A Comprehensive Beginners Guide to SQL 2020

The world is dominated by data. Healthcare centers produce it, manufacturing facilities are run with it, and enterprises make business decisions from them. This is why the highest paid jobs in tech all revolve around managing data, securing data or understanding the science behind data. But before being able to reap the rewards of the data being produced, it must first be managed and understood. Structured Query Language (SQL) provides the opportunity to do so.

SQL is a language that allows communication with databases when the need to manage the data they store or contain comes up. This means anyone interested in managing data must have an understanding of the communication languages databases understand in which SQL happens to be the most popular. This guide will be dedicated to explaining SQL and its application in database management making it the place to start in your journey to SQL mastery.

Index

What is SQL?

How is SQL Used?

The Industries Reliant on SQL

Database Systems You Should Know

Top 5 Books for Learning SQL

Why Learn SQL with Tutorial 45?

Getting Started with SQL

What is SQL?

The question 'what is SQL' takes us right to the beginning and it's important to grasping its features and use. As you already know, the acronym SQL represents Structured Query Language. SQL is a programming language or a command language that allows developers, programmers, and analysts to work with data. More on why we called it a command language will be provided in the following paragraphs.

SQL was developed by a team of engineers led by Donald Chamberlain and Raymond Boyce at IBM in 1970. The aim was to create a more powerful domain-specific language to manipulate the data within

IBM's early relational database management system. As with most things, the earliest model was termed Structured English Query Language (SEQUEL) before settling to SQL. SQL was designed as a domain-specific language which allowed it to manipulate databases using command lines. This was because early databases were not provisioned to understand app programming languages such as python.

Thus, SQL and other domain-specific languages remain the benchmark for manipulating the data in databases. It is a fact that you will be required to learn SQL if you intend to participate or build a career in any data-related field. With that being said, SQL like other programming languages has its own language elements and features. One important feature is its use of tables and queries. Here, table results refer to a list of rows and columns that represent or consist of queried data sets.

SQL is also divided into several language elements which also define how the language functions and can be applied to manipulating a database. These language elements include the following:

- Clauses – clauses are constituent components of statements and queries
- Expressions – These produce values in diverse formats such as scalar values or tables consisting of rows and columns of data as previously explained.
- Predicates – These are used to specify conditions that can be evaluated by SQL. Examples of these conditions include limiting the effects of statements and queries.
- Queries – These are used to retrieve the data within a database according to some specified criteria. This makes queries one of the more important elements of SQL.
- Statements – statements are used to control transactions, program flow, and sessions in diverse ways. They generally have persistent effects on data when used.

It is important to note that unlike traditional programming languages used in building applications, SQL is different. While these programming languages are procedural and are used for app creation through blocks of code, SQL is a declarative language used for creating and manipulating databases using commands. Some of the popular SQL commands you will consistently use include:

- CREATE DATABASE – As its name suggests, the command line is used in creating a new database.
- CREATE TABLE – This is used for creating tables which consist of rows and columns of data
- SELECT – This is used to find and extract data from databases
- UPDATE – This is used to make adjustments and edit data.
- DELETE – This is designed for deleting specific data from a database

Other commands are more complicated and are used in achieving more complex demands than these common ones outlined here. As commands in SQL go, these should be seen as simplistic examples used in making an impression. But you have to start from somewhere, right?

How is SQL Used?

The above commands and queries are used to define how SQL is used to manipulate databases. A quick example of how to use a command line can be seen below. Here, an attempt to create a new database using the command previously highlighted should help. The process is:

CREATE DATABASE name_of_a_databse – This command line creates a new database titled name_of_a_databse or any other name you choose.

You can also choose to create multiple databases that serve diverse needs. For example, an application like Twitter can have multiple databases to cater to its users and their sensibilities. The Twitter database may include the following; Users, User Lists, and Location. As you can already tell, the User database consists of the names or identification details used in defining users. Lists refer to the lists created by each user to navigate Twitter while location stores the geopolitical zones or locations users tweet from.

These are basic examples of how SQL is used. SQL is capable of more complex database manipulations such as ordering tables and analyzing data sets. To accomplish complex tasks, more technical knowledge on how it is used is required.

The Industries That Rely on SQL

Now, is probably the time to introduce databases into the discussion. A database is an organized collection of data stored and accessed digitally within a computer system. Also, a relational-database refers to a digital database based on the relational model of collected data which is also stored and accessed within a computer system.

Every industry produces data and the widespread adoption of information technology has also led to the use of electronic databases in every industry. Thus, any industry that produces data currently makes use of databases that must be manipulated and managed to receive some insight which means they rely on SQL. This is also one reason why SQL professionals within data-related fields are highly sought after.

A discussion on all industries making use of databases will be exhaustive, so here is an outline of the top industries that rely on databases and SQL to function properly.

I. **The Financial Sector** – According to research by [Market Watch](), the banking and finance industry relies heavily on data and the technological tools that drive it. This includes SQL and database. Putting the tools that drive the financial sector such as apps, and payment processors into perspective, this provides some insight into why the industry relies on SQL.

   The billions of transactions that occur in minutes within the finance industry, as well, as the billions using financial services produce big data sets that must be managed. This is why the finance industry relies on SQL and order compliance and regulatory standards that ensure security while manipulating databases.

II. **The Retail/E-Commerce Sector** – Large retail enterprises such as Ali Express, Amazon, and E-bay produce big data that require extensive analytics to enable the real-time services that drives the retail sector. Both small and large retail enterprises with digital storefronts also make use of e-commerce applications and the data they produce plays an important role in determining the success of the retail industry. Thus, the retail industry relies heavily on SQL and its abilities to manipulate and manage data.

III. **Healthcare Sector –** The healthcare industry also consists of billions of people, millions of applications handling billions of transactions on a daily basis. This means the data it produces must be accurately processed and managed due to the sensitive nature of the healthcare industry. Here also, SQL and databases play an important role in supporting the services doctors, nurses, pharmacist, and other professionals within the healthcare industry provide.

IV. **The Manufacturing Sector** – The manufacturing industry is vast and it consists of enterprise producing a product for sale. This includes the automation industry, aviation, discrete manufacturers etc. All players within the manufacturing sector produce large data sets which have seen the adoption rate of data analytics increase within this sector.

   Databases are needed to manage the data produced by the manufacturing industry and SQL plays an important role in managing the data.

This highlights the top four industry that relies on SQL to manipulate the vast amount of data they produce daily. It also goes without saying that these industries offer job opportunities to experienced SQL users due to the constant demand for data management.

Database Systems You Should Know

Database systems is a software that supports the creation, storage, definition, and manipulation of data. The system provides enterprises with a centralized point or platform to perform diverse data operations using languages such as SQL. Database systems also consist of templates, builders, and other tools needed to automate the management of database systems.

Today, most of the popular database systems are proprietary software managed and serviced by leading enterprises. According to Statista, the top database management systems by market share include the following:

1. Oracle – Statistics put Oracle's database management systems as the most popular SQL database system currently in use. Oracle is used across the aforementioned industries and industries that deliver online transactions rank high up the ladder of enterprises that make use of Oracle's database management systems. The tech giant has dominated the relational –database management system space since its inception approximately 43 years ago.
   Its value proposition is seamless hardware and software that deliver an excellent database management platform. It also integrates the cloud to scale its databases and application processes.
2. MYSQL – MYSQL is one of the few open-source database systems that make the list of popular databases used by enterprises. The fact that it comes with no license fees makes it the most popular database management system for SMEs and individuals looking for affordable database solutions. It also provides an excellent platform for beginners to learn the basics of database management with SQL. It is important to note that MySQL is an offshoot of Oracle and it serves as the open-source version that delivers a reliable interface for developers.
3. Microsoft SQL Server – This is an industry-standard database management system that has carved a sizeable market share for itself. Its primary objectives are for storing and retrieving data and SQL is used to handle the data manipulation process. SQL Server can be used to manage workloads from small single-machine applications, as well as, larger internet-facing applications. This means it is commonly used by SMEs and large enterprises who are interested in relying on its versatile deployment processes. SQL server can be provisioned for use through the cloud or on-premise.
4. POSTGRESQL – This database management system is another open-source database management system competing with MySQL. It is also widely used by SMEs and individuals to

manage data. It is an object-relational database management system that emphasizes on extensibility and standards –compliance. POSTGRESQL is developed and maintained by the POSTGRESQL Global Development Group to run on multiple platforms or operating systems which includes Linux and Windows. It provides aspiring developers with the tools needed to explore database management and SQL.

5. MongoDB – MongoDB is also open-source and a cross-platform document-oriented database management system. This means it can run over multiple servers and operating systems while delivering its services. MongoDB is widely used by smaller companies as its document-oriented database is easier to use than full scale relational-database systems offered by more established database service providers.

6. IBM DB2 – No list about databases will be complete without including IBM's DB2. This system is an industry standard database management systems that consist of both object-relational and non-relational structures. IBM also bills its database system as one that integrates artificial intelligence to support cognitive applications. The database system is highly reliable and secure which makes it a favorite for enterprises that provide online transaction processing services.

7. Apache Cassandra – Apache Cassandra was originally developed to power Facebook's in-box search features for the millions of users on Facebook. Its success led to its deployment as an open-source database management system for in-memory applications. It can handle large data sets from commodity servers while allowing low latency operations for its users. The database management system is used extensively by SMEs and a few large enterprises.

Top 5 Books for Learning SQL

Mastering SQL requires extensive study and practice with SQL. There are diverse books that you can use to start the process of mastering SQL. These books generally provide instructions about the fundamentals of SQL elements and queries. The books also help developers navigate through common mistakes using practical examples and practice questions as teaching tools. To start learning SQL, you can choose to use any of the following books:

- SQL Quick Start Guide: The Simplified Beginners Guide to SQL – This guide is an extensive guide that ensures you understand SQL using simple exercises that introduce data programming to you. Each chapter introduces a different aspect of SQL and leads you on to advanced topics that

involve actually managing databases with SQL. It also introduces you to diverse SQL syntaxes, troubleshooting SQL programs and other challenges beginners are expected to come across.

- Getting Started with SQL – The getting started guide takes a hands-on approach to imparting knowledge about SQL to its reader. This means you can expect tones of practice questions and examples that introduce you to the complexities of SQL programming. You will also learn the basics of SQL and progress to more advanced concepts as you progress through the chapters in the book.
- Sam's Teach Yourself SQL in 10 Minutes – This book by Ben Forta is an excellent resource for learning SQL programming and database management. The premise behind the book is that it intends to speed up your learning process and it delivers on that. The book consists of practical examples that intend to teach you about programming with SQL in a concise manner.
- SQL CookBook: Query Solutions and Techniques for Database Developers – This cook book covers the functions and features of popular database management systems such as Oracle, SQL Server, and IBM DB2. It imparts knowledge through the use of examples and practical questions that relate to the diverse database management systems covered in the book.
- SQL for Dummies Cheat Sheet– If you are a fan of the dummy series, then SQL for dummies may just be the book you need to learn the basics of SQL programming. The dummies series also comes with spin-offs such as the SQL for Dummies Cheat Sheet. The Cheat Sheet book consists of several tables, list, queries, and information that are constantly used when working with SQL.

Note that these books are not free but come at an affordable cost. You can also choose to make use of free online SQL tutorials to learn the basics of SQL programming.

Online Tutorials for Learning SQL

Not everyone likes making use of books as learning tools and if video instructions are your thing, then Tutorial 45's SQL fundamental tutorials is an excellent tool for mastering SQL programming. The tutorials consist of multiple videos that introduce you to using SQL as a database management tool and its application within database systems.

Making use of these tutorials provides you with a 360 view into SQL's features in real-time. This means you can see how command lines actually function and the queries or results they provide. You can also take advantage of the practice questions that come with this tutorial to advance your knowledge of SQL

programming. You can also ask for help from the SQL experts who designed the tutorial when you come across challenging topics or concepts you need further clarifications on.

Other online resources such as reedit forums, and Quora provide support systems for building your experience with using SQL. Although these forums do not actually teach the use of SQL, they provide extensive real-life experiences that can help you start and grow your career as a database manager or analyst. So, bookmarking related SQL topics within these social media learning platforms is recommended.

Getting Started with SQL

According to a [Robert Half survey](#), the top 5 paying jobs in IT are related to database management or securing data in one form or the other. This is one reason why now is a great time to start learning the basics of SQL. We recommend that you use this beginner's guide to discover the resources needed to get started with SQL.

The best way to accelerate your SQL learning is actually studying and immediately putting what you learnt into practice. You can make use of open-source tools to create databases of your music play lists, novels or other simple lists. Get started today with the tutorial videos and build experience by practicing everything you are thought and this will help you gain a competitive advantage for kick starting a new career in 2020.