

# # SQL - L1(Level-1)

## ## Q&A DLC :-----:

1. Who is often credited with inventing SQL?
  - **SQL (Structured Query Language) was first developed in the early 1970s at IBM by a team led by \*\*Donald D. Chamberlin\*\* and \*\*Raymond F. Boyce\*\*. The original name of the language was SEQUEL, which stood for "Structured English Query Language". However, the foundational concept for SQL, the relational data model, was proposed by \*\*Dr. Edgar Frank (Ted) Codd\*\*, an English computer scientist employed at IBM. His work started the era of relational databases in computer science. Therefore, while Chamberlin and Boyce developed SQL, Codd's contributions were fundamental to its inception.**
2. In what year was SQL first developed?
  - **SQL was first developed in the early 1970s at IBM by a team led by Donald D. Chamberlin and Raymond F. Boyce. The original name of the language was SEQUEL, which stood for "Structured English Query Language".**
3. What company developed the first version of SQL?
  - **The first version of SQL was developed by IBM. The development was led by a team that included Donald D. Chamberlin and Raymond F. Boyce in the early 1970s.**
4. What was the original name of SQL?
  - **The original name of the language was SEQUEL, which stood for "Structured English Query Language".**
5. What programming language influenced the creation of SQL?
  - **SQL was inspired by the relational model proposed by Edgar F. Codd in 1970. In fact, Codd proposed two different languages for the relational model: relational algebra and relational calculus (also known as the language Alpha). Both of these languages used mathematical notation with quantifiers and various mathematical operators. These concepts influenced the creation of SQL. However, SQL is a set-**

based, declarative programming language, not an imperative programming language like C or BASIC.

6. When was the first commercial implementation of SQL released?
- **The first commercially available implementation of SQL was released in 1979 by Relational Software, Inc., which is now known as Oracle.**

7. What was the initial purpose of SQL when it was created?
- **SQL was designed for a specific purpose: to query data contained in a relational database. SQL stands for Structured Query Language and it lets you access and manipulate databases. Here are some of the things SQL can do:**

- **Execute queries against a database**
- **Retrieve data from a database**
- **Insert records in a database**
- **Update records in a database**
- **Delete records from a database**
- **Create new databases**
- **Create new tables in a database**
- **Create stored procedures in a database**
- **Create views in a database**
- **Set permissions on tables, procedures, and views**

Although SQL is an ANSI/ISO standard, there are different versions of the SQL language. However, to be compliant with the ANSI standard, they all support at least the major commands (such as SELECT, UPDATE, DELETE, INSERT, WHERE) in a similar manner.

8. What were some of the early versions of SQL called?
- **The early versions of SQL were known by different names:**
  - **The first SQL standard was SQL-86, published in 1986 by ANSI and ISO. This version of the SQL standard is also known as SQL 1.**
  - **The next SQL standard was SQL-89, published in 1989. This was a minor revision of the earlier standard, a superset of SQL-86 that replaced SQL-86.**
  - **The first commercially available implementation of SQL was Oracle V2, released in 1979 by Relational Software.**
  - **The first Microsoft SQL Server product was SQL Server 1.0, launched in 1989 for the OS/2 operating system.**
  - **SQL Server 4.2 was shipped in 1992, bundled with OS/2 version 1.3, followed by version 4.21 for Windows NT, released alongside Windows NT 3.1.**

9. In which decade did SQL become a standard?

- **SQL became a standard in the 1980s. The first SQL standard was SQL-86, published in 1986 by ANSI and ISO. This version of the SQL standard is also known as SQL 1.**

10. What organization standardized SQL?

- **SQL was standardized by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO).**

11. When was SQL first standardized?

- **SQL was first standardized in 1986 by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). This version of the SQL standard is also known as SQL-86 or SQL 1.**

12. What are the three major categories of SQL statements?

- **SQL statements are traditionally divided into several categories, but the three major categories are:**
- **Data Definition Language (DDL): These statements can declare, rename, modify, or destroy objects in the database. Examples of DDL commands include CREATE, DROP, ALTER, TRUNCATE, COMMENT, and RENAME.**
- **Data Manipulation Language (DML): These statements can retrieve, insert, delete, or modify data values. Examples of DML commands include SELECT, INSERT, UPDATE, DELETE.**
- **Data Control Language (DCL): These statements specify discretionary access privileges and support concurrent access to the database by multiple users. Examples of DCL commands include GRANT and REVOKE.**
- **Different sources may categorize SQL statements differently. For example, some sources also mention Transaction Control Language (TCL) and Data Query Language (DQL) as separate categories.**

13. What was the primary motivation behind creating SQL?

- **The primary motivation behind creating SQL was to provide a simple and efficient way to interact with relational databases. SQL stands for Structured Query Language and it lets you access and manipulate databases. Here are some of the things SQL can do:**
- **Execute queries against a database**
- **Retrieve data from a database**
- **Insert records in a database**
- **Update records in a database**

- Delete records from a database
- Create new databases
- Create new tables in a database
- Create stored procedures in a database
- Create views in a database
- Set permissions on tables, procedures, and views
- SQL was designed to be a declarative language, which means that it describes what needs to be accomplished, not how to accomplish it. This is in contrast to imperative programming languages like C or BASIC, which require the programmer to specify exactly how to achieve the desired results.

14. How has SQL evolved over the years?

- SQL has evolved significantly since its inception in the 1970s. Here's a brief history of its evolution:
- 1970s: SQL was first developed in the early 1970s at IBM by a team led by Donald D. Chamberlin and Raymond F. Boyce. The original name of the language was SEQUEL, which stood for "Structured English Query Language".
- 1978: IBM worked to develop Codd's ideas and released a product named System/R.
- 1986: IBM developed the first prototype of relational database and standardized by ANSI. SQL became the part of the International Organization for Standardization (ISO).
- 1989: SQL-89 was introduced, which added support for transactions and triggers.
- 1992: SQL-92 was released, which was a major update to SQL.
- 1999: SQL-99 was introduced, which added support for object-relational databases, XML data, and user-defined data types.
- Over the next several decades, SQL evolved and expanded to include new features and capabilities. For example, the ANSI SQL-92 standard introduced support for triggers, stored procedures, and views<sup>1</sup>. The SQL:1999 standard added support for recursive queries and user-defined data types.
- In addition to these standardization efforts, SQL also saw the emergence of several popular open-source implementations of the language, such as MySQL and PostgreSQL. Oracle and Microsoft's implementations and commercial offerings are widely used today.
- In recent years, SQL has been complemented by new technologies such as NoSQL databases and big data platforms like Hadoop and Spark. These technologies are optimized for handling large amounts of unstructured data and distributed

computing, whereas SQL is optimized for structured data and single-machine computing.

- Despite the rise of these newer technologies, SQL remains a crucial tool for managing and manipulating relational databases. It is widely used in various industries, including finance, healthcare, and retail.

15. What are some of the key features introduced in SQL-92?

- **SQL-92, also known as SQL 2, introduced several new features to the SQL language. These include:**
- **Explicit JOIN syntax and the introduction of outer joins: LEFT JOIN, RIGHT JOIN, FULL JOIN.**
- **New data types defined: DATE, TIME, TIMESTAMP, INTERVAL, BIT string, VARCHAR strings, and NATIONAL CHARACTER strings.**
- **Support for additional character sets beyond the base requirement for representing SQL statements.**
- **New scalar operations such as string concatenation and substring extraction, date and time mathematics, and conditional statements.**

16. What role did IBM play in the development of SQL?

- **IBM played a significant role in the development of SQL. The language was first developed in the early 1970s at IBM by a team led by Donald D. Chamberlin and Raymond F. Boyce. The original name of the language was SEQUEL, which stood for "Structured English Query Language".**
- **In 1978, IBM worked to develop Edgar F. Codd's ideas and released a product named System/R. This was one of the first systems to implement SQL, which helped popularize the language.**
- **IBM also contributed to the standardization of SQL. The first SQL standard, known as SQL-86 or SQL 1, was published in 1986 by ANSI and ISO. This standardization helped establish SQL as the de facto language for relational databases.**
- **So, IBM's contributions were instrumental in both the creation and popularization of SQL.**

17. When did SQL start gaining popularity outside of academia and research?

- **SQL was adopted as a standard by the American National Standards Institute (ANSI) in 1986 and the International Organization for Standardization (ISO) in 1987. This standardization likely played a significant role in its adoption outside of academia and research. However, it is important to note that the first commercially available implementation of SQL was released by Relational**

Software, now known as Oracle, in 1979. This suggests that SQL was being used in industry settings even before its standardization.

18. What are the differences between SQL and other query languages of its time?

- **SQL, or Structured Query Language, was designed to interact with relational databases and has become the standard for such operations<sup>1</sup>. Here are some differences between SQL and other query languages of its time:**
- **SQL vs T-SQL: SQL is an open-source query language, while T-SQL is owned and maintained by Microsoft. SQL is used for Data Manipulation Language (DML) and Data Definition Language (DDL) commands. But in the case of T-SQL, you can use triggers, views, and functions which all are called T-SQL objects.**
- **SQL vs MySQL: SQL is a structured query programming language that manages the relational database management system. It supports only a single storage engine for different operations. MySQL, on the other hand, is a relational database management system that uses SQL. It supports different storage engines for different functions and operations.**
- **SQL vs PL/SQL: SQL is a Structural Query Language created to manipulate relational databases. It is a declarative, detail-oriented language. Whereas, PL/SQL is a Procedural Language/Structured Query Language that uses SQL as its database. It is an application-oriented language.**
- **It is important to note that while there are differences between these languages, they all serve the purpose of managing and manipulating data in databases.**

19. Who were some of the early contributors to the development of SQL?

- **The development of SQL was a collaborative effort involving several key contributors. Here are some of the early contributors to the development of SQL:**
- **Donald D. Chamberlin: Chamberlin was one of the key developers of SQL at IBM. He worked on the System R project, which was one of the first systems to implement SQL.**
- **Raymond F. Boyce: Boyce was another key developer of SQL at IBM. He worked with Chamberlin on the development of SQL.**
- **Dr. Edgar Frank (Ted) Codd: While Codd did not directly develop SQL, his work on the relational model was fundamental to its inception. Codd was an English computer scientist employed at IBM, and his work started the era of relational databases in computer science.**

- These individuals played significant roles in the creation and development of SQL, contributing to its evolution into the standard language for managing and manipulating relational databases.

20. What are some of the notable SQL-based database management systems that emerged in the 1970s and 1980s?

- **Several notable SQL-based database management systems emerged in the 1970s and 1980s:**
- **IBM's DB2:** DB2 became the flagship database product for IBM.
- **Oracle Database:** Released in 1979 by Relational Software, now known as Oracle Corporation<sup>1</sup>. Oracle brought the first commercial relational database to market.
- **Ingres:** This is the predecessor of the PostgreSQL database. Ingres used a query language known as QUEL, and it led to the creation of systems such as Ingres Corp., MS SQL Server, Sybase, Wang's PACE, and Britton-Lee.
- **System R:** Created at IBM San Jose, System R used the SEQUEL query language, and it contributed to the development of SQL/DS, DB2, Allbase, Oracle, and Non-Stop SQL.
- **DB2, SAP Sysbase ASE, and Informix:** These followed after Oracle brought the first commercial relational database to market in 1979.
- **These systems played a significant role in the commercial success of relational databases and the widespread adoption of SQL.**

~~~~~**END OF ASSIGNMENT**~~~~~

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