Complex Queries

- REVIEW BASICS
- USING OPERATORS
- FUNCTIONS
- NESTED QUERIES

Single Table Example

Cookies Table
CookieID
Manager
Type
Price
Calorie

CookieID	Manager	Type	Price	Calorie
0001	Grace	Chocolate	5	420
0002	Amanda	Caramel	4	480
0003	Grace	Peanut Butter	8	400
0004	Grace	Cranberry	6	300
0005	Araya	Lemon	4	300
006	Araya	Chocolate Mints	5	400
…				

Some Basics

Selection without conditions:

SELECT Type FROM Cookies;

Selection with conditions:

SELECT CookieID FROM Cookies WHERE Manager='Grace';

More Basics

1. Select ALL operator *:
- SELECT ***** FROM Cookies WHERE Manager='Grace';

2. Display non-duplicate values:
- SELECT **DISTINCT** Manager FROM Cookies;

3. Column alias:
- SELECT Type **AS "Flavors",** Price FROM Cookies;

4. Concatenation operator:
- SELECT **CONCAT** (Type, ' cookies have ', Calorie, ' calories.') FROM Cookies;

5. Arithmetic operations:
- SELECT Type, Price, **Price * 5 AS "Price for Five Boxes"** FROM Cookies;

Complex Queries: the WHERE Clause…

```
SELECT column_name,column_name
FROM table_name
WHERE column_name operator value;
```

Operators in WHERE Clause

Operator	Description
=	Equal
<>	Not equal. **Note:** In some versions of SQL this operator may be written as !=
>	Greater than
<	Less than
>=	Greater than or equal
<=	Less than or equal
BETWEEN	Between an inclusive range
LIKE	Search for a pattern
IN	To specify multiple possible values for a column

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006	Araya	Chocolate Mints	5	400
…				

BETWEEN, LIKE, and IN

```
SELECT column_name(s)
FROM table_name
WHERE column_name LIKE pattern;
```

SELECT * FROM Cookies
WHERE Type **LIKE 'choco%';**

```
SELECT column_name(s)
FROM table_name
WHERE column_name BETWEEN value1 AND value2;
```

SELECT * FROM Cookies
WHERE Calorie **BETWEEN 350 AND 450**;

```
SELECT column_name(s)
FROM table_name
WHERE column_name IN (value1,value2,...);
```

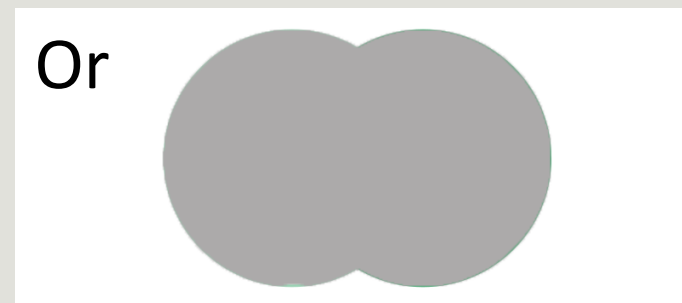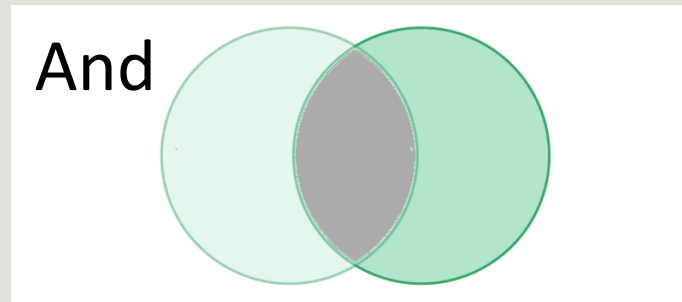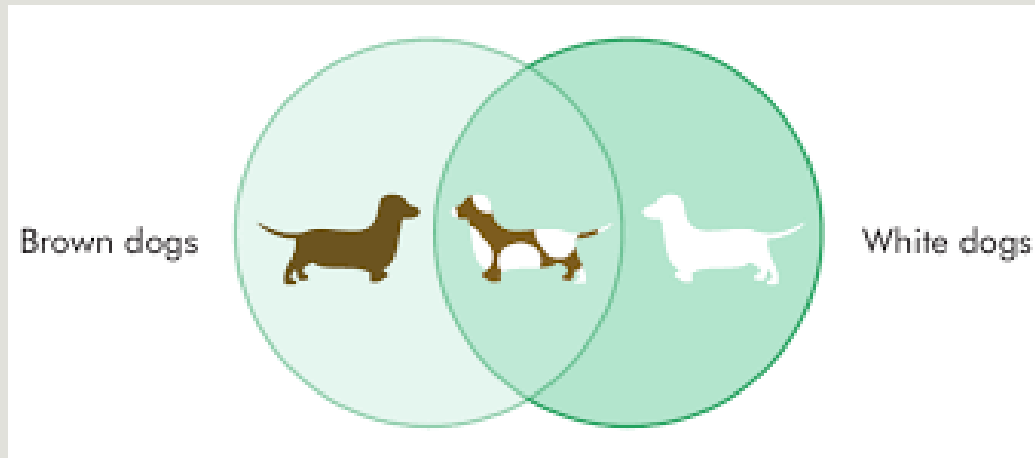SELECT * FROM Cookies
WHERE Manager **IN ('Grace', 'Amanda');**

AND, OR, and NOT

The AND operator displays a record if both the first condition AND the second condition are true.

The OR operator displays a record if either the first condition OR the second condition is true.

And

Or

Functions

Count(): returns the number of rows that matches a specified criteria

Sum(): returns the total sum of a numeric column

Avg(): returns the average value of a numeric column

Max(): returns the largest value of the selected column

Min(): returns the smallest value of the selected column

Group By: is used in conjunction with the aggregate functions to group the result-set by one or more columns.

Functions

Now(): returns the current system date and time

First(): returns the first value of the selected column

Last(): returns the last value of the selected column

Mid(): is used to extract characters from a text field   SELECT MID(City,1,4) AS ShortCity FROM Customers;

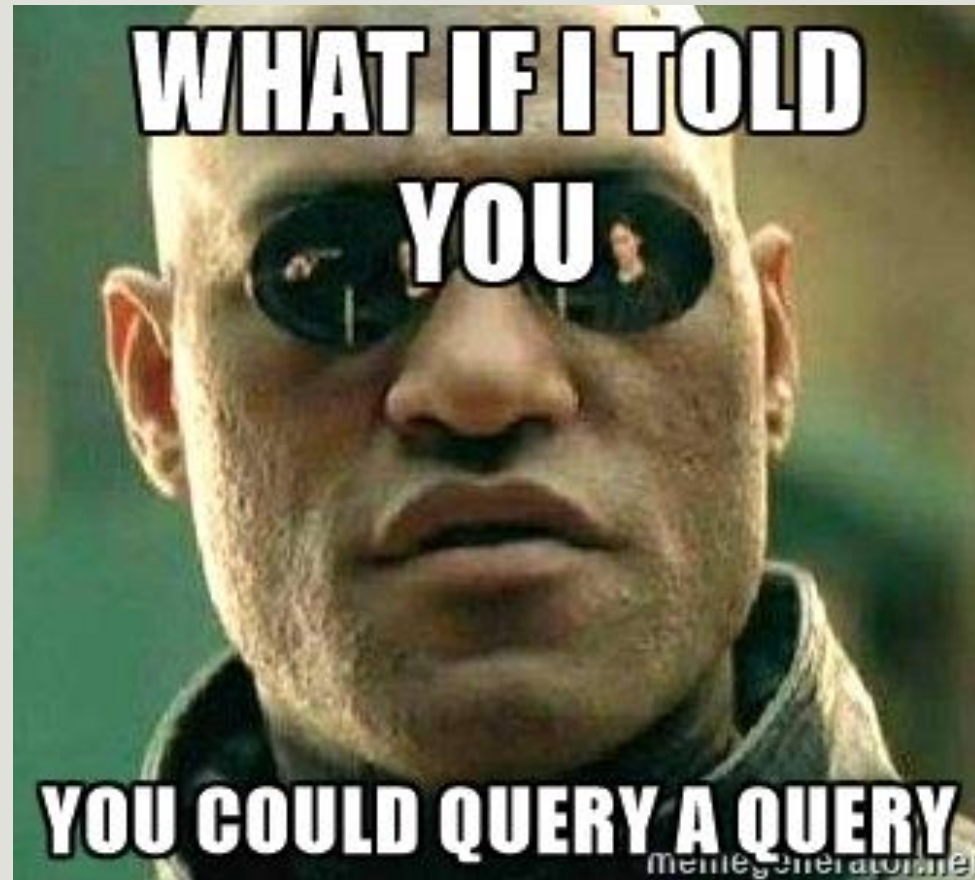Ucase(): converts the value of a field to uppercase

Lcase(): converts the value of a field to lowercase

Len(): returns the length of the value in a text field

Round(): is used to round a numeric field to the number of decimals specified

Nested Query

Nested Query

SELECT organizations.OrganizationID

FROM organizations

WHERE organizations.Organization LIKE "%university%"

Nested Query

```
SELECT FirstName, LastName, Organization
FROM persons
JOIN organizations
 ON persons.OrganizationID = organizations.OrganizationID
```

Nested Query

First and second query nested

SELECT FirstName, LastName, Organization
FROM persons
JOIN organizations
  ON persons.OrganizationID = organizations.OrganizationID
WHERE persons.OrganizationID IN
(SELECT organizations.OrganizationID
FROM organizations
WHERE organizations.Organization LIKE "%university%")