

Library Management Data Analysis Project

 Prepared by

Anas Ahmed Zakaria Mohamed

Project Overview

This project focuses on analyzing data from a Library Management System to gain insights into book circulation, member activity, staff performance, and financial outcomes.

The goal is to support data-driven decision-making for optimizing operations, enhancing customer satisfaction, and improving overall efficiency.

Data Sources

The dataset consists of six main tables:

Books – Contains book details such as title, author, category, rental price, publisher, and availability status.

Members – Stores information about library members.

Employees – Includes details of staff handling transactions.

Branch – Contains branch locations and related details.

Issued_Status – Records book issue transactions.

Return_Status – Tracks book returns and corresponding dates.

Key Analysis Areas

Data Exploration – Understanding dataset structure, total members, books, employees, and transaction volumes.

Revenue Insights – Evaluating total revenue, top-earning categories, and monthly revenue trends.

Category Insights – Identifying most issued and returned book categories.

Member Insights – Highlighting the most active members and borrowing patterns.

Employee & Branch Insights – Measuring staff productivity and branch performance.

Return Insights – Analyzing return rates and average delays.

Advanced Analysis – Assessing profitability by category, publisher performance, and book availability rates.

Business Questions Answered

1.What are the top categories generating the highest revenue?

2.Which members are most active in borrowing books?

3.Which branches and employees are performing best?

4.What is the average return delay and overall return rate?

5.What percentage of books are currently available or issued?

6.Which publishers contribute most to total revenue?

Tools & Techniques Used

SQL Server – For data querying and insight extraction.

Data Cleaning & Transformation – Custom columns and filters for better analysis.

Analytical SQL Queries – Using joins, aggregations, ranking, and date functions.

Data Visualization (Optional) – Power BI or Excel can be used for dashboards.

Key Insights Summary

- 1.Total Members: 12
- 2.Total Employees: 11
- 3.Total Books: 35
- 4.Total Issued Books: 31
- 5.Total Returned Books: 35
- 6.Total Revenue: 230

Top Performing Categories: History, Classic, Dystopian

-  Most Active Members: Ivy Martinez, Jack Wilson, Grace Taylor
-  Top Branch: B001 – 123 Main St (Highest Revenue & Transactions)
-  Top Employees: Laura Martinez & Michelle Ramirez
-  Return Rate: 100%
-  Average Borrow Duration: 62 days

Conclusion

The analysis successfully highlights operational strengths and areas for improvement.

It provides valuable insights into revenue generation, customer engagement, and staff efficiency—helping the library make strategic, data-driven decisions for future growth.