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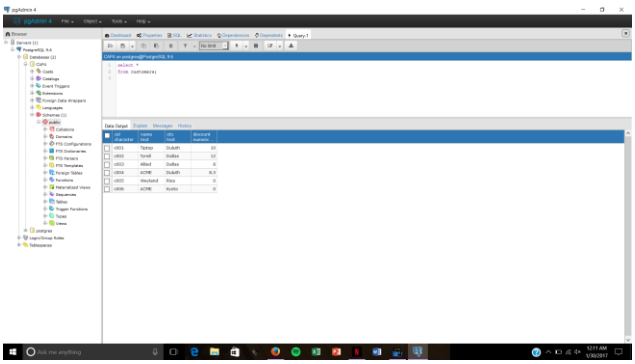
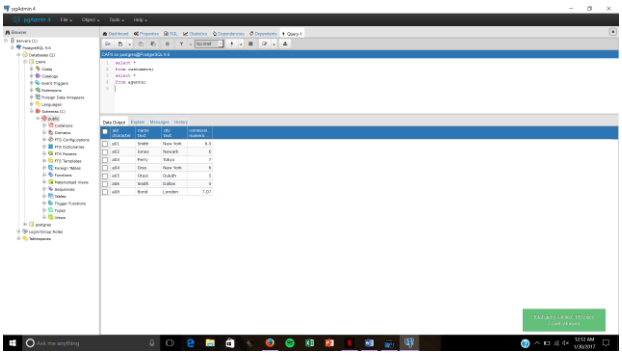
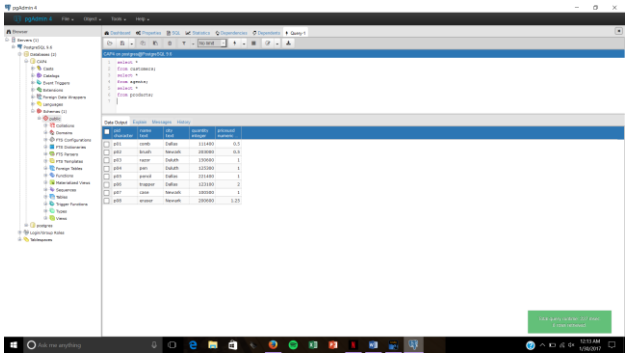
January 30, 2017

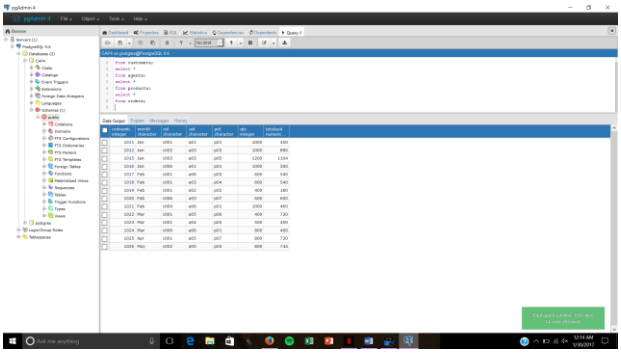
Lab 2

**On this assignment, I used my notes from class and information from W3 Schools.









Keys:

A **super key** is a column or columns in a table that ensure that every row will be unique. A super key is s set of multiple columns usually, so long as that set has no redundant attributes. For example, a super key could be any of the following in a database: ID, Name, Age; ID, Name; ID, Age; ID; Name; Age. A super key can be any combination of columns that creates unique entries. Name, Age cannot be a super key because it is quite possible for there to be two employees with both the same name and age.

A **candidate key** is a super key with minimum columns. In the case of the earlier example, the candidate key would be ID. Name and Age cannot be candidate keys, because they could potentially have repetitive entries. There can be multiple candidate keys in a table.

A **primary key** is a chosen candidate key. This is the key you choose to be the identifier for the table, with no redundant attributes. In the case of the example, the primary key would also be the ID column, because it is the only table that will have no repetitive entries.

Data Types:

The type of value that a column in a table can have is called a data type. There are several different types of data types. The most common data types are as follows: character and varchar, Boolean, integer, date, and time. Character is regular text, but with a fixed number of characters. An example of this would be a username that can only be 10 characters long; the character data type would only allow 10 characters to be entered. Varchar is also regular text, but it can have a variable amount of characters. Boolean is a true/false data type, so the attributes entered can only be true or false. Integer is any sort of integers that are entered as an attribute, such as age, ID number, or a quantity. Date and time are exactly what they say they are, they store dates and times as entries. A topic for which you may make a table is employee information. The columns and data types would be as follows:

Employee ID	Integer	NOT NULL
Name	Varchar	NOT NULL
Date of Birth	Integer	NULL
Address	Varchar	NULL
Department ID	Integer	NOT NULL
Senior Employee?	Boolean	NOT NULL
Username	Character(10)	NOT NULL
Password	Varchar	NOT NULL

Null values are entries in a table that have an empty attribute. It is simply a placeholder for values that are unknown, it is not equal to 0. When a column is created, it can by default hold null values, but the creator of the database can enter NOT NULL, which will not allow any null inputs.

Relational Rules:

a. The “first normal form” rule – This rule states at the intersection of a row and column, there can be no structure. This means that there can only be one piece of data at each intersection in a table.
b. The “access rows by content only” rule – This rule states that one can only access a row by its’ content only. Rows cannot be accessed by a row number because databases are not always presented in the same order, it is random, and therefore giving the rows their own numbers that aren’t stored in the table is unnecessary. The first row to appear may be the tenth row the next time you call the table.
c. The “all rows must be unique” rule – This rule states that every row in a table must be unique. There should not be more than one row that contains the exact same data. The reason for this is that redundancy and duplicate data leads to inconsistency in data, and inconsistency is a cardinal sin.