

# SQL

14 DAYS

# ROADMAP

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Master SQL in Just 14 Days

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## \*Disclaimer\*

Everyone learns uniquely

What matters is your ability to understand  
and write SQL queries efficiently.

This Doc will help you with the same.



DAY 1

## Introduction to SQL and Relational Databases

- Understand what SQL is and its role in managing databases.
- Learn about relational databases and their components.
- Study basic SQL commands: SELECT, INSERT, UPDATE, DELETE.
- Practice writing simple queries and retrieving data from a database.

### EXAMPLE:

Write a SQL query to retrieve all the columns from the "customers" table.

### PRACTICE QUESTIONS:

1. Write a SQL query to insert a new record into the "employees" table.
2. Write a SQL query to update the "quantity" column of the "products" table to 10 where the "product\_id" is 5.
3. Write a SQL query to delete all records from the "orders" table where the "status" is 'cancelled'.

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## DAY 2

# Filtering and Sorting Data

- Learn about the WHERE clause and its usage for filtering data.
- Study the ORDER BY clause for sorting data.
- Practice writing queries with filtering and sorting.

## EXAMPLE:

Write a SQL query to retrieve all the columns from the "employees" table where the "salary" is greater than 50000.

## PRACTICE QUESTIONS:

1. Write a SQL query to retrieve all the columns from the "products" table where the "category" is 'Electronics' and the "price" is less than 1000.
2. Write a SQL query to retrieve the names of all customers from the "customers" table in alphabetical order.
3. Write a SQL query to retrieve the total number of orders from the "orders" table.

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## DAY 3

# Joining Tables

- Understand the concept of joining tables.
- Learn about different types of joins: INNER JOIN, LEFT JOIN, RIGHT JOIN, and FULL JOIN.
- Practice writing queries that involve joining multiple tables.

## EXAMPLE:

Write a SQL query to retrieve the customer name and order date from the "customers" and "orders" tables, joining them on the "customer\_id" column.

## PRACTICE QUESTIONS:

1. Write a SQL query to retrieve the product name, category, and supplier name from the "products", "categories", and "suppliers" tables, joining them on the appropriate columns.
2. Write a SQL query to retrieve the employee name and department name from the "employees" and "departments" tables, joining them on the "department\_id" column.
3. Write a SQL query to retrieve the customer name and order amount from the "customers" and "orders" tables, joining them on the "customer\_id" column, and only including orders with amounts greater than 1000.

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## DAY 4

# Aggregating Data

- Study aggregate functions like COUNT, SUM, AVG, MAX, and MIN.
- Learn to use the GROUP BY clause to group data.
- Practice writing queries that involve aggregating data.

## EXAMPLE:

Write a SQL query to retrieve the total number of orders for each customer from the "orders" table.

## PRACTICE QUESTIONS:

1. Write a SQL query to retrieve the average price of products in each category from the "products" table.
2. Write a SQL query to retrieve the maximum salary for each department from the "employees" table.
3. Write a SQL query to retrieve the total revenue generated by each customer from the "orders" and "order\_items" tables.

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DAY 5

## Data Manipulation

- Study advanced SQL commands: UPDATE, DELETE, and INSERT INTO SELECT.
- Understand how to modify existing data in a database.
- Practice writing queries for data manipulation.

### EXAMPLE:

Write a SQL query to update the "quantity" column of the "products" table to 20 for all products with a price greater than 100.

### PRACTICE QUESTIONS:

1. Write a SQL query to delete all records from the "customers" table where the "last\_login\_date" is older than 1 year.
2. Write a SQL query to insert new records into the "employees" table, selecting data from the "temp\_employees" table.
3. Write a SQL query to update the "discount" column of the "orders" table by increasing it by 5% for all orders placed before a specific date.

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DAY 6

## Advanced Filtering and Sorting

- Learn about advanced filtering techniques: LIKE, IN, BETWEEN, and NULL.
- Study complex sorting options using multiple columns.
- Practice writing queries with advanced filtering and sorting.

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### EXAMPLE:

Write a SQL query to retrieve all the customers whose names start with 'J' and have a city containing 'York'.

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### PRACTICE QUESTIONS:

1. Write a SQL query to retrieve all the products with a price either above 1000 or below 500.
  2. Write a SQL query to retrieve the employees who were hired between a specific date range.
  3. Write a SQL query to retrieve all the customers who do not have a phone number specified in the database.
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DAY 7

## Working with Functions

- Study various SQL functions: String functions, Date functions, and Numeric functions.
- Learn how to use these functions in your queries.
- Practice writing queries that involve SQL functions.

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### EXAMPLE:

Write a SQL query to retrieve the length of the product names from the "products" table.

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### PRACTICE QUESTIONS:

1. Write a SQL query to retrieve the current date and time.
2. Write a SQL query to retrieve the uppercase names of all the employees from the "employees" table.
3. Write a SQL query to retrieve the average price of products after applying a 10% discount from the "products" table.

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DAY 8

## Subqueries

- Understand the concept of subqueries and their usage.
- Learn to write subqueries in different parts of a SQL statement.
- Practice writing queries that include subqueries.

### EXAMPLE:

Write a SQL query to retrieve all the products with a price higher than the average price of all products.

### PRACTICE QUESTIONS:

1. Write a SQL query to retrieve the names of all employees who have a salary higher than the maximum salary of the 'Sales' department.
2. Write a SQL query to retrieve all the customers who have placed an order after the latest order date for a specific product.
3. Write a SQL query to retrieve all the products that belong to categories with more than 10 products.

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DAY 9

## Views and Indexes

- Study views and their importance in database design.
- Learn to create and use views in SQL.
- Understand indexes and their role in optimizing query performance.
- Practice creating views and indexes.

### EXAMPLE:

Create a view named "high\_salary\_employees" that retrieves all the employees with a salary greater than 50000 from the "employees" table.

### PRACTICE QUESTIONS:

1. Create a view named "order\_summary" that retrieves the total order amount and the number of orders for each customer from the "orders" table.
2. Create an index on the "email" column of the "customers" table for faster searching.
3. Create a view named "product\_inventory" that retrieves the product name and the available quantity for each product from the "products" and "inventory" tables.

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## DAY 10

# Data Integrity and Constraints

- Learn about data integrity and the role of constraints.
- Understand different types of constraints: NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY.
- Practice creating tables with constraints.

## EXAMPLE:

Create a table named "employees" with columns for employee ID, name, and email, where the employee ID is the primary key and the email must be unique.

## PRACTICE QUESTIONS:

1. Create a table named "orders" with columns for order ID, customer ID, and order date, where the order ID is the primary key and the customer ID references the "customers" table.
2. Create a table named "products" with columns for product ID, name, and price, where the product ID is the primary key and the price cannot be null.
3. Create a table named "categories" with columns for category ID and name, where the category ID is the primary key and the name must be unique.

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DAY 11

## Modifying Tables

- Study commands for modifying existing tables: ALTER TABLE, DROP TABLE, and RENAME TABLE.
- Learn how to add, modify, and delete columns in a table.
- Practice modifying table structures.

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### EXAMPLE:

Alter the "employees" table to add a new column named "address" of type VARCHAR(100).

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### PRACTICE QUESTIONS:

1. Rename the table "customer\_details" to "client\_details".
  2. Delete the "quantity" column from the "products" table.
  3. Modify the "orders" table to change the data type of the "order\_date" column to DATE.
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DAY 12

## Advanced Joins and Subqueries

- Study advanced join techniques: self-joins, non-equijoins, and complex join conditions.
- Learn to use correlated subqueries and EXISTS operator.
- Practice writing queries with advanced joins and subqueries.

### EXAMPLE:

Write a SQL query to retrieve all employees and their respective managers from the "employees" table using a self-join.

### PRACTICE QUESTIONS:

1. Write a SQL query to retrieve all the orders that do not have any corresponding items in the "order\_items" table using a subquery.
2. Write a SQL query to retrieve all the products along with the total quantity sold for each product from the "products" and "order\_items" tables using a join and subquery.
3. Write a SQL query to retrieve all the customers who have placed an order in the same month and year as their registration date.

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DAY 13

## Transactions and Locking

- Understand the concept of transactions and their importance.
- Learn about different transaction states and properties (ACID).
- Study locking and concurrency control in SQL.
- Practice writing queries with transactions.

### EXAMPLE:

Write a SQL query to start a transaction, update the "inventory" table by reducing the quantity of a product, and commit the transaction.

### PRACTICE QUESTIONS:

1. Write a SQL query to start a transaction, delete all records from the "orders" table, and roll back the transaction.
2. Write a SQL query to update the "balance" column of the "accounts" table by adding a specific amount for a specific account, ensuring the consistency of the transaction.
3. Write a SQL query to lock a specific row in the "employees" table to prevent other transactions from modifying it.

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DAY 14

## Advanced Topics

- Explore advanced topics like stored procedures, triggers, and user-defined functions.
- Learn about SQL optimization techniques.
- Practice writing queries involving advanced topics.

### EXAMPLE:

Create a stored procedure named "get\_customer\_orders" that takes a customer ID as input and retrieves all the orders placed by that customer.

### PRACTICE QUESTIONS:

1. Create a trigger named "update\_inventory" that automatically updates the quantity in the "inventory" table when an order is placed.
2. Create a user-defined function named "calculate\_discount" that takes the order total as input and returns the discount amount based on specific conditions.
3. Write a SQL query to optimize a slow-performing query by adding appropriate indexes and rewriting the query structure.

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