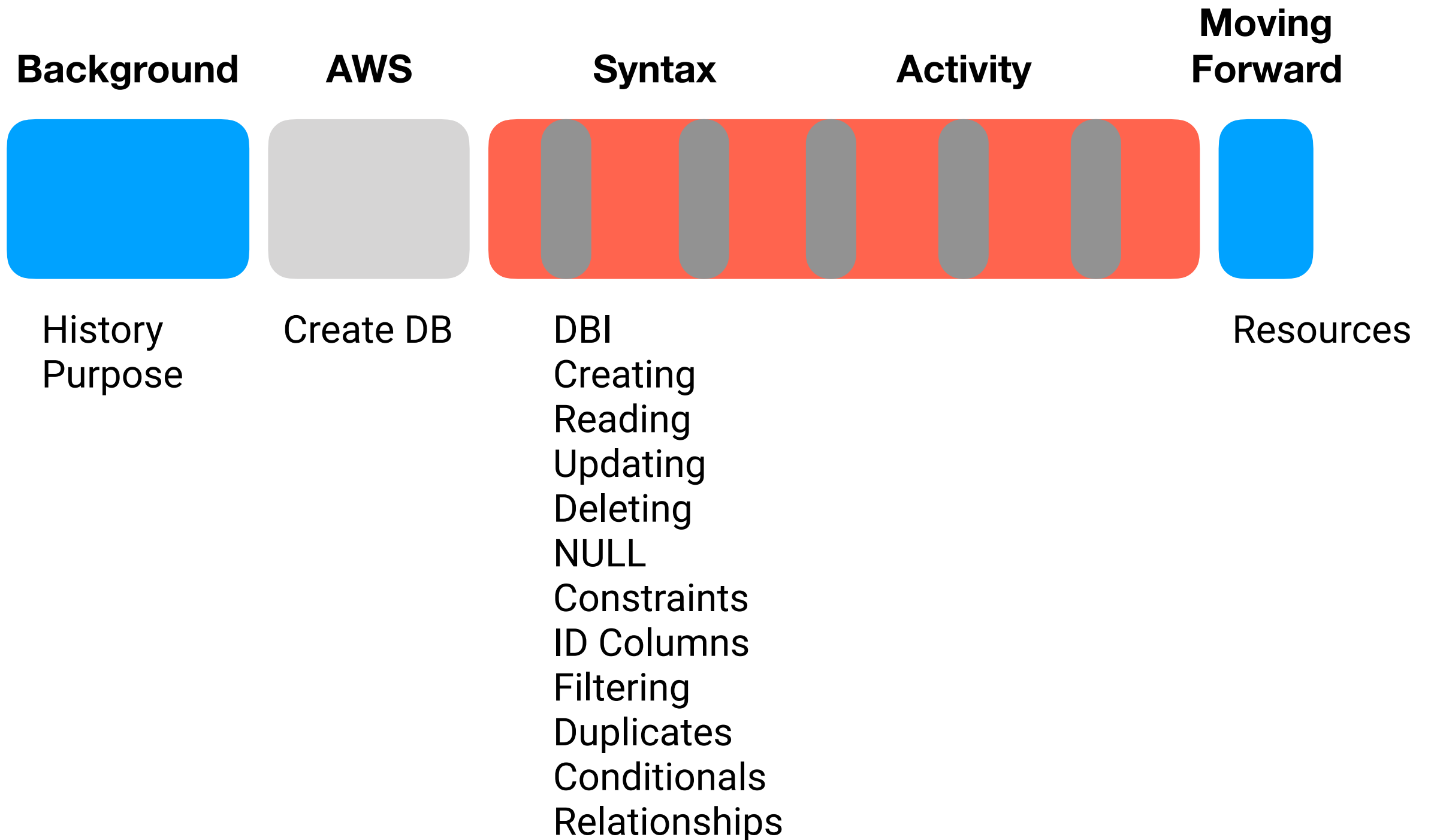


Introduction to SQL

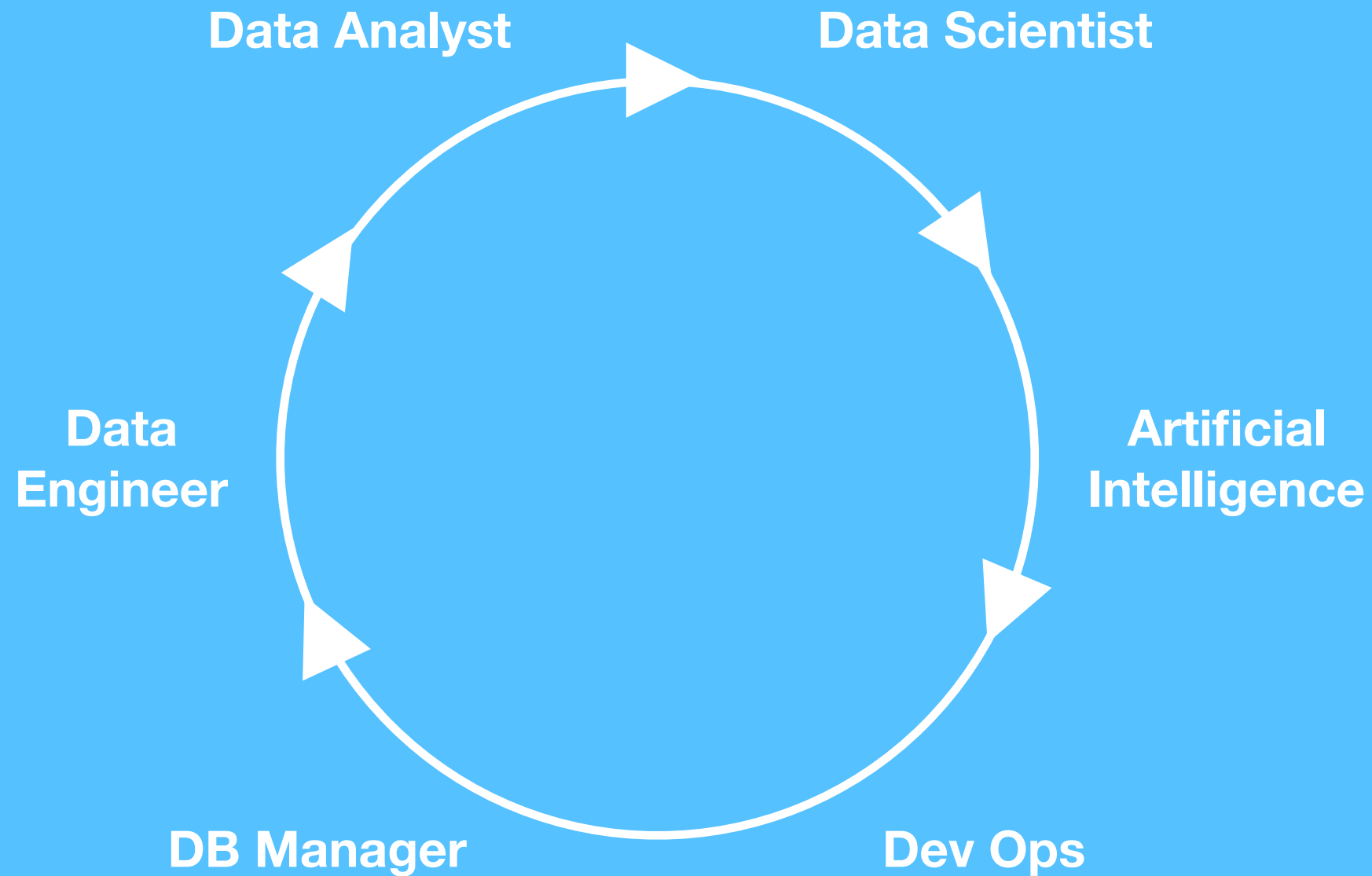
Charles Lang
Teachers College

<https://github.com/la-process-and-theory/sql-db-setup>

Today



Data Science Workflow



DB Taxonomy

Relational (RDBMS)

Old School

MySQL
Oracle
PostgreSQL

New School

Amazon Aurora
MySQL Cluster
Maria

Object-Oriented
Smalltalk

Non-Relational

NoSQL

Key-Value

Membrane

Document

MongoDB

Graph

InfiniteGraph

Distributed

Blockchain

Relational DBs

student Table

| student_id | username | email |
|------------|----------|--------|
| 1 | AAA | emailA |
| 2 | BBB | emailB |
| 3 | CCC | emailC |
| 4 | DDD | emailD |

Unique Key/
Primary key*

Column/
Field

Row/
Record

lesson

| id | student_id |
|----|------------|
| Z | 1 |
| Z | 2 |
| Z | 3 |
| Z | 4 |

Foreign key

game

| id | lesson_id | level |
|----|-----------|-------|
| 1A | Z | 1 |
| 1A | Z | 2 |
| 1A | Z | 1 |
| 1B | Z | 1 |

* Can be hidden

DB Popularity

| Rank | | | DBMS | Database Model | Score | | |
|----------|----------|----------|------------------------|------------------------------|----------|----------|----------|
| Oct 2019 | Sep 2019 | Oct 2018 | | | Oct 2019 | Sep 2019 | Oct 2018 |
| 1. | 1. | 1. | Oracle + | Relational, Multi-model i | 1355.88 | +9.22 | +36.61 |
| 2. | 2. | 2. | MySQL + | Relational, Multi-model i | 1283.06 | +3.99 | +104.94 |
| 3. | 3. | 3. | Microsoft SQL Server + | Relational, Multi-model i | 1094.72 | +9.66 | +36.39 |
| 4. | 4. | 4. | PostgreSQL + | Relational, Multi-model i | 483.91 | +1.66 | +64.52 |
| 5. | 5. | 5. | MongoDB + | Document, Multi-model i | 412.09 | +2.03 | +48.90 |
| 6. | 6. | 6. | IBM Db2 + | Relational, Multi-model i | 170.77 | -0.79 | -8.91 |
| 7. | 7. | ↑ 8. | Elasticsearch + | Search engine, Multi-model i | 150.17 | +0.90 | +7.85 |
| 8. | 8. | ↓ 7. | Redis + | Key-value, Multi-model i | 142.91 | +1.01 | -2.38 |
| 9. | 9. | 9. | Microsoft Access | Relational | 131.18 | -1.53 | -5.62 |
| 10. | 10. | 10. | Cassandra + | Wide column | 123.22 | -0.18 | -0.17 |

<https://db-engines.com/en/ranking>

Create a MySQL DB

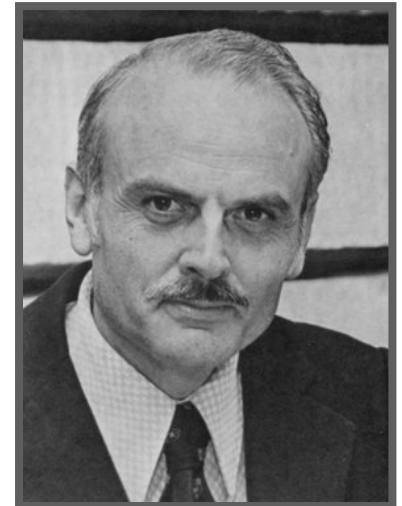
- Log into your [AWS Management Console](#)
- Locate RDS under the Databases heading
- Within Amazon RDS click Create database
- Under Choose a database creation method click Standard Create
- Under Engine options choose MySQL
- Under Templates choose Free tier
- Under Settings name your DB instance identifier as sqltest
- Under Credential settings create a username and password combination and write it down (you will need it later)
- Under Connectivity expand Additional connectivity configuration to show additional menu items and make sure that Publicly accessible is checked Yes
- Expand the Additional configuration menu
- Under Initial database name write testdb
- Uncheck Automatic backups
- Click Create database

Structured Query Language (SQL)

- Developed SEQUEL at IBM ~1970
- Domain-specific language for querying relational DBs
- Based on relational algebra
- Works with structured data
- Main benefit: don't need to specify how to reach a given record (no file path, index number)
- Is *loosely standardized* across products



Donald
Chamberlin



Todd
Codd

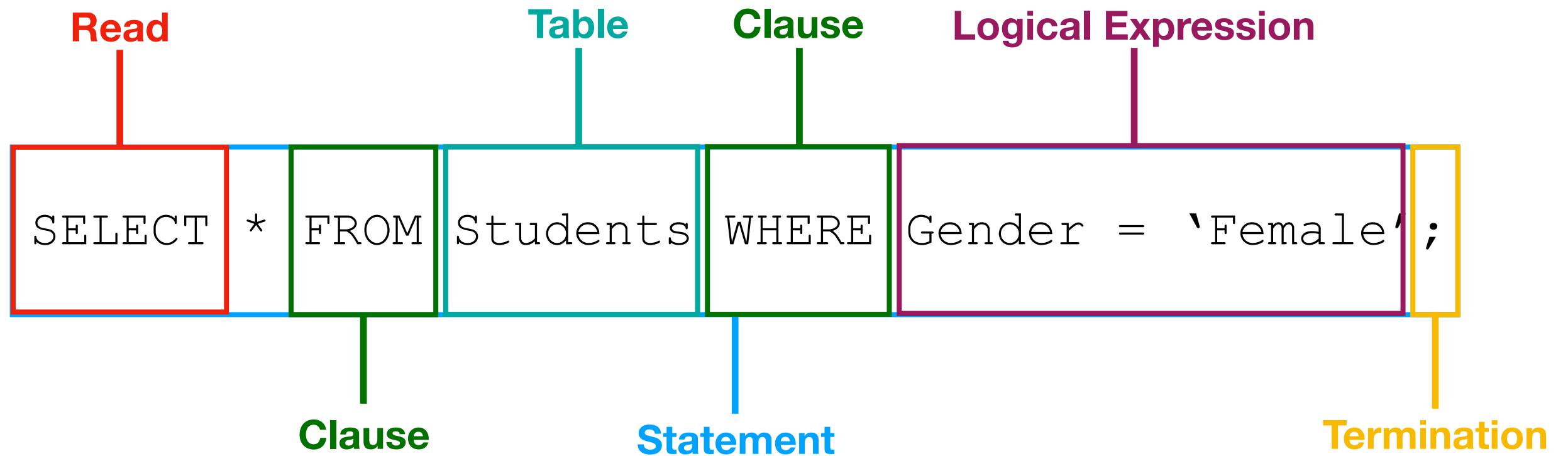


Ray
Boyce

DB Fundamental Functions

- Create
- Read
- Update
- Delete

Basic Statement



***Capitalization of SQL keywords is not required but is useful**

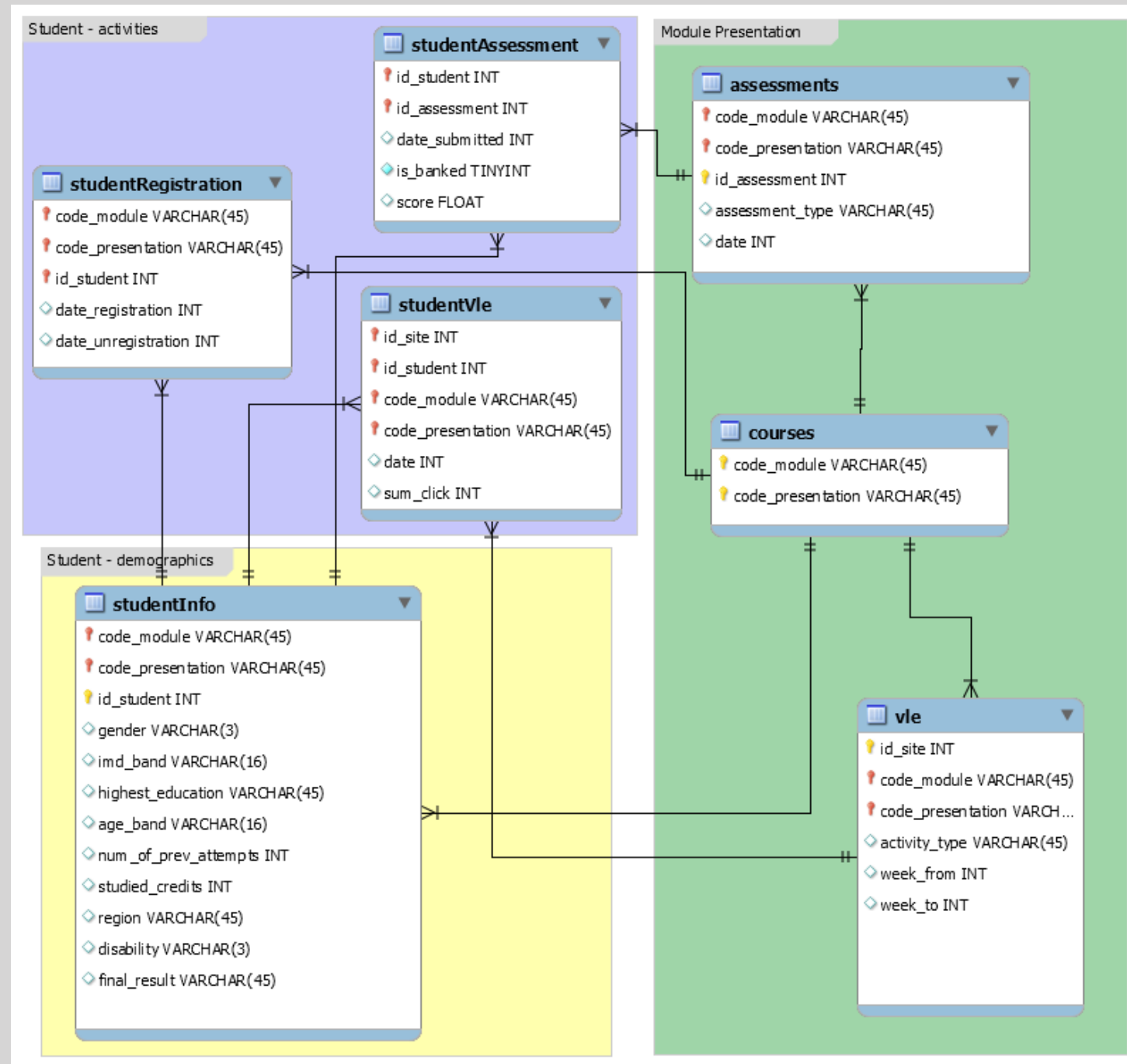
DB Fundamental Functions

- Create: INSERT - Add rows
- Read: SELECT - Get data
- Update: UPDATE - Change data
- Delete: DELETE - Remove rows

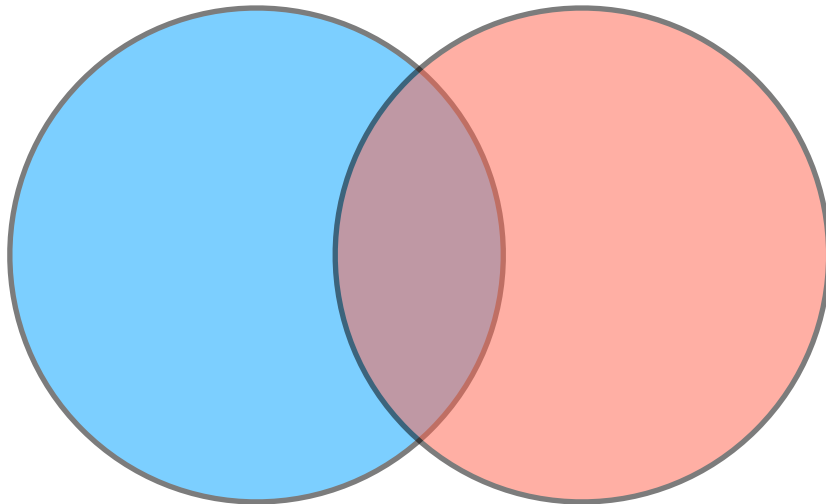
Create a MySQL DB

- Once your DB has been created
- Under Security groups rules click the hyperlink
- Click Inbound and then Edit
- Do not delete any rules!
- Add the rule SQL/Aurora on Port 3306 with the
Connection of MyIP

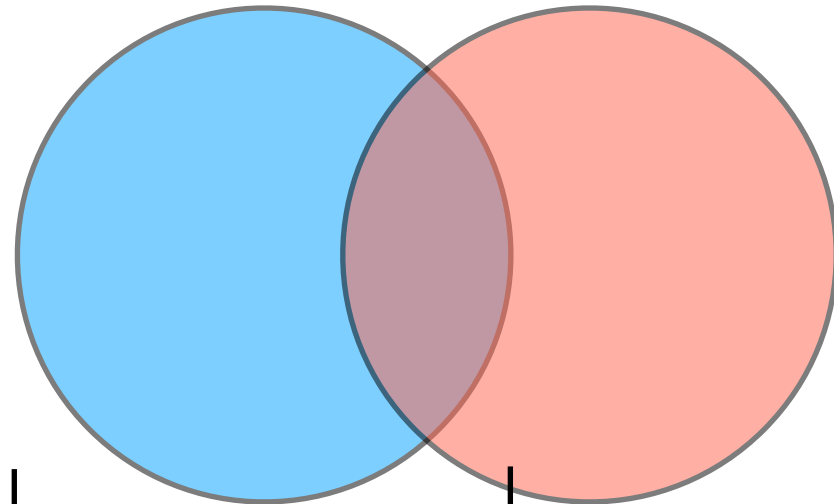
OU LA Data Set



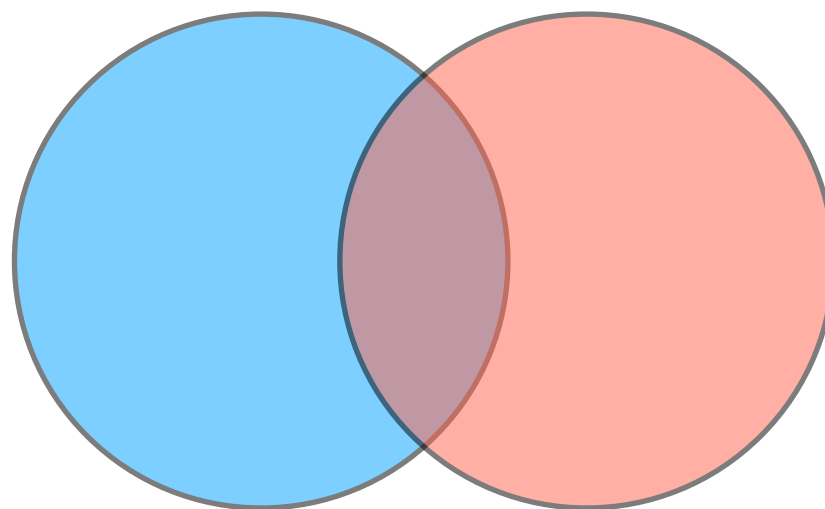
Joins



Inner Join



Left Outer Join



Full Join

Moving Forward

- SoloLearn
- LeetCode.com
- Test
- Projects