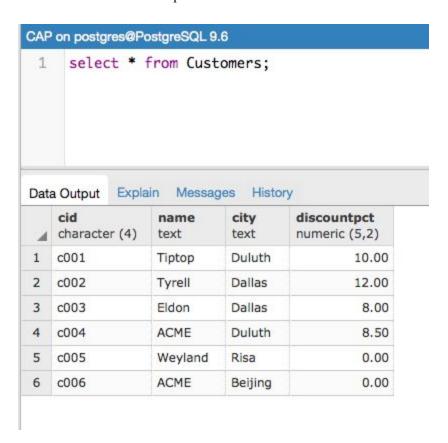Thomas Magnusson

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Lab 2

1. Four screenshots of the queries:

```
CAP on postgres@PostgreSQL 9.6
1    select * from Customers;
```

Data Output   Explain   Messages   History

	cid character (4)	name text	city text	discountpct numeric (5,2)
1	c001	Tiptop	Duluth	10.00
2	c002	Tyrell	Dallas	12.00
3	c003	Eldon	Dallas	8.00
4	c004	ACME	Duluth	8.50
5	c005	Weyland	Risa	0.00
6	c006	ACME	Beijing	0.00

```
1   select * from Products;
```

Data Output | Explain | Messages | History

	pid character (3)	name text	city text	qty integer	priceusd numeric (10,2)
1	p01	Heis...	Dallas	111400	0.50
2	p02	univ...	New...	203000	0.50
3	p03	Com...	Dulu...	150600	1.00
4	p04	LCA...	Dulu...	125300	1.00
5	p05	pencil	Dallas	221400	1.00
6	p06	trap...	Dallas	123100	2.00
7	p07	flux ...	New...	100500	1.00
8	p08	HAL..	New...	200600	1.25

```
1   select * from Agents;
```

Data Output   Explain   Messages   History

	aid character (3)	name text	city text	commission numeric (5,2)
1	a01	Smith	New...	5.60
2	a02	Jones	New...	6.00
3	a03	Perry	Hon...	7.00
4	a04	Gray	New...	6.00
5	a05	Otasi	Dulu...	5.00
6	a06	Smith	Dallas	5.00
7	a08	Bond	Lon...	7.07

```
CAP on postgres@PostgreSQL 9.6
1    select * from Orders;
```

Data Output   Explain   Messages   History

	ordno integer	month character (3)	cid character (4)	aid character (3)	pid character (3)	quantity integer	totalusd numeric (12,2)
1	1011	Jan	c001	a01	p01	1100	495.00
2	1012	Jan	c002	a03	p03	1200	1056.00
3	1015	Jan	c003	a03	p05	1000	920.00
4	1016	Jan	c006	a01	p01	1000	500.00
5	1017	Feb	c001	a06	p03	500	540.00
6	1018	Feb	c001	a03	p04	600	540.00
7	1019	Feb	c001	a02	p02	400	180.00
8	1020	Feb	c006	a03	p07	600	600.00
9	1021	Feb	c004	a06	p01	1000	457.50
10	1022	Mar	c001	a05	p06	450	810.00
11	1023	Mar	c001	a04	p05	500	450.00
12	1024	Mar	c006	a06	p01	880	400.00
13	1025	Apr	c001	a05	p07	888	799.20
14	1026	May	c002	a05	p03	808	711.04

2. A superkey is a set of columns in a relational database that uniquely identifies each row

    in the table. The most obvious superkey is all of the columns of table. A candidate key is

    a minimal superkey, meaning that it is the smallest set of columns whose values uniquely

    identify each row of the table. A primary key is a candidate key that the database

    administrator chooses. In cases where there are many candidate keys, the DBA choses

    one and designates it as the primary key.

3. I would like to set up a website for pet adoption. Families or shelters that have animals who need a home can post a listing on the website, and prospective families can browse their new best friends online. For my beta, I'm limiting the animals to types of dogs.

name	Text, nullable
BID	Int, nullable
birthday	Date, nullable
picture	Raw data, nullable
description	Text, nullable
DID	Int, primary key

All of the rows besides the primary key DID (Dog ID) are nullable because shelters often don't have all the information on dogs in their care, though they should have at least some of the information. The BID (Breed ID) is a reference to a relational table representing a many to many relationship between dogs and breeds (mutts are often multiple breeds, and there are definitely many dogs for each breed).

4. Three rules

a. First normal form: Data must be atomic, meaning broken down to its most basic parts. A violation of this rule is a "name" field for a person. In most cases in Western culture, people have first and last names. A "name" field in which contains both a first name and last name could be further broken up into two fields, firstname and lastname fields. Therefore, a name field is not atomic.

b. What? Not Where?!: Since tables are sets of rows and columns, neither have any concept of ordering. If I were to refer to the first record in my Dogs table from

above, I would be violating this rule. There is no guarantee about which record would be first, therefore the operation would be invalid until an ordering was stipulated (ascending DIG, perhaps).

c. All rows must be unique: this rule stipulates that all rows in a table should be unique to eliminate data redundancy. Furthermore, all rows in a database should be unique. If I were to hire a team of developers and database administrators to create my adoption website, I must require them to create a singular Dogs table. Any time they must reference a dog in another place in the database, they must reference the DID. Creating another Dogs table, perhaps ShelterDogs table with the same fields, makes it possible for a single dog tuple to end up in two tables (if by mistake or by purposeful replication). This practice would violate the rule that all rows must be unique.