Shannon Maier
Database Management
Lab #2
January 26, 2024

1. **Execute the following queries (one at a time) from pgAdmin's SQL Tool:**

select *
From People;

	pid [PK] integer	prefix text	firstname text	lastname text	suffix text	homecity text	dob date
1	1	Dr. (Hon)	Maynard	Ferguson		Montreal	1928-05-04
2	2	Ms.	Bria	Skonberg	[null]	Chilliwack	1987-12-29
3	3	Mr.	Miles	Davis	Esq.	Alton	1926-05-26
4	4	Mr.	Doc	Severinsen	[null]	Arlington	1927-07-07
5	5	Mr.	Louis	Armstrong	[null]	New Orleans	1901-08-04
6	6	Ms.	Tine	Helseth	Esq.	Oslo	1987-08-18
7	7	Dr.	Cynthia	Robinson	MD	Sacramento	1944-01-12
8	8	Dr.	James	Morrison	Ph.D.	Oslo	1962-11-11
9	10	Mr.	Dizzy	Gillespie	III	Montreal	1917-10-21

People

```
 pid |  prefix   | firstName |  lastName  | suffix |  homeCity   |    DOB
-----+-----------+-----------+------------+--------+-------------+------------
   1 | Dr. (Hon) | Maynard   | Ferguson   |        | Montreal    | 1928-05-04
   2 | Ms.       | Bria      | Skonberg   |        | Chilliwack  | 1987-12-29
   3 | Mr.       | Miles     | Davis      | Esq.   | Alton       | 1926-05-26
   4 | Mr.       | Doc       | Severinsen |        | Arlington   | 1927-07-07
   5 | Mr.       | Louis     | Armstrong  |        | New Orleans | 1901-08-04
   6 | Ms.       | Tine      | Helseth    | Esq.   | Oslo        | 1987-08-18
   7 | Dr.       | Cynthia   | Robinson   | MD     | Sacramento  | 1944-01-12
   8 | Dr.       | James     | Morrison   | Ph.D.  | Oslo        | 1962-11-11
  10 | Mr.       | Dizzy     | Gillespie  | III    | Montreal    | 1917-10-21
```

- The select * from people; query obtains the entire People table from the CAP database

select *
from Customers;

	pid [PK] integer	paymentterms text	discountpct numeric (5,2)
1	1	Net 30	21.12
2	4	Net 15	2.47
3	5	In Advance	5.05
4	7	On Receipt	2.00
5	8	Net 30	10.01

Customers

```
 pid | paymentTerms | discountPct
-----+--------------+-------------
   1 | Net 30       |       21.12
   4 | Net 15       |        2.47
   5 | In Advance   |        5.05
   7 | On Receipt   |        2.00
   8 | Net 30       |       10.01
```

- The select * from customer; query obtains the entire Customers table from the CAP database

select *
from Agents;

	pid [PK] integer	paymentterms text	commissionpct numeric (5,2)
1	2	Quarterly	5.00
2	3	Annually	10.00
3	5	Monthly	1.00
4	6	Weekly	2.00

Agents

```
 pid | paymentTerms | commissionPct
-----+--------------+---------------
   2 | Quarterly    |          5.00
   3 | Annually     |         10.00
   5 | Monthly      |          1.00
   6 | Weekly       |          2.00
```

- The select * from Agents; query obtains the entire Agents table from the database

select *
from Products;

	prodid [PK] text	name text	city text	qtyonhand integer	priceusd numeric (10,2)
1	p01	Heisenberg Compensator	Dallas	47	67.76
2	p02	Universal Translator	Newark	2399	51.50
3	p03	Apple //+	Duluth	1979	65.02
4	p04	LCARS module	Duluth	3	17.01
5	p05	Denis Wick Valve Oil	Dallas	8675309	16.61
6	p06	PDP-11 operator panel	Beijing	88	88.00
7	p07	Flux Capacitor	Newark	1007	1.00
8	p08	HAL 9000 memory chip	Newark	200	1.25
9	p09	Bach Stradivarius 37	Montreal	1	37900.42

Products

```
 prodid |          name           |   city   | qtyOnHand | priceUSD
--------+-------------------------+----------+-----------+----------
 p01    | Heisenberg Compensator  | Dallas   |        47 |    67.76
 p02    | Universal Translator    | Newark   |      2399 |    51.50
 p03    | Apple //+               | Duluth   |      1979 |    65.02
 p04    | LCARS module            | Duluth   |         3 |    17.01
 p05    | Denis Wick Valve Oil    | Dallas   |   8675309 |    16.61
 p06    | PDP-11 operator panel   | Beijing  |        88 |    88.00
 p07    | Flux Capacitor          | Newark   |      1007 |     1.00
 p08    | HAL 9000 memory chip    | Newark   |       200 |     1.25
 p09    | Bach Stradivarius 37    | Montreal |         1 | 37900.42
```

- The select * from Products; query obtains the entire Products table from the CAP database

select *
from Orders;

	ordernum [PK] integer	dateordered date	custid integer	agentid integer	prodid character	quantityordered integer	totalusd numeric (12,2)
1	1011	2024-01-22	1	2	p01	1100	58794.00
2	1012	2023-01-23	4	3	p03	1200	76096.81
3	1015	2022-01-23	5	3	p05	1000	15771.20
4	1016	2021-01-23	8	3	p01	1000	60977.22
5	1017	2023-02-14	1	3	p03	500	25643.98
6	1018	2023-02-14	1	3	p04	600	8050.49
7	1019	2023-02-14	1	2	p02	400	16249.28
8	1020	2023-02-14	4	5	p07	600	585.18
9	1021	2023-02-14	4	5	p01	1000	66086.33
10	1022	2023-03-15	1	3	p06	450	31236.48
11	1023	2023-03-15	1	2	p05	500	6550.98
12	1024	2023-03-15	5	2	p01	880	56671.55
13	1025	2022-04-01	8	3	p07	888	799.11
14	1026	2022-05-04	8	5	p03	808	47277.29

Orders

orderNum	dateOrdered	custId	agentId	prodId	quantityOrdered	totalUSD
1011	2024-01-22	1	2	p01	1100	58794.00
1012	2023-01-23	4	3	p03	1200	76096.81
1015	2022-01-23	5	3	p05	1000	15771.20
1016	2021-01-23	8	3	p01	1000	60977.22
1017	2023-02-14	1	3	p03	500	25643.98
1018	2023-02-14	1	3	p04	600	8050.49
1019	2023-02-14	1	2	p02	400	16249.28
1020	2023-02-14	4	5	p07	600	585.18
1021	2023-02-14	4	5	p01	1000	66086.33
1022	2023-03-15	1	3	p06	450	31236.48
1023	2023-03-15	1	2	p05	500	6550.98
1024	2023-03-15	5	2	p01	880	56671.55
1025	2022-04-01	8	3	p07	888	799.11
1026	2022-05-04	8	5	p03	808	47277.29

- The select * from Orders; query obtains the entire Orders table from the CAP database

2. **Explain the distinctions among the terms primary key, candidate key, and superkey**
    - The Super Key is a set of fields that is able to uniquely identify every row in a table. The Super key can be the entire table, or just on a column of the table.
    - The Candidate key is the most minimal super key you can obtain from the table.
    - The Primary key is the chosen candidate key that will identify a row.

3. **Write a short essay on data types. Select a topic for which you might create a table. Name the table and list its fields (columns). For each field, give its data type and whether or not it's nullable.**
    - Data types refer to what kind of values define certain attributes. For example, if there was an attribute for height in centimeters, the data type would be integers. There are several data types that are commonly supported in SQL including character strings, bit strings, booleans, integers, floating point numbers, and dates and times. Some attributes like height in centimeters, cannot be null because the integer 0 would represent no height, but in other cases, like an attribute dog name, the null value could be used if someone does not have a dog.

    Student Athletes Table
    - ID - integer, not nullable
    - First Name - character string, not nullable
    - Last Name - character string, not nullable
    - Sport - character string, not nullable

- Height in inches - floating point number. not nullable
- Most recent Award Earned - character string, nullable

4. **Explain the following relational "rules" with examples and reasons why they are important.**
    - The "first normal form" rule
        - This rule explains that there can be no multi valued attributes or values with an internal structure of a row and column in a table. Basically, this means that there can be no repeating groups or fields.. The values found at every intersection must be atomic (not able to be subdivided). This rule is important because it makes sure that there is no data redundancy or attributes that are not uniform.
        - Example: Table about students that has columns for their name, major, and hometown - if some students have more than 1 major then the table would not follow the first normal form rule because there would be more than one value in an intersection.
    - The "access rows by content only" rule
        - This rule pertains to queries of databases. In order to access data, we must query it by what data is there, not where the data is. This means that we query through content, not just location. For example, from the People table in the CAP database shown below, we cannot ask "What is the prefix in the first row?", but we can ask "What is the prefix of pid 1?". The reason for this is that tables are sets, and sets have no intrinsic order, so they are subject to change at any time. If we queried through location, the information queried could change if the set order changes.

People

pid	prefix	firstName	lastName	suffix	homeCity	DOB
1	Dr. (Hon)	Maynard	Ferguson		Montreal	1928-05-04
2	Ms.	Bria	Skonberg		Chilliwack	1987-12-29
3	Mr.	Miles	Davis	Esq.	Alton	1926-05-26
4	Mr.	Doc	Severinsen		Arlington	1927-07-07
5	Mr.	Louis	Armstrong		New Orleans	1901-08-04
6	Ms.	Tine	Helseth	Esq.	Oslo	1987-08-18
7	Dr.	Cynthia	Robinson	MD	Sacramento	1944-01-12
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- The “all rows must be unique” rule
    - This rule states that databases should not have completely duplicate rows in a table. The only way to be able to distinguish each row when querying is to have every row be unique. This can simply be the chance of one value in the row.

Not allowed:

pid	FirstName	lastName	hometown	DOB
1	Shannon	Maier	Atlantic Beach	11-16-03
1	Shannon	Maier	Atlantic Beach	11-16-03
2	Maggie	Maier	Atlantic Beach	12-03-01

Allowed**:**

pid	FirstName	lastName	hometown	DOB
1	Shannon	Maier	Atlantic Beach	11-16-03
2	Kate	Maier	Atlantic Beach	11-16-03
23	Maggie	Maier	Atlantic Beach	12-03-01