Alliyah Taylor
9/15/2016
Lab 2

1.

Cap3 on postgres@PostgreSQL 9.6

```
1  select *
2  from customers;
```

Data Output | Explain | Messages | History

cid character	name text	city text	discount numeric ...
c001	Tiptop	Duluth	10
c002	Tyrell	Dallas	12
c003	Allied	Dallas	8
c004	ACME	Duluth	8.5
c005	Weyland	Acheron	0
c006	ACME	Kyoto	0

Cap3 on postgres@PostgreSQL 9.6

```
1  select *
2  from agents;
```

Data Output | Explain | Messages | History

aid character	name text	city text	commissi... numeric ...
a01	Smith	New York	6.5
a02	Jones	Newark	6
a03	Perry	Tokyo	7
a04	Grey	New York	6
a05	Otasi	Duluth	5
a06	Smith	Dallas	5
a08	Bond	London	7.07

Cap3 on postgres@PostgreSQL 9.6

```
1  select *
2  from products;
```

Data Output | Explain | Messages | History

pid character	name text	city text	quantity integer	priceusd numeric ...
p01	comb	Dallas	111400	0.5
p02	brush	Newark	203000	0.5
p03	razor	Duluth	150600	1
p04	pen	Duluth	125300	1
p05	pencil	Dallas	221400	1
p06	folder	Dallas	123100	2
p07	case	Newark	100500	1
p08	eraser	Newark	200600	1.25

Cap3 on postgres@PostgreSQL 9.6

```
1  select *
2  from orders;
```

Data Output | Explain | Messages | History

ordnum integer	mon character	cid character	aid character	pid character	qty integer	totalusd numeric ...
1011	jan	c001	a01	p01	1000	450
1013	jan	c002	a03	p03	1000	880
1015	jan	c003	a03	p05	1200	1104
1016	jan	c006	a01	p01	1000	500
1017	feb	c001	a06	p03	600	540
1018	feb	c001	a03	p04	600	540
1019	feb	c001	a02	p02	400	180
1020	feb	c006	a03	p07	600	600
1021	feb	c004	a06	p01	1000	460
1022	mar	c001	a05	p06	400	720
1023	mar	c001	a04	p05	500	450
1024	mar	c006	a06	p01	800	400
1025	apr	c001	a05	p07	800	720
1026	may	c002	a05	p03	800	744

2. A primary key, candidate key, and superkey are all closely related. A superkey is the set of all attributes or all sets of attributes that can uniquely identify an element in a relation. All candidate keys and primary keys are superkeys, however, not every superkey is a candidate or a primary key. A candidate key is a minimal superkey. Removing any attribute from a candidate key would cease to maintain uniqueness. Any candidate key can serve as a primary key. Candidate keys that are not chosen as primary keys are referred to as alternate keys.

3. SQL supports the data types CHAR, VARCHAR, BIT, BIT VARYING, BOOLEAN, INT, SHORTINT, DATE, TIME, FLOAT/REAL, and DECIMAL/NUMERIC.

   In a catalog of *Star Trek* films, the following fields would be needed:

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Table Name: Official *Star Trek* films

Fields	Data Type	Nullable?
Movie Number (Primary Key)	SHORTINT	No
Movie Name	VARCHAR	No
Director	VARCHAR	No
IMDb Rating	DECIMAL	Yes
Release Date	DATE	No
MPAA Rating	CHAR	Yes

4. a. The "first normal form" rule stats that all fields in a relation are atomic, or indivisible. This means that no fields may have multiple values. This is important for making sure that a database is organized and searchable. If we are storing email addresses belonging to students in Alan's Database class, rather than having a table with attributes id, name, and email address, we should have two tables. One table should have the attributes student_id and name and the other should have the attributes email_id, student_id, and email.

b. The "access rows by content" rule means that we should access the data in the database by what it is rather than where it is, as location is not always static. If the database is updated or reordered in any way, attempting to access a record by its location may return a completely different record. Take a database of Alan's Database students. When organized alphabetically by first name, Alliyah Taylor may be in row 3. If the database is sorted alphabetically by last name and someone searches for the entry in row 3, they may instead find Nicholas Barranco.

c. The "all rows must be unique" rule removes redundancy in a table and makes a database more organized and searchable. In the database of email addresses belonging to Alan's students, repeating entities in a column would be redundant, and potentially make it seem like the Alliyah Taylor who owns alliyah.taylor1@marist.edu is different than the Alliyah Taylor who owns 27ARTaylor@gmail.com, when that is not the case. This problem can be solved in the same manner as the problem presented in 4a, by making two tables.