# 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)
Linkedin: linkedin.com/in/douglasjamesbruce/

# Introduction

Used at work:
    Microsoft Sharepoint and Onedrive
    Microsoft Teams
    SQL
    Microsoft Excel
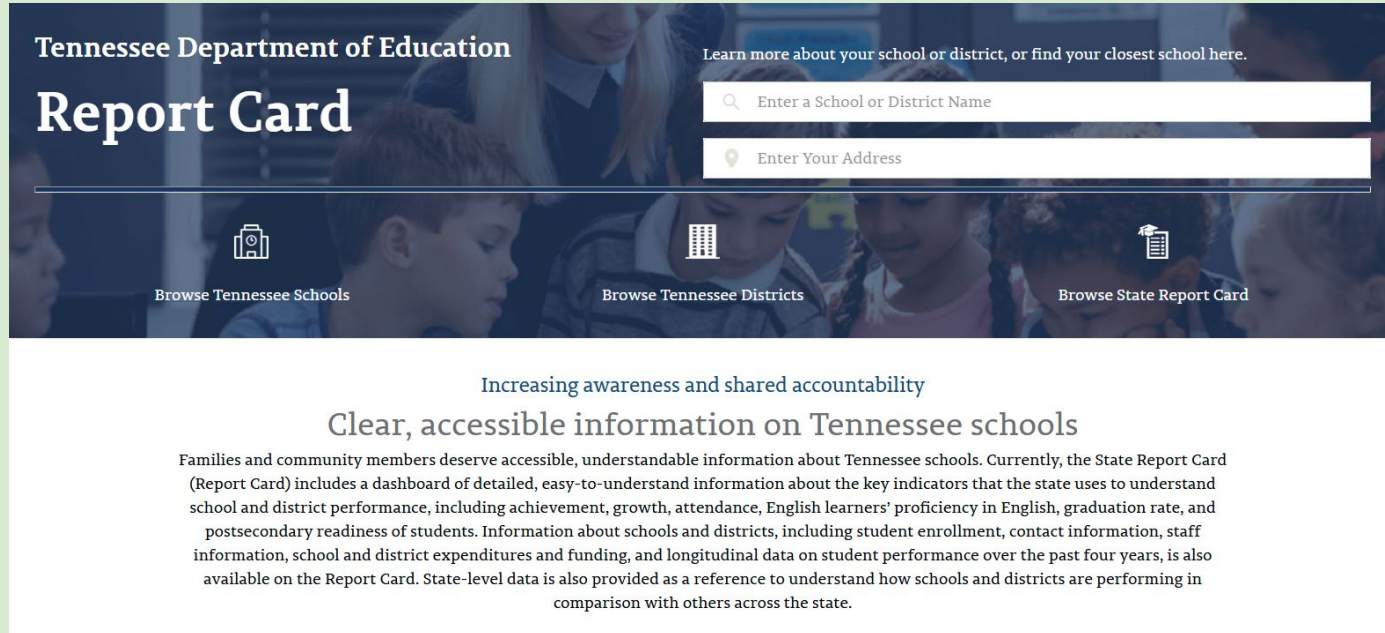    R (dplyr package)

# Data

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

# 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 Sc |

### Calculation of School Letter Grade

A

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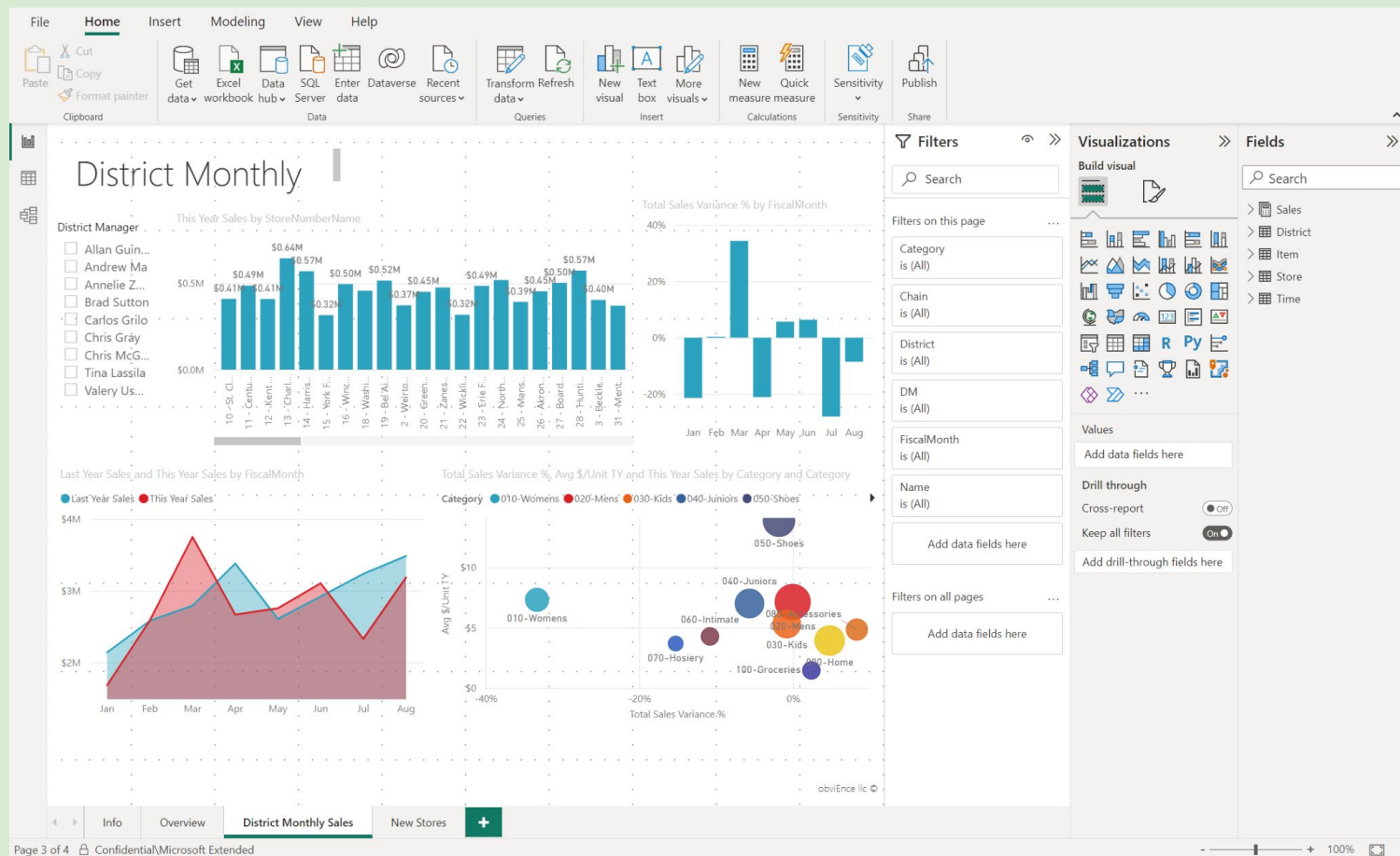
# Ribbon
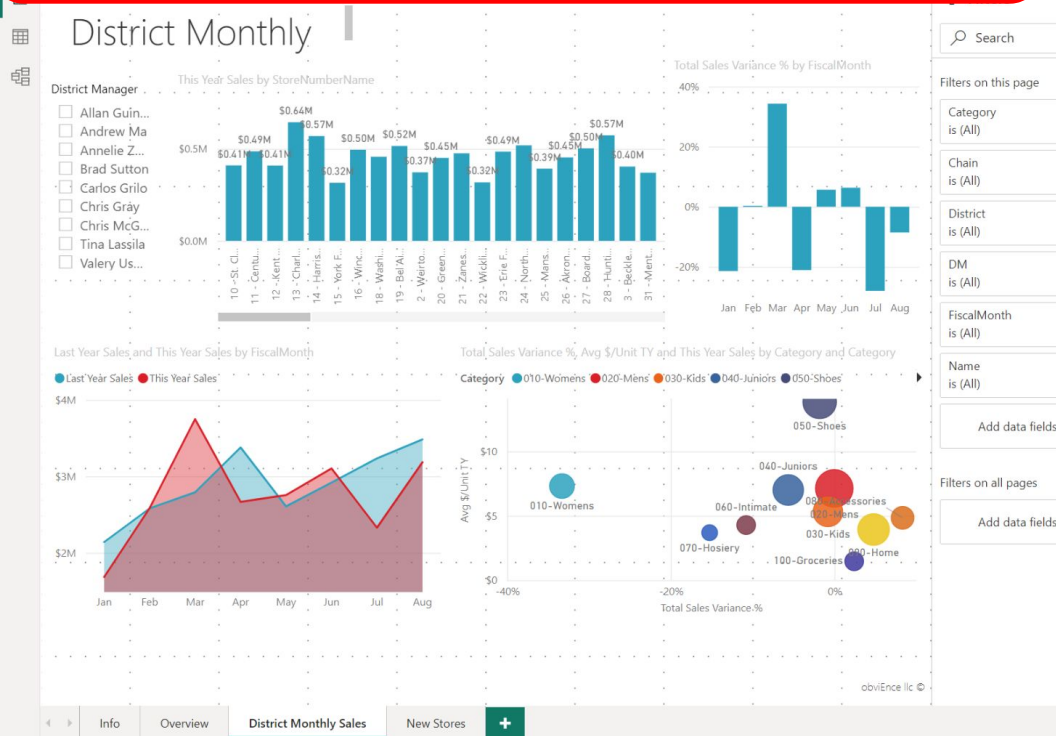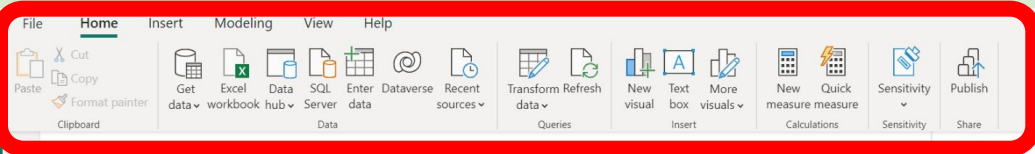


Similar to using Word or Excel

Many different actions under

Home
        Get Data!

Insert
Modeling
View

# Report Canvas
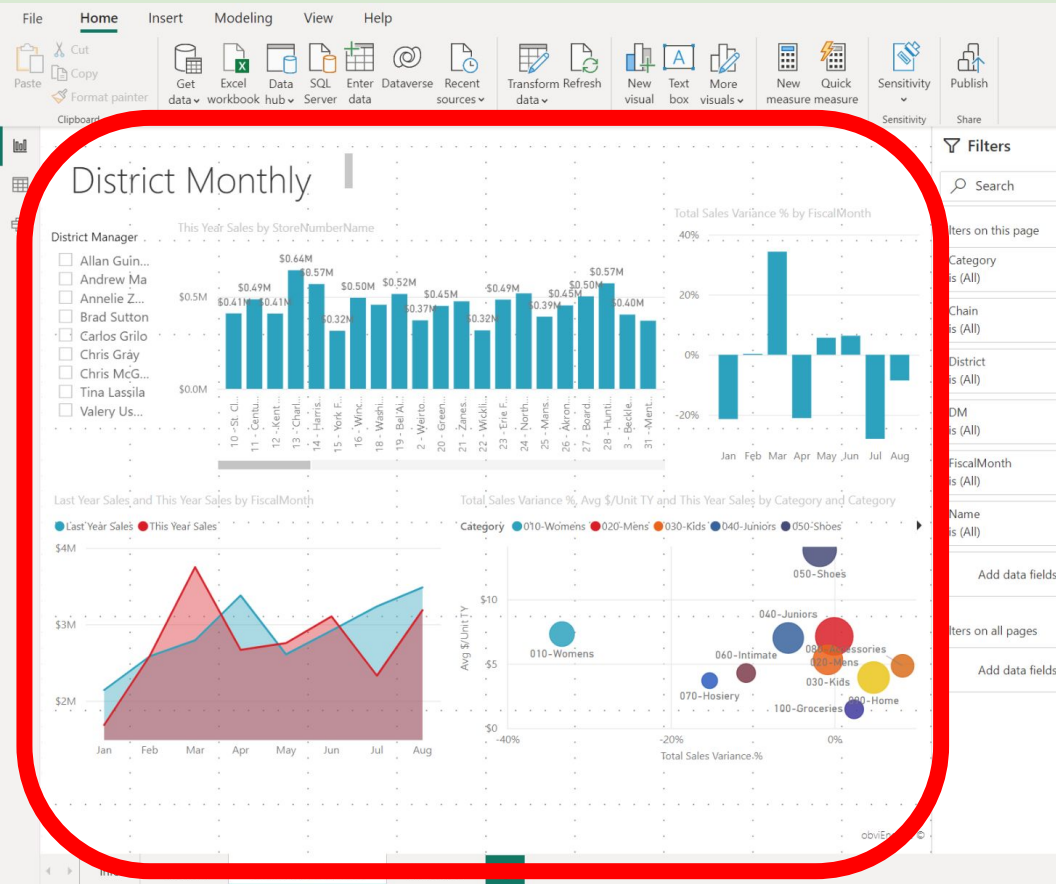


Similar to using Word or Excel

Analyze!

Visualize!

Create!

# Fields



Check on the data in the report

Tables

Columns

Data Types

Measures

# Visualizations

Choose

Bar charts
Line charts
Scatter charts
Slicers
Maps

Choose data
Format appearance
Further analysis
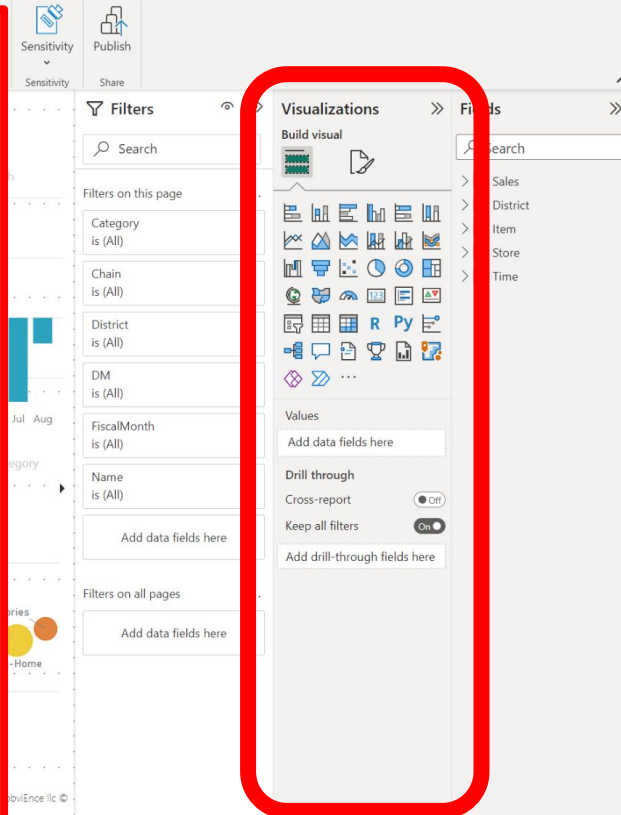
# Filters

Filter one visual

Filter whole page

Filter whole report

Filter categories from list

Filter numbers (less than x)

Sensitivity

Publish

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

Visualizations

Fields

Search

Sales

District

Item

Store

Time

Values

Add data fields here

Drill through

Cross-report        Off

Keep all filters     On

Add drill-through fields here

# Power BI: experience your data
# Any data, any way, anywhere



Cloud data

On-premises data

Power BI

Web

Mobile

Excel

Embedded
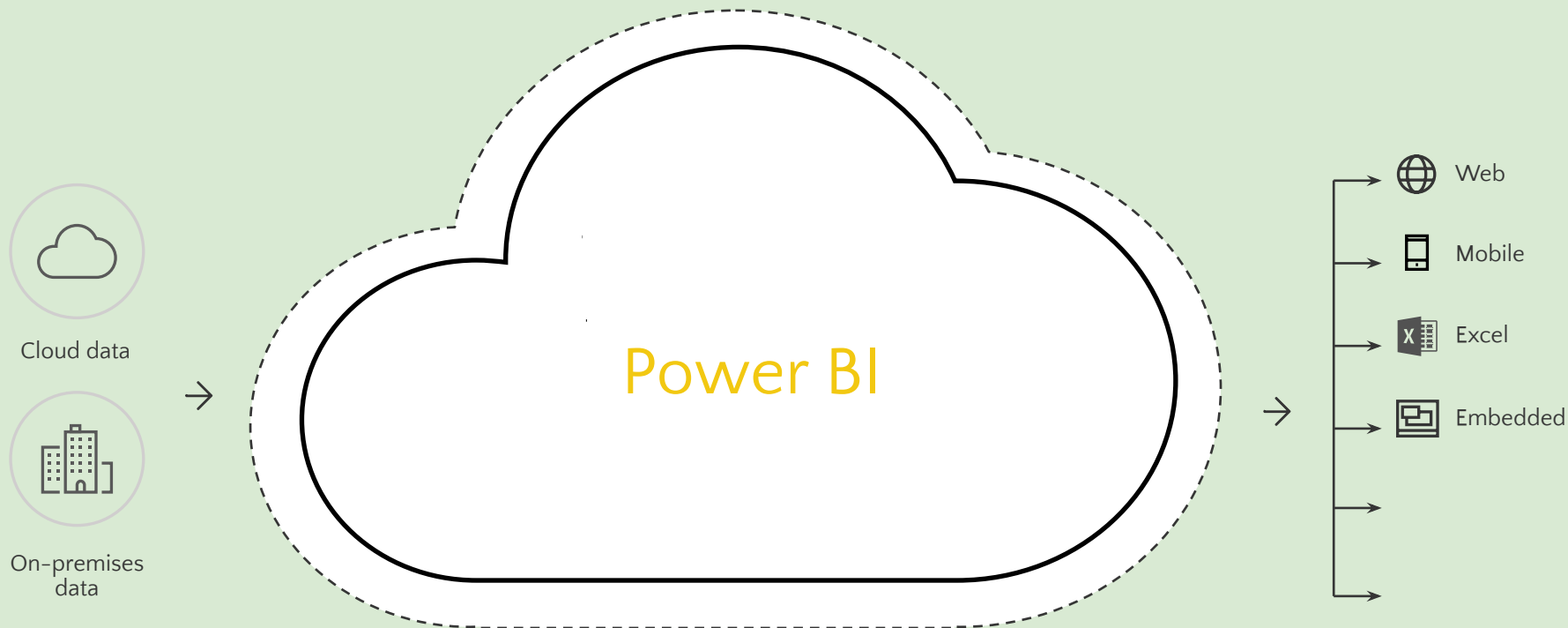
# Clean and mash–up your DATA

- 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

Prepare

Explore

Visualize

Share & collaborat

# Explore your DATA

**Prepare**

**Explore**

**Visualize**

**Share & collaborat**
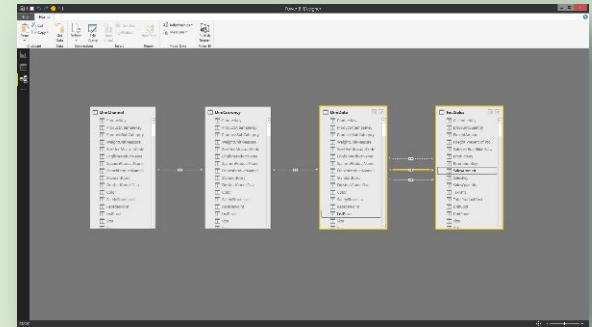
- Explore data in a variety of ways and across multiple visualizations using drag and drop canvas

- 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
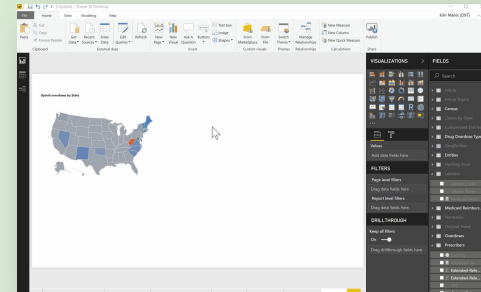
# Visualize your DATA

- 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
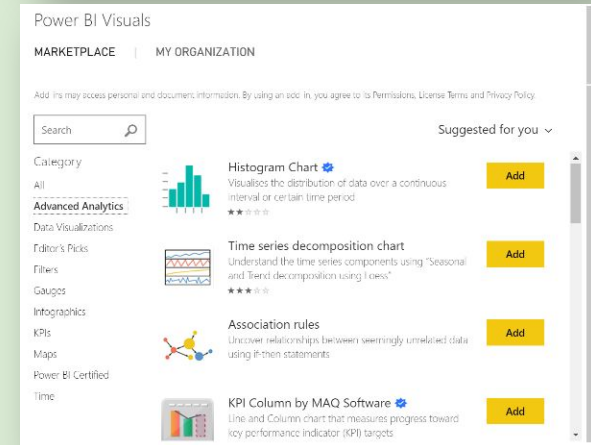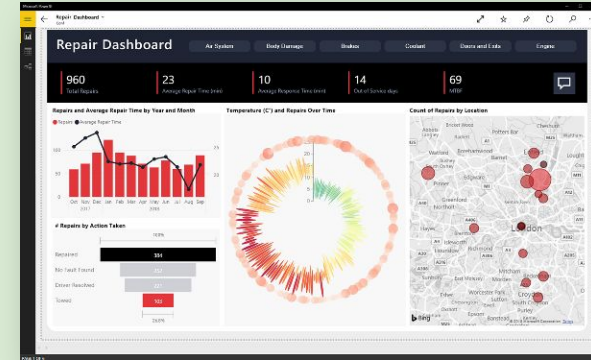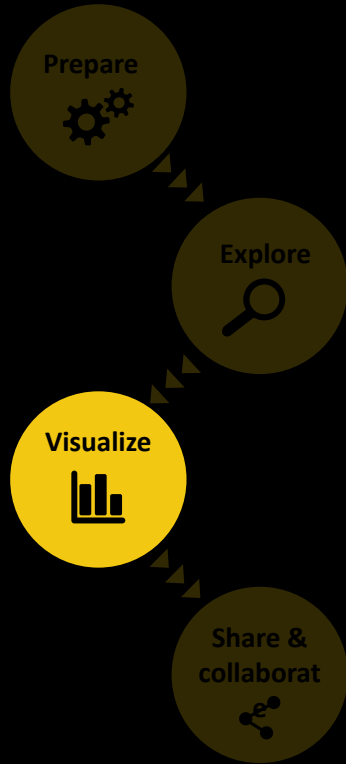
# Bring your story to life with DATA

- 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**

**Prepare**

**Explore**

**Visualize**

**Share & collaborat**
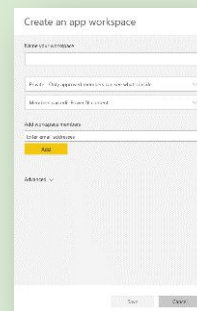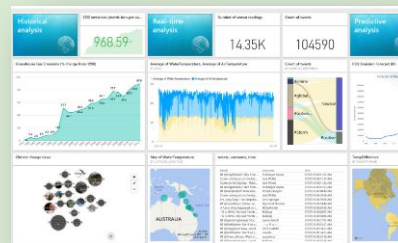
# Terminology

**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 |
|---------|----------|--------|-------------|-------|
| A | 1 | G10H12 | DC Personal Finance | 62 |
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|----------|--------|-------------|-----------|
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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



You saved me… why?

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



WHERE ARE THEY?!?!

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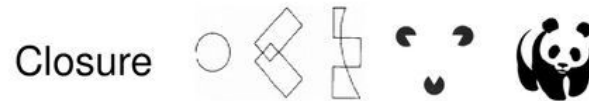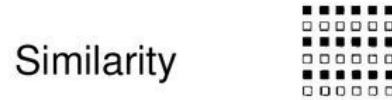
- **Explanation**
- Summarize
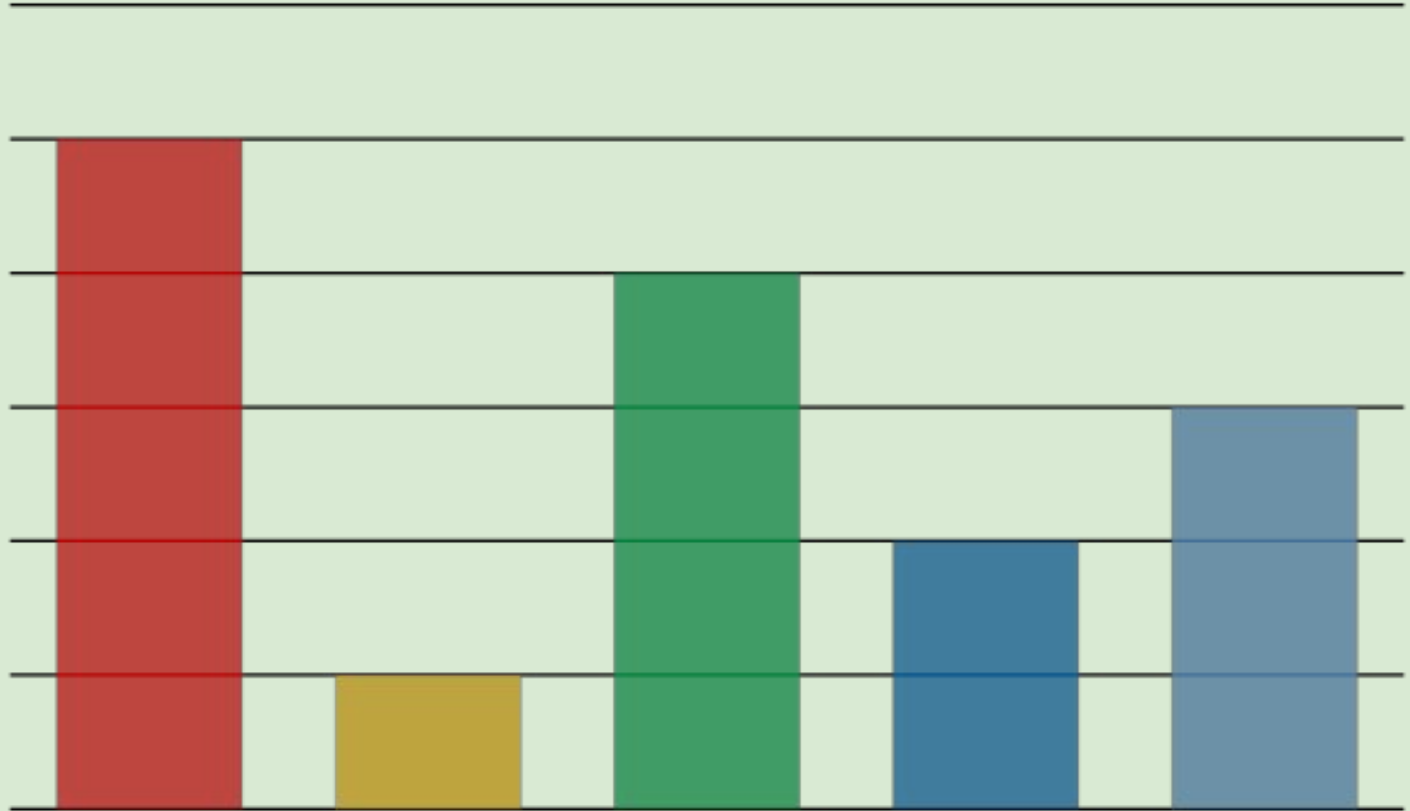- Question and Answer
- Monitor
- Maintain
- Make a decision



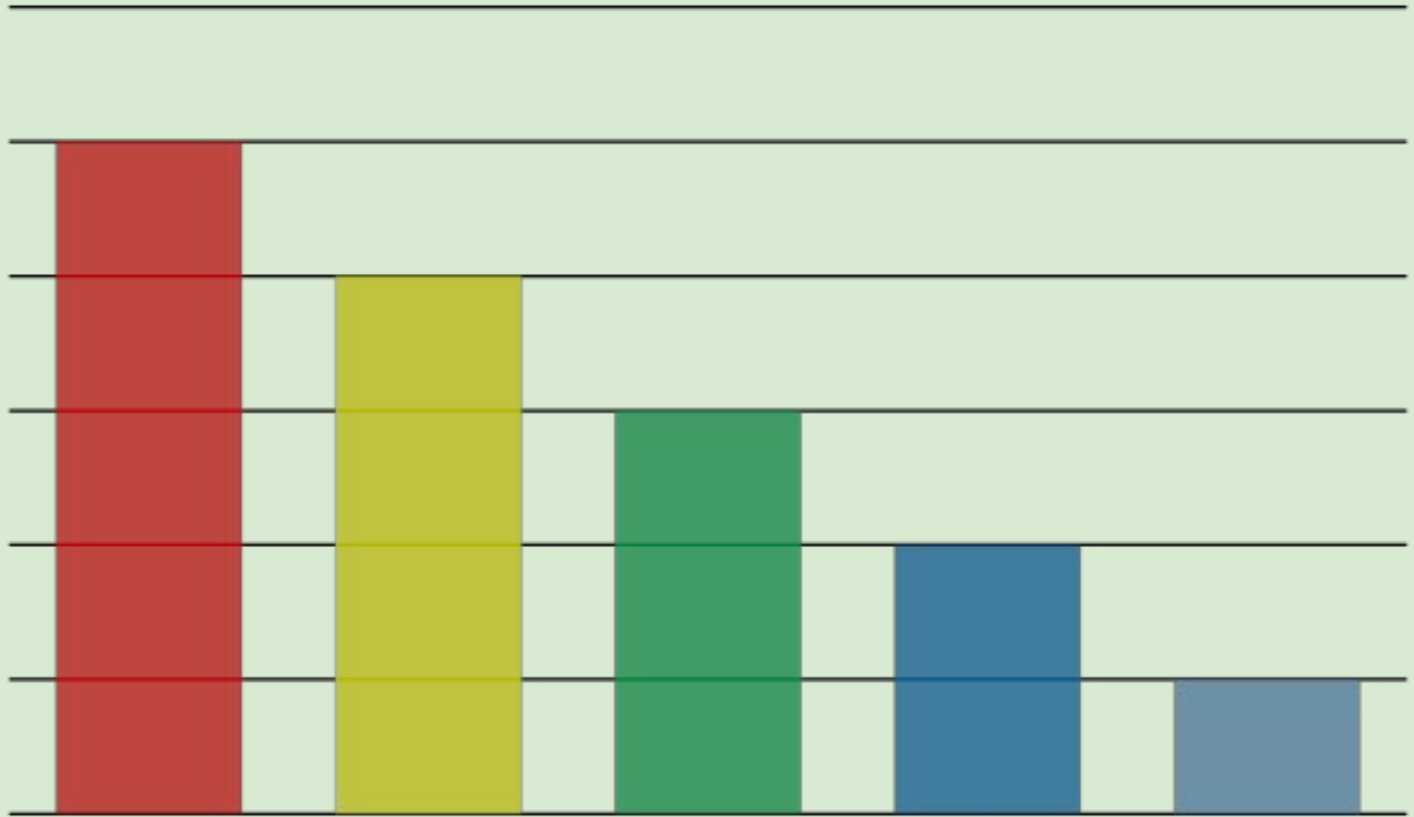"We shall now commence throwing money at the problem."
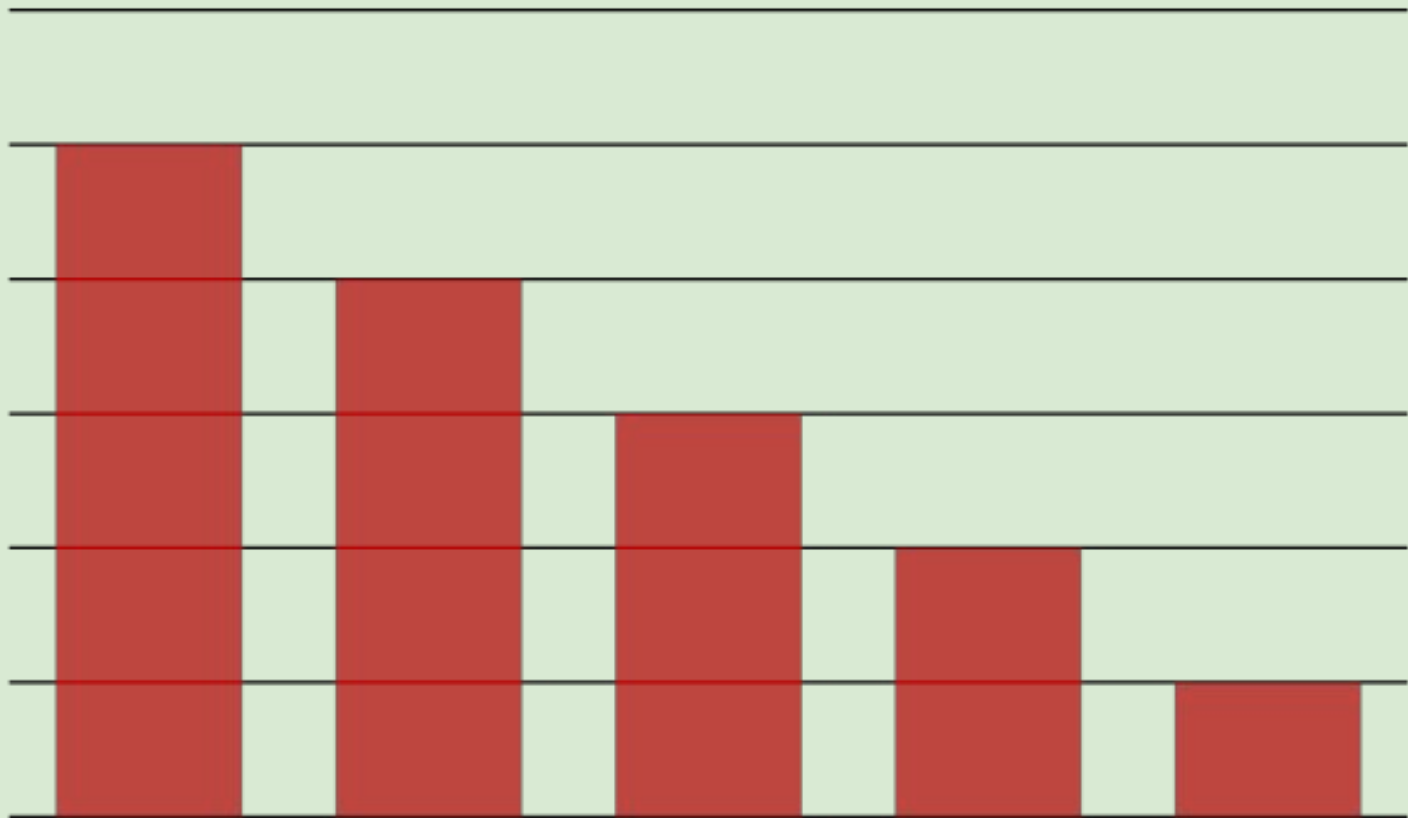
# Design

## Gestalt Principles of Visual Perception



Simplicity

Proximity

Similarity

Enclosure

Closure

Continuity

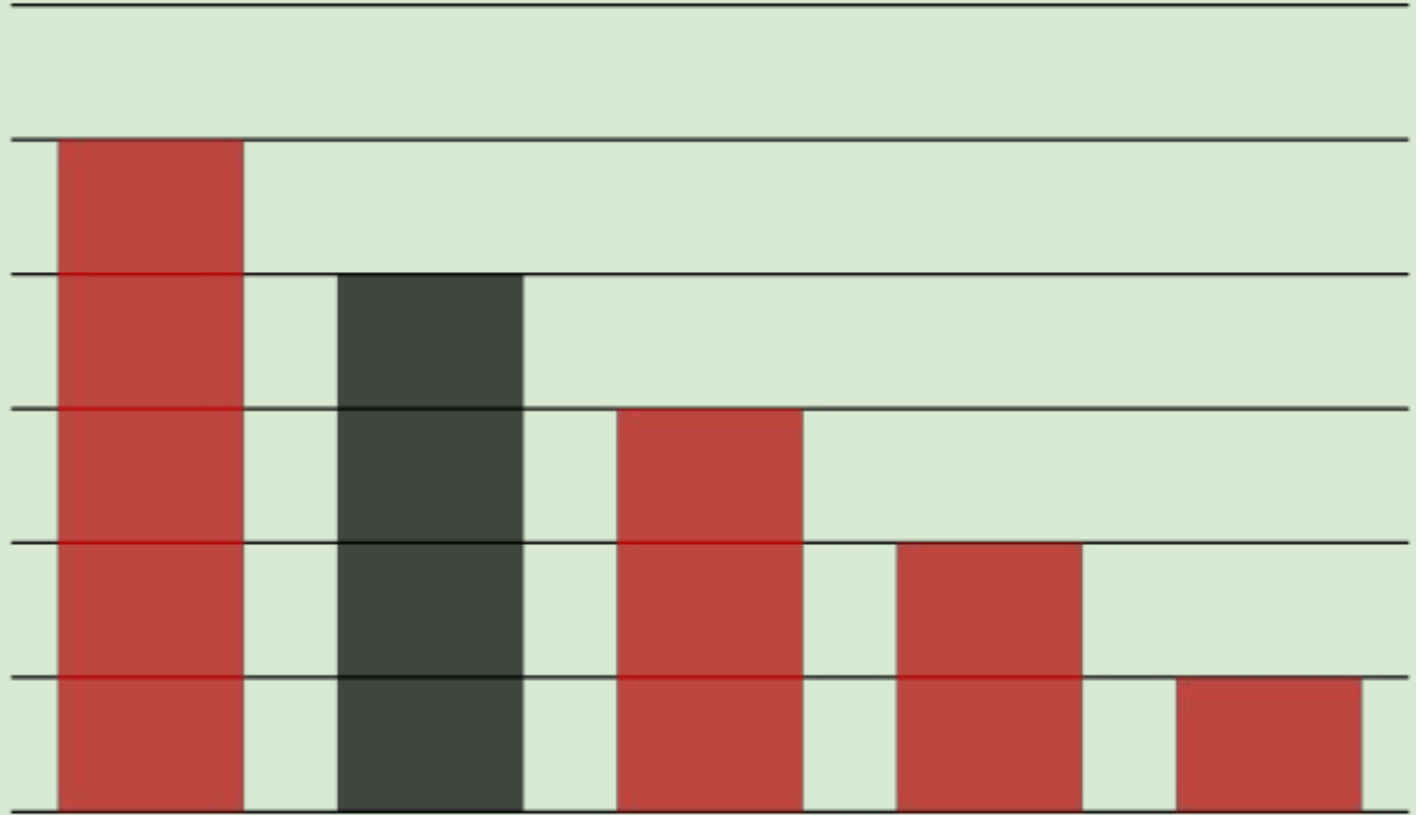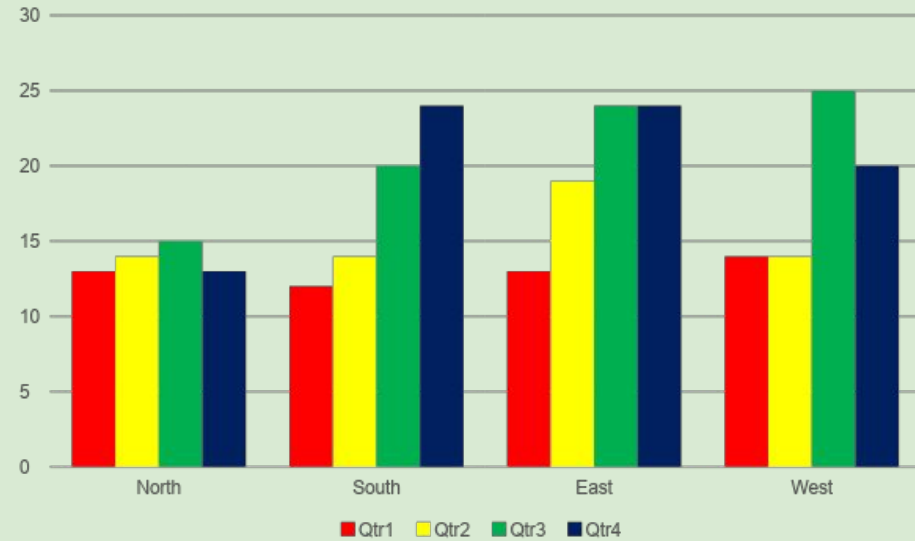Connection

Figure & Ground

# Data

# Continuity

# Simplicity

# Focal Point

# Story
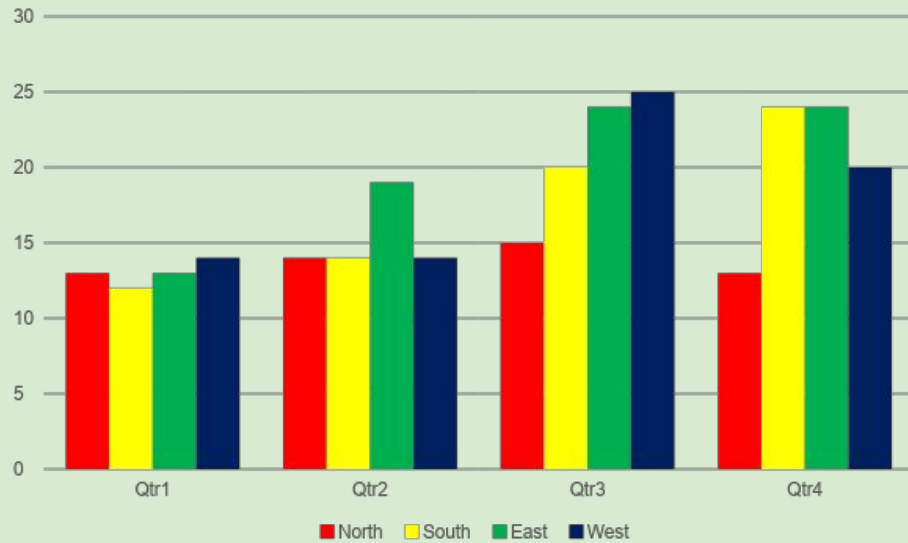
# What can Power BI make?

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 30 minutes



**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 ...

32:21
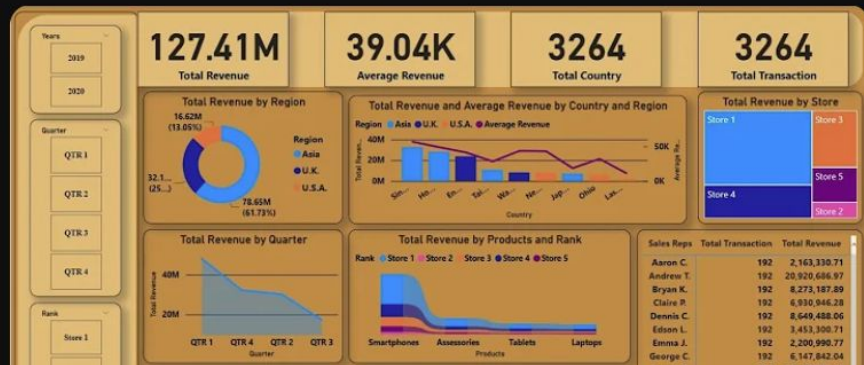


**Basic Financial Analysis Dashboard || Learn Power BI Basics in 30 MINS || POWER BI DASHBOARD ||**

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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