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Professor Labouseur
CMPT308
7 September 2020

Lab 2

1.

CAP/postgres@PostgreSQL

Query Editor Query History

```sql
select *
from People;
```

Data Output Explain Messages Notifications

	pid [PK] integer	prefix text	firstname text	lastname text	suffix text	homecity text	dob date
1	1	Dr.	Neil	Peart	Ph.D.	Toronto	1952-09-12
2	2	Ms.	Regina	Schock	[null]	Toronto	1957-08-31
3	3	Mr.	Bruce	Crump	Jr.	Jacksonville	1957-07-17
4	4	Mr.	Todd	Sucherman	[null]	Chicago	1969-05-02
5	5	Mr.	Bernard	Purdie	[null]	Teaneck	1939-06-11
6	6	Ms.	Demetra	Plakas	Esq.	Santa Monica	1960-11-09
7	7	Ms.	Terri Lyne	Carrington	[null]	Boston	1965-08-04
8	8	Dr.	Bill	Bruford	Ph.D.	Kent	1949-05-17
9	9	Mr.	Alan	White	III	Pelton	1949-06-14

CAP/postgres@PostgreSQL

Query Editor Query History

```sql
select *
from Customers;
```

Data Output Explain Messages Notifications

	pid [PK] integer	paymentterms text	discountpct numeric (5,2)
1	1	Net 30	21.12
2	4	Net 15	4.04
3	5	In Advance	5.50
4	7	On Receipt	2.00
5	8	Net 30	10.00

CAP/postgres@PostgreSQL

Query Editor Query History

```
select *
from Agents;
```

Data Output Explain Messages Notifications

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

CAP/postgres@PostgreSQL

Query Editor Query History

```
select *
from Products;
```

Data Output Explain Messages Notifications

	prodid [PK] character (3)	name text	city text	qtyonhand integer	priceusd numeric (10,2)
1	p01	Heisen...	Dallas	47	67.50
2	p02	Univers...	Newark	2399	5.50
3	p03	Comm...	Duluth	1979	65.02
4	p04	LCARS ...	Duluth	3	47.00
5	p05	Remo d...	Dallas	8675309	16.61
6	p06	Trapper...	Dallas	1982	2.00
7	p07	Flux Ca...	Newark	1007	1.00
8	p08	HAL 90...	Newark	200	1.25
9	p09	Red Ba...	Toronto	1	379000.47

CAP/postgres@PostgreSQL

Query Editor | Query History

```
select *
from Orders;
```

Data Output | Explain | Messages | Notifications

	ordernum [PK] integer	dateordered date	custid integer	agentid integer	prodid character (3)	quantityordered integer	totalusd numeric (12,2)
1	1011	2020-01-23	1	2	p01	1100	58568.40
2	1012	2020-01-23	4	3	p03	1200	74871.83
3	1015	2020-01-23	5	3	p05	1000	15696.45
4	1016	2020-01-23	8	3	p01	1000	60750.00
5	1017	2020-02-14	1	3	p03	500	25643.88
6	1018	2020-02-14	1	3	p04	600	22244.16
7	1019	2020-02-14	1	2	p02	400	1735.36
8	1020	2020-02-14	4	5	p07	600	575.76
9	1021	2020-02-14	4	5	p01	1000	64773.00
10	1022	2020-03-15	1	3	p06	450	709.92
11	1023	2020-03-15	1	2	p05	500	6550.98
12	1024	2020-03-15	5	2	p01	880	56133.00
13	1025	2020-04-01	8	3	p07	888	799.20
14	1026	2020-05-01	8	5	p03	808	47282.54

2. Explain the distinctions among the terms primary key, candidate key, and superkey.

A super key is a set of one or more keys that can uniquely identify all rows in a table. A candidate key is a "minimal" super key, meaning the smallest subset of super key attributes which are unique. Every table has to have at least one candidate key, but there can be more than one. In every table, a primary key is a candidate key selected as a unique identifier for each record in a table. There can only be one primary key in each table and it cannot hold null or duplicate values.

3. Write a short essay on data types. Select a topic for which you might create a table. Name the table and list its Wields (columns). For each Wield, give its data type and whether or not it is nullable.

If a Girl Scout wanted to organize her cookie orders, she could create a table to organize the information on each order. She could name the table Cookie Orders 2020 with the following columns: order number, customer ID, number of boxes for each cookie type (a column for each), total number of boxes, and amount due. The data type for order number, cookie type quantity, and total quantity would be integers. Customer ID could either be a string or an integer and amount due would be represented by a float. None of this data is nullable due to the fact that all of this information is vital for the table to make sense. Even if someone were only to order Samoas (because they are the best) the rest of the cookie type quantities would have to be 0. If they were null, this would create issues when comparing the individual quantities to the total quantity column.

4. Explain the following relational “rules” with examples and reasons why they are important.

a. The “First normal form” rule

The intersection of any row and column must be atomic, meaning there cannot be any multi-valued attributes. For example, if there was a table of Students with columns listed as student ID, name, and major, any student with a double major would have to be listed in two separate rows, each holding one major. Listing both majors in the same row/column intersection would be a violation of the 1NF rule. Having multi-valued attributes will likely cause issues with data manipulation and extraction, therefore the 1NF rule is essential for removing ambiguity from a database.

b. The “access rows by content only” rule

In any given table, data can only be accessed by its relation to other data and never by its location. In regards to the previous example mentioned, this means that we cannot ask for the name of the student in the first row, but we can ask for the name of the student with a specific student ID. This is because the table is subject to changes constantly, therefore errors are likely to arise if we query data based purely on its location in the table. A new student might get added to the table, which means that the student’s name we intended to ask for is no longer in the first row.

c. The “all rows must be unique” rule

All rows in a table must be unique in order to ensure that all data can be accessed. Being that tables are sets of rows and columns, which have no inherent order, rows must be identifiable in some way in order to maintain efficiency. In the table of Students example, there cannot be two people with the same student ID, otherwise it would be impossible to access both students' individual data. This rule establishes a basis for overall relational database structure, in that it identifies the necessary layout of each table.