

# RELATIONAL DATABASES


February 2019

Tara English-Sweeney

Technical Information Developer

(Redacted confidential information)

# AGENDA

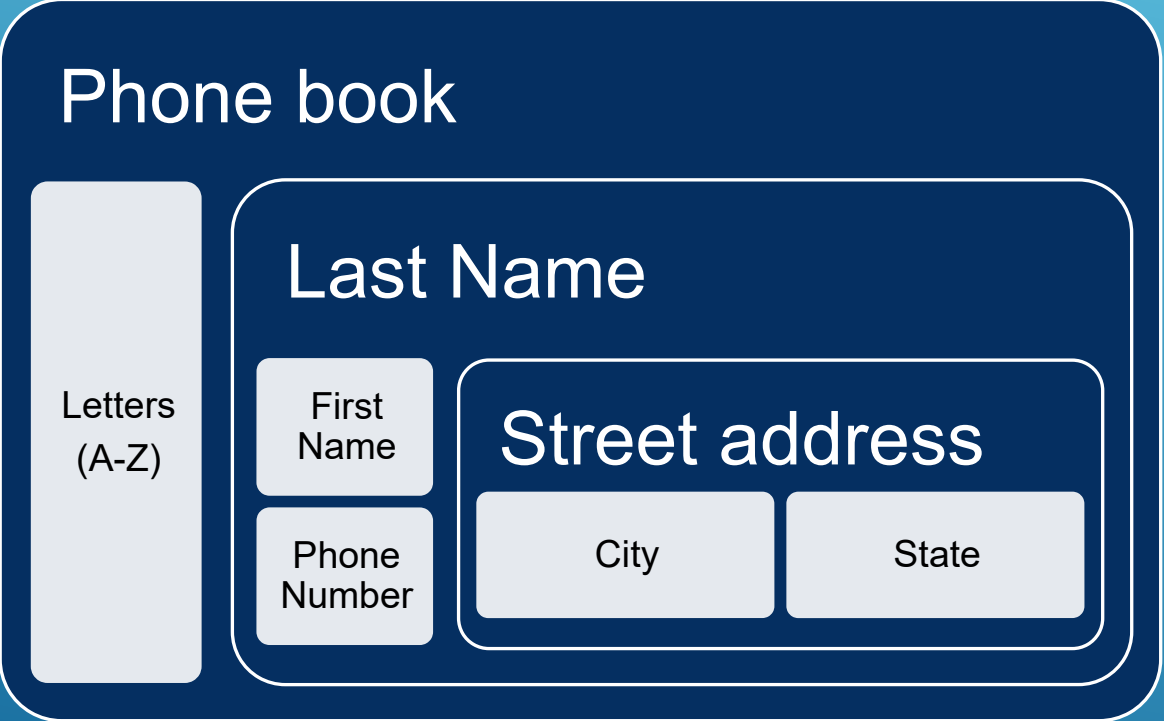
- Describe databases
  - Demonstrate CRUD actions on a sample database
  - Demonstrate how this knowledge is useful
- 

# WHAT ARE DATABASES AND THE PARTS OF A DATABASE?



# DATABASE

+



-



# RELATIONAL DATABASE

- Most common database management system
- Data in logical, manageable units for maintenance and performance
- Tables that relate to each other using a primary key.

Customer ID	Forename	Surname
1	Simon	Jones
2	Emma	Price
3	Laura	Jones
4	Jonathan	Hale
5	Emma	Smith

Simple primary key

# WHICH DATABASE TO CHOOSE?

*It depends on scalability, performance, platform, security, and cost!*

*PostgreSQL is the “hot” topic*



# SQL

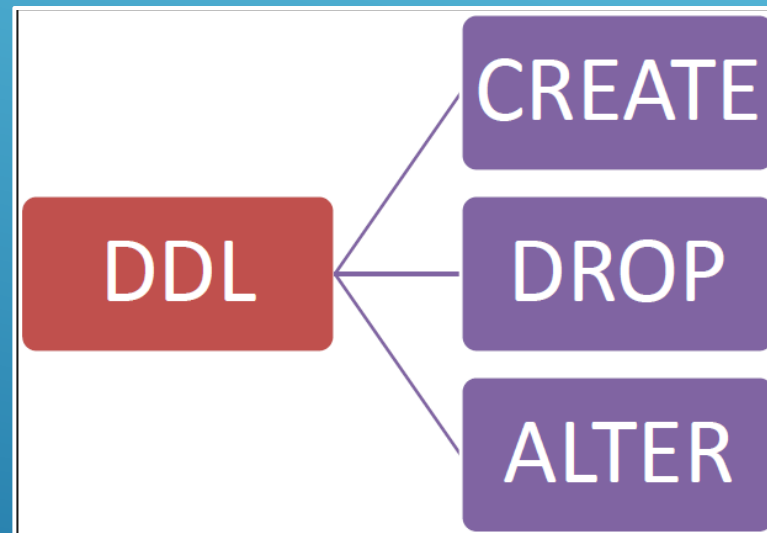
- Structured Query Language
- Standard language to talk to a relational database
- Implementations may offer additional commands and options to work with a specific database server



# DEFINE DATABASE STRUCTURE


Data Definition Language (DDL) to create and structure database objects. The basic SQL commands used are:

- CREATE TABLE
- ALTER TABLE
- DROP TABLE
- CREATE INDEX
- ALTER INDEX
- DROP INDEX
- CREATE VIEW
- DROP VIEW







# MANIPULATING DATA

- Use Data Manipulation Language (DML) to manipulate data in objects.  
The basic commands are:
    - INSERT
    - UPDATE
    - DELETE
- 

# CONTROLLING ACCESS TO DATA

- Use Data Control Language (DCL) to control access to data in the database, typically related to users and privileges. The basic commands are:
    - ALTER PASSWORD
    - GRANT
    - REVOKE
    - CREATE SYNONYM
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

# DATA


- Information stored in a database
  - Data is classified by data types.
  - Stored in lowercase, uppercase, mixed case
  - Can be manipulated or changed
- 

# DATA TYPES

- Provide rules for the way values are stored in a column
- Defining fields with data types eliminates errors
- Examples of basic data types:
  - String
  - Numeric
  - Date and time




# TABLES


- Primary storage object for data
  - Consists of rows and columns
  - Data stored can be temporary or permanent
  - **Columns**
    - Assigned a data type
    - Every database must have at least one column
    - Use underscores or CamelCase when naming the column
    - Typically, contains string data
    - Can be null or not null
- 

# TABLES (CONTINUED)

## Rows

- Record of data in the database table
  - Composed of fields that contain data from one record
- 

# CREATE A TABLE

- Plan the structure
  - Consider the following:
    - Type of data to be entered in the table
    - Table name
    - Columns that will compose the primary key
    - Column (field) names
    - Data type assigned to each column
    - Column length
    - Columns that can have null values
- 
- A decorative graphic consisting of several parallel white lines of varying lengths and orientations, located in the bottom right corner of the slide.

# USE CASES

- Create, Read, Update, and Delete (CRUD) records in the tables
  - Updating seed data in UPF
- 



## Pet Owner Table

	OWNERID	PETID	FIRSTNAME	LASTNAME	PHONENUMBER	ADDRESS	CITY	STATE	ZIP	EMAIL
1	1111111111	123456	EMMA	LANG	732-222-5454	NULL	WLB	NJ	7764	ELANG@GMAIL.COM
2	2222222222	416523	MEGAN	SEARS	7322221212	NULL	OP	NJ	7757	MSEARS@GMAIL.COM
3	3333333333	21325	JOE	SCHROEDER	7322222536	NULL	OP	NJ	7757	JSCHROE@GMAIL.COM

## Pet Table

	PETID	OWNERID	SERVICEID	PETNAME	DOGSIZE	DOGBREED	FIRSTSERVICEDATE	LASTSERVICEDATE	COMMENTS
1	123456	1111111111	0001	CHARLEY	LARGE	GERMAN_SHEPHERD	NULL	2019-04-13	WELL BEHAVED
2	21325	3333333333	0003	JUNIPER	LARGE	ROTTIE	NULL	2018-03-10	SEPARATION ANXIETY
3	416523	2222222222	0002	CLIO	MEDIUM	BLACK_LAB	NULL	2019-06-03	PUPPY. NEEDS CALMING GROOMER

## Services Table

	SERVICEID	DESCRIPTION	COST
1	0001	SHAMPOO	15
2	0002	NAIL_TRIM	10
3	0003	THE_WORKS	100
4	0004	HAIRCUT_SM	25

# USE CASES: CRUD

## Create Read Update and Delete (CRUD)

- Use Data Manipulation Language (DML) to Create (Insert), Read, Update, and Delete objects in the database
  - Add a pet owner (Create)
  - See the list of services the groomer offers and then the list of services under \$100 (Read)
  - Delete a pet owner (Delete)
  - Update the service a dog had today and enter comments (Update)

## JOIN

Get the service that a specific pet had.

- The service IDs and descriptions are in one table.
- The pets and the service IDs are in another table.

Must use a join to retrieve the description of the service that a specific pet had.

# WHAT IS SEED DATA?

*Data that is loaded into the application for it to work*

- Examples are text in drop-down or descriptions



The screenshot displays a web application interface. On the left, a large dark blue rectangle is overlaid. On the right, a table is visible with a 'Description' column. A red arrow points to the first row of data in the table, which contains the text: "This IT targeted role would allow the user to manage (both Create and Authorize) System Object...". Other rows in the table include "Can only View System Objects" and "Can view and download system violation report.".

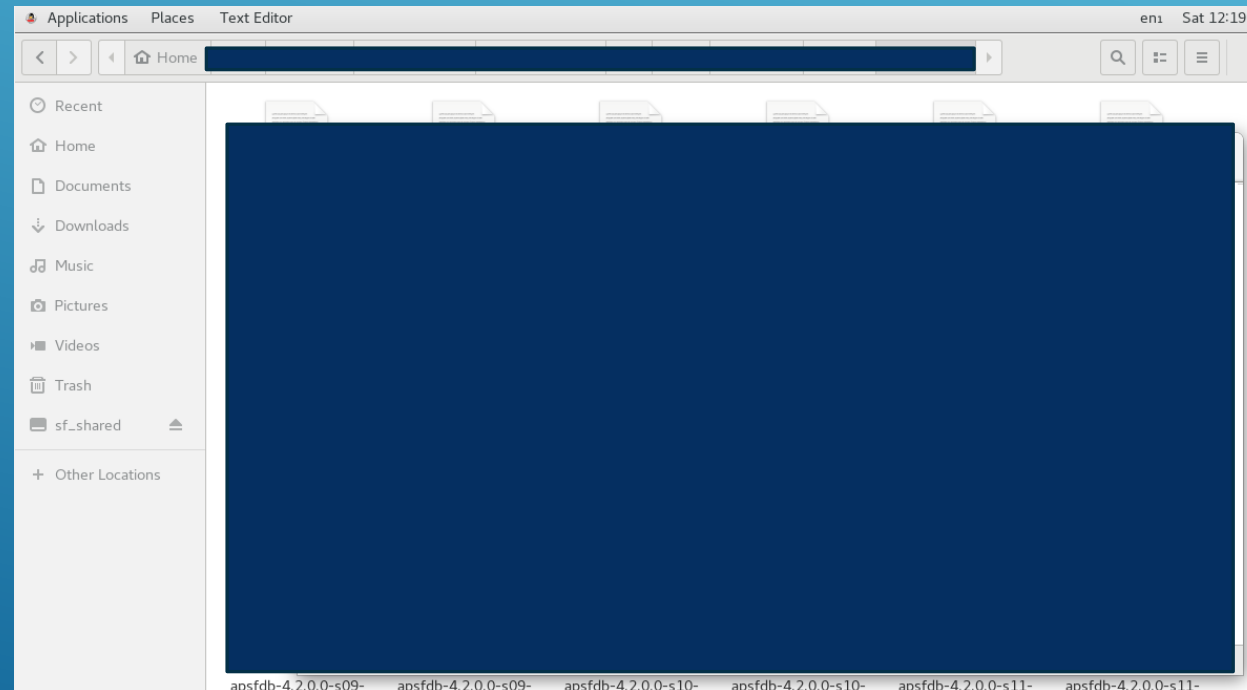
Description
This IT targeted role would allow the user to manage (both Create and Authorize) System Object...
Can only View System Objects
Can view and download system violation report.

# <PRODUCT> – SEED DATA UPDATES

*“...being able to contribute to pieces of documents that refer to tables, or pull data from tables, and such. Another thing that I think could be useful would be to update seed data...”*

*“I think these are both valid and great points. There is so much un-reviewed text in the seed data, especially around description text.”*

- Virtual machine
- PostgreSQL
- UPF code
- Create SQL scripts




# POSSIBLE <PRODUCT> DOCUMENTS

*Relational database knowledge may help me contribute to the following documents*

- <redacted list of documents>



# IDS DON'T HAVE TO BE DBAS

- DBA = Database Administrator
  - You can teach yourself enough to be effective!
- 



QUESTIONS?

