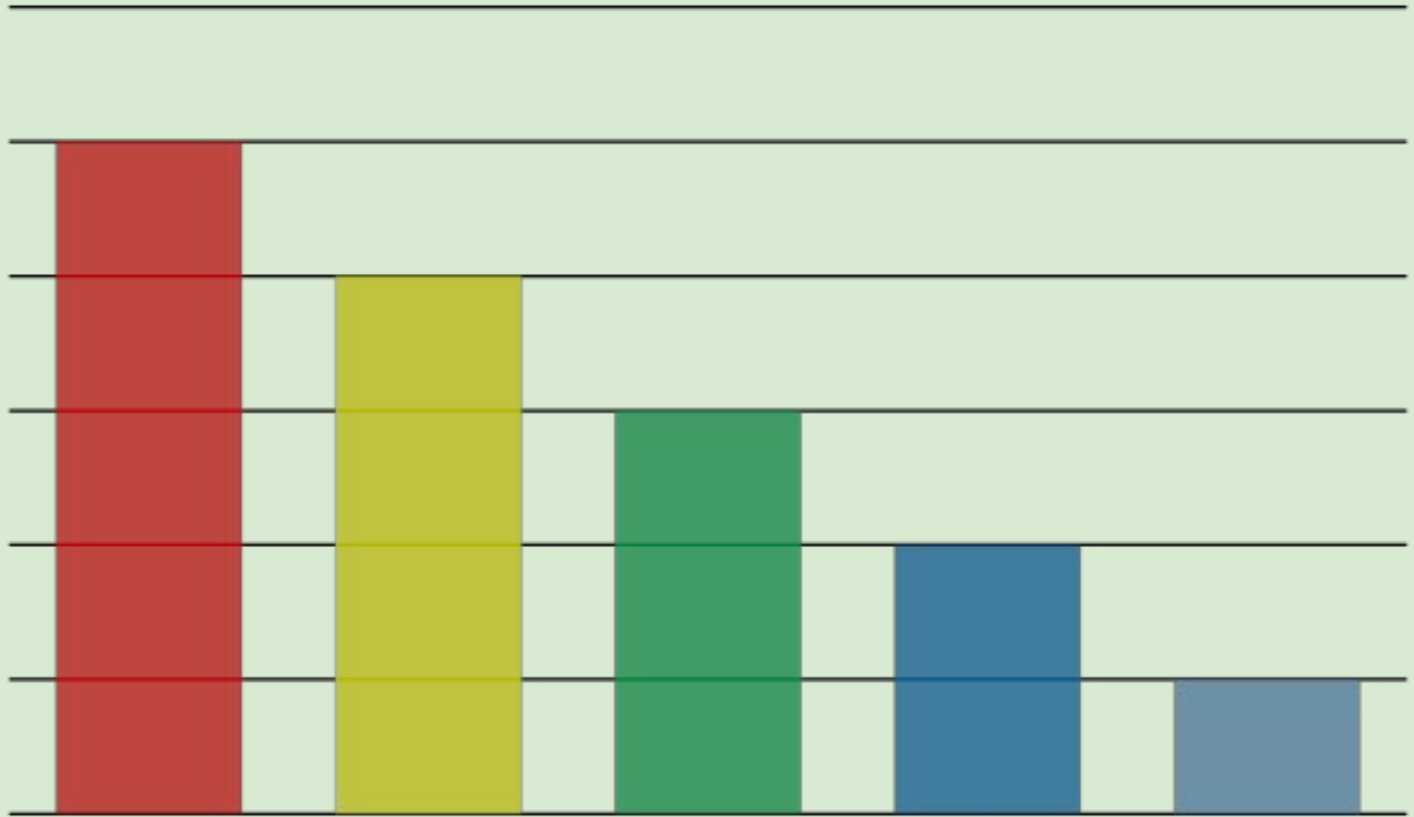
Gestalt Principles of Visual Perception



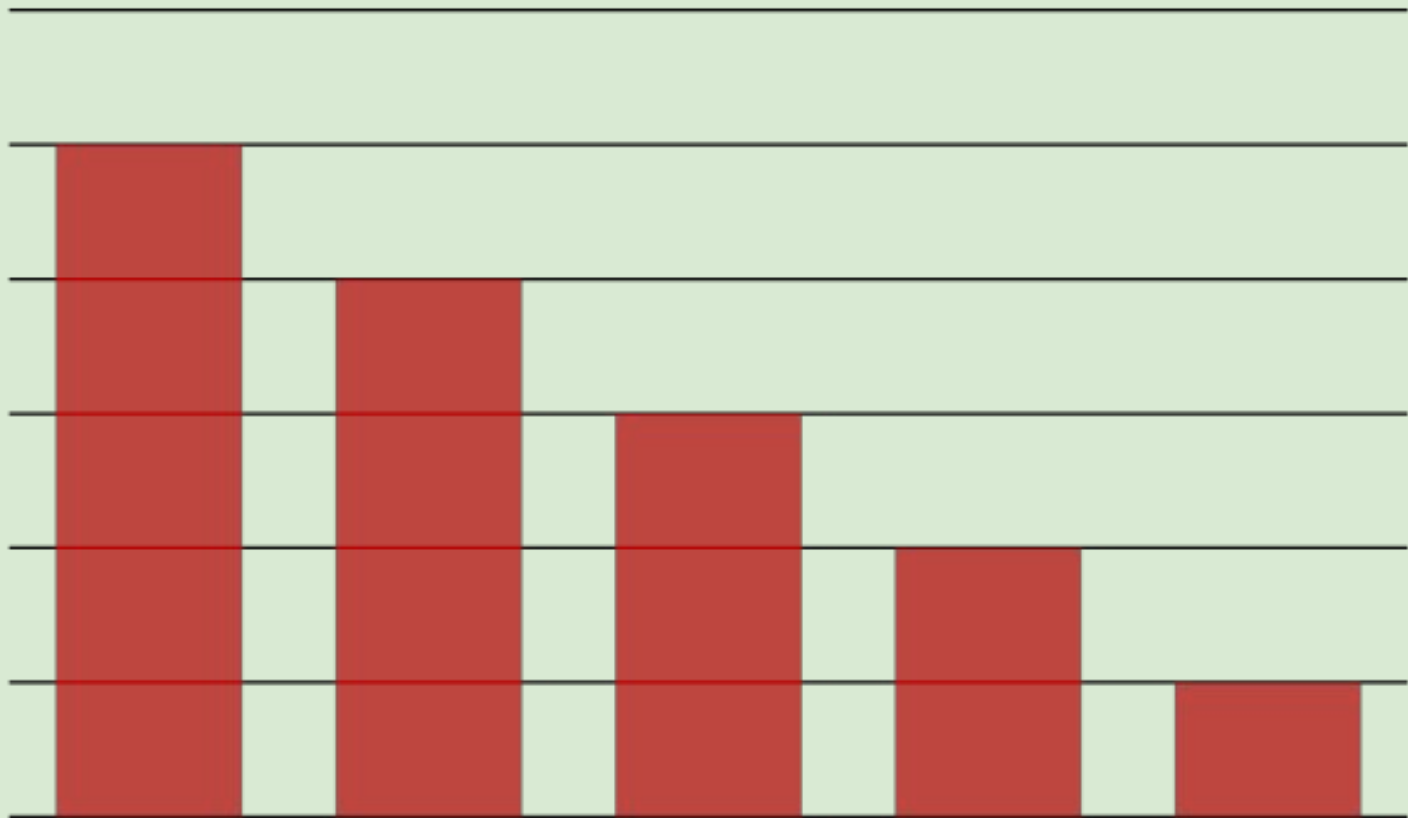
Data



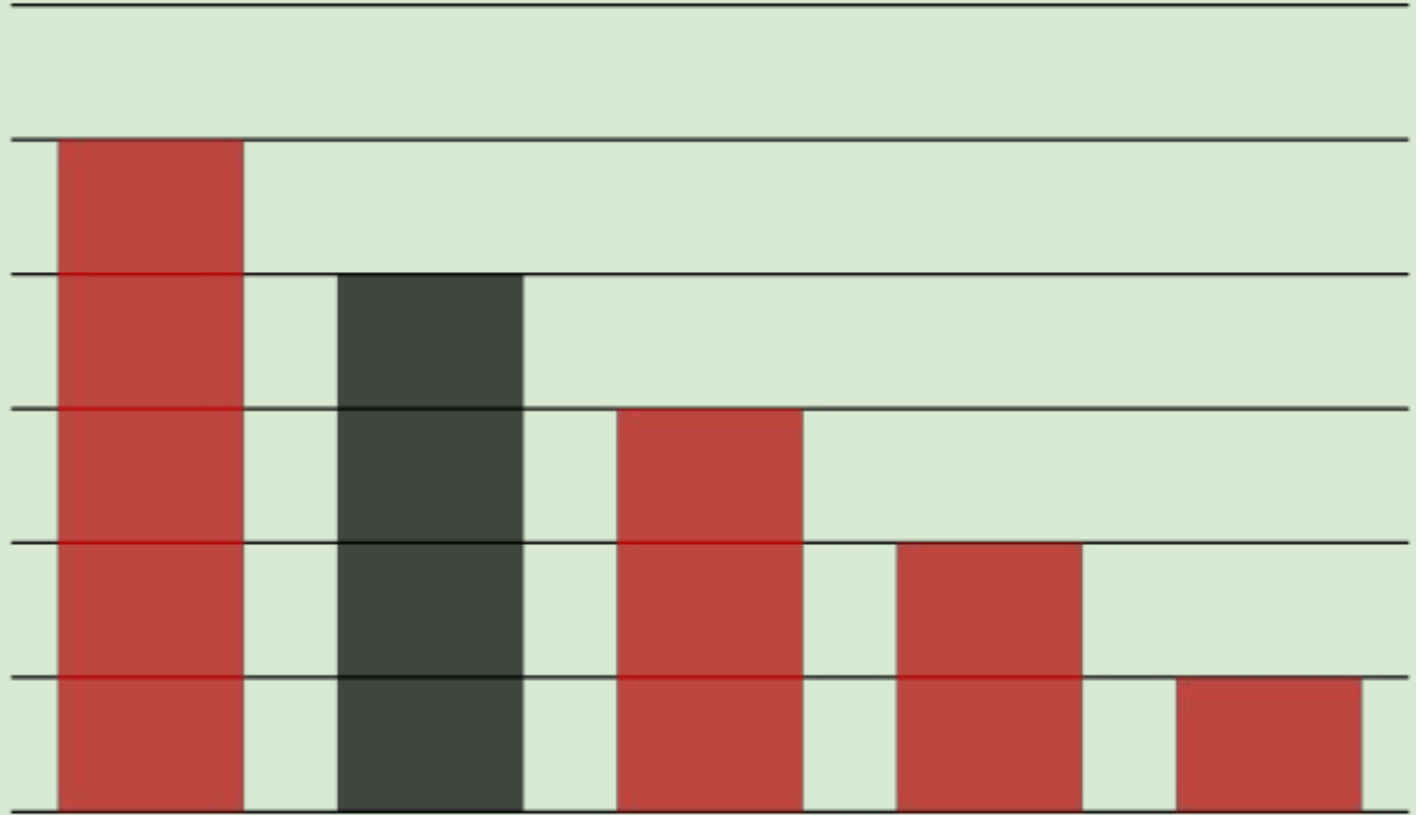
Continuity



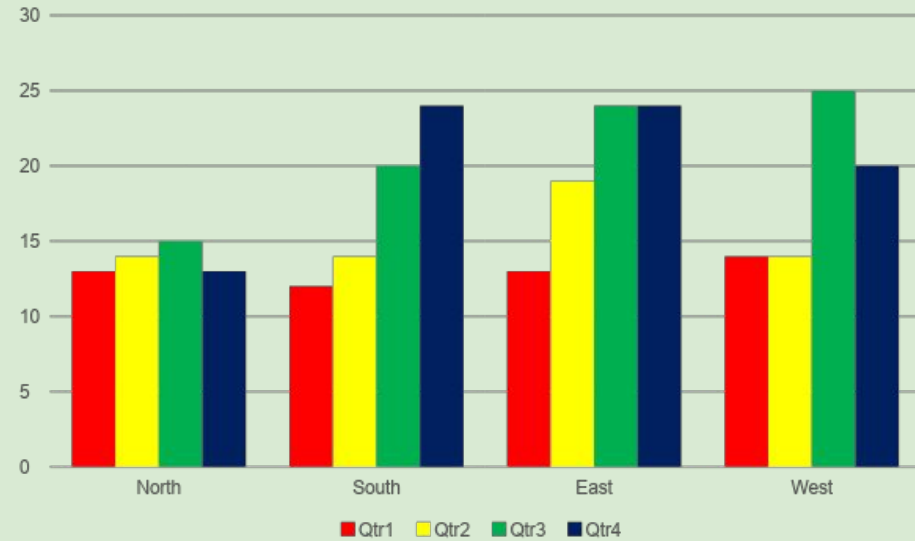
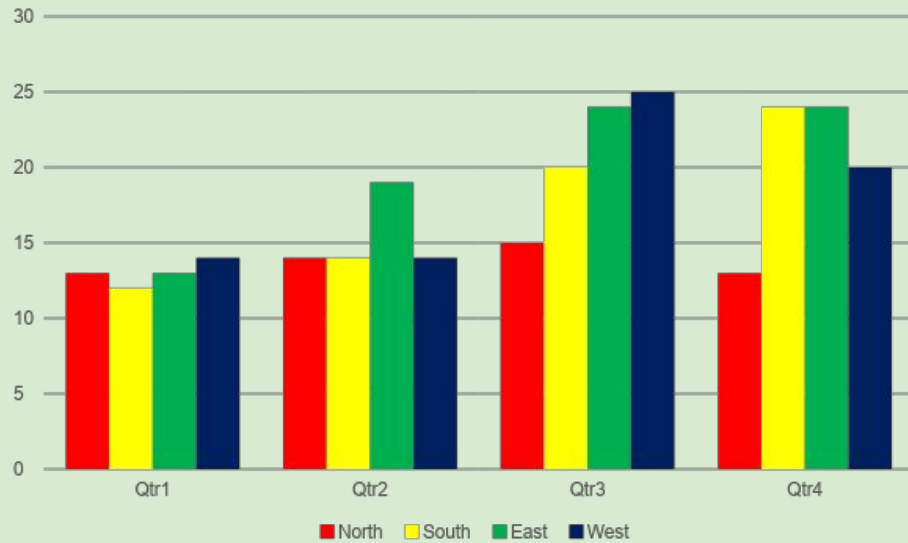
Simplicity



Focal Point



Story



What can Power BI make?

I have an example to show.

[Data Stories Gallery - Microsoft Fabric Community](https://community.fabric.microsoft.com/t5/Data-Stories-Gallery/bd-p/DataStoriesGallery?featured=yes)

<https://community.fabric.microsoft.com/t5/Data-Stories-Gallery/bd-p/DataStoriesGallery?featured=yes>

A few more tips:

- Top to bottom, Left to right
- Can I skim this dashboard?
- Is the dashboard noisy?
- Check labels (avg_sls_reg)
- Check axes (min and max)
- Check units (km, miles, \$)
- Check scale (count vs %)

More Resources:

<https://guyinacube.com/>

<https://www.sqlbi.com/>

<https://docs.microsoft.com/en-us/power-bi/>

<https://docs.microsoft.com/en-us/learn/paths/data-analytics-microsoft/>

<https://www.havensconsulting.net/blog-and-media>



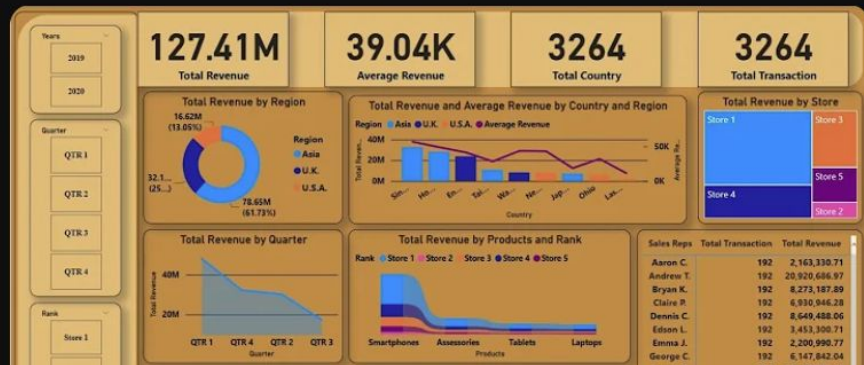
Power BI | Dashboard in 30 minutes

1.4K views • 1 year ago



soumen roy

This video explains on how to create dashboard in Power BI. It also explains, how to clean and prepare mess data for report ...



Basic Financial Analysis Dashboard || Learn Power BI Basics in 30 MINS || POWER BI DASHBOARD ||

91K views • 1 year ago



Google Sheets Tips and Tricks

businessintelligence #microsoftpowerbi #powerbi Hi Family ! Building a Power BI dashboard from scratch is achievable but ...

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