GenAI-Assisted Data Migration Capstone Project

**Case Study**

The retail company currently stores its sales, inventory, and customer data in flat CSV files exported from a legacy system.   
The organization is transitioning to a MySQL database so that data can be queried and analyzed more efficiently.   
At the same time, they want to leverage Generative AI (GenAI) to accelerate the migration and validation process.

You will design and implement a GenAI‑assisted migration plan that:

1. Builds a MySQL schema based on the CSV structures (tables, datatypes, constraints).
2. Loads the CSV data into the MySQL database and validates the import.
3. Uses GenAI to translate existing business logic (e.g., stored procedures or PL/SQL code) into MySQL SQL syntax.
4. Creates sample analyses and reports on the new database.
5. Documents the migration process and reflects on how GenAI assisted each step.

**Task & Deliverables**

# 1. Schema Design with GenAI

• Start by feeding the CSV structures (column names, datatypes) into a GenAI tool.  
• GenAI generates MySQL CREATE TABLE scripts (tables, keys, constraints) and data dictionary.  
• You review, refine, and finalize the schema design.  
👉 Outcome: A ready schema in MySQL where data can be loaded.

# 2. Data Import & Validation

• Using the schema you just created, import the CSV files into your MySQL tables.  
• Then, with GenAI’s help, run validation checks to confirm:  
 - Counts match (rows in CSV vs rows in table).  
 - Foreign keys work (e.g., each product\_id in sales\_fact exists in product\_dim).  
 - Basic totals (e.g., sum of sales matches original CSV).  
👉 Outcome: You know your database is loaded correctly and ready for queries.

# 3. Query & Logic Translation

• If you have existing SQL/PLSQL logic.[ **oracle\_plsql\_procedures**], provide it to GenAI/   
• GenAI will translate it into MySQL syntax that runs on your schema.  
• Check results against expected outputs to ensure accuracy.  
👉 Outcome: Business rules and queries are now working in your MySQL environment.

# 4. Automated Testing with GenAI

• Ask GenAI to create test cases + SQL queries to verify data quality and business logic:  
 - Example: “Find orders without invoices.”  
 - Example: “Ensure no negative sales amounts.”  
• Run these tests to confirm reliability.  
👉 Outcome: Your database is tested and consistent.

# 5. BI Reporting & Insights

• With GenAI’s help, write queries for KPIs like:  
 - Monthly sales, revenue variance vs forecast.  
 - Top customers/products.  
 - Supplier delivery delays.  
• Visualize results in a BI tool (Power BI / Qlik / SAP Analytics Cloud)

**Conclusion**

This capstone project demonstrates how Generative AI can streamline every step of a data migration—from initial schema design to query translation and validation. By working through these tasks, you will gain practical experience in database migration, data quality assurance, and BI reporting, all while leveraging cutting‑edge AI tools to enhance productivity and accuracy.