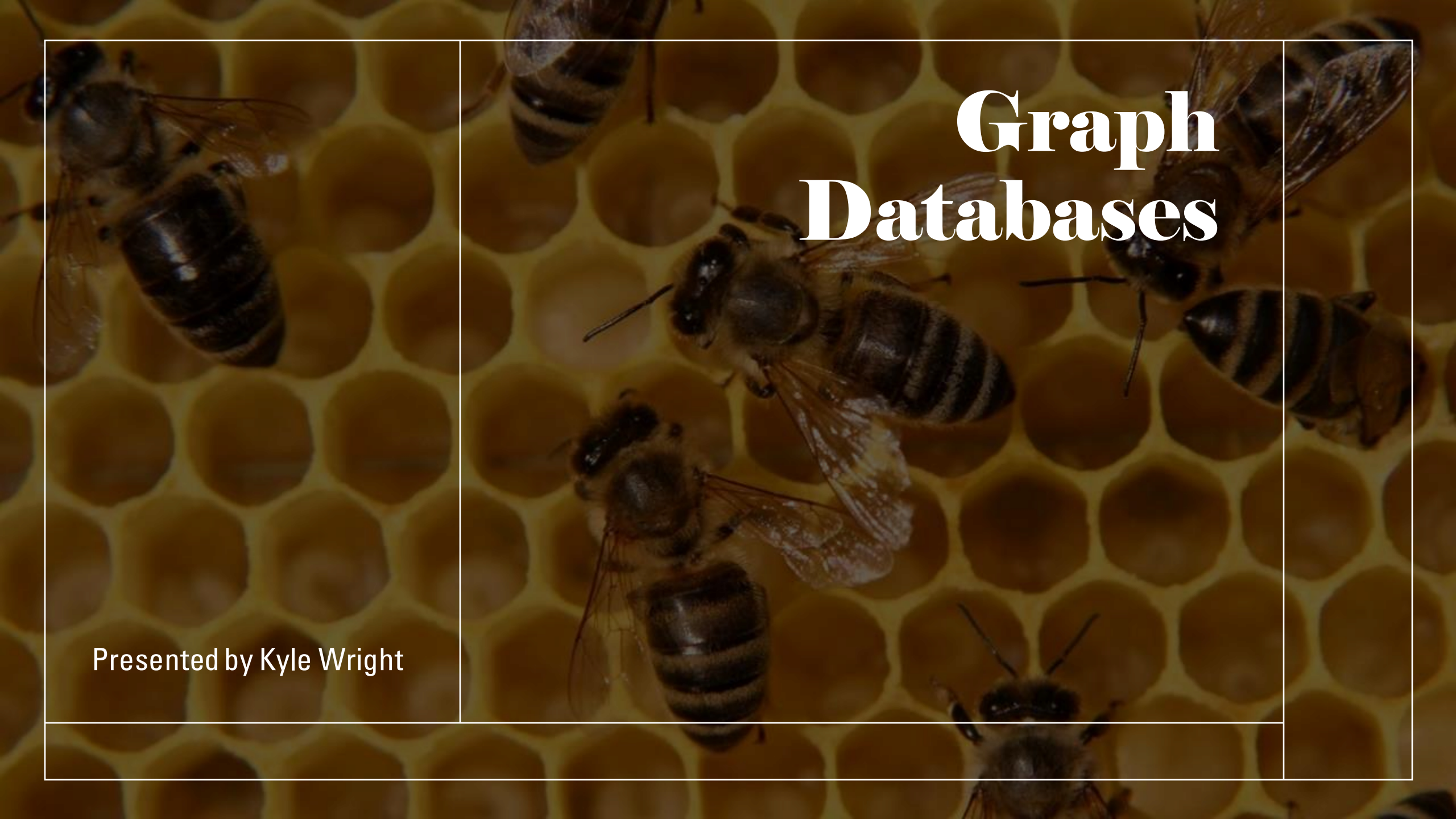
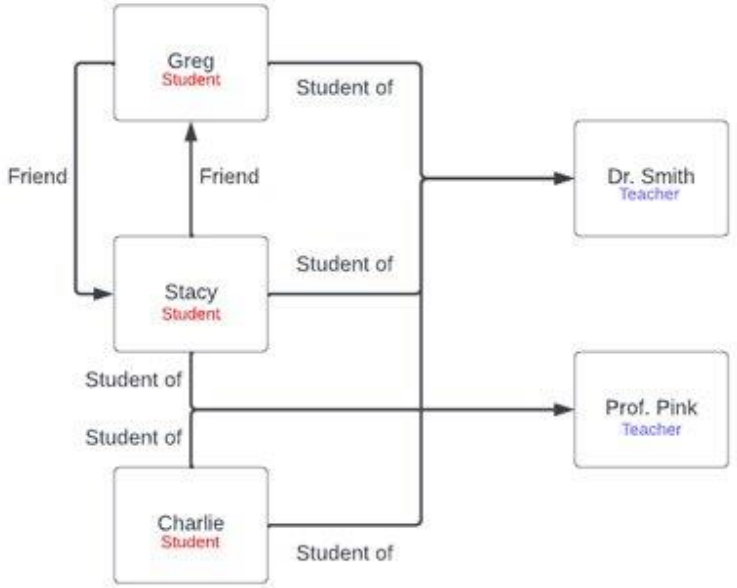


# Graph Databases

Presented by Kyle Wright

# What is a Graph Database?

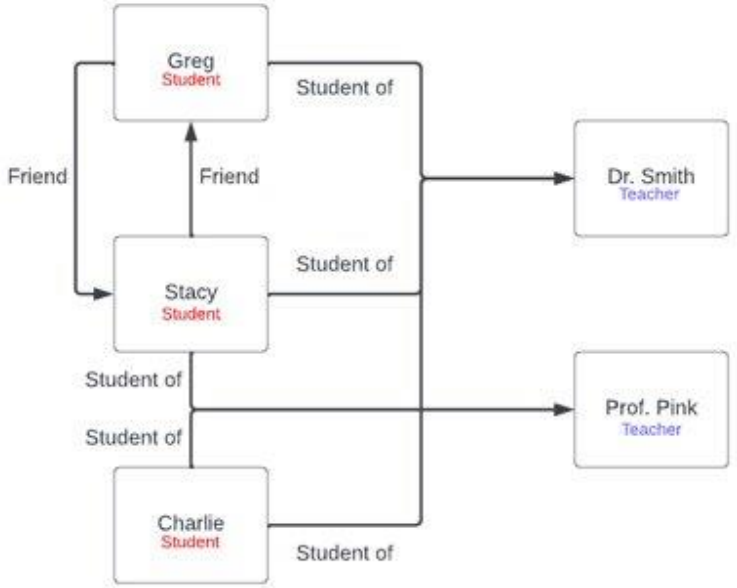
- A graph database is an alternative schema in which to store data that focuses on the relationships (edges) between entities (nodes)
- Entities have a "class" assigned to them and can store values
  - In Neo4j, these are called labels and properties
- Relationships have a type and direction, and connect two nodes
  - They can also have properties
- Almost anything can be represented as a graph
- Querying through graph databases can be quicker because the entire graph is already stored in memory, so no assembly must be done at query time
  - Neo4j claims that "Nodes can have any number or type of relationships without sacrificing performance"



Compare to

# Relational Databases

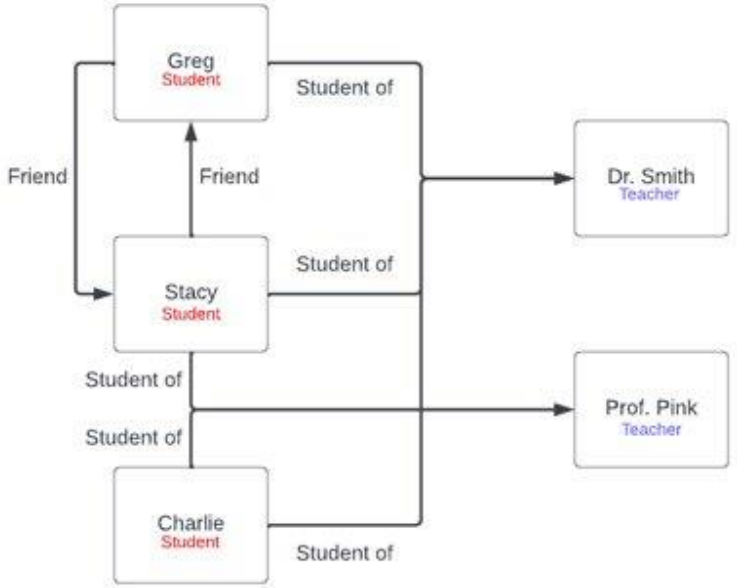
- Relational Databases are tables of rows and columns in which each row is effectively one "entity" of the "type" defined by the table
  - The tables reference each other using primary and foreign keys
- When executing queries, some complex logic is required to navigate between tables or take data from multiple tables
  - This means that exceptionally complex queries can take much longer to execute in a relational database when compared to a graph database
- The schema of a graph database is less rigid than that of relational databases



Compare to

# Document Stores

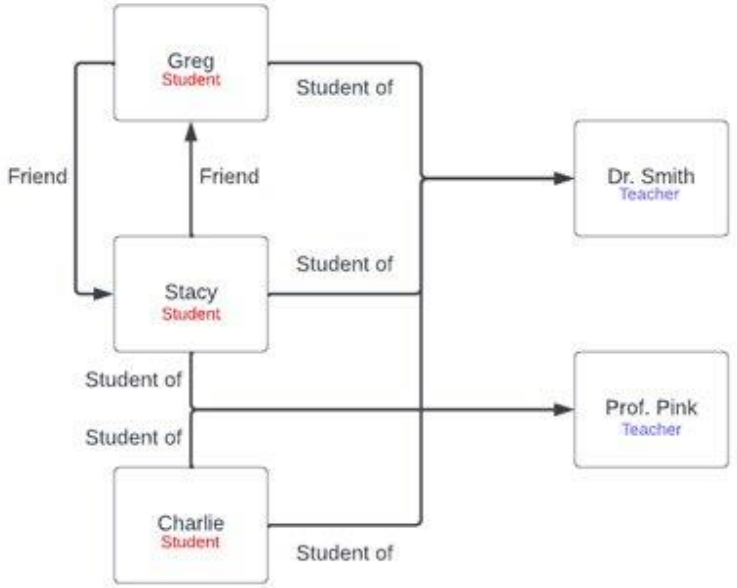
- Document stores are a data schema in which a single document contains all data pertaining to an entity
- Relationships between entities are less necessary using this schema, because all information required should be in an entity's document
- The entities function similarly to nodes in a graph database, but graph databases focus more on connections or relationships while document stores focus more on the entities themselves



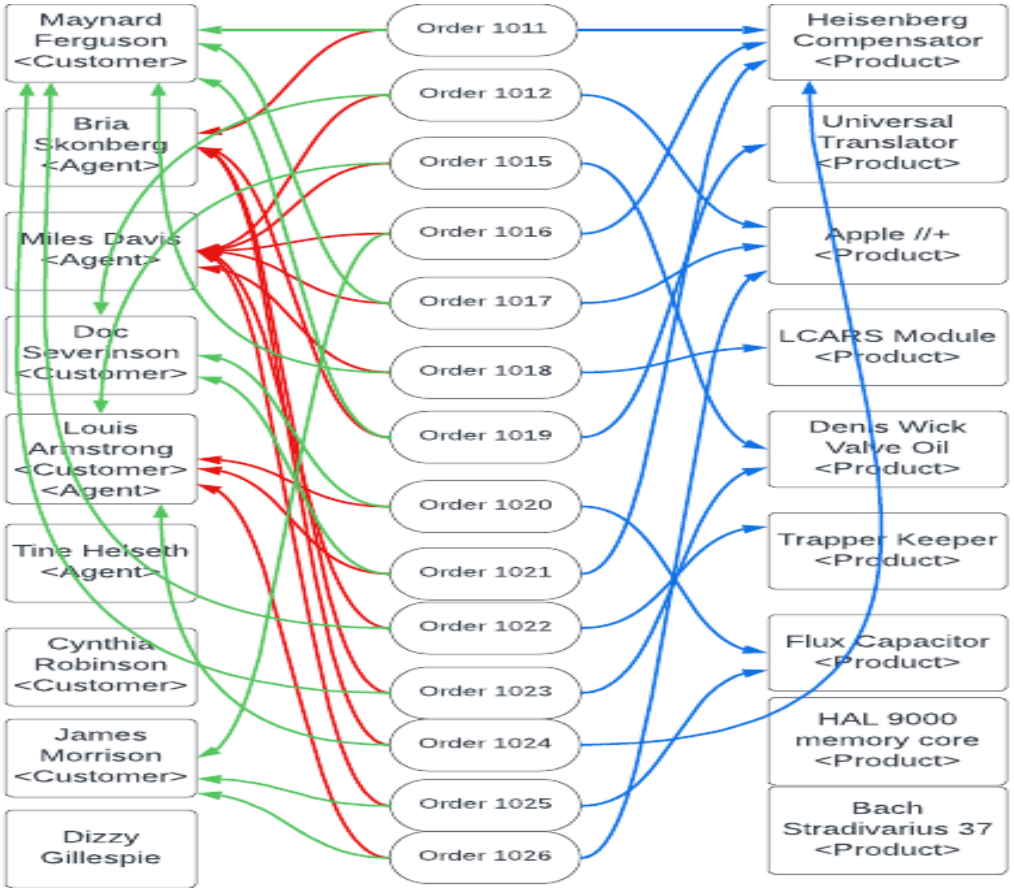
Compare to

# Key-Value Stores

- Key-value stores are a data schema common in programming, often referred to as dictionaries
- Data is contained in a two-column table where the first column contains a "key" and the second a "value"
  - These can be theoretically any data type based on the design of the database
- Graph databases scale better than key-value stores, but in certain capacities, the key-value store is an effective data storage schema



# CAP Database



# References


- https://neo4j.com/developer/graph-database/
- https://www.oracle.com/autonomous-database/what-is-graph-database/
- https://database.guide/what-is-a-document-store-database/
- https://database.guide/what-is-a-key-value-database/
- https://www.labouseur.com/courses/db/