

Diploma in Web Development – Part II



Servers & Databases – Week 2
Advanced SQL

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Relational Database Management Systems

- How Relational Databases Work
- Field & Multifield Keys
- Creating a Relational Database
(with phpMyAdmin)
- Summary
- Q&A



Today's Lesson

Advanced SQL

- Reintroducing SQL
 - Introducing CRUD
- Filtered SQL Queries
- SQL Functions
- Summary
- Q&A

AGENDA



Let's Begin!



Structured Query Language



Structured Query Language

is the language used to communicate with a relational database



Review

- Sequence of instructions
- Knowns as a **query** or **statement**
- Instructions consist of:
 - Keywords
 - Column Names
 - Values

SQL



Review

- Sequence of instructions
- Knowns as a **query** or **statement**
- Instructions consist of:
 - Keywords
 - Column Names
 - Values
- Queries are executed by the database
(subject to constraints)

SQL



Reintroducing SQL

Basic SQL Instructions

Retrieve information

```
SELECT * FROM table_name
```

Add information

```
INSERT INTO table_name  
VALUES (value1, value2, value3)
```



Create **R**ead **U**pside **D**ownload



Create Read Update Delete

are the four basic functions of persistent storage



Introducing CRUD

In SQL

- Create: **INSERT**
- Read: **SELECT**
- Update: **UPDATE**
- Delete: **DELETE**

SQL



Filtered SQL Queries



Filtered SQL Queries

are SQL queries executed subject to **any number of conditions, filters, or sorting** as defined in the statement



Filtered SQL Queries

Filtered Queries in SQL

Allow us to ask for specific portions of a table or set of tables

Databases are designed to *very efficiently* perform these tasks (even with many records)

Searching using an indexed field speeds up the search process



The WHERE clause



The WHERE clause

allows us to filter result sets based on conditions
separated by **AND**, **OR**



Filtered SQL Queries

The WHERE clause

General:

```
SELECT * FROM <table_name>  
WHERE <column_name1> <operator1> <value1> AND  
<column_name2> <operator2> <value2> OR  
<column_name3> <operator3> <value3>;
```



Filtered SQL Queries

The WHERE clause

Example:

```
SELECT id, name, stock FROM products  
WHERE stock > 5 AND discount < 0.2;
```



Filtered SQL Queries

WHERE clause operators

Operator	Meaning
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to
=	Equal to
!= or <>	Not equal to



Filtered SQL Queries

WHERE clause operators

BETWEEN:

```
SELECT id, name, stock FROM products  
WHERE stock BETWEEN 5 AND 10;
```



Filtered SQL Queries

WHERE clause operators

IN or NOT IN:

```
SELECT id, name, stock FROM products  
WHERE discount IN (0.1, 0.2, 0.3);
```



Filtered SQL Queries

WHERE clause operators

LIKE:

```
SELECT id, name, stock FROM products  
WHERE name LIKE "C%";
```



ORDER BY clause



ORDER BY clause

allows us to sort result sets based on columns in a specific order



Filtered SQL Queries

ORDER BY clause

General:

```
SELECT * FROM <table_name>  
ORDER BY <column_name1> ASC/DESC;
```



Filtered SQL Queries

ORDER BY clause

Example:

```
SELECT id, name, stock FROM products  
ORDER BY name DESC;
```



LIMIT clause



LIMIT clause

allow us to filter results sets based on a maximum number of queries, and to offset the start point of the result set using OFFSET



LIMIT clause

General:

```
SELECT * FROM <table_name>  
LIMIT <value1> OFFSET <value2>;
```



LIMIT clause

Example:

```
SELECT id, name, stock FROM products  
LIMIT 6 OFFSET 12;
```



SQL Functions



SQL Functions

are functions built into an SQL relational database that can be used to manipulate and analyse database records



SQL

Demo



Advanced SQL

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 - Introducing CRUD
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- SQL Functions
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Servers & Databases Semester

- The next session is “Databases & Security”
 - What is SQL Injection?
 - PHP Primer: MySQLi
 - Prepared SQL Statements
- Recordings are available within 24 hours after the live webinar
 - Go to www.shawacademy.com and then the Top Right Corner – **Members Area**



Next Lesson is

Databases & Security

- Learn about one of the most common security issues surrounding web application databases
- You will understand how **SQL Injection** works and how to set up your web application to **defend against these attacks**



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