**Lesson 4 – SQL**

* **Database importing bigger (Why?):**
  + **Metadata** – Data about data. The reason the SQL database has more storage then the CSV is because of the metadata around the CSV.
  + Also the transaction logs for rollback purposes also increases the database size.
* Error Write-up:
  + What? (Clearly document the error message and the scenario at which it occurred)
  + Why(?) (When troubleshooting an issue come up with a couple of working hypothesis (potential root issues)).
  + How? (What steps did you take to resolve the issue?)
* **When using quotations around an object in SQL**, the object we are creating/selecting/updating/deleting, etc will be **CASE SENSITIVE (FOR POSTGRES)**
  + create table student and create table “Student” is 2 different tables.
* **Data Definition Language (DDL) vs. Data Manipulation (DML):**
  + DDL is
    - Create (C)
    - ALTER
    - DROP – Completely gets rid of a table (the schema and all the rows within the table are gone).
    - REFERENTIAL INTEGRITY
    - TRUNCATE (?) – Gets rid of the rows but not the schema. The table itself still remains.
  + DML IS
    - SELECT (READ)
    - INSERT – How you get data into a table
    - UPDATE (U) - How you change data within an existing table
    - DELETE (D) – How you remove data from an existing table
      * **Delete Operation will INCREASE the size of a database because the data is being logged in the transaction log which will increase the data size. \*\*\*\*\*IMPORTANT\*\*\*\*\***
        + So, Postgres doesn’t actually hard delete from a database (for clearing memory).
        + How to actually do it:
  + **Rollback** – Undo changes and goes back to the last committed
  + **Index** – Used to retrieve data from a database quickly by establishing a way to speed up searches/queries.
  + **Alter Table:**
    - Changes some properties of a table
      * ADD or DROP columns
      * ADD or DROP constraints
      * Change index related properties
    - EX:

ALTER TABLE students

ADD COLUMN test varchar NULL;

-- Adds a Column named test of datatype varchar and column CAN be NULL

* + **Truncate Table**:
    - **Deletes ALL** rows from the table (all or nothing)
      * **Quick**
      * All or nothing
      * One transaction
    - EX:

TRUNCATE students; -- Deletes all rows(tuples) from the student table

* + **Select Table:**
    - All or listed columns
    - Project and select from relational algebra
    - Doesn’t change the data or table
  + **Insert Table**:
    - INSERT values into
      * Table
      * Predefined columns
      * All columns
    - EX:

INSERT INTO student(id, f\_name, l\_name)

Values (22, “james”, “Mancuso”);

* + **SELECT:**
    - WHERE
    - GROUP BY
    - ORDER BY
* EX: SELECT \* from students

Where f\_name = “James”

and test is null

order by id;