

Recall the concept

- Database
- Database Model
- DBMS – Benefits of a DBMS
- XAMPP
- Entity relationship
- RDBMS – MySQL

Queries

Learning Objective:

Create, evaluate and improve search queries that use multiple criteria and relational operators to find specific information

Success criteria

- know what is Queries
- know the purpose of the Queries
- can create Queries using the structure
- can create Queries using commands
SQL: SELECT, WHERE

MySQL – RDBMS

SQL stands for the Structured Query Language.

It defines how to insert, retrieve, modify and delete data.

Создание базы данных

```
CREATE DATABASE my_first_db;
```

DROP DATABASE: Удалить базу данных

DROP TABLE: Удалить таблицу

EXPLAIN: Показать структуру таблицы

USE: Выбор базы данных

Создать таблицу

```
CREATE TABLE users (  
    username VARCHAR(20),  
    create_date DATE  
);
```

Первичный ключ

```
CREATE TABLE users (  
    user_id INT AUTO_INCREMENT PRIMARY KEY,  
    username VARCHAR(20),  
    create_date DATE  
);
```

ALTER TABLE: Изменить таблицу

Удаляем столбец

```
ALTER TABLE users DROP email;
```

Изменение столбца

```
ALTER TABLE users
```

```
CHANGE username
```

```
User_name VARCHAR<30>;
```

INSERT: Добавляем данные в таблицу

```
INSERT INTO users VALUES ('Alex','2002-07-25');
```

Select

SELECT is used to retrieve rows selected from one or more tables.

The SELECT statement allows you to ask the database a question (Query it), and specify what data it returns.

```
SELECT name, DoB --what to return  
FROM crooks      --where are you returning it from
```

name	DoB
Geoff	12/05/1982
Jane	05/08/1956
Keith	07/02/1999
Oliver	22/08/1976
Kelly	11/11/1911
Marea	14/07/1940

SELECT, WHERE

We need to use another statement, the WHERE clause, allowing us to give the query some criteria (or options):

```
SELECT ID, name, DoB
FROM crooks
WHERE town = 'Snape' AND gender = 'male' --Criteria
```

ID	name	DoB
3	Keith	07/02/1999

Operators in The WHERE Clause

So you can see we used AND statement, we also can use OR, NOT and others like:

=	Equal
!=	Not Equal
>	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

Example

Say the police knew that a crime had been committed by a heavily scarred woman (4+ scars), they want a list of all the scarred women:

```
SELECT name, town, scars
FROM crooks
WHERE numScars >= 4 AND gender = 'female' --Criteria
```

This would return:

name	town	numScars
Kelly	East Ham	10
Marea	Wythenshawe	6

Example

However, the police want to quickly sort through and see who is the most heavily scarred. We are going to use an **ORDER** command:

```
SELECT name, town
FROM crooks
WHERE numScars >= 4 AND gender = 'female' --Criteria
ORDER BY numScars DESC --sorts the numScars values in big to small order
```

ORDER BY numScars sorts your returned data into **DESC**ending (big to small) or **ASC**ending (small to big) order

Select with Comparison Operators

For numbers (INT, DECIMAL, FLOAT)

```
mysql> SELECT name, price FROM products WHERE price < 1.0;
```

```
+-----+-----+  
| name      | price |  
+-----+-----+  
| Pencil 2B | 0.48 |  
| Pencil 2H | 0.49 |  
+-----+-----+
```

```
2 rows in set (0.00 sec)
```

```
mysql> SELECT name, quantity FROM products WHERE quantity <= 2000;
```

```
+-----+-----+  
| name      | quantity |  
+-----+-----+  
| Pen Black | 2000 |  
+-----+-----+
```

```
1 row in set (0.00 sec)
```

For strings, you could also use '=', '<>', '>', '<', '>=', '<=' to compare two strings (e.g., `productCode = 'PEC'`).

```
mysql> SELECT name, price FROM products WHERE productCode = 'PEN';  
-- String values are quoted
```

```
+-----+-----+  
| name      | price |  
+-----+-----+  
| Pen Red   | 1.23  |  
| Pen Blue  | 1.25  |  
| Pen Black | 1.25  |  
+-----+-----+  
3 rows in set (0.00 sec)
```

String Pattern Matching - LIKE and NOT LIKE

we can perform pattern matching using operator LIKE (or NOT LIKE) with wildcard characters. The wildcard '_' matches any single character; '%' matches any number of characters (including zero). For example,

```
-- "name" begins with 'PENCIL'
```

```
mysql> SELECT name, price FROM products WHERE name LIKE 'PENCIL%';
```

```
+-----+-----+
| name      | price |
+-----+-----+
| Pencil 2B | 0.48  |
| Pencil 2H | 0.49  |
+-----+-----+
```

```
-- "name" begins with 'P', followed by any two characters,  
-- followed by space, followed by zero or more characters
```

```
mysql> SELECT name, price FROM products WHERE name LIKE 'P__ %';
```

```
+-----+-----+
| name      | price |
+-----+-----+
| Pen Red   | 1.23  |
| Pen Blue  | 1.25  |
| Pen Black | 1.25  |
+-----+-----+
```

Arithmetic Operators - +, -, *, /, DIV, %

Logical Operators - AND, OR, NOT, XOR

```
mysql> SELECT * FROM products WHERE quantity >= 5000 AND name LIKE 'Pen %';
```

```
+-----+-----+-----+-----+-----+
| productID | productCode | name      | quantity | price |
+-----+-----+-----+-----+-----+
|      1001 | PEN         | Pen Red   |      5000 | 1.23 |
|      1002 | PEN         | Pen Blue  |      8000 | 1.25 |
+-----+-----+-----+-----+-----+
```

```
mysql> SELECT * FROM products WHERE quantity >= 5000 AND price < 1.24 AND name LIKE 'Pen %';
```

```
+-----+-----+-----+-----+-----+
| productID | productCode | name      | quantity | price |
+-----+-----+-----+-----+-----+
|      1001 | PEN         | Pen Red   |      5000 | 1.23 |
+-----+-----+-----+-----+-----+
```

Further Reading.....

IN, NOT IN

```
SELECT * FROM products WHERE name IN ('Pen Red', 'Pen Black');
```

BETWEEN, NOT BETWEEN

```
SELECT * FROM products WHERE (price BETWEEN 1.0 AND 2.0) AND  
(quantity BETWEEN 1000 AND 2000);
```

IS NULL, IS NOT NULL

```
SELECT * FROM products WHERE productCode IS NULL;
```

ORDER BY Clause

```
SELECT * FROM products WHERE name LIKE 'Pen %' ORDER BY price  
DESC;
```


- **create table Employee(empno int(5) primary key, ename varchar(30), job varchar(25), hiredate date, sal double(10,2), commission double(6,2), deptt int(2));**
- **INSERT INTO employee VALUES (1001,"Alex","Teacher",'2017-07-25', 5678.90, 100.0, 10);**
- **Select * from Employee where commission>0**
- **Select jobs from employee;**
- **SELECT * FROM EMPLOYEE WHERE ENAME LIKE "_____";**
- **SELECT * FROM EMPLOYEE WHERE ENAME LIKE "_____p%";**
- **SELECT * FROM employee WHERE deptt= 'computer ' ORDER BY ename;**
- **Select ename, hiredate from employee where job not like "history";**

- <http://jtest.ru/bazyi-dannyix/sql-dlya-nachinayushhix-chast-3.html>
- https://www.ntu.edu.sg/home/ehchua/programming/sql/MySQL_Beginner.html
- <https://myrusakov.ru/>
- <http://www.firststeps.ru/sql/r.php?9>