Maji Ndogo: From analysis to action

Starting the journey

Maji Ndogo: From analysis to action

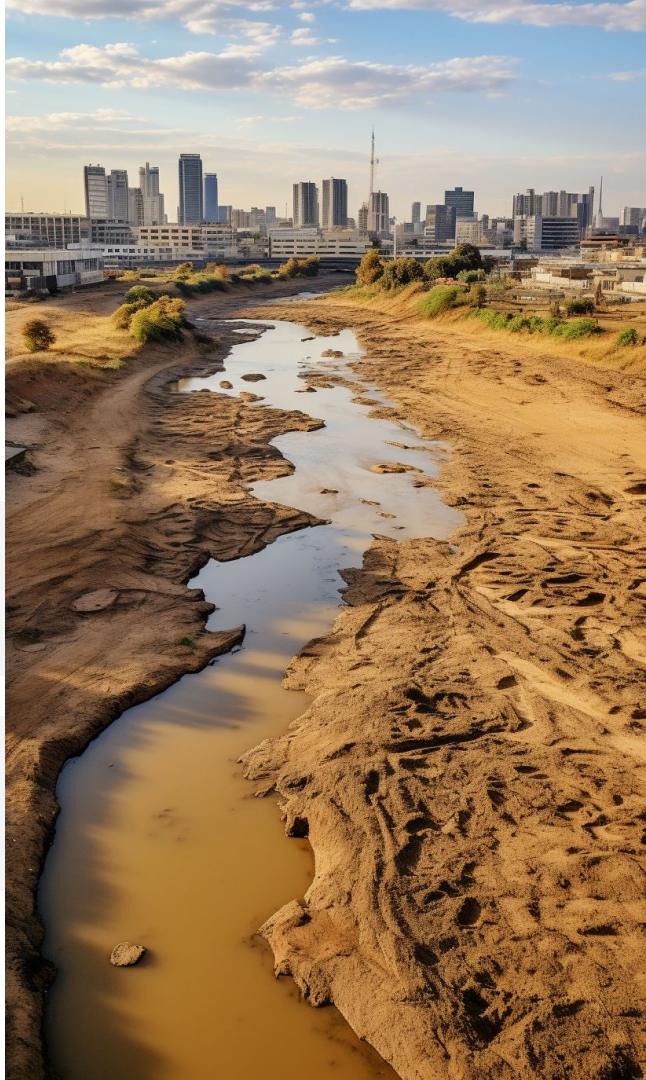
Welcome to Maji Ndogo

The story we'll step into is not unique to Maji Ndogo; it **mirrors real-world challenges** faced in many places across the globe.

Our mission is to help rejuvenate the drying *Mto wa Matumaini* – The River of Hope—using a data-driven approach.

Completing this mission won't just make you adept at SQL; it will **empower** you to tackle complex challenges, equipping you with highly desirable skills.

Large parts of this project were generated using AI. All characters and places are fictional but purposely designed.

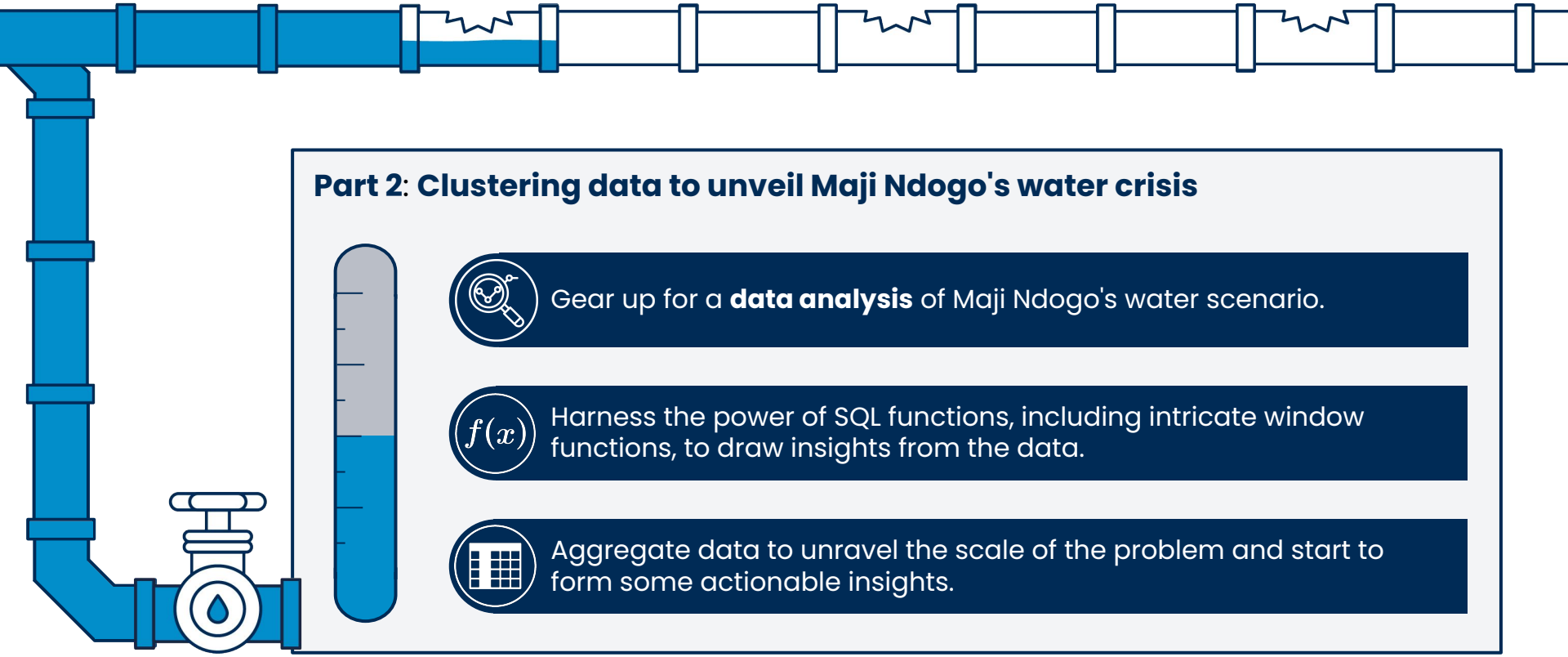


What will we be doing?

Part 1: Beginning our data-driven journey in Maji Ndogo

- Explore a realistic **database with SQL**.
- Use SQL to **clean** and **explore** a database with 60,000 unique records.
- Become immersed in a story-driven simulation of real data **projects**, **data analysis**, and **good leadership**.

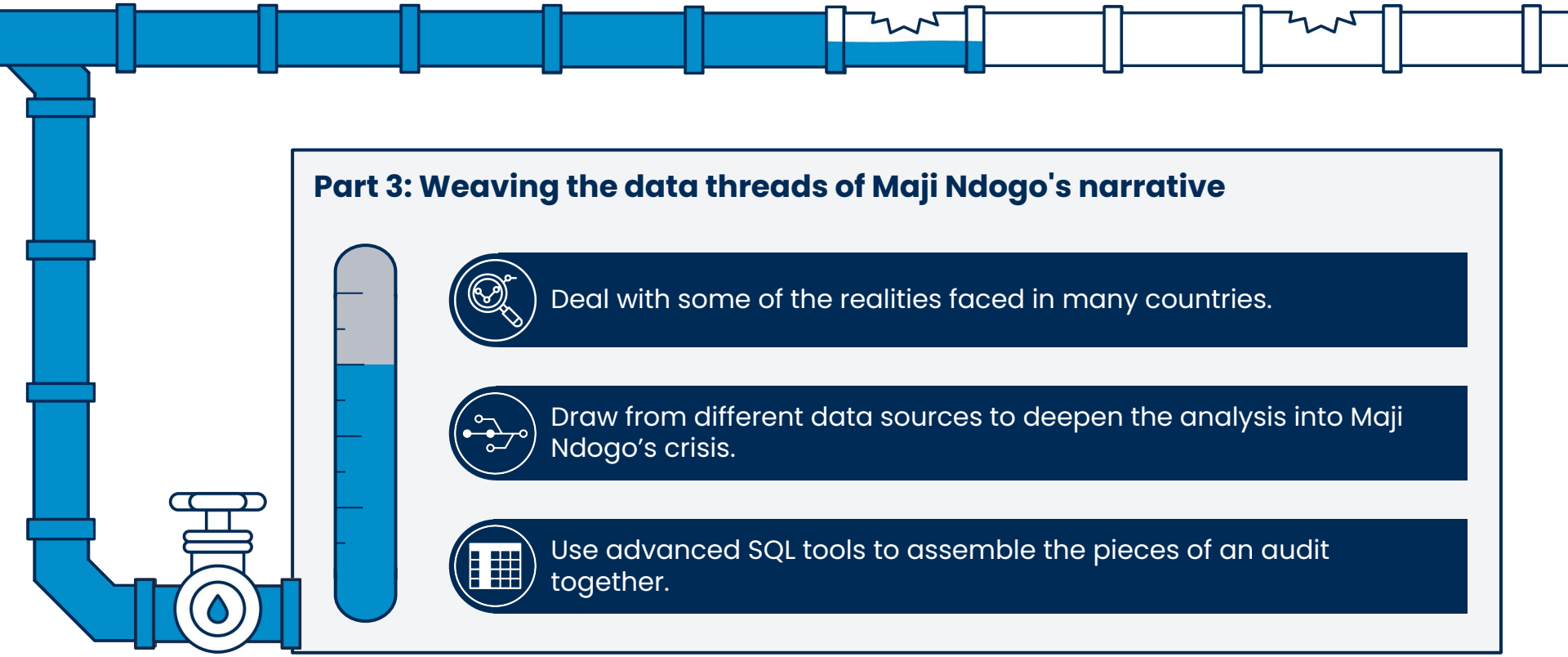
What will we be doing?



Part 2: Clustering data to unveil Maji Ndogo's water crisis

- Gear up for a **data analysis** of Maji Ndogo's water scenario.
- Harness the power of SQL functions, including intricate window functions, to draw insights from the data.
- Aggregate data to unravel the scale of the problem and start to form some actionable insights.

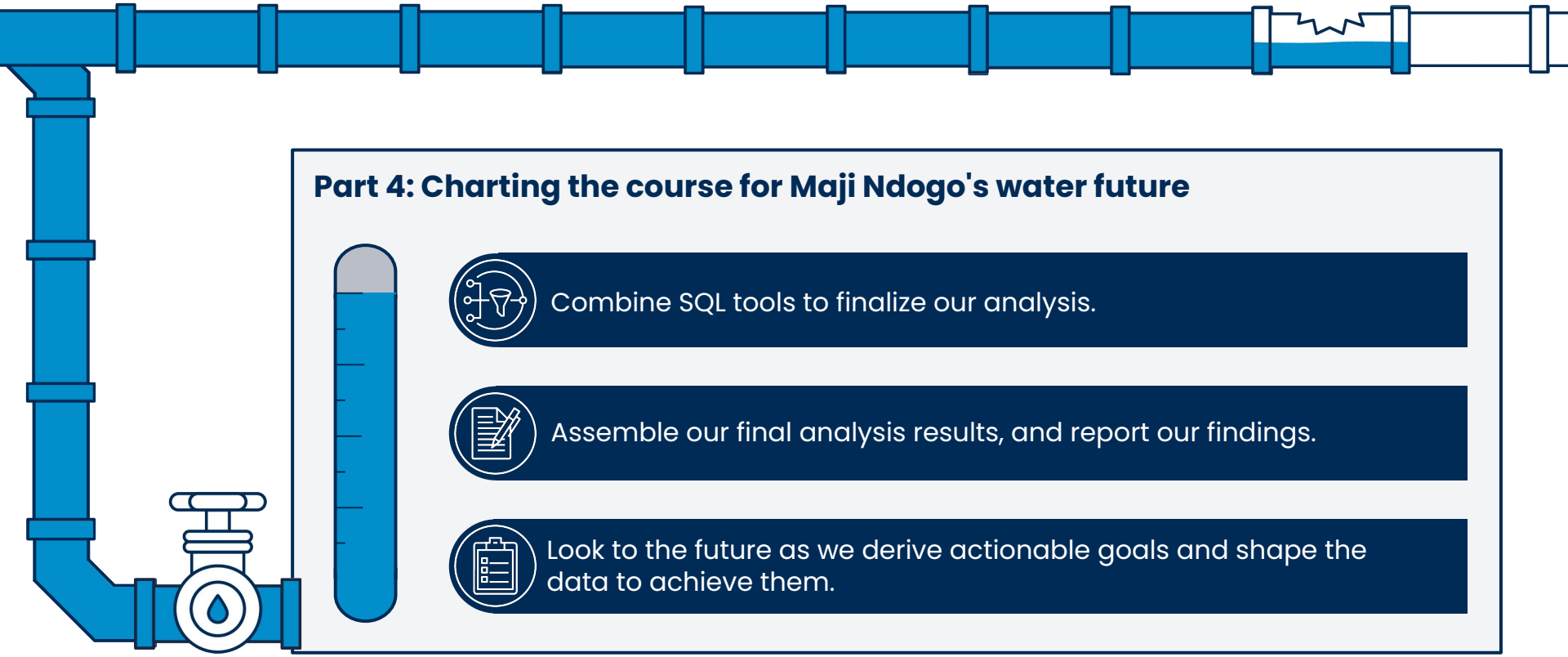
What will we be doing?



Part 3: Weaving the data threads of Maji Ndogo's narrative

- Deal with some of the realities faced in many countries.
- Draw from different data sources to deepen the analysis into Maji Ndogo's crisis.
- Use advanced SQL tools to assemble the pieces of an audit together.

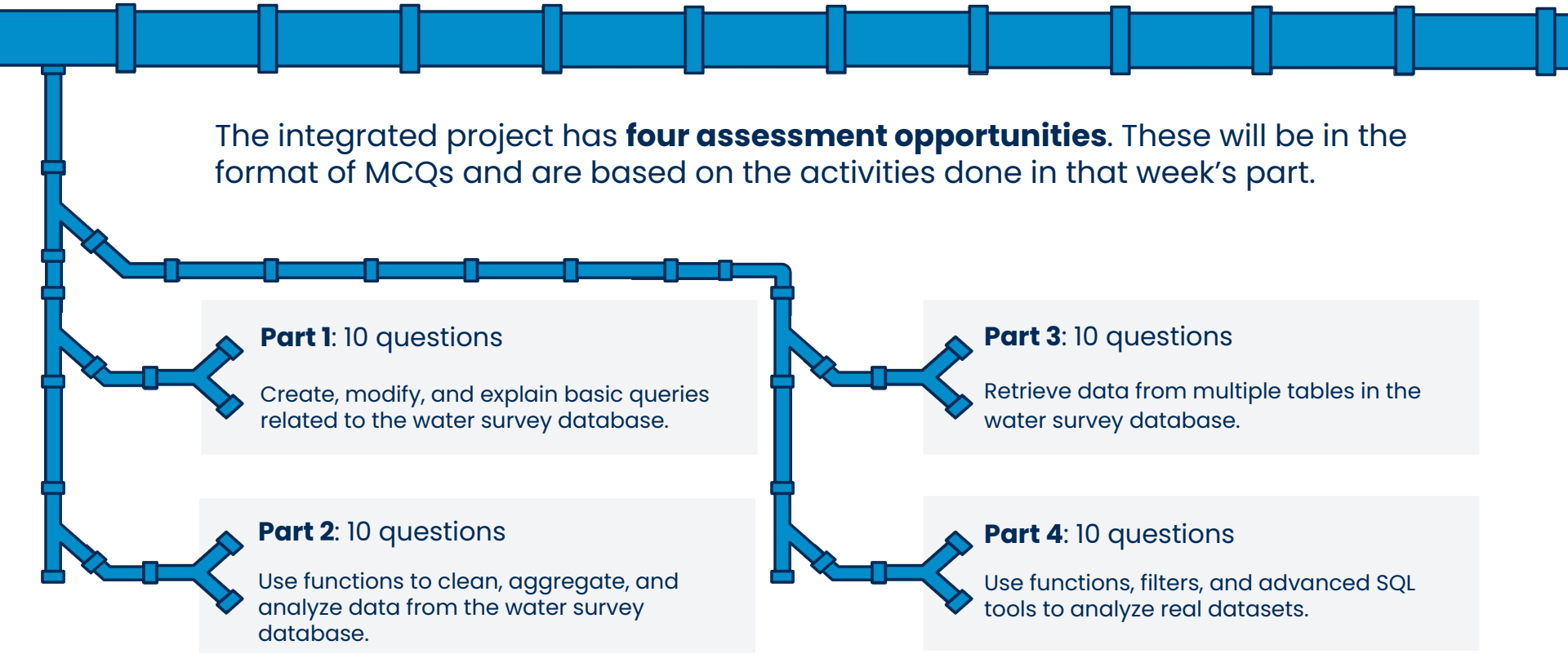
What will we be doing?



Part 4: Charting the course for Maji Ndogo's water future

- Combine SQL tools to finalize our analysis.
- Assemble our final analysis results, and report our findings.
- Look to the future as we derive actionable goals and shape the data to achieve them.

Assessments



The integrated project has **four assessment opportunities**. These will be in the format of MCQs and are based on the activities done in that week's part.

Part 1: 10 questions

Create, modify, and explain basic queries related to the water survey database.

Part 2: 10 questions

Use functions to clean, aggregate, and analyze data from the water survey database.

Part 3: 10 questions

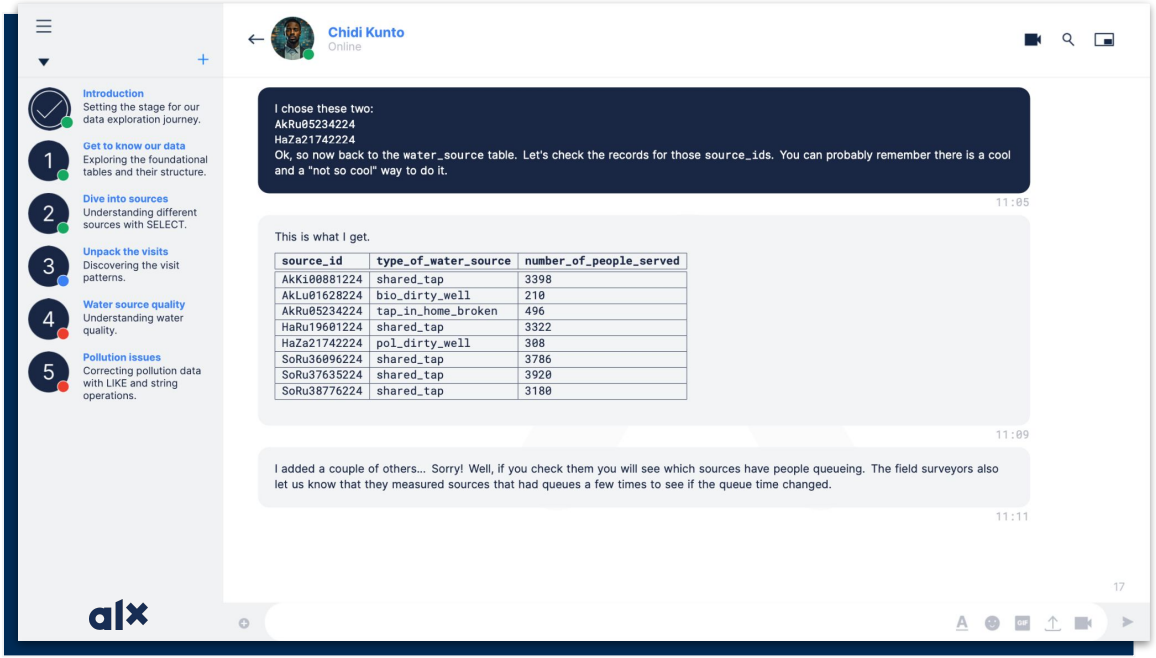
Retrieve data from multiple tables in the water survey database.

Part 4: 10 questions

Use functions, filters, and advanced SQL tools to analyze real datasets.

Project instructions format

The format of the slides that **guide us through the project each week** mimics a chat-like interface, similar to Google Chat.

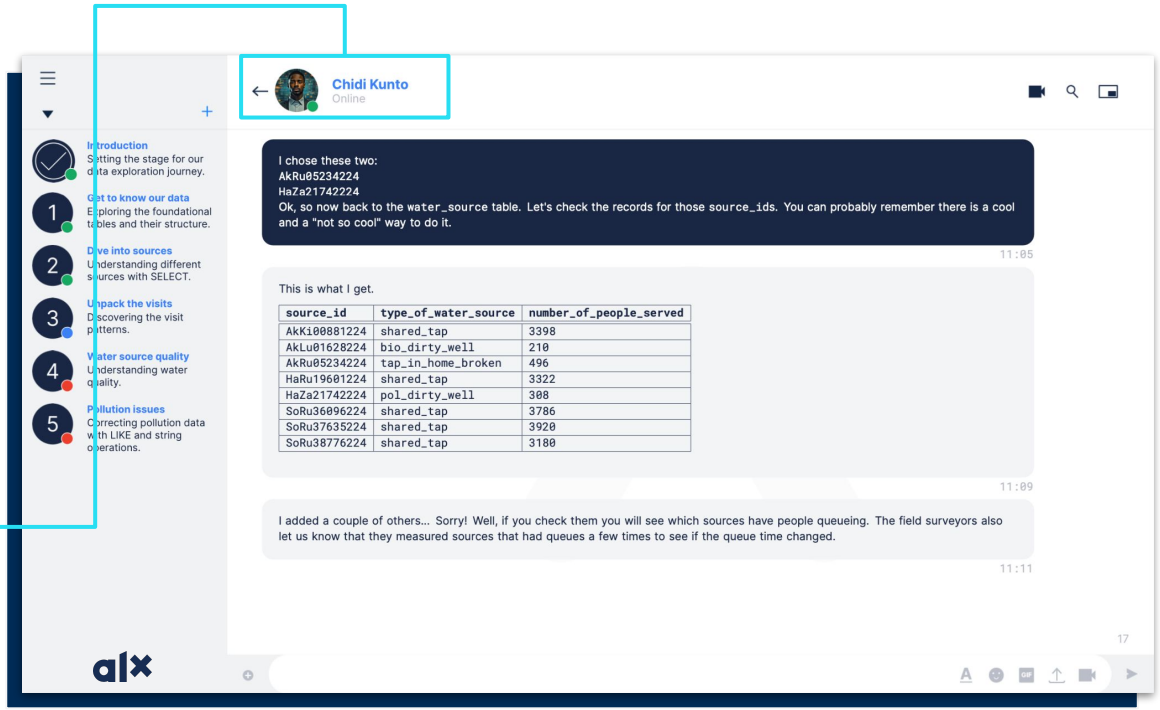


Project instructions format

The format of the slides that **guide us through the project each week** mimics a chat-like interface, similar to Google Chat.

Chidi Kunto is our best virtual data analyst, who will **help to break down tasks** from President Naledi into more technical data questions.

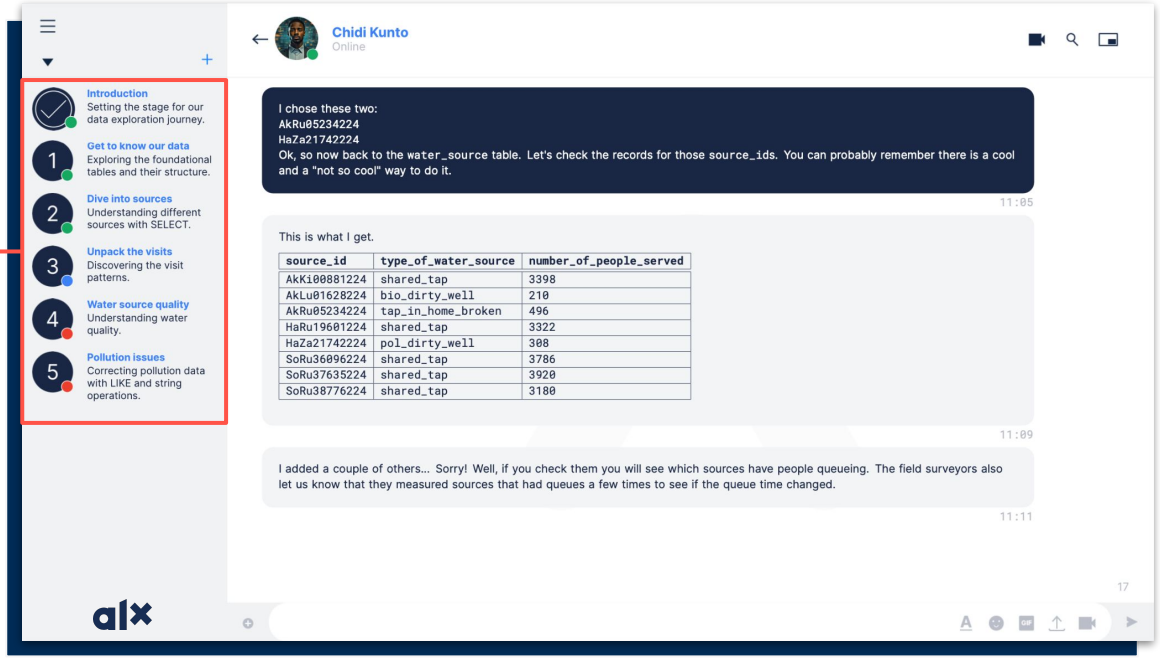
Chidi represents a role model for an analyst. He is a good leader, passionate about the work he does, and critically thinks about everything.



Project instructions format

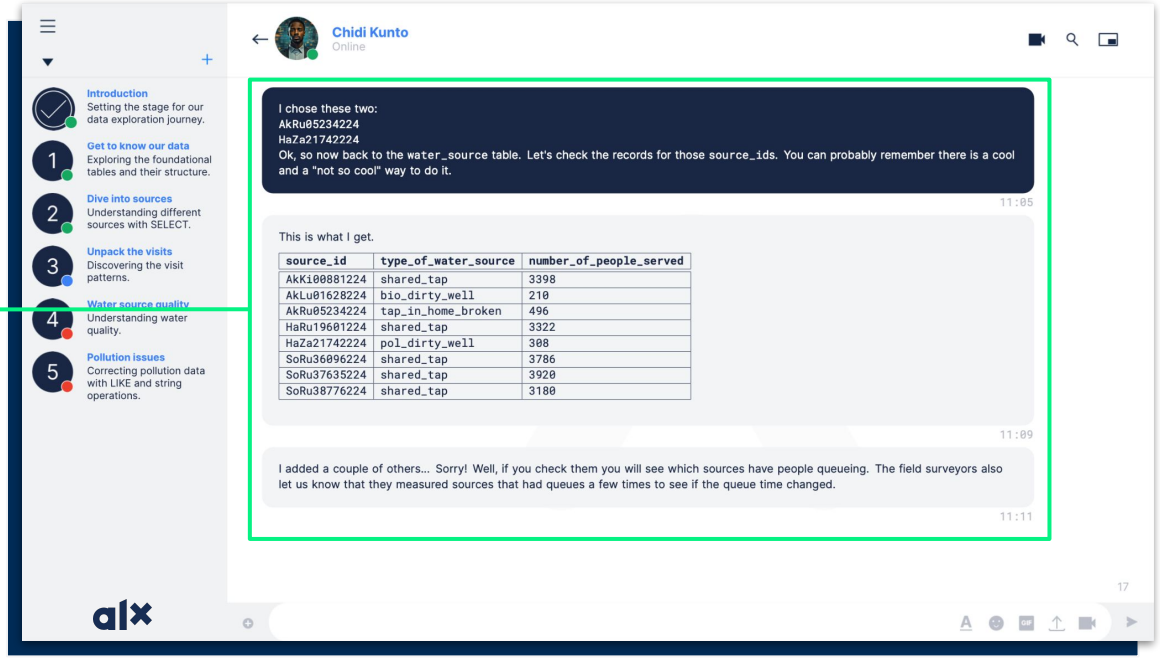
These **status icons** indicate progress. As we **complete** sections, the status icons turn **green**.

The **current task** we're working on is shown in **blue**, and tasks yet to come are still in red.



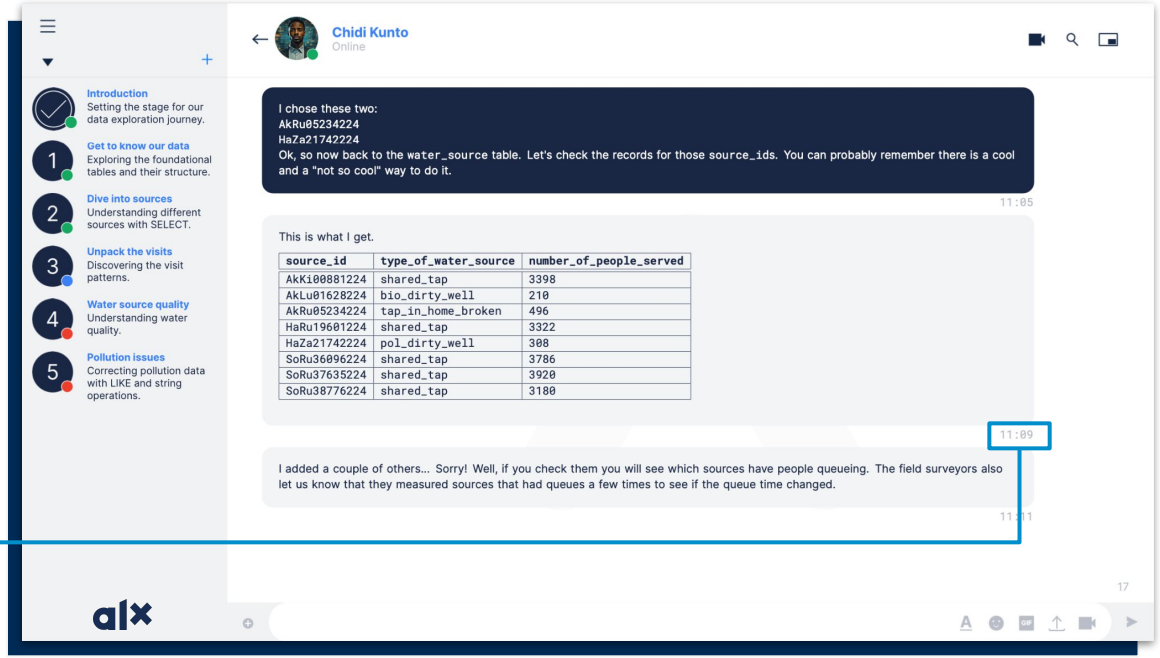
Project instructions format

The story, **tasks**, **code blocks**, and **query results** are shared by Chidi in this space.



Project instructions format

The **timestamps** on these messages are **unique**. We can **reference** these like page numbers when collaborating or when asking questions.

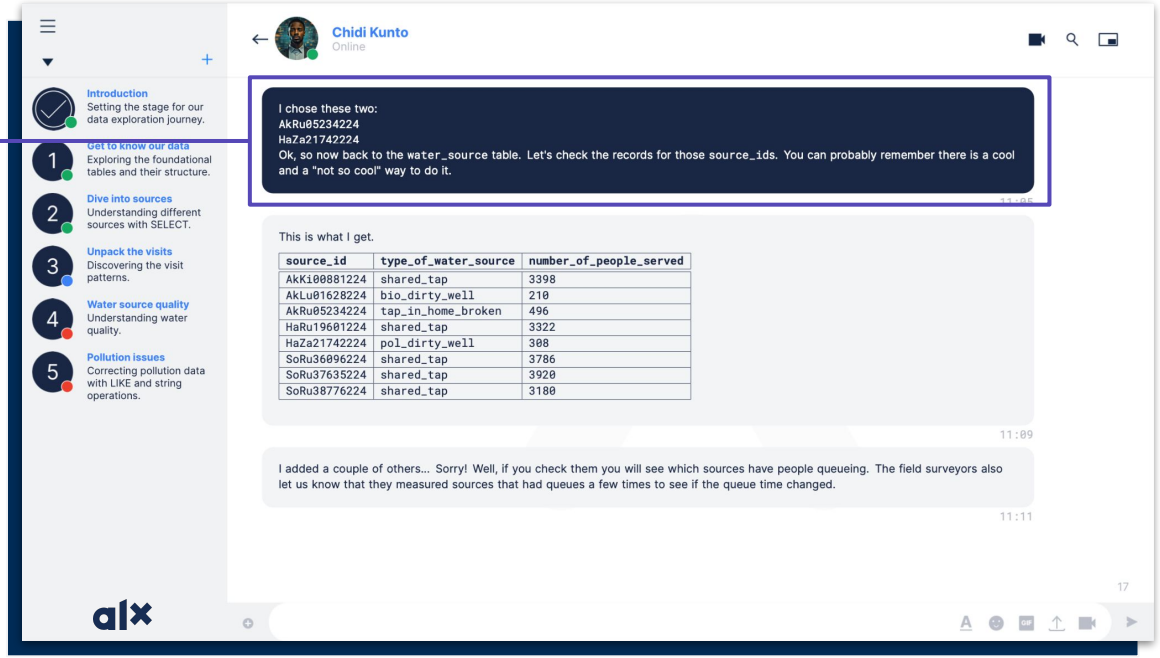


Format

The **story** of Maji Ndogo's struggle is told in **grey chat bubbles**.

The **tasks** we should do are **highlighted in dark blue**.

These are the queries we need to create to get the result sets Chidi shares throughout the project.



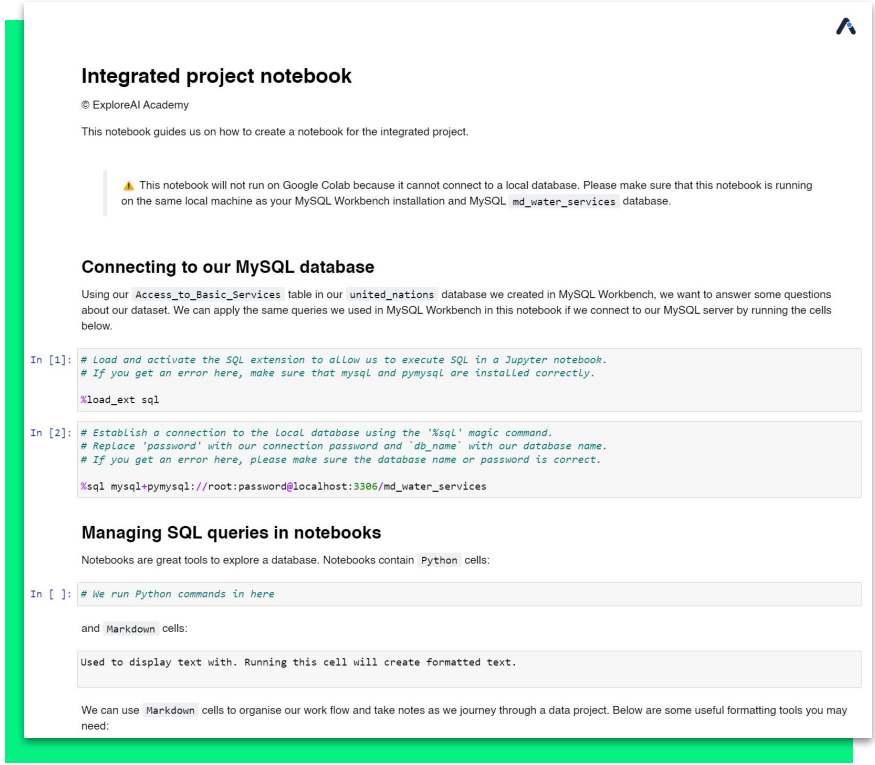
Managing SQL queries in MySQL Jupyter notebooks

Jupyter notebooks offer an **interactive environment** that's perfect for **data projects**, especially when working with SQL databases.

We can write SQL queries, execute them, and store the results of those queries – **all in one place**.

We can create notebooks in Jupyter to **organize** our **work**, **summarize** our **findings**, make some **notes**, and **store results** so that we can reference them **later**.

An example notebook is available for Part 1, but we encourage you to **create these on your own** for the rest of the project.



Integrated project notebook

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This notebook guides us on how to create a notebook for the integrated project.

> ⚠️ This notebook will not run on Google Colab because it cannot connect to a local database. Please make sure that this notebook is running on the same local machine as your MySQL Workbench installation and MySQL `md_water_services` database.

Connecting to our MySQL database

Using our `Access_to_Basic_Services` table in our `united_nations` database we created in MySQL Workbench, we want to answer some questions about our dataset. We can apply the same queries we used in MySQL Workbench in this notebook if we connect to our MySQL server by running the cells below.

In [1]:
```
# Load and activate the SQL extension to allow us to execute SQL in a Jupyter notebook.
# If you get an error here, make sure that mysql and pymysql are installed correctly.

%load_ext sql
```

In [2]:
```
# Establish a connection to the local database using the '%sql' magic command.
# Replace 'password' with our connection password and `db_name` with our database name.
# If you get an error here, please make sure the database name or password is correct.

%sql mysql+pymysql://root:password@localhost:3306/md_water_services
```

Managing SQL queries in notebooks

Notebooks are great tools to explore a database. Notebooks contain `Python` cells:

In [ ]:
```
# We run Python commands in here
```

and `Markdown` cells:

```
Used to display text with. Running this cell will create formatted text.
```

We can use `Markdown` cells to organise our work flow and take notes as we journey through a data project. Below are some useful formatting tools you may need:

Our main goal

To make sure **we're the ones standing out** in an interview, we should be able to **solve any problem** we're given using our SQL skills.

Engaging with this project fully will help you to do that! So forget about the marks, and **build your skills** in SQL.

Several points in this project will be challenging, so we should rely on each other to learn. If you get stuck, **reach out to your teammates** and ask for help.