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CMPT 308
Professor Rivas

Lab 2

Keys

There are several types of keys in a database that aid in the relations between the tables. Every single table in a database must have a primary key. The primary key is an attribute or combination of attributes that uniquely identifies any given row. A superkey is a key that can uniquely identify any row in the table. A certain set of columns in a superkey guarantee to be unique. For example, in class we discussed the superkey Name+SSN+Birthdate. In a database this would yield a unique customer. A candidate key can be considered a type of superkey. A candidate key is a superkey but without the unnecessary attributes. For example if we take a look at a university. Let's say the database for the students has a column called student code which every student has a unique code. This would be an example of a candidate key. Candidate keys can be possible primary keys also.

Data Types

Data types are used to tell the database what kind of data a certain field can take. In a database, each column in a table is required to have a name and a data type. This allows the SQL to understand what type of data is inside of each column and how the database will interact with the data. Data types also help the structural organization of a database by providing a format for data entries.

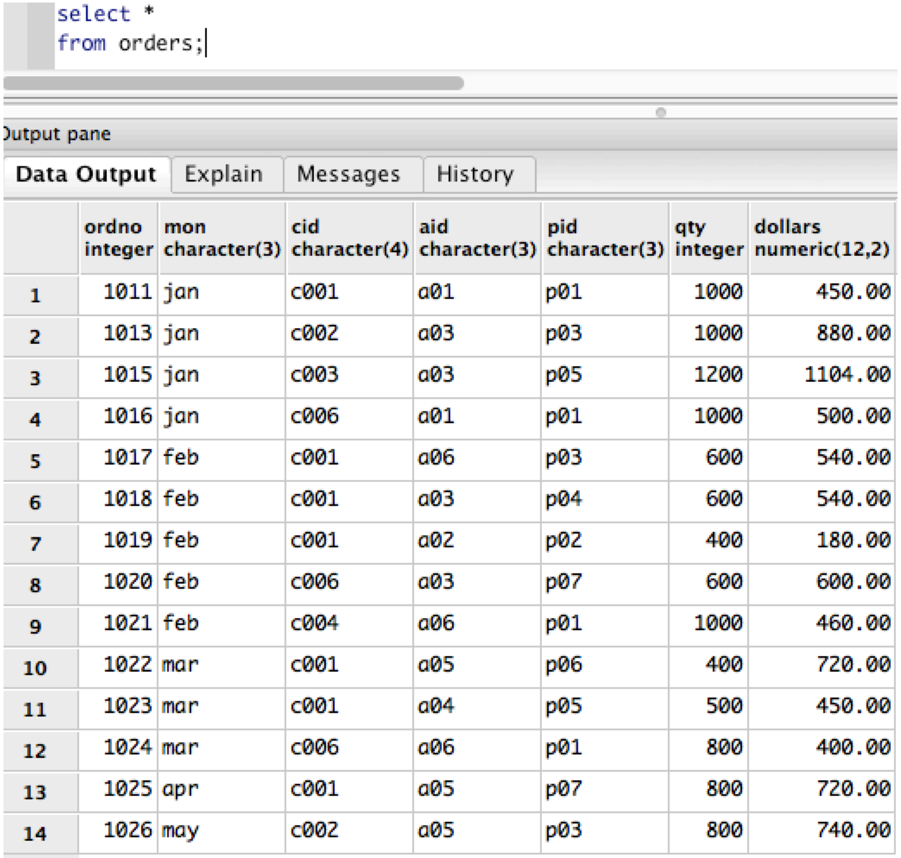
To provide an example for data types, let's say you've created a table called products. This table might have columns, or attributes such as p_code (product code), p_descript (product description), and p_indate (stocking date). The product code would consist of numbers and letters, which makes the data type VARCHAR(n). The "n" is the number of characters allowed. Being that this column is p_code and will most likely be a primary key, it cannot be null. The product description will also be VARCHAR(n). The stocking date column, however, will have a data type *date.* In this field, only numbers in the format DD-MON-YYYY will be accepted by the database. The attributes other than p_code can be null because in the theoretical database it is not a primary key or foreign key.

Relational Rules

The 1NF Rule- Sets the basic rules for an organized database. The first normal rule ensures that there is a primary key, and that there are no repeating groups of data. This is important because without the fist normal form rule there would be unorganized data and this would cause a lot of data redundancy in the database.

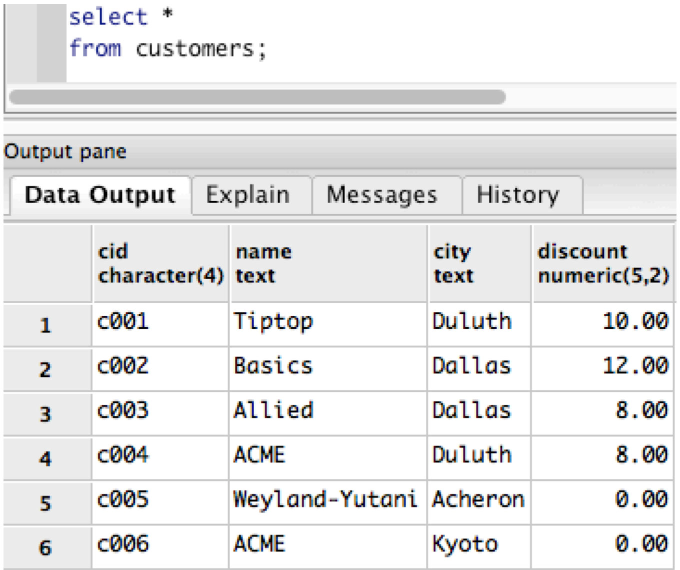
The "access rows by content only" rule- This rule ensures that every atomic value in a database can be accessed by a combination of table names, primary keys, value and column name.

The "all rows must be unique" rule-This rule ensures the integrity of a table. This rule requires that all rows in a table must have a unique identifier. This is important because this allows the user to tell apart each record. For example if you have students in a table where there are attributes student ID and student name, and student ID is a primary key. This makes it so that each student can only appear once in a table to prevent redundancy.



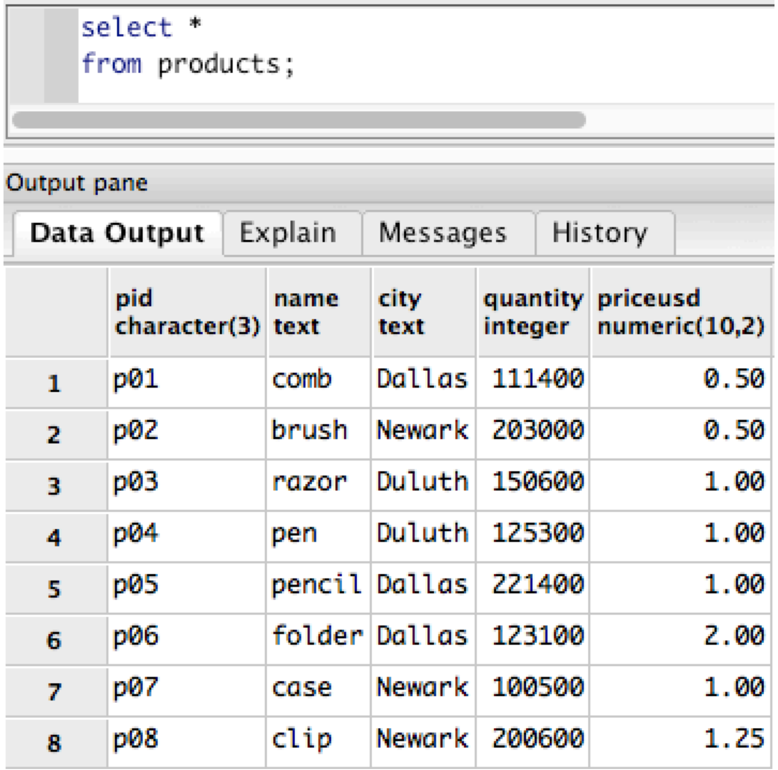
```
select *
from orders;
```

	ordno	mon	cid	aid	pid	qty	dollars
	integer	character(3)	character(4)	character(3)	character(3)	integer	numeric(12,2)
1	1011	jan	c001	a01	p01	1000	450.00
2	1013	jan	c002	a03	p03	1000	880.00
3	1015	jan	c003	a03	p05	1200	1104.00
4	1016	jan	c006	a01	p01	1000	500.00
5	1017	feb	c001	a06	p03	600	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	460.00
10	1022	mar	c001	a05	p06	400	720.00
11	1023	mar	c001	a04	p05	500	450.00
12	1024	mar	c006	a06	p01	800	400.00
13	1025	apr	c001	a05	p07	800	720.00
14	1026	may	c002	a05	p03	800	740.00



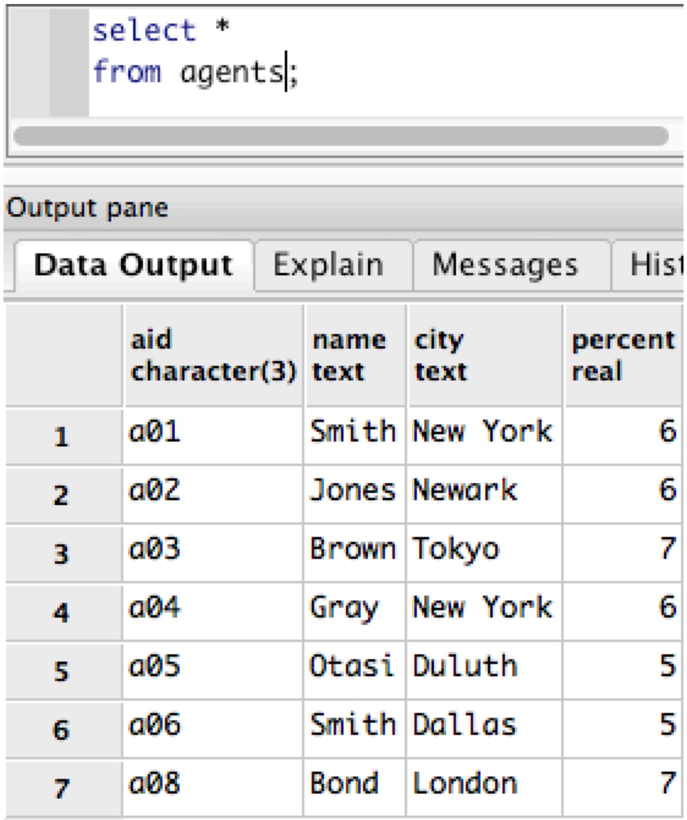
```
select *
from customers;
```

	cid	name	city	discount
	character(4)	text	text	numeric(5,2)
1	c001	Tiptop	Duluth	10.00
2	c002	Basics	Dallas	12.00
3	c003	Allied	Dallas	8.00
4	c004	ACME	Duluth	8.00
5	c005	Weyland-Yutani	Acheron	0.00
6	c006	ACME	Kyoto	0.00



```
select *
from products;
```

	pid	name	city	quantity	priceusd
	character(3)	text	text	integer	numeric(10,2)
1	p01	comb	Dallas	111400	0.50
2	p02	brush	Newark	203000	0.50
3	p03	razor	Duluth	150600	1.00
4	p04	pen	Duluth	125300	1.00
5	p05	pencil	Dallas	221400	1.00
6	p06	folder	Dallas	123100	2.00
7	p07	case	Newark	100500	1.00
8	p08	clip	Newark	200600	1.25



```
select *
from agents;
```

	aid	name	city	percent
	character(3)	text	text	real
1	a01	Smith	New York	6
2	a02	Jones	Newark	6
3	a03	Brown	Tokyo	7
4	a04	Gray	New York	6
5	a05	Otasi	Duluth	5
6	a06	Smith	Dallas	5
7	a08	Bond	London	7