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Best Online Resources for Learning SQL and Database Concepts

SQL is one of the most important skill for any programmer be it a Java, C++, PHP or Ruby developer.

- **Almost 95%** of the Java applications uses relational database in their back-end and almost all web applications uses database.
- **From my experience** I can say that SQL is **easy to learn** but **difficult to master**. You can start writing SQL queries in about an hour or so, but when it comes to write queries to solve real time requirements or for reporting purpose, its not that easy.
- **Practicing SQL online** on sites like **SQLZoo or SQLFiddle** and more others will help you to keep yourself up-to-date.
- **You can also take help from some good SQL books** like:
  - **Head First SQL** *(if you are beginner, head first way is one of the best way to learn SQL).*

1. W3Schools – "SQL Tutorial"

- W3Schools claims to be the largest web developer site on the Internet. It provides various tutorials and references on web development languages such as HTML, CSS, JavaScript, PHP, SQL, and JQuery, covering most aspects of web programming.
- Their online SQL Tutorial guides you through syntax and most important statements, keywords, and functions. Short but concrete descriptions and many examples make this tutorial easy to read and understand.
- A distinctive feature is the ability to test queries online. At the start of the tutorial, there is a sample database which you can modify and restore back to its original content at any time. The guide ends with a simple quiz.

The entire tutorial is available without registration.

2. Vertabelo Academy

- Vertabelo Academy offers interactive SQL courses, available directly in the browser. You can learn about SQL queries, data management, and table creation.
- The "SQL Queries" course starts with simple queries, progressing through GROUP BY queries to advanced topics like subqueries. You will also find out about the subtle changes between various joining methods, including INNER JOIN, LEFT JOIN, RIGHT JOIN and OUTER JOIN. Finally, you'll have a chance to test your knowledge in a comprehensive quiz.
- In the "Operating on Data in SQL" course, you will learn how to manage data in relational databases, i.e., how to insert, update, and delete information from a database.
- In the "Creating Tables in SQL" course, you will find out how to manage the structure of a relational database. You'll learn to create tables and define their

various elements, like primary keys, UNIQUE keys, and foreign keys. You will get to know how to use and define constraints. Finally, you will find out how to create views.

- Each course features dozens of interactive exercises with a detailed explanation of the theory behind the lesson, and an interactive console that verifies your solution. After completing all lessons, you can take a final quiz to test your knowledge.

You can start the course without registration but you will be asked to sign up after completing the first few exercises. You can register with your email address, or your social profiles (Facebook, Google+, Twitter, or GitHub).

3. **Codecademy – "Learn SQL"**

- Codecademy is an online platform that offers a wide range of free coding courses in programming languages like HTML, JavaScript, jQuery, PHP, Python, and Ruby. In addition to these courses, Codecademy's students can learn how to manage data with SQL.
- Like all other courses at Codecademy, "Learn SQL" is free and interactive. It covers the basics of database fundamentals: tables, queries, aggregate functions, constructing advanced database queries and more.

The course consists of 4 lessons that focus on:

1. *basic SQL commands to manipulate data stored in relational databases*
2. *the most commonly used SQL commands to query a table in a database*
3. *using SQL to perform calculations during a query*
4. *querying multiple tables using joins*

- The user interface of each lesson is divided into three panels. The left one contains a description of the exercise with a brief theoretical introduction. In the center, there's an interactive SQL command line where the user writes SQL against an SQLite database. The panel on the right features a visual representation of the database schema with the query result.
- After completing a lesson, you can test your knowledge with a quiz, or master your skills with a real-world project to teach you how to apply what you're learning in a hands-on, practical way. Unfortunately, both quizzes and projects are available only for users who have subscribed to a paid Pro version of Codecademy.

In order to participate in the course, you need to register using an email address or a Google or Facebook account.

4. **Khan Academy – "Intro to SQL"**

- Khan Academy provides its users with micro-lectures in the form of YouTube videos, lots of practice exercises, and a personalized learning dashboard. Combined, these tools empower learners to study at their own pace inside and outside of the classroom.
- Among many courses offered by Khan Academy, you can find a free SQL course called "Intro to SQL: Querying and Managing Data."

- Each lesson consists of two elements. The window on the left is a video tutorial, while the window on the right shows real-time changes in the database structure and the results of queries performed under the SQLite database. Exercises are supported by documentation and useful hints. After finishing the first part of the course, learners complete a more advanced project.
- The whole course contains 5 parts, starting with SQL fundamentals. It continues with constructing more advanced SQL queries using operators (such as AND/OR, IN, LIKE, etc.) and joins. An ending section called "What to learn next" provides useful tips and links.

Khan Academy allows users to watch videos without registering; however, after registration (via Facebook, Google, or email) they can ask questions regarding videos and participate in discussions.

5. **SQLZoo**

- SQLZoo is a nice free and interactive SQL tutorial developed and maintained by Edinburgh Napier University.
- The course features live interpreters and interactive exercises for multiple types of databases, such asMySQL, PostgreSQL, Oracle, SQL Server, and DB2.
- This site has three major sections: Tutorials, Assessments, and Reference.
- A tutorial is a set of exercises that aims to acquaint you with new topics. You start with SQL basics, then go through nested SELECT statements and aggregate functions (such as COUNT, SUM, or AVG), ending with more advanced JOIN operations. At any time, you can consult the Reference section for background on the appropriate theory, explained with interactive examples.
- After completing each tutorial, you can take a quiz to show how well you understand the topic.
- The Assessments section offers several mini projects; each includes 15 questions of varying levels of difficulty.
- The course is available without registration, however, you can create an account with your email. This is recommended if you want to publish comments or contribute to the site.

6. Tutorials Point – "Learn SQL"

- Tutorials Point claims to be the web's largest library of tutorials. Indeed, it offers dozens of online courses in computer engineering, information technology, programming languages, and management.
- If you're looking to learn SQL or database concepts, you will find several tutorials here, including courses in SQL, MySQL, PostgreSQL, SQLite, DB2, PL/SQL, and others.
- The "Learn SQL" tutorial provides a nice guide to basic SQL, its most useful functions, and more advanced topics. There are plenty of easy-to-understand examples, but no interactive exercises to practice what you have learned.

It's worth mentioning that you can download the whole tutorial as a PDF file to get back to it at any time, even when offline.

7. Udacity – "Intro to Relational Databases"

- Udacity offers interactive online courses aimed at advancing academic and vocational skills. Although Udacity is profit-oriented, some courses are available for free.
- One of its free courses is "Intro to Relational Databases", which provides the learner with the basics of SQL and database design. Since the course uses examples and programming exercises in Python, you'll also get to know the Python API. For this reason, Python fundamentals are required. You don't need any previous database experience since this course is an entry-level introduction to relational databases.

The course consists of video lessons, and each lesson includes a final quiz. The lessons are divided into four parts:

1. Relational Concepts
2. SQL queries
3. Python DB-API (accessing a relational database from Python code)
4. Advanced SQL (joins, normalization)

- The course ends with a project that focuses on building a database-backed Python module to run a game tournament.

You don't have to register to preview the course, but if you want to get full access, you must sign up with your email, Google, or Facebook account.

8. SQL Problems and Solutions

- SQL Problems and Solutions is an interactive textbook which lets you visualize tables and execute queries against a sample database. The tutorial explains the basic concepts and constructs of SQL and provides examples at various levels of expertise.
- Once you get familiar with SQL, you can practice your skills on the sister site "SQL Exercises". Here you can build and test your SQL DML statements: there are exercises for retrieving and modifying data using the SELECT, INSERT, UPDATE, and DELETE statements.

You can read the entire textbook without registration, but if you'd like to write your own queries in the interactive SQL console and execute them against sample databases, you'll need to sign up with your email address.

9. Tuts+ – "SQL for Beginners"

- Tuts+ offers video courses and written tutorials that teach a wide range of creative and technical skills, including coding. Unlike video courses, all tutorials and articles are completely free. Based around specific projects, they include step-by-step written instructions and screenshots to help you practice and master your skills.
- Among over 20,000 free tutorials, there's a pretty good one that teaches SQL. In fact, this is more of an article than tutorial. It consists of two parts: "SQL for Beginners" and "SQL for Beginners Part 2." The first article includes an easy-to-grasp explanation of basic SQL queries, complete with many screenshots.

In the second article, users learn about indexes, data types, and some rather more complex query structures.

Both articles are available without registration.

10. **Essential SQL**

- Essential SQL, authored by Kris Wenzel (@sqlkris), is a great place to learn the fundamentals of SQL and database concepts. The course is based on Microsoft SQL Server, which is why the author provides newbie users with a guide on how to get started using this database engine.
- The tutorial presents free tools to get you started, a guide leading you through the setup process, step-by-step explanations of how to download and activate a sample database, and much more. You'll get to know how to create simple select and sort queries, introduce yourself to SQL Server's built-in function, learn how to normalize your database, and much more.
- An especially great thing with Essential SQL is that Kris is personally involved in the teaching process. When there are problems or doubts, he strongly encourages readers to contact him.
- A significant drawback of this course is its lack of a structured learning program. It's more an extensive collection of articles covering a wide range of SQL-related topics than a step-by-step tutorial.

Most of the articles are available without registration; however, some content requires users to sign up with an email account.

11. **Learn SQL The Hard Way**

12. **Udemy – SQL Tutorials**

13. **MySQL Tutorial**

14. **SQLCourse**

15. **Database Journal**

16. **Guru99**

17. **SQL for Web Nerds**

18. **Stanford Database Course**

Recommended SQL Books for Further Reading

1. Beginning SQL Queries: From Novice to Professional by Clare Churcherss
2. Joe Celko's SQL Puzzles and Answers, Second Edition
3. Head First SQL: Your Brain on SQL -- A Learner's Guide