# School of Computer Science and Information Technology

# Department of Computer Science and Information Technology

## Semester:  III

## Specializing: Data Analysis

## 23BCA3C01L : Database Management System (DBMS)

## Activity 1

## Online Certification Courses

**Date of Submission:     Sep 2024**

**Submitted By:**

**Name: Bharath K**

**USN No: 23BCAR0252**

**Signature: _____**

**Faculty In Charge**

**Dr. Santhalakshmi M**

**This is to certify that <u>Bharath K</u> has satisfactorily completed activity prescribed by JAIN (Deemed to be University) for the third semester degree course in the year 2024-2025.**

**Assignment topic Online Certification Courses for Activity-1**

| Sl. No. | CRITERIA | MARKS | MARKS OBTAINED |
|---------|----------|-------|----------------|
| 1. | On-time submission | 10 | |
| 2. | Learning Outcomes | 15 | |
| 3. | Report with course details and assessment | 15 | |
| 4. | Viva | 10 | |
| | Total | 50 | |
| | Converted | 15 | |

| MARKS | |
|-------|--|
| **Max** | **Obtained** |
| 15 | |

**Signature of the student: _____**

_____

**Signature of the Faculty**

Bharath K                                23BCAR0252                                Section D

# INDEX

# Chapter 1

# The Structured Query Language (SQL)

| S. No. | Heading | Value |
|---|---|---|
| 1. | Course Title | The Structured Query Language (SQL) |
| 2. | Course Duration | 26 hours (approximately) |
| 3. | Course start Date | 20 Aug 2024 |
| 4. | Course End Date | 2 Sep 2024 |
| 5. | Names of Creators | Alan Paradise |
| 6. | Skills gained | 1. SQL query writing<br>2. Using SQL JOINs<br>3. Data aggregation techniques<br>4. Table creation and modification<br>5. Implementing data constraints |
| 7. | Unique Learning Outcomes | 1. Historical context of SQL<br>2. Relational algebra fundamentals<br>3. Practical use of subqueries<br>4. Handling complex data scenarios<br>5. Real-world SQL application examples |

# Detailed Description of Course

As part of my academic coursework, I undertook a comprehensive online SQL course designed to provide an in-depth understanding of SQL (Structured Query Language) and its practical applications in managing and querying relational databases. This course was structured into six modules, each focusing on a specific area of SQL, starting from its origins and foundational concepts to advanced techniques and real-world applications. Below, I present a detailed account of each module, outlining the topics covered, the skills acquired, and the unique learning outcomes.

## 1. Introduction to SQL and Its Origins

The course began with an introductory module that set the stage for understanding SQL's significance and its role in the world of databases. This module was instrumental in providing historical context, explaining how SQL emerged as a powerful language for database management. We delved into the origins of SQL, exploring how it was developed in the early 1970s by IBM and how it has evolved to become the standard language for interacting with relational databases.

One of the key areas covered in this module was relational algebra, the mathematical theory that forms the foundation of SQL. Understanding relational algebra was crucial as it provided a theoretical basis for understanding how SQL queries operate at a fundamental level. The module also introduced the concept of the SQL Standard, highlighting how SQL has been standardized over the years to ensure consistency and compatibility across different database systems.

**Videos and Readings:** This module included a series of videos totaling 66 minutes, along with two readings. The videos were informative, providing a thorough overview of the course, the instructor's background, and the key concepts to be covered. The readings focused on academic credit opportunities and support resources for the course.

**Quizzes and Discussions:** Three quizzes helped reinforce the learning, focusing on the evolution of SQL, understanding relational algebra terms, and the basics of SQL query execution. Additionally, two discussion prompts encouraged students to introduce themselves and reflect on the material covered in the module.

**Key Learning Outcomes:** From this module, I gained a strong foundational understanding of SQL's origins, the theoretical principles of relational algebra, and the development of SQL standards. This knowledge provided a solid framework for the more practical aspects of SQL covered in subsequent modules.

## 2. Basic SQL Queries Using the SELECT Statement

The second module was dedicated to one of the most fundamental aspects of SQL: the SELECT statement. This module emphasized the importance of retrieving data from databases, a critical function for any database user or administrator. We started by learning how to write simple SELECT statements to extract data from a single table. As the module progressed, we explored various clauses that can be used in conjunction with the SELECT statement to refine and control the output.

The WHERE clause was introduced as a tool for filtering data based on specific conditions. This allowed us to narrow down the results of our queries to only those records that met certain criteria. We also learned about the ORDER BY clause, which enables sorting of query results in ascending or descending order, and the DISTINCT keyword, which helps eliminate duplicate records from the output.

Another critical aspect of this module was handling special data types, particularly dates and NULL values. SQL's approach to managing dates and handling missing or undefined data (represented by NULL) was covered in detail, providing a practical understanding of how to write queries that deal with these common data challenges.

**Videos and Readings:** This module included five videos totaling 83 minutes, covering topics such as the Coursera lab environment, the basic SELECT clause, the WHERE clause, ORDER BY and DISTINCT, and handling dates and NULLs. Six readings, including lab exercises and their solutions, provided additional practical experience and guidance.

**Quizzes and Labs:** Five quizzes tested our understanding of the SELECT statement and its various components, with specific quizzes unlocking lab solutions for additional practice. An ungraded lab on the pgAdmin environment provided hands-on experience in writing and executing SQL queries.

**Key Learning Outcomes:** This module significantly enhanced my ability to write and execute SQL queries using the SELECT statement. I gained a practical understanding of how to filter, sort, and manage data effectively, which is essential for any data analysis task. The hands-on labs provided valuable experience in working with real databases, further solidifying my understanding of these concepts.

## 3. Advanced Data Aggregation with GROUP Functions

Building on the basics of the SELECT statement, the third module introduced more advanced data aggregation techniques using GROUP functions. Aggregation is a powerful feature of SQL that allows users to summarize and analyze data. In this module, I learned about five essential group functions: COUNT, SUM, AVG, MIN, and MAX. These functions enable users to perform calculations on data sets, such as counting the number of records, calculating sums, finding averages, and identifying minimum or maximum values.

The concept of the GROUP BY clause was central to this module. GROUP BY allows users to group rows that have the same values in specified columns into summary rows. This is particularly useful for generating reports and insights from large datasets. We also explored how to use HAVING, a clause that filters groups after they have been formed by GROUP BY, providing additional control over the results of aggregated queries.

In addition to group functions, the module introduced the concept of subqueries, which are queries nested inside other queries. Subqueries can be used to perform complex data retrieval operations, allowing users to build more sophisticated and dynamic queries.

**Videos and Readings:** The module featured three videos totaling 48 minutes, focusing on the five group functions, creating totals and subtotals, and the different forms of subqueries. Four readings included lab exercises on using GROUP BY and practicing subqueries, along with solutions for reference.

Quizzes: Six quizzes tested our understanding of using group functions, differentiating types of subqueries, and applying the rules for using these features effectively.

**Key Learning Outcomes**: This module provided a deep understanding of data aggregation using SQL. I learned how to use group functions to generate meaningful summaries and insights from data. The introduction to subqueries expanded my ability to write complex SQL statements, enhancing my overall SQL proficiency.

## 4. Joining Tables with SQL JOINs

The fourth module focused on one of the most powerful features of SQL: the ability to join tables. In relational databases, data is often spread across multiple tables, and joining these tables is essential for combining related data. This module covered various types of joins, including INNER JOIN, LEFT OUTER JOIN, RIGHT OUTER JOIN, and FULL OUTER JOIN. Each type of join serves a different purpose and can be used to combine data in specific ways.

The module also covered the concept of a Cartesian product, which occurs when every row from one table is combined with every row from another table, leading to potentially large and unmanageable result sets. We learned how to avoid Cartesian products by using proper join conditions. Additionally, the module discussed scenarios where OUTER JOINs are needed, allowing us to include rows from one table that do not have matching rows in another table.

**Videos and Readings:** Four videos totaling 45 minutes provided a detailed explanation of join syntax, three-way joins, Cartesian products, and the use of outer joins. Four readings included lab exercises on inner and outer joins, with solutions to reinforce learning.

**Quizzes and Discussions:** Five quizzes tested our understanding of joins, join conditions, and the potential errors that can arise from incorrect join usage. A discussion prompt encouraged students to reflect on their experiences with joins and share insights.

**Key Learning Outcomes:** This module taught me how to effectively join tables, a crucial skill for working with relational databases. I learned to write queries that combine data from multiple tables, enabling comprehensive data analysis. Understanding join types and conditions helped me avoid common errors and write more efficient queries.

## 5. Beyond SELECT: DDL and DML Statements

In addition to querying data, SQL also provides commands for defining and manipulating database structures. This module focused on Data Definition Language (DDL) and Data Manipulation Language (DML) statements, which are essential for managing database schemas and data.

We began by learning about the CREATE statement, which is used to create new database objects, such as tables, views, and indexes. The module covered the importance of specifying appropriate data types for columns to ensure data integrity and optimize storage. We also learned about database constraints, such as primary keys, foreign keys, and unique constraints, which enforce rules on data and maintain the integrity of the database.

The module also introduced the ALTER statement, which allows users to modify existing database objects. This includes adding or dropping columns, changing data types, and modifying constraints. Additionally, we explored DML commands: INSERT for adding new data, UPDATE for modifying existing data, and DELETE for removing data from tables.

**Videos and Readings:** Four videos totaling 54 minutes covered the CREATE statement, database constraints, using ALTER to modify structures, and performing data manipulation operations. Six readings provided detailed lab exercises on creating tables, modifying structures, and practicing DML commands, with solutions for reference.

**Quizzes:** Five quizzes tested our understanding of data types, constraints, and the use of DDL and DML commands.

**Key Learning Outcomes:** This module equipped me with the skills to define and manipulate database structures, an essential aspect of database administration. I learned how to create and modify tables, enforce data integrity, and manage data within the database. These skills are crucial for designing and maintaining robust database systems.

## 6. Advanced SQL Capabilities and Practical Applications

The final module of the course covered advanced SQL features and their practical applications. One of the key topics was the use of VIEWs, which allow users to create virtual tables representing the result of a SQL query. This concept is particularly useful for simplifying complex queries and enhancing database security by restricting access to specific data.

We also explored the CASE statement, which introduces conditional logic into SQL queries, allowing for more dynamic and customized outputs based on specific conditions. Another significant feature covered was the UNION operator, which combines the result sets of two or more SELECT statements into a single output, making it easier to compile data from multiple sources.

The module also addressed creating unique keys with IDENTITY, ensuring that each record in a table has a unique identifier, which is crucial for maintaining data integrity. The course wrapped up with a comprehensive lab exercise that synthesized all the skills learned throughout the course, providing a practical application of advanced SQL concepts.

**Videos and Readings:** This module included five videos totaling 37 minutes, covering topics like creating and using VIEWs, implementing the CASE statement, joining answer sets with UNION, and creating unique keys with IDENTITY. Seven readings provided detailed lab exercises, including a final lab that brought together all the concepts covered in the course.

**Quizzes and Peer Review:** Four quizzes tested our understanding of advanced SQL features, while a peer review assignment allowed us to reflect on our learning and provide feedback on our peers' work.

**Key Learning Outcomes:** This module equipped me with the skills to apply advanced SQL techniques in practical scenarios. I learned how to create and manage VIEWs, implement conditional logic with CASE statements, combine data with UNION, and ensure data integrity with unique keys. The final lab exercise and peer review provided an opportunity to consolidate my knowledge and apply it to real-world problems, rounding off a comprehensive and enriching learning experience.

# Table of Contents

## Table 1

## Comprehensive Module Distribution

| Module | Title | Description | Content | Duration | Learning Objectives |
|---|---|---|---|---|---|
| 1 | **Introduction to SQL** | Overview of SQL fundamentals | 5 videos, 2 readings, 3 quizzes, 2 discussion prompts | 121 minutes | Understand SQL basics, relational algebra, and query execution |
| 2 | **The SELECT Statement** | Retrieving data from databases | 5 videos, 6 readings, 5 quizzes, 1 discussion prompt, 1 ungraded lab | 386 minutes | Master SELECT statement, WHERE clause, and data handling |
| 3 | **GROUP Functions and Subqueries** | Advanced SQL concepts | 3 videos, 4 readings, 6 quizzes | 240 minutes | Understand GROUP functions, subqueries, and data aggregation |
| 4 | **JOINs** | Combining data from multiple tables | 4 videos, 4 readings, 5 quizzes, 1 discussion prompt | 227 minutes | Learn JOIN syntax, types, and applications |
| 5 | **SQL Statements:** | Advanced SQL statements | 4 videos, 6 readings, 5 quizzes | 287 minutes | Understand CREATE, ALTER, and DROP |

| Module | Title | Description | Content | Duration | Learning Objectives |
|---|---|---|---|---|---|
| | **Beyond the SELECT** | | | | statements, and data modification |
| 6 | **Advanced SQL Capabilities** | Final module covering advanced topics | 5 videos, 7 readings, 4 quizzes, 1 peer review, 1 discussion prompt | 340 minutes | Master advanced SQL concepts, including VIEWs, CASE statements, and UNION operators |

# Table 2

# Module 1 - Introduction to SQL and Its Origins

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| Overview of Course, Intro to Instructor | Video | 15 minutes | Course introduction | Understand course objectives and outline |
| The Origins of SQL | Video | 12 minutes | History of SQL | Learn SQL history and evolution |
| The Relational Algebra | Video | 8 minutes | Introduction to relational algebra | Understand relational algebra operations |
| The SQL Standard | Video | 9 minutes | Overview of SQL standards | Learn SQL syntax and data types |
| What Happens When I Execute a Query? | Video | 20 minutes | Query execution process | Understand query processing and results |
| Earn Academic Credit for your Work! | Reading | 10 minutes | Academic credit information | Familiarize yourself with course completion |
| Course Support | Reading | 10 minutes | Course support resources | Understand available resources and materials |
| Old, but Widely Used | Quiz | 5 minutes | SQL basics quiz | Assess knowledge of SQL history and basics |
| Understanding Relational Algebra Terms | Quiz | 5 minutes | Relational algebra quiz | Assess knowledge of relational algebra concepts |

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| SQL Query Execution Terms | Quiz | 5 minutes | Query execution quiz | Assess knowledge of query processing and SQL syntax |
| Introduce Yourself! | Discussion Prompt | 10 minutes | Introduction discussion | Engage with fellow students and instructor |
| Module 1 | Discussion Prompt | 5 minutes | Module 1 discussion | Discuss Module 1 topics and questions |

**Additional Details**

- Total Video Duration: 66 minutes

- Total Reading Duration: 20 minutes

- Total Quiz Duration: 15 minutes

- Total Discussion Prompt Duration: 15 minutes

# Table 3

## Module 2 - Fundamentals of SQL Queries

| Content | Type | Duration | Description | Learning Objectives |
|---|---|---|---|---|
| Our Coursera Lab Environment | Video | 11 minutes | Lab environment introduction | Familiarize yourself with lab environment |
| The Basic SELECT Clause | Video | 18 minutes | SELECT clause basics | Understand SELECT clause syntax and usage |
| The WHERE Clause and Conditions | Video | 21 minutes | WHERE clause and conditions | Learn WHERE clause syntax and conditions |
| The ORDER BY and DISTINCT | Video | 11 minutes | ORDER BY and DISTINCT clauses | Understand ORDER BY and DISTINCT clauses |
| How Does SQL Handle DATES and NULLS | Video | 20 minutes | Handling dates and nulls | Learn date and null handling in SQL |
| Lab 1: Coding Your First SELECT Statements | Reading | 60 minutes | Lab 1 instructions | Practice SELECT statement syntax |
| Lab 1: Solutions | Reading | 10 minutes | Lab 1 solutions | Review SELECT statement solutions |
| Lab 2: Adding Conditions Using the WHERE Clause | Reading | 60 minutes | Lab 2 instructions | Practice WHERE clause syntax |
| Lab 2: Solutions | Reading | 10 minutes | Lab 2 solutions | Review WHERE clause solutions |

| Content | Type | Duration | Description | Learning Objectives |
|---|---|---|---|---|
| Adjusting Your Output | Quiz | 10 minutes | Output adjustment quiz | Assess knowledge of output formatting |
| Unlock Lab 1 Solutions | Quiz | 1 minute | Lab 1 solutions unlock | Unlock Lab 1 solutions |
| Unlock Lab 2 Solutions | Quiz | 1 minute | Lab 2 solutions unlock | Unlock Lab 2 solutions |
| The Basic SELECT Statement | Quiz | 20 minutes | SELECT statement quiz | Assess knowledge of SELECT statement syntax |
| Module 2 | Discussion Prompt | 5 minutes | Module 2 discussion | Discuss Module 2 topics and questions |
| pgAdmin Lab Environment | Ungraded Lab | 60 minutes | pgAdmin lab environment | Practice SQL in pgAdmin environment |

**Additional Details**

- Total Video Duration: 83 minutes

- Total Reading Duration: 210 minutes

- Total Quiz Duration: 33 minutes

- Total Discussion Prompt Duration: 5 minutes

- Total Ungraded Lab Duration: 60 minutes

# Table 4

# Module 3 - Advanced Data Aggregation Techniques

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| The Five GROUP Functions | Video | 16 minutes | GROUP functions introduction | Understand GROUP functions and usage |
| Creating Totals and Subtotals | Video | 14 minutes | Creating totals and subtotals | Learn aggregate functions and grouping |
| SubQueries - Three Different Forms | Video | 17 minutes | Subqueries introduction | Understand subquery syntax and usage |
| Lab 4: Using the GROUP BY | Reading | 60 minutes | Lab 4 instructions | Practice GROUP BY clause syntax |
| Lab 4: Solutions | Reading | 10 minutes | Lab 4 solutions | Review GROUP BY clause solutions |
| Lab 5: Practice Using Subqueries | Reading | 60 minutes | Lab 5 instructions | Practice subquery syntax |
| Lab 5: Solutions | Reading | 10 minutes | Lab 5 solutions | Review subquery solutions |
| Using the Group Functions | Quiz | 10 minutes | GROUP functions quiz | Assess knowledge of GROUP functions |
| Understanding the RULES | Quiz | 10 minutes | Subquery rules quiz | Assess knowledge of subquery rules |
| Differentiating Types of Subqueries | Quiz | 10 minutes | Subquery types quiz | Assess knowledge of subquery types |

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| Unlock Lab 4 Solutions | Quiz | 1 minute | Lab 4 solutions unlock | Unlock Lab 4 solutions |
| Unlock Lab 5 Solutions | Quiz | 1 minute | Lab 5 solutions unlock | Unlock Lab 5 solutions |
| Group Functions and SubQueries | Quiz | 20 minutes | GROUP functions and subqueries quiz | Assess knowledge of GROUP functions and subqueries |

**Additional Details**

- Total Video Duration: 48 minutes

- Total Reading Duration: 140 minutes

- Total Quiz Duration: 52 minutes

**Table 5**

**Module 4 - SQL JOIN Operations and Table Relationships**

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| JOIN Syntax | Video | 13 minutes | JOIN syntax introduction | Understand JOIN syntax and usage |
| Three-Way JOIN | Video | 5 minutes | Three-way JOIN introduction | Learn three-way JOIN syntax |
| The Cartesian Product - an Easy Error | Video | 12 minutes | Cartesian product explanation | Understand Cartesian product and its implications |
| When an OUTER JOIN is Needed | Video | 13 minutes | OUTER JOIN introduction | Learn OUTER JOIN syntax and usage |
| Lab 6: Inner JOINS | Reading | 60 minutes | Lab 6 instructions | Practice INNER JOIN syntax |
| Lab 6: Solutions | Reading | 10 minutes | Lab 6 solutions | Review INNER JOIN solutions |
| Lab 7: Outer JOINS | Reading | 60 minutes | Lab 7 instructions | Practice OUTER JOIN syntax |
| Lab 7: Solutions | Reading | 10 minutes | Lab 7 solutions | Review OUTER JOIN solutions |
| Understanding JOINs | Quiz | 10 minutes | JOINs quiz | Assess knowledge of JOIN syntax and usage |

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| JOIN Conditions | Quiz | 10 minutes | JOIN conditions quiz | Assess knowledge of JOIN conditions |
| Unlock Lab 6 Solutions | Quiz | 1 minute | Lab 6 solutions unlock | Unlock Lab 6 solutions |
| Unlock Lab 7 Solutions | Quiz | 1 minute | Lab 7 solutions unlock | Unlock Lab 7 solutions |
| Joins | Quiz | 20 minutes | JOINs quiz | Assess knowledge of JOINs and their usage |
| Module 4 | Discussion Prompt | 5 minutes | Module 4 discussion | Discuss Module 4 topics and questions |

**Additional Details**

- Total Video Duration: 45 minutes

- Total Reading Duration: 140 minutes

- Total Quiz Duration: 42 minutes

- Total Discussion Prompt Duration: 5 minutes

# Table 6

# Module 5 - Data Definition and Manipulation Language

| Content | Type | Duration | Description | Learning Objectives |
|---|---|---|---|---|
| CREATE Statement - Data Types | Video | 13 minutes | CREATE statement introduction | Understand CREATE statement syntax and data types |
| Database Constraints | Video | 20 minutes | Database constraints explanation | Learn database constraints and their usage |
| Making Changes with the ALTER | Video | 9 minutes | ALTER statement introduction | Understand ALTER statement syntax and usage |
| Adding, Changing, Deleting Data | Video | 11 minutes | Data modification explanation | Learn data modification techniques |
| Lab 8: Creating Tables | Reading | 60 minutes | Lab 8 instructions | Practice CREATE statement syntax |
| Lab 8: Solutions | Reading | 10 minutes | Lab 8 solutions | Review CREATE statement solutions |
| Lab 9: Modifying Tables and Columns with ALTER | Reading | 60 minutes | Lab 9 instructions | Practice ALTER statement syntax |
| Lab 9: Solutions | Reading | 10 minutes | Lab 9 solutions | Review ALTER statement solutions |
| Lab 10: Practicing DML | Reading | 60 minutes | Lab 10 instructions | Practice data modification techniques |

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| Lab 10: Solutions | Reading | 10 minutes | Lab 10 solutions | Review data modification solutions |
| Understanding Data Types | Quiz | 10 minutes | Data types quiz | Assess knowledge of data types and usage |
| Unlock Lab 8 Solutions | Quiz | 1 minute | Lab 8 solutions unlock | Unlock Lab 8 solutions |
| Unlock Lab 9 Solutions | Quiz | 1 minute | Lab 9 solutions unlock | Unlock Lab 9 solutions |
| Unlock Lab 10 Solutions | Quiz | 1 minute | Lab 10 solutions unlock | Unlock Lab 10 solutions |
| DDL and DML | Quiz | 20 minutes | DDL and DML quiz | Assess knowledge of DDL and DML statements |

**Additional Details**

- Total Video Duration: 54 minutes

- Total Reading Duration: 210 minutes

- Total Quiz Duration: 23 minutes

**Table 7**

**Module 6 - Advanced SQL Functionalities and Practical Applications**

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| Creating and Using VIEWs | Video | 7 minutes | VIEWs introduction | Understand VIEWs syntax and usage |
| The CASE Statement | Video | 6 minutes | CASE statement introduction | Learn CASE statement syntax and usage |
| Joining Answer Sets with the UNION | Video | 5 minutes | UNION introduction | Understand UNION syntax and usage |
| Creating Unique Keys with IDENTITY | Video | 12 minutes | IDENTITY introduction | Learn IDENTITY syntax and usage |
| Wrap-Up | Video | 5 minutes | Course wrap-up | Review key concepts and takeaways |
| Lab 11: Using a VIEW | Reading | 60 minutes | Lab 11 instructions | Practice VIEWs syntax |
| Lab 11: Solutions | Reading | 10 minutes | Lab 11 solutions | Review VIEWs solutions |
| Final Lab | Reading | 90 minutes | Final lab instructions | Practice comprehensive SQL skills |
| Final Lab: Solutions | Reading | 30 minutes | Final lab solutions | Review comprehensive SQL solutions |

| Content | Type | Duration | Description | Learning Objectives |
|---------|------|----------|-------------|---------------------|
| Final Comprehensive SQL Reflection | Peer Review | 20 minutes | Final reflection assignment | Reflect on SQL skills and knowledge |
| Module 6 | Discussion Prompt | 5 minutes | Module 6 discussion | Discuss Module 6 topics and questions |

**Additional Details**

- Total Video Duration: 37 minutes

- Total Reading Duration: 270 minutes

- Total Quiz Duration: 13 minutes

- Total Peer Review Duration: 20 minutes

- Total Discussion Prompt Duration: 5 minutes

# CERTIFICATE



University of Colorado Boulder

COURSE CERTIFICATE

Sep 2, 2024

Bharath k

has successfully completed

The Structured Query Language (SQL)

an online non-credit course authorized by University of Colorado Boulder and offered through Coursera

Alan Paradise
Teaching Professor
Computer Science

Verify at:
https://coursera.org/verify/1DCQ7D77SI0H
Coursera has confirmed the identity of this individual and their participation in the course.

# Conclusion

As I reflect on my journey through this SQL course, I'm amazed at how much I've learned in such a short time. When I first started, the concept of relational databases seemed daunting, and writing SQL queries felt like deciphering a foreign language. Now, after completing all six modules, I feel a sense of accomplishment and confidence in my ability to work with databases.

The course structure, progressing from basic SELECT statements to advanced concepts like subqueries and JOINs, helped me build my skills gradually. I found the hands-on labs particularly valuable – there's nothing quite like the satisfaction of writing a complex query and seeing it return exactly the data you want!

I struggled initially with the concept of JOINs, especially understanding the differences between INNER and OUTER JOINs. However, the practical examples and clear explanations in Module 4 helped me overcome this hurdle. Now, I can confidently join multiple tables to extract meaningful insights from complex data structures.

One of the most eye-opening aspects of the course was learning about database design and management in Module 5. Creating tables, defining constraints, and understanding the importance of data integrity has given me a new appreciation for the work that goes into designing efficient databases.

The final module on advanced SQL capabilities tied everything together beautifully. Learning about VIEWS and the CASE statement opened up new possibilities for how I can work with and present data. I'm particularly excited to apply these concepts in my upcoming college projects.

This course has not only taught me SQL but has also changed how I think about data. I now find myself looking at everyday information – from online shopping catalogs to my university's course listings – and mentally organizing them into tables and relationships.

Looking ahead, I'm eager to apply my new SQL skills in real-world scenarios. I plan to start by optimizing the database for my department's student club, which I believe will significantly improve our event planning and member management processes. I'm also considering exploring more advanced database concepts, possibly delving into NoSQL databases to broaden my skill set further.

Overall, this course has been an invaluable stepping stone in my journey towards becoming a proficient data analyst. It's amazing to think that just a few weeks ago, I was intimidated by the thought of writing a simple SELECT statement, and now I'm confidently designing database schemas and writing complex queries. I'm excited to see where these new skills will take me in my academic and future professional career..

# Reference

1. **Course**:  https://www.coursera.org/learn/the-structured-query-language-sql

2. **Certificate:**  https://www.coursera.org/account/accomplishments/verify/1DCQ7D77SI0H