

# SQL MASTERY

Commands • Joins • Subqueries • Indexes

Portfolio Project

Data Analyst

SQL

# Table of Contents

1. Essential SQL Commands
2. SQL Joins (INNER, LEFT, RIGHT, FULL)
3. Subqueries (Single & Correlated)
4. Indexes & Performance Optimization
5. Portfolio Use Case Examples

# 1. Essential SQL Commands

## SELECT

Retrieve data from tables

```
SELECT * FROM users;  
SELECT name, email FROM users WHERE age > 25;
```

## INSERT

Insert new records

```
INSERT INTO users (name, email, age)  
VALUES ('John', 'john@mail.com', 30);
```

## UPDATE

Update existing records

```
UPDATE users  
SET email = 'new@mail.com'  
WHERE id = 1;
```

## DELETE

Delete records

```
DELETE FROM users WHERE id = 1;
```

## 2. SQL Joins

### INNER JOIN

Returns matching records from both tables

```
SELECT o.order_id, c.name
FROM orders o
INNER JOIN customers c ON o.customer_id = c.id;
```

### LEFT JOIN

Returns all left table records

```
SELECT c.name, o.order_id
FROM customers c
LEFT JOIN orders o ON c.id = o.customer_id;
```

### RIGHT JOIN

Returns all right table records

```
SELECT o.order_id, c.name
FROM orders o
RIGHT JOIN customers c ON o.customer_id = c.id;
```

### 3. Subqueries

#### Single Row Subquery

Query inside WHERE clause

```
SELECT name, salary
FROM employees
WHERE salary > (
    SELECT AVG(salary)
    FROM employees
);
```

#### Correlated Subquery

Subquery depends on outer query

```
SELECT e1.name, e1.salary
FROM employees e1
WHERE salary > (
    SELECT AVG(e2.salary)
    FROM employees e2
    WHERE e2.department = e1.department
);
```

## 4. Indexes & Performance

### CREATE INDEX

Speeds up search queries

```
CREATE INDEX idx_users_email  
ON users(email);
```

### DROP INDEX

Remove unused index

```
DROP INDEX idx_users_email;
```

## 5. Portfolio Use Case

### Business Question

```
"Find top 5 customers by total purchase amount"
```

### SQL Solution

```
SELECT c.name, SUM(o.amount) AS total_spent
FROM customers c
JOIN orders o ON c.id = o.customer_id
GROUP BY c.name
ORDER BY total_spent DESC
LIMIT 5;
```

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