## **1. Integration:**

### **Documentation:**

The integration process involved exporting data from the MySQL database to a CSV file and then importing this data into Excel for analysis and visualization. Below are the detailed steps:

1. **Exporting Data from SQL to CSV:**
   * A SQL query was used to join the Region and Water\_Source tables and export the combined data into a CSV file.
   * The INTO OUTFILE command in MySQL was utilized to export the data. The command specifies the file path, field delimiters, and line terminators to ensure the data is structured correctly in the CSV file.
   * The command example used:

In mysql:

>SELECT r.region\_id, r.region\_name, r.population, r.water\_access\_percentage,  
 w.source\_id, w.source\_type, w.capacity, w.location  
>FROM Region r  
>JOIN Water\_Source w ON r.region\_id = w.source\_id  
>INTO OUTFILE '/tmp/combined\_data.csv'  
>FIELDS TERMINATED BY ','   
>ENCLOSED BY '"'  
>LINES TERMINATED BY '\n';

1. **Importing Data into Excel:**
   * The CSV file was imported into Excel by opening Excel, selecting the "Data" tab, and choosing "From Text/CSV."
   * During import, data mappings were checked to ensure that each column from the CSV file was correctly mapped to an Excel column. The data format was set to match the intended analysis, such as ensuring numerical data types were correctly assigned.
2. **Ensuring Consistency in Data Mappings and Formats:**
   * The data was reviewed in Excel to ensure that field delimiters and encodings from the CSV were correctly interpreted. Dates, numbers, and text fields were formatted to match the required analysis and presentation standards.

## **2. Testing:**

### **Verification:**

To ensure that the exported and imported data was accurate and that the Excel analysis reflects the correct insights, the following verification steps were performed:

1. **Data Matching:**
   * The data in the Excel sheets was compared to the original MySQL database tables to verify that all records were exported correctly and no data was lost or misrepresented.
   * A random sampling method was employed to cross-check individual rows from the CSV against the database to confirm accuracy.
2. **Calculation and Visualization Validation:**
   * Pivot tables and charts in the Excel dashboard were reviewed to ensure they correctly calculated percentages and aggregated values.
   * The visualizations, including bar charts and pie charts, were checked to ensure that they reflected the intended data insights.
   * Interactive elements, such as slicers, were tested for functionality, verifying that filtering by region or water source status provided accurate and dynamic updates to the charts.
3. **Final Review:**
   * The Excel dashboard was subjected to a final review, ensuring that all labels, titles, and data points were clear, accurate, and aligned with the project’s goals.

## Presentation :

https://gamma.app/docs/t0nsvyx9a4t5fld?following\_id=14xghw2mawv539l&follow\_on\_start=true