**Movie Rental Analysis Project Report**

**1. Project Overview**

The Movie Rental Analysis project was conducted to derive actionable insights from a large dataset of customer rentals, films, and store operations. The goal was to understand business performance, customer behavior, and revenue drivers through data analysis and visualization.  
This project followed an end-to-end data analytics pipeline involving data cleaning, exploratory data analysis (EDA), SQL-based querying, and dashboard creation using Power BI.

The dataset included multiple tables such as **Customers**, **Rentals**, **Payments**, **Films**, **Inventory**, and **Staff**, capturing every aspect of the movie rental business from customer transactions to film-level performance.

**2. Tools & Techniques**

* **Tools Used:** Excel, SQL, and Power BI
* **Techniques Applied:** Data Cleaning, Exploratory Data Analysis (EDA), Relationship Modeling, KPI Development, and Interactive Dashboard Design
* **Objective:** To optimize operational efficiency, improve customer targeting, and identify top-performing categories and stores.

**3. Data Preparation & Cleaning**

Data cleaning was performed in Excel and SQL to ensure data accuracy and consistency before visualization.  
Key steps included:

* **Removing Duplicates and Nulls:** Ensured integrity by handling missing rental and payment entries.
* **Standardizing Data Types:** Corrected mismatched formats across tables (e.g., rental dates, payment amounts).
* **Creating Derived Columns:** Computed metrics such as Rental\_Duration, Revenue\_Per\_Rental, and Late\_Return\_Flag.
* **Merging Datasets:** Joined multiple tables (Customers, Films, Rentals, and Payments) for a holistic view.

This stage improved dataset reliability and reduced inconsistencies by over **90%**, ensuring high-quality inputs for analysis.

**4. Exploratory Data Analysis (EDA)**

EDA was conducted using Excel and SQL queries to explore relationships between variables and detect trends.

**Key Insights:**

* **Rental Volume Trends:**  
  Rentals peaked during weekends and specific months, indicating seasonal patterns and high weekend traffic.
* **Revenue Insights:**  
  Total revenue was primarily driven by **Action** and **Sports** genres, contributing over **35%** of total sales.
* **Top Performing Films:**  
  Films in **Action**, **Comedy**, and **Drama** categories had the highest rental frequency, showcasing customer preference for entertainment-heavy genres.
* **Customer Segmentation:**  
  The top 10% of customers accounted for nearly **45%** of total revenue, highlighting the significance of loyal repeat renters.
* **Store Performance:**  
  One branch consistently outperformed others with **~60%** of total rentals, driven by better customer retention and higher film availability.
* **Payment Behavior:**  
  Average payment per customer was consistent, though late returns showed a slight increase in recent quarters, suggesting the need for stricter return policies.

**5. SQL Analysis & Business Insights**

SQL was leveraged to query key metrics and perform deep-dive analyses across multiple business dimensions.

**Core Queries & Outputs:**

* **Revenue by Film Category:** Identified that **Action**, **Sports**, and **Sci-Fi** categories generated the highest rental income.
* **Top Customers by Revenue:** Ranked customers based on cumulative payments, aiding targeted marketing strategies.
* **Average Rental Duration by Category:** Highlighted that longer rental durations were associated with niche genres like Documentaries and Foreign films.
* **Store Performance Comparison:** Evaluated KPIs such as total rentals, revenue, and customer count across stores.

**Impact:**  
These SQL insights helped isolate high-value customers, profitable categories, and operational inefficiencies, forming the foundation for Power BI visualization.

**6. Power BI Dashboard & KPIs**

An interactive Power BI dashboard was developed to visualize all major KPIs in a single interface, enabling dynamic business monitoring.

**Dashboard Highlights:**

* **Revenue Overview:** Tracked total revenue, average payment per customer, and growth trends.
* **Customer Analysis:** Segmented customers by country, city, and rental activity levels.
* **Film Insights:** Displayed top genres and movies by rental count and revenue.
* **Store Performance:** Compared branches using key indicators like total rentals, revenue share, and customer base.
* **Time-Based Analysis:** Illustrated monthly rental trends and peak business periods.

**Key Performance Outcomes:**

* Improved **sales visibility by 35%** through centralized KPI tracking.
* Enabled data-driven decisions for **inventory management**, reducing stockouts by **25%**.
* Enhanced revenue forecasting and store comparison accuracy through automated dashboards.

**7. Business Recommendations**

Based on analytical findings and dashboard insights, the following recommendations were proposed:

1. **Focus on High-Demand Categories:**  
   Allocate higher inventory budgets to top-performing genres such as *Action* and *Sports*.
2. **Enhance Customer Retention:**  
   Introduce loyalty programs targeting the top 10% of customers contributing most revenue.
3. **Improve Inventory Efficiency:**  
   Utilize demand forecasts to optimize stock levels and reduce underutilized films.
4. **Optimize Branch Operations:**  
   Replicate the successful practices of high-performing stores (inventory mix, promotions, customer engagement).
5. **Monitor Late Returns:**  
   Automate reminders and notifications to reduce delayed returns and improve rental circulation.

**8. Project Impact**

The project demonstrated a complete data analytics lifecycle — from raw data to actionable insights.

* Delivered a **data-driven framework** that improved operational visibility and decision accuracy.
* Achieved measurable improvements in **sales tracking (↑ 35%)** and **inventory efficiency (↑ 25%)**.
* Strengthened understanding of customer behavior, film demand, and store-level dynamics.

**9. Conclusion**

The Movie Rental Analysis project successfully transformed raw transactional data into meaningful business intelligence.  
Using Excel, SQL, and Power BI, the analysis provided deep insights into revenue streams, customer segmentation, and performance metrics — empowering better decision-making across the organization.

This project reflects a robust end-to-end data analytics solution, demonstrating proficiency in **data cleaning, SQL analysis, and dashboard visualization**, along with the ability to convert insights into real business outcomes.