**1. Objective / Business Ask:**

The primary objective was to demonstrate the expertise on database design, ETL process, SQL queries and data visualization using visualisation tool. The main goals included:

* Database design and optimization
* Data migration and ETL pipelines
* SQL queries/stored procedures
* Reporting/visualization (Power BI, Tableau, Excel)
* Automation or performance tuning tasks

**2. Approach Chosen:**

To efficiently handle and analyse the data, the following approach was adopted:

1. **Data Preparation:**
   * Created a sample database in MySQL using structured DDL commands.
   * Designed and created all necessary tables, required for the processes separately
2. **Data Loading:**
   * Loaded sample data into the tables using python+sql handling utility.
   * Ensured data loaded without any transformations or validations to focus on data.
   * Loaded processed data using ETL process, focusing on data quality and data modelling.
3. **SQL Query Development:**
   * Developed and tested multiple SQL queries for reporting:
   * Used aggregate functions and joins to create meaningful metrics.
   * Created stored procedures.
4. **Power BI Reporting:**
   * Connected Power BI to the sample datasets.
   * Built interactive dashboards with visuals representing:
     + Customer segmentation.
     + Sales and order trends.
     + Revenue insights.

**3. Tools & Technologies Used:**

|  |  |
| --- | --- |
| **Tool / Technology** | **Purpose** |
| **MySQL** | Database creation, data storage, SQL query execution |
| **SQLAlchemy** | Connecting Python with MySQL for data loading and scripting |
| **Power BI** | Building visual dashboards and reports |
| **Python (partially)** | ETL development (planned for later phase) |
| **Jupyter Notebook** | For code execution and logging during ETL & analysis phase |
| **SQL Connector** | To use with python, load processed data |
| **pandas** | For data frame design and modelling |
| **Other python packages** | Datetime, os, |

**4. Outcome:**

* Successfully set up the sample database and inserted required records.
* Developed essential SQL queries to support business reporting.
* Developed ETL pipeline to process required data.
* Created dynamic Power BI dashboards to visualize key customer and sales insights.