Data Camp Live Training:

Getting Started in SQL

DataCamp

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DataCamp

Live Training Session Agenda

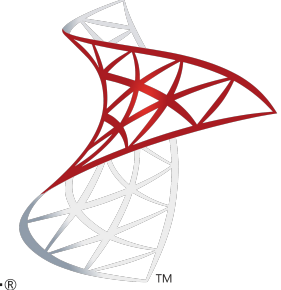
- Introduction
- Context
- Coding Activity
- Recap/Closing Notes
- Next Steps/Take home assignment

SQL stands for ‘Structured Query Language’

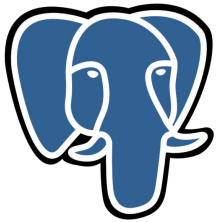
- Originally developed in the 1970s
  - Designed to isolate and return data from an IBM relational database management system (RDMS)
  - Has undergone many evolutions and updates
- Strengths
  - SQL can handle much, much larger databases than Excel, which can only handle 1,048,576 rows
  - SQL can also aggregate and clean data much faster
- Weaknesses
  - SQL does not produce data visualizations - to do this, you will need to export your cleaned data to another program

Why Learn SQL?

- SQL remains a vitally important data coding language
- Used by data analysts, data scientists, and database administrators
- Can be used to query, clean, and organize data quickly and efficiently



Microsoft®
SQL Server®



PostgreSQL

ORACLE®
PL/SQL

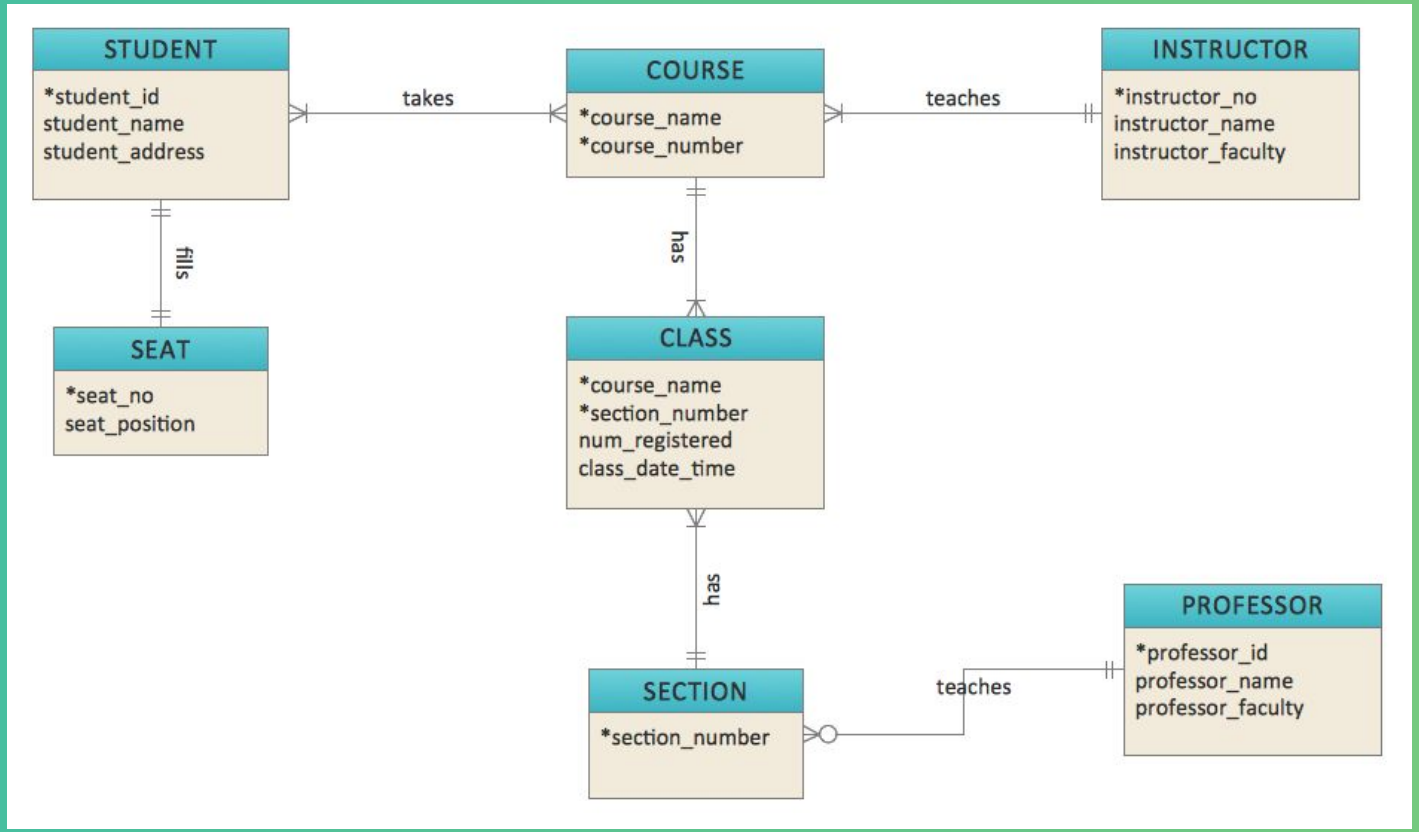
MySQL™

There are several different “dialects” of SQL

We’re going to be using Postgres for our session today - it’s widely used, an object oriented relational database management system (DBMS), it’s powerful, and it’s FREE!

Let’s Talk about Tables

This is an entity relationship diagram (ERD) - it shows how tables connect to each other using a ‘primary key’



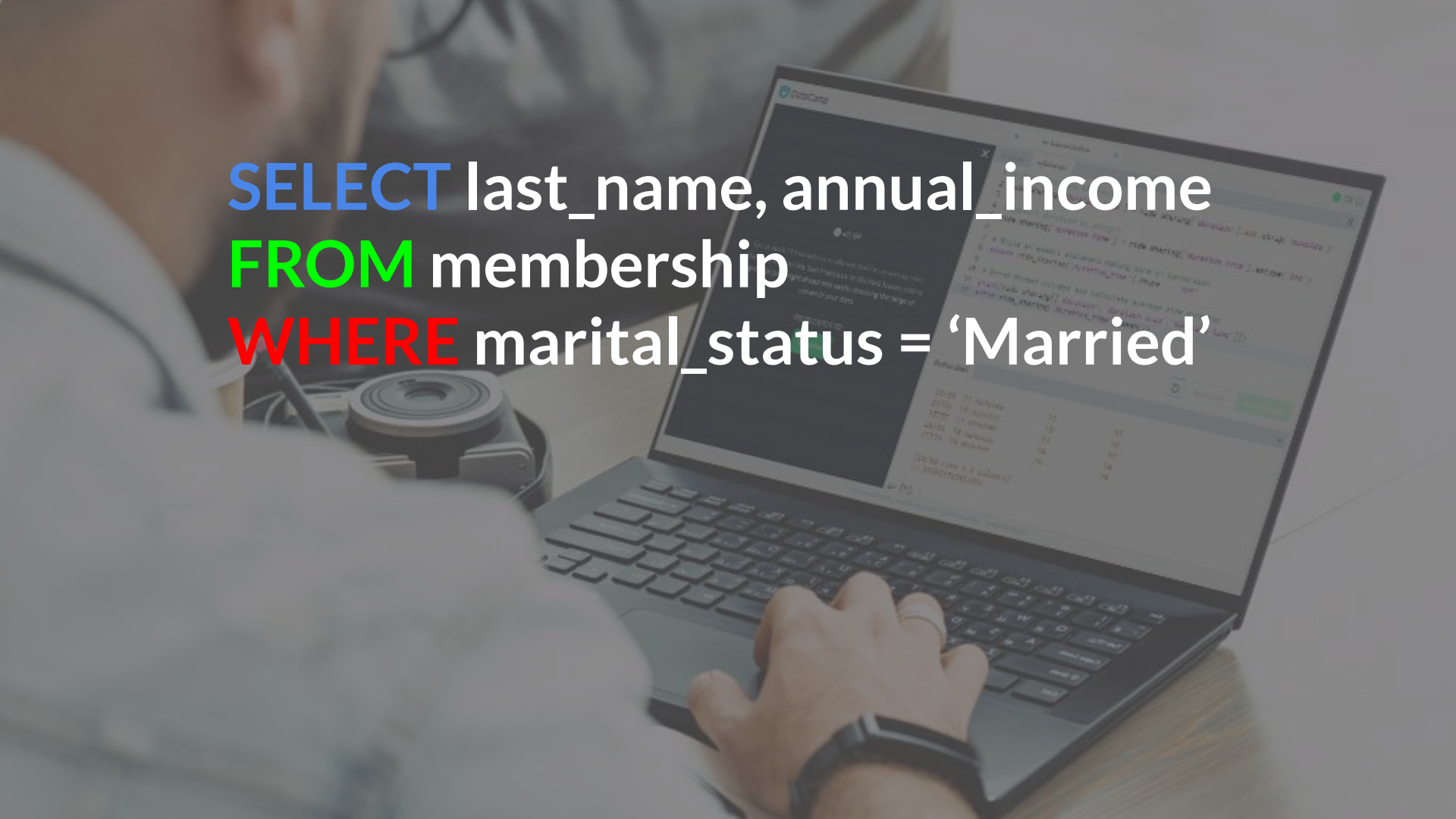
SQL and Table Anatomy

SELECT (returns columns)

FROM
(entire table)

WHERE (filters on rows)

id	last_nam	marital_status	gender	annual_income	industry	zip_code
A02601	Barrett	Married	M	$ 115,613.00	Consumer Discretionary	80202
A00128	Boyd	Married	M	$ 102,874.00	Consumer Staples	80202
A00102	Hudson	Married	M	$ 87,772.00	Utilities	80202
A02479	Green	Single	M	$ 81,574.00	Consumer Staples	80202
A02434	Parker	Married	F	$ 90,410.00	Real Estate	80202
A01133	Woods	Married	F	$ 48,462.00	Energy	80202
A02148	Page	Married	M	$ 90,171.00	Consumer Staples	80202
A04898	Gonzalez	Married	M	$ 111,065.00	Health Care	80202
A04686	Jacobs	Married	M	$ 114,428.00	Consumer Discretionary	80202
A06081	Tyler	Single	M	$ 69,769.00	Telecommunication Services	80202
A04755	Adkins	Married	M	$ 103,336.00	Telecommunication Services	80202
A00936	Brock	Single	M	$ 115,486.00	Health Care	80202
A04326	Rowe	Married	M	$ 103,926.00	Consumer Staples	80202
A04236	Cohen	Married	M	$ 104,903.00	Materials	80202
A02151	Maxwell	Single	M	$ 64,316.00	Health Care	80202
A04291	Allen	Married	M	$ 79,918.00	Materials	80202
A00773	Gregory	Married	M	$ 101,686.00	Financials	80202


SELECT last_name, annual_income
FROM membership
WHERE marital_status = ‘Married’

SQL Order of Execution

What Query looks like:

1. SELECT
2. FROM
3. WHERE
4. GROUP BY
5. HAVING
6. ORDER BY
7. LIMIT

How it's Executed:

1. FROM
2. WHERE
3. GROUP BY
4. HAVING
5. SELECT
6. ORDER BY
7. LIMIT

Live Coding Activity

jupyter applayout_example Last Checkpoint: 20 hours ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

```
                      icon='backward',
                      layout=Layout(width='80%',
                                    height='30%'))
next_button = Button(description="Next",
                     icon='forward',
                     layout=Layout(width='80%',
                                   height='30%'))
footer = HTML("Filename: {}".format(image_file))

AppLayout(header=header,
          left_sidebar=prev_button,
          center=image,
          right_sidebar=next_button,
          footer=footer,
          grid_gap='20px',
          justify_items='center',
          align_items='center')
```

Simple Image Viewer

Prev

Next

Filename: images/cat.jpg

jupyter CO

❗❗Requires a gmail account to edit❗❗

Session Notebook

Recap and Closing Notes

What Did We Learn Today?

Basic Queries

- SELECT, FROM, ORDER BY, LIMIT

Filtering Data

- WHERE, LIKE, ILIKE, IS, BETWEEN, IIN
- >, <, =, >=, <=

Aggregation

- SUM, COUNT
- AVERAGE, MAX, MIN
- GROUP BY, HAVING

Other Useful Functions

- ROUND, DISTINCT
- Aliasing


Remember - Stay Organized!

Things to Remember When Writing Your Queries

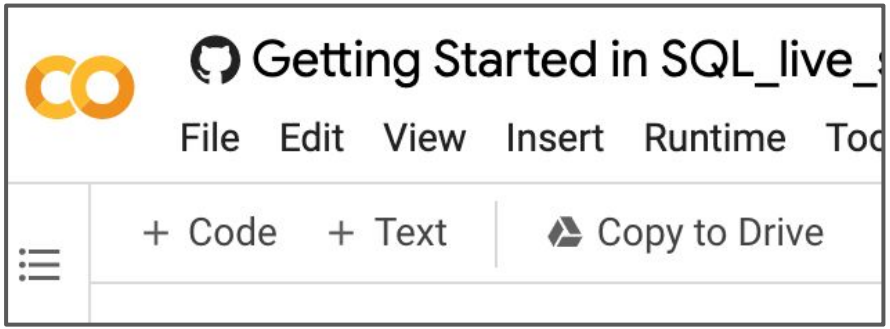
Use inline commenting to “brainstorm”
Frame your query as a business question first

Ask yourself, “What do I need for this query?”
You will always need a SELECT and FROM statement - but what else?

Test out each step along the way
Build your query one line at a time and run it frequently to check that it works

Further Practice

- Today's Notebook is yours to keep
  - Save a copy to your Google Drive
- Remember:
  - You will need to reload the Setting Up Postgres cells every time you reopen the notebook
  - If you see the error message "sql magic not found", that means that Postgres was not loaded into the notebook
- To add a new text cell, click "code"
  - Start the cell with the code %%sql before starting a SQL query



Resources

Recap of Statements Used

Statement	Description
SELECT	Returns indicated columns
.FROM	Indicates which table to query data from
WHERE	Filters data on rows
LIKE	Used in the WHERE statement to filter data
GROUP BY	Aggregates data as indicated in SELECT statement
HAVING	Filters on aggregated data
ORDER BY	Orders the rows returned by column indicated, can be ASC or DESC
LIMIT	Limits the number of rows returned

Recap of Filtering Functions Used

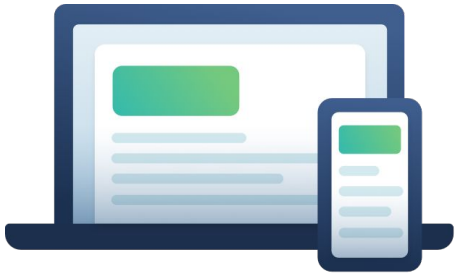
Function	Description
>, <, =	Greater than, less than, equal to
BETWEEN	Indicates a range of values, includes both values provided BETWEEN ‘X’ and ‘Y’
IN	Filters for set of exact, known values. IN(‘term1’, term2’, ‘term3’)
LIKE	Can be used to search boolean terms, is case sensitive. LIKE ‘X%” (where % stands for the unknown values)
ILIKE	Similar to LIKE, but is case indifferent
NOT	Used to negate the following filter function, as in, return values NOT LIKE ‘x’

Recap of Aggregation /Other Functions Used

Function	Description
SUM	Adds values in column
COUNT	Returns count of values in column
AVG	Returns average of numerical values in column
MAX	Returns highest numerical value in column
MIN	Returns lowest numerical value in column

Function	Description
DISTINCT	Used in the SELECT statement to indicate unique values should be returned
ROUND	Used in the SELECT statement to round a number to indicated number of decimals

Additional Resources



Here are some other resources to help you get started on your journey to becoming a SQL Superstar!

- DataCamp SQL Fundamentals Skill Track
- DataCamp Resources
- Upcoming Webinars
- SQL Style Guide
- StackOverflow

Coming Soon!

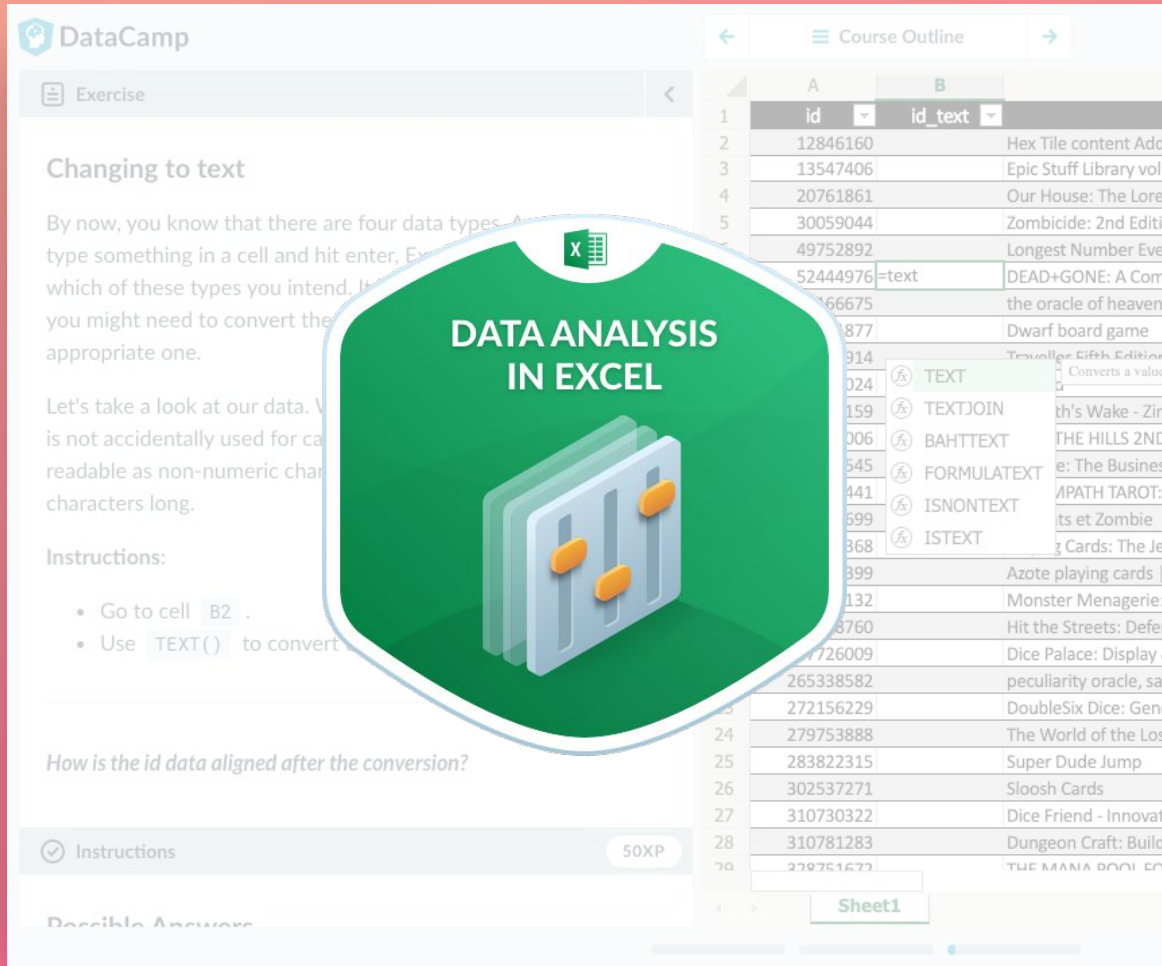
Don’t miss these upcoming webinars and live training sessions!

- Data Analysis in Excel (5/28)
- String Manipulation in SQL (6/4)
- Data Analysis in SQL (6/11)

NEW COURSE

Data Analysis in Excel

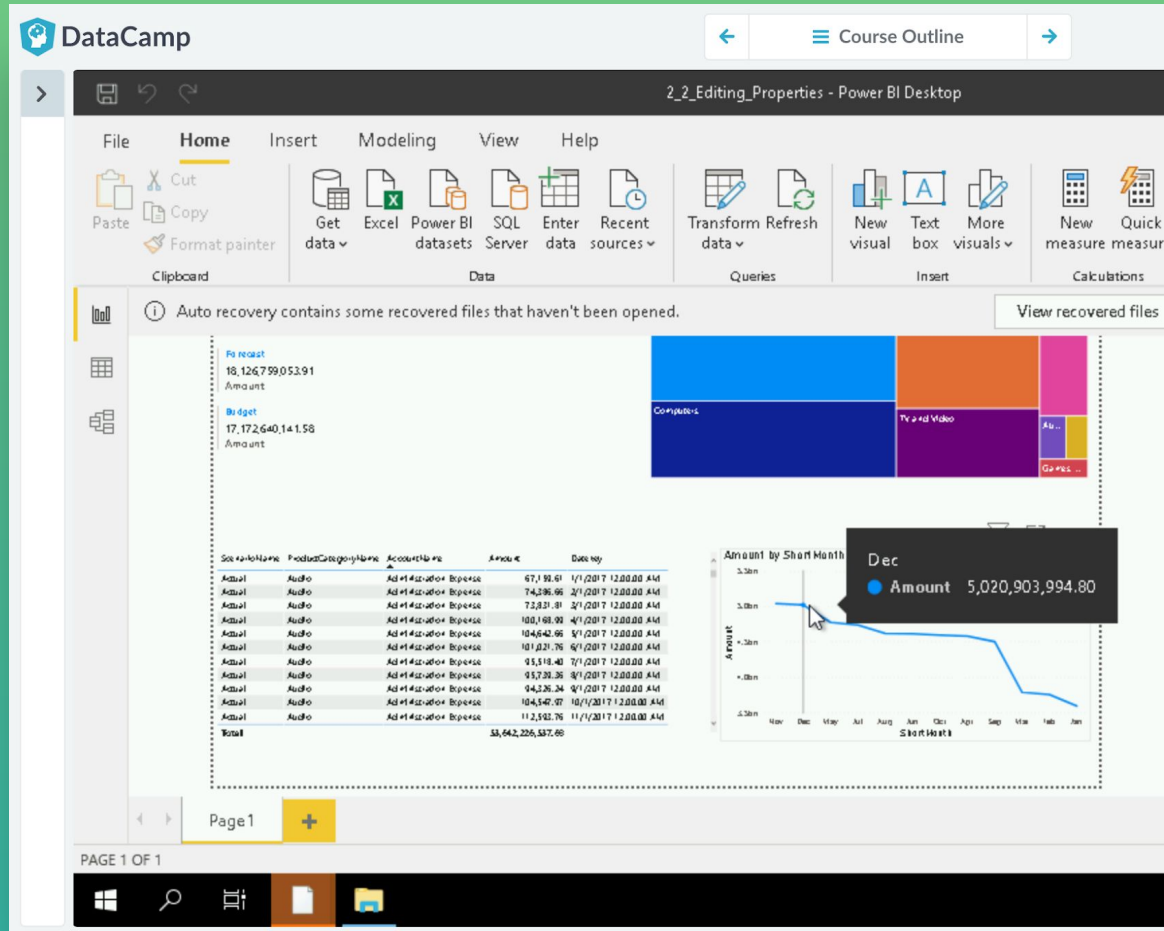
Learn how to use time-saving keyboard shortcuts, convert data types, and build impressive logic functions and conditional aggregations.

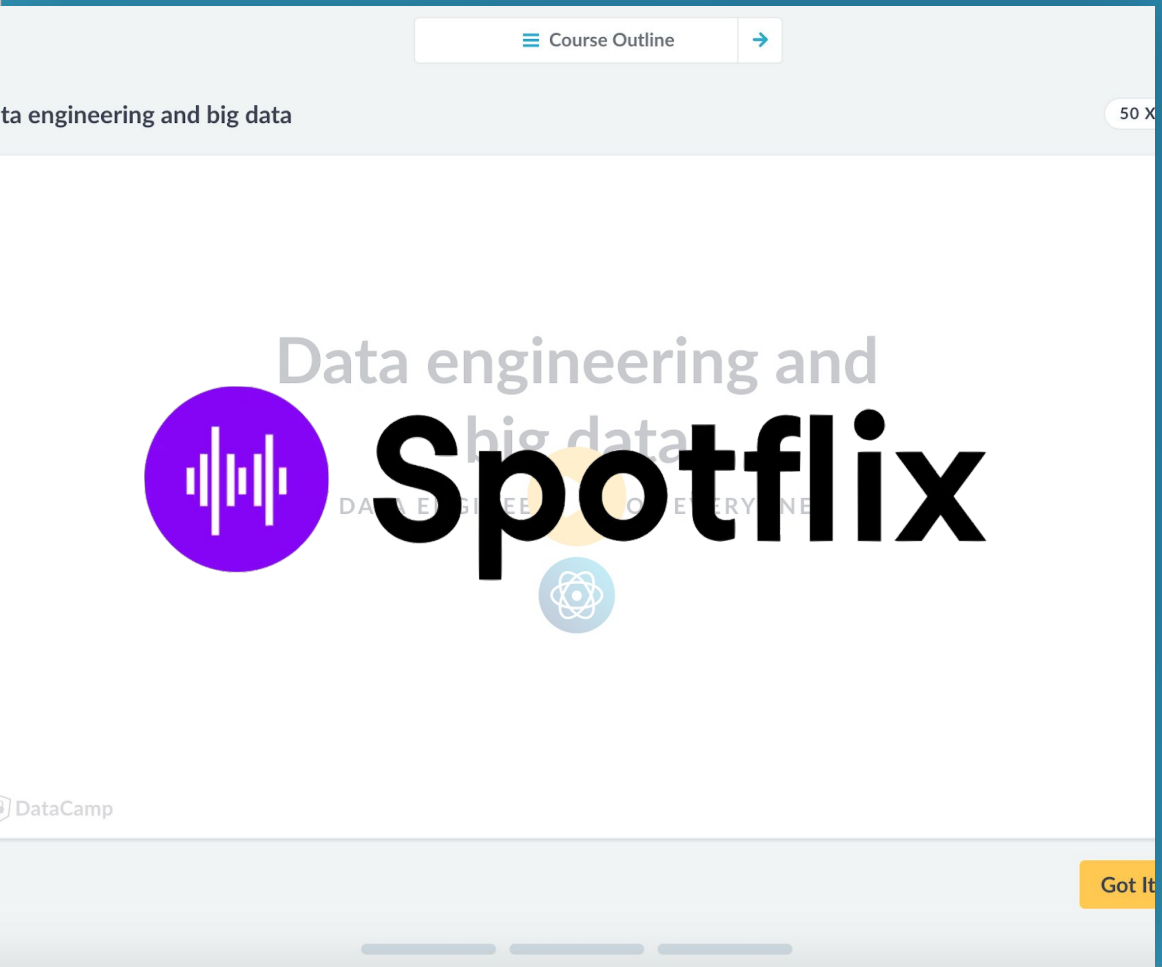


NEW COURSE

Introduction to Power BI

Unlock more value from your Microsoft plan. This interactive course empowers everyone with a 360-degree overview of how to analyze data and build impactful reports.





NEW COURSE

Data Engineering for Everyone

Learn about data engineering and why demand for them is at an all time high. Grow your knowledge in this area or take your first step towards becoming a data engineer.

NEW COURSE

Introduction to Tableau

Learn how to navigate, analyze, and build awesome dashboards that bring your data to life—all within your browser.

Thank you

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