SQL | Assessment and project plan | 5 weeks

Project

Restoring the lifeblood of Maji Ndogo

At the heart of this project is the **water crisis** faced by a fictitious **country** called **Maji Ndogo**. In this project, we will dive deep into the intricacies of **using SQL to solve complex problems**.

This project **progressively challenges** us and offers **less guidance** as we progress, pushing us to **think critically**. By the end, we won't just have a **deeper understanding** of **SQL** but also a **blueprint** for how to **approach problems** in future missions.

We'll complete the **project over the five weeks** of the SQL module.

Assessments

This module includes **four summative assessments** related to the integrated project **Restoring the lifeblood of Maji Ndogo** and an additional summative assessment in the form of an MCQ exam.

Each week there will be an MCQ **assessment** based on the **work completed** that week. The MCQ tests will require you to **run**, **modify**, and **refer** to the **queries** that were **used** in that part of the project.

The **datasets** you'll need to complete the integrated project and compulsory MCQs can be downloaded from the **Download Additional Files** button on the integrated project **slides** on Athena.

Week	Content name	Context	Learning objectives and outcomes
Integrated project overview			
	Maji Ndogo: Restoring the flow, rebuilding hope (Integrated project introduction) [Video]	In this video, we are immersed in the world of Maji Ndogo and follow the call to action.	
	Integrated project: Starting the journey [Slides]	This slide deck introduces the format of the integrated project. We set out some goals to achieve at the end of the project and outline how to reach them.	
1	**Part 1 – Beginning our data-driven journey in Maji Ndogo**		
	Integrated project: Beginning our data-driven journey in Maji Ndogo (Part 1) [Slides]	In this first part of the integrated project, we dive into Maji Ndogo's expansive database containing 60,000 records spread across various tables. As we navigate this trove of data, we'll use basic queries to **familiarise** ourselves with the **content of each table**. Along the way, we'll also **refine some data using DML**.	Demonstrate the ability to **create** and **navigate through a new database**. Demonstrate the ability to **create** and **modify basic queries**. Demonstrate the ability to **use operators to create conditional filters**. Demonstrate an understanding of **operators** to **filter data with multiple criteria**. Demonstrate how to **use DML** and the **risks associated with changing a database.**
	Integrated project: Maji Ndogo part 1 [MCQ]	This MCQ will test your understanding of the basic queries covered in Part 1. **Number of questions:** 10 Revise the following week one SQL lessons: • SQL basics • Querying with SQL	

2	**Part 2 – Clustering data to unveil Maji Ndogo's water crisis**		
	Integrated project: Clustering data to unveil Maji Ndogo's water crisis (Part 2) [Slides]	In this second part of the integrated project, we gear up for a deep analytical dive into Maji Ndogo's water scenario. Harness the power of a wide range of **functions**, including **intricate window functions**, to tease out insights from the data tables.	Demonstrate an understanding of **SQL functions**. Demonstrate an understanding of how **SQL window functions** work and how to use them effectively. Demonstrate the ability to **use various functions** to **clean and analyse** data. Demonstrate an understanding of data **aggregation techniques**.
	Integrated project: Maji Ndogo part 2 [MCQ]	This MCQ will test your understanding of data aggregation and data analysis. **Number of questions**: 10 Revise the following lessons from week two of SQL: • SQL string, date, and miscellaneous functions • SQL numeric functions and aggregation • SQL window functions • Control flow functions	
4	**Part 3 – Weaving the data threads of Maji Ndogo's narrative**		
	Integrated project: Weaving the data threads of Maji Ndogo's narrative (Part 3) [Slides]	In this third part of the integrated project, we will pull data from **many different tables** and apply some **statistical analyses** to examine the consequences of an audit report that cross-references a random sample of records.	Demonstrate the ability to **retrieve data from multiple sources**. Demonstrate an understanding of the challenges associated with **joining multiple data sources together**.
	Integrated project: Maji Ndogo part 3 [MCQ]	This MCQ will test your knowledge of database structures and how to combine data from multiple sources. **Number of questions**: 10 Revise the following lessons from week three of SQL: • Entity-relationship data models	

		• Joins and set operations	
5	**Part 4 – Charting the course for Maji Ndogo's water future**		
	Integrated project: Charting the course for Maji Ndogo's water future [Slides]	In this final part of the project, we finalise our data analysis using the **full suite of SQL tools**. We will gain our final insights, use these to classify water sources, and prepare relevant data for our engineering teams.	Demonstrate the ability to **utilise filters**, **aggregations**, **functions**, **and joins together** in data analysis. Demonstrate an understanding of the **challenges faced in solving complex, real-world problems using SQL**. Demonstrate the ability to **use subqueries**, **CTEs**, and **views**.
	Integrated project: Maji Ndogo part 4 [MCQ]	This MCQ will assess your mastery of SQL by employing a comprehensive toolkit of query techniques. **Number of questions**: 10 Revise the following lessons in SQL: • SQL numeric functions and aggregation • SQL window functions • Joins and set operations • Optimising queries • Views • Normalisation	
5	**SQL exam**		
	SQL exam [Notebook]	In this final exam, we will be evaluated on our mastery of the **core principles of SQL**. The exam is designed to assess our ability to **apply SQL concepts and techniques to problems**.	Demonstrate the ability to write SQL queries to get data from one or more tables, including **filtering, sorting, and aggregating data**. Demonstrate an understanding of the principles of relational database design, including **creating tables, defining primary and foreign keys, and establishing**

	SQL exam [Dataset]	In this exam, we will be exploring **The Movie Database**. An online movie and TV show database, which houses some of the most popular movies and TV shows at our fingertips. The TMDb database supports 39 official languages used in over 180 countries daily and dates all the way back to 2008.	**relationships between tables.** Demonstrate proficiency in **joining tables** and **using subqueries and views to retrieve data from complex database structures.** Demonstrate an understanding of **database normalisation principles.**
	SQL exam [MCQ]	The exam will consist of a series of **multiple-choice questions** to gauge our understanding of SQL. **Number of questions**: 15 Revise all the lessons in SQL.	