# CineMax Rentals Data Analysis Project: Uncovering Insights with Power BI

# Objectives

1. This project aims to utilise the provided database schema to create a realistic business scenario where I extracted and analysed data using MySQL and Power BI.

2. In other to answer specific business questions through descriptive, diagnostic, and predictive analysis.

# Introduction

- This report provides a comprehensive analysis of CineMax Rentals, a mid-sized movie rental company renowned for its extensive film collection and outstanding customer service. CineMax Rentals has been

- The business has been operational for several years, accumulating a wealth of data on its operations.

- The extensive data will be analyse in order to gain insights and actionable recommendations to enhance the company's performance and boost customer satisfaction.

# Database Schema and Model

- The database consists of several tables, however in this report analysis only including category, city, country, customer, film, film_category, inventory, payment, rental, store
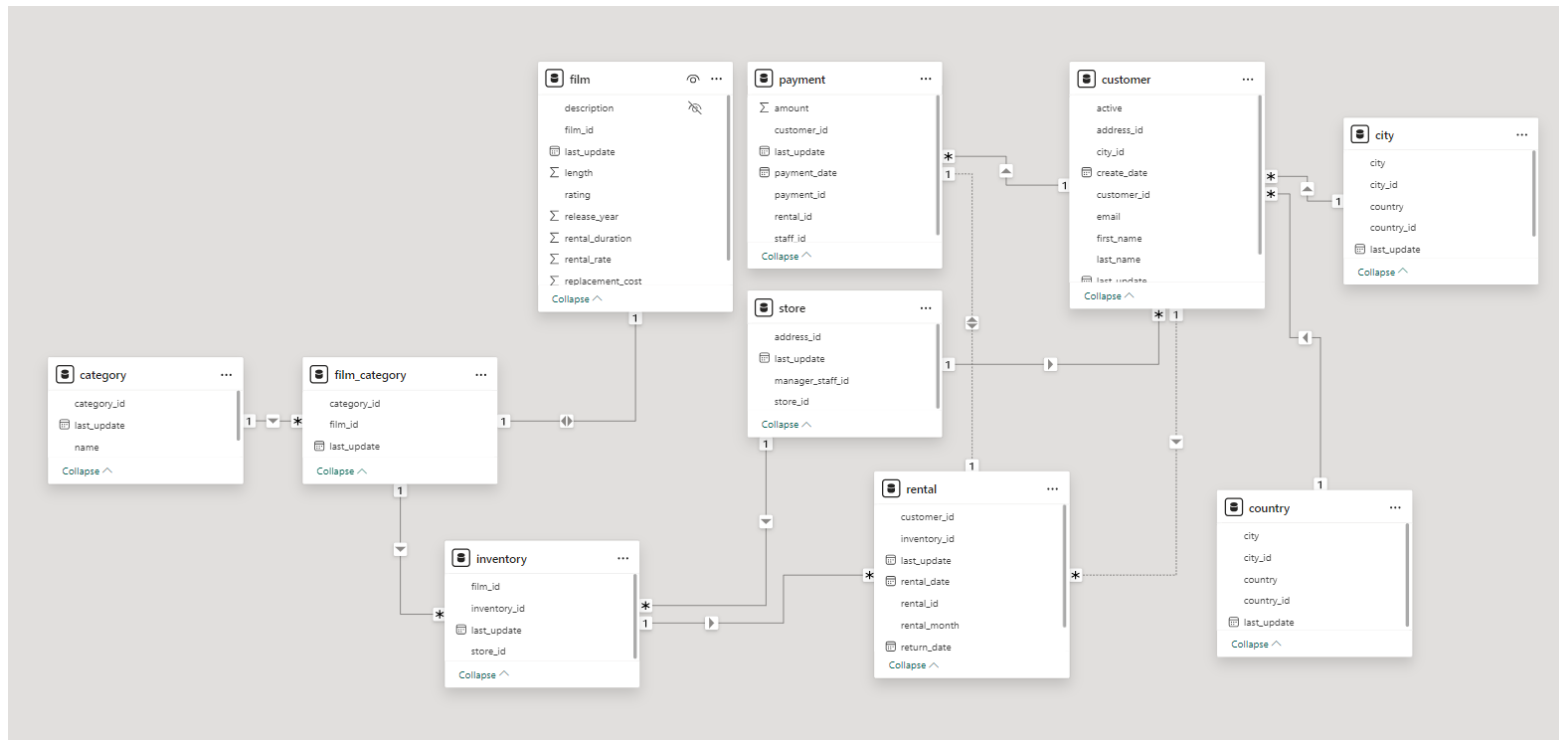
# Methodology

**Divided into three parts:**

1. Data Cleaning
   - Identify which tables are needed(category, city, country, customer, film, film_category, inventory, payment, rental, store)
   - Checked for unknown data or incorrect formatting
   - Corrected missing data and standardised date formats.
   - Converted all monetary figures to GBP(£)
- 2. Data Preparation
   - Created new columns to summarise the data
   - Formatted data for consistency.
- 3. Data Visualisation and Analysis
   - Created a visual report using the slicers linked to important dimensions of the graphs such as countries, cities, film categories and Store ID,
   - The visualisation are used to provide valuable insights and actionable recommendations to enhance the company's performance and boost customer satisfaction.
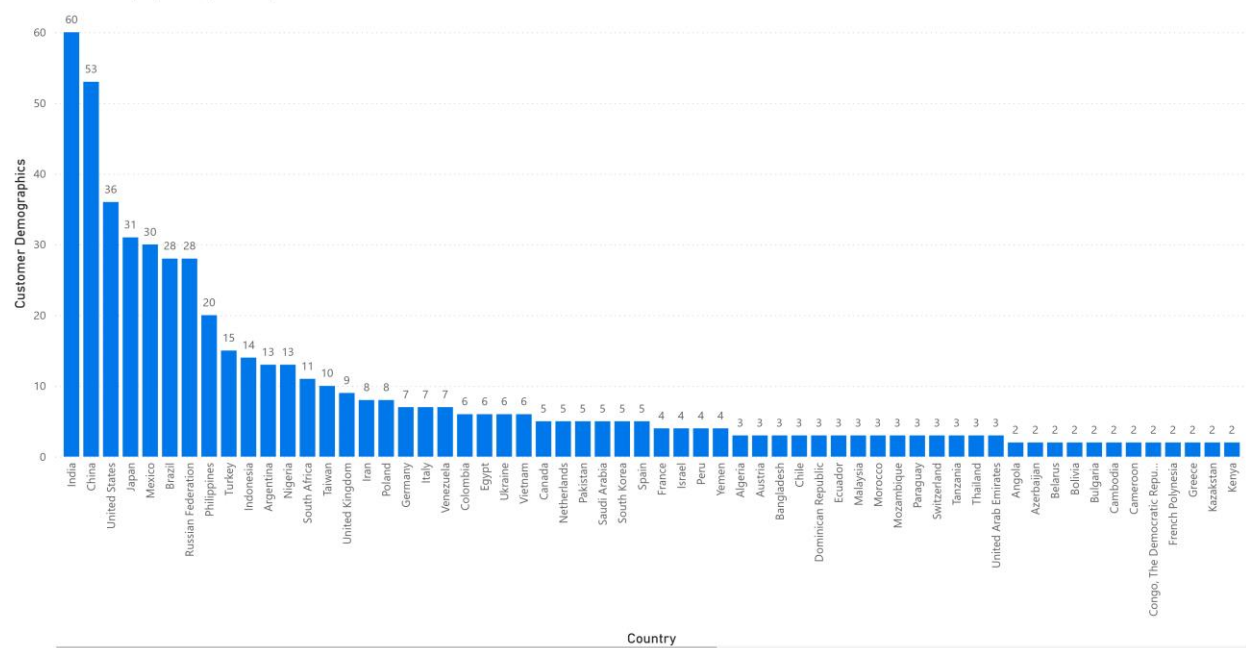
# Key Findings
## Descriptive Analysis

**Top Countries:**
- **India** has the highest number of customers, totalling 60.
- **China** follows with 53 customers.
- **United States** is next with 36 customers.
- These three countries alone represent a significant proportion of the total customer base.

**Other Significant Countries:**
- **Japan** (31 customers) and **Mexico** (30 customers) also have substantial customer representation.
- **Brazil** and the **Russian Federation** are tied with 28 customers each.
- Countries like the **Philippines** (20), **Turkey** (15), and **Indonesia** (14) also have notable numbers.



Customer Demographics by Country

# Key Findings
Descriptive Analysis

## Mid-Tier Countries:
- Countries like **Argentina** (13), **Nigeria** (13), **South Africa** (11), and **United Kingdom** (10) fall in the mid-range of customer numbers.
- **Iran**, **Poland**, **Germany**, and **Italy** each have between 7 and 8 customers.

## Countries with Smaller Customer Bases:
- Many countries have a smaller customer base, ranging from 6 down to 2 customers.
- These include countries like **Venezuela**, **Colombia**, **Egypt**, **Canada**, **Pakistan**, **Spain**, **France**, and others.
- The list continues with countries having 3 or fewer customers, such as **Israel**, **Peru**, **Yemen**, **Austria**, **Algeria**, **Bangladesh**, and many others.

## Least Represented Countries:
- Several countries have the lowest customer representation with 2 customers each, including **Angola**, **Azerbaijan**, **Bulgaria**, **Congo**, **Greece**, **Kazakhstan**, **Kenya**, and others.

# Key Findings

Descriptive Analysis

- **Distribution:** The distribution shows a positive right skew. The customer base is heavily skewed towards a few countries with very high numbers (e.g., **India** and **China**), while most countries have a much smaller representation.

- **Global Reach:** The chart indicates a wide geographic distribution of customers, with representation across multiple continents, including Asia, Africa, Europe, and the Americas.
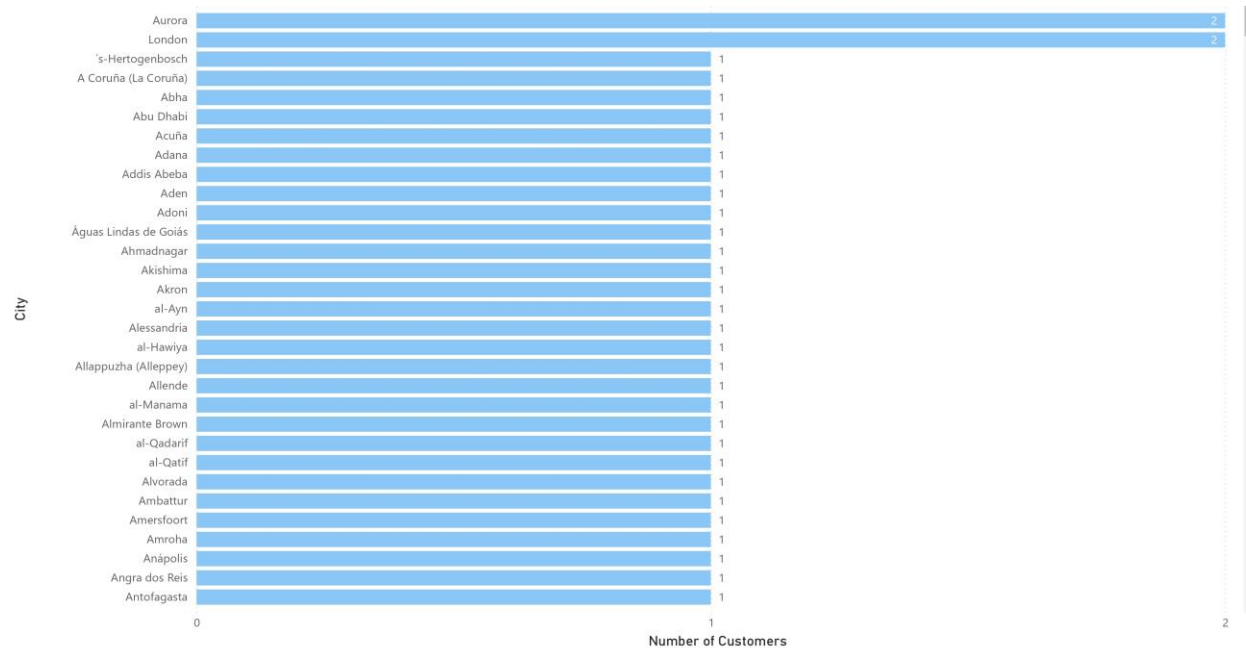
# Key Findings
Descriptive Analysis

## Cities with the Highest Number of Customers:

1. **Aurora** and **London** are the two cities with the highest number of customers, with 2 customers each.
2. These are the only two cities that stand out from the rest.

## Other Cities:

1. All other cities listed in the chart have exactly 1 customer each.
2. The cities span a wide geographical range, indicating a diverse distribution of customers.

Number of Customers by City

| City | Number of Customers |
|------|---------------------|
| Aurora | 2 |
| London | 2 |
| 's-Hertogenbosch | 1 |
| A Coruña (La Coruña) | 1 |
| Abha | 1 |
| Abu Dhabi | 1 |
| Acuña | 1 |
| Adana | 1 |
| Addis Abeba | 1 |
| Aden | 1 |
| Adoni | 1 |
| Águas Lindas de Goiás | 1 |
| Ahmadnagar | 1 |
| Akishima | 1 |
| Akron | 1 |
| al-Ayn | 1 |
| Alessandria | 1 |
| al-Hawiya | 1 |
| Allappuzha (Alleppey) | 1 |
| Allende | 1 |
| al-Manama | 1 |
| Almirante Brown | 1 |
| al-Qadarif | 1 |
| al-Qatif | 1 |
| Alvorada | 1 |
| Ambattur | 1 |
| Amersfoort | 1 |
| Amroha | 1 |
| Anápolis | 1 |
| Angra dos Reis | 1 |
| Antofagasta | 1 |

# Key Findings

Descriptive Analysis

**No Cities with Higher Concentration:**

- There are no cities with more than 2 customers, suggesting that the customer base is very evenly distributed across numerous locations without significant clustering in any particular city.

**Even Distribution:**

- The chart reveals a very evenly distributed customer base with no significant concentrations in any specific cities. Most cities only have 1 customer, showing a broad but shallow market penetration.

# Key Findings

Descriptive Analysis

**Global Reach:**

- The cities listed cover a broad range of geographic locations, suggesting that the service or product being analysed has a global presence, even if in small numbers per city.

- This chart indicates that the customer demographics are widely spread across various cities with very few concentrations. **Aurora** and **London** are slightly ahead with 2 customers each, while all other cities have just 1 customer.

- This distribution could imply that the company has successfully reached a wide array of locations but has yet to build a deep customer base in any particular city.
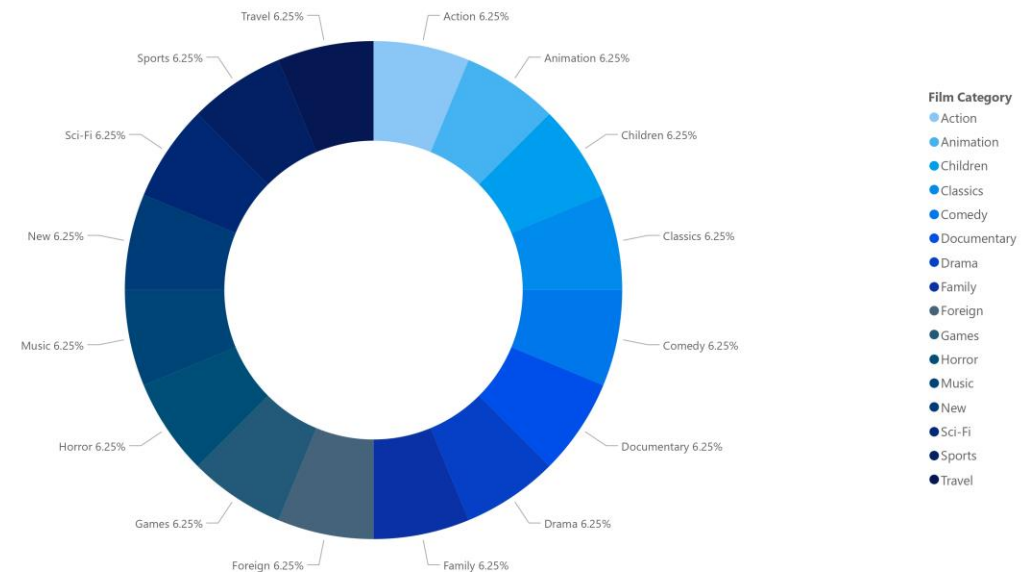
# Key Findings
Descriptive Analysis

## Overall Inventory status:

- There are 16 distinct film categories.

- Each category has 1 film available in each store.

- There are 2 stores in total.

- The total number of films across both stores is 32 split across 16 categories which one film being represented in both stores.



Film Inventory Organised by Film Category

**Film Category**
- Action
- Animation
- Children
- Classics
- Comedy
- Documentary
- Drama
- Family
- Foreign
- Games
- Horror
- Music
- New
- Sci-Fi
- Sports
- Travel

# Key Findings

Descriptive Analysis

**Key Observations:**

- The inventory is evenly distributed across all categories and stores with each film taking up 6.25% (or 3.125% in Store 1 and Store 2 separately) of the total inventory resulting in equal representation.

- There was no difference in the number of films between Store 1 and Store 2 for any category.

- The inventory seems to be quite limited, with only one film per category per store.
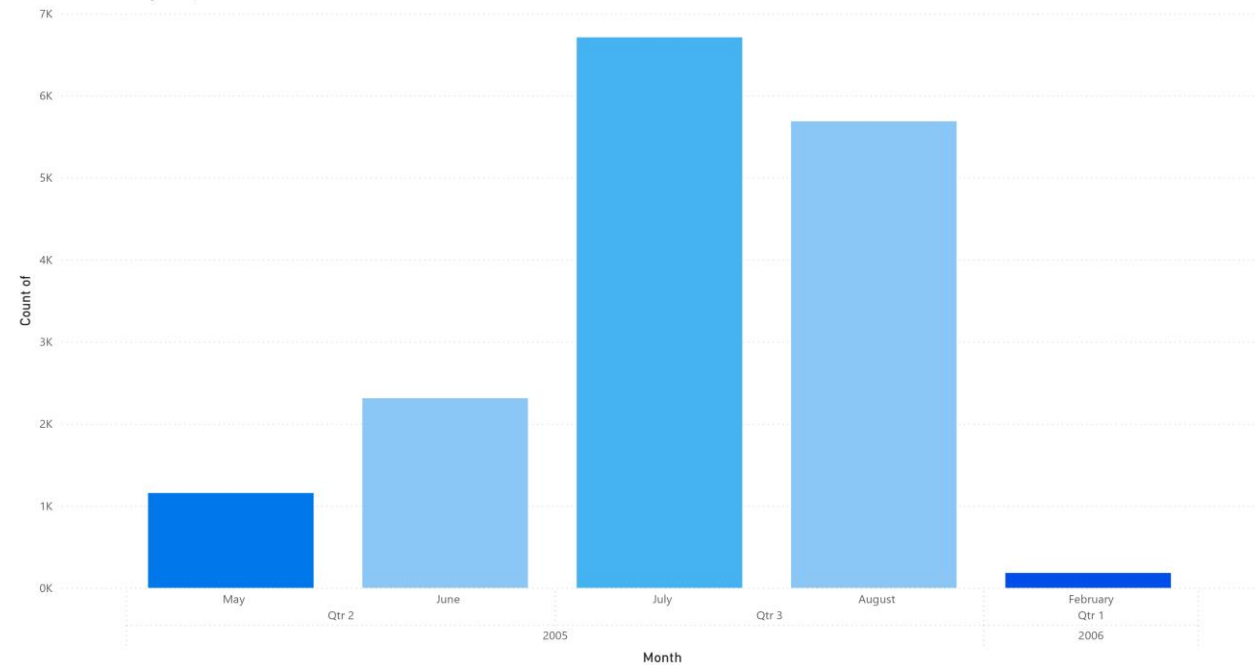
# Key Findings
Diagnostic Analysis

**Rental Activity by month, from Highest to Lowest:**

- July 2005: 6,709 rentals
- August 2005: 5,686 rentals
- June 2005: 2,311 rentals
- May 2005: 1,156 rentals
- February 2006: 182 rentals

Rental Activities by Year, Quarter and Month

# Key Findings

Diagnostic Analysis

**Key Observations:**

- Highest rental activity: July 2005 (6,709 rentals)
- Lowest rental activity: February 2006 (182 rentals)
- Strong seasonal trend, with summer months showing significantly higher activity

# Key Findings
Diagnostic Analysis

## Possible Reasons for Rental Activity:

- **Summer peak (July and August):**
  - School summer holidays result in an increase in family time at home resulting in increased rentals for films
  - Warmer weather encourages communal activities at home and travel
  - Peak tourist season in many destinations leading to an increase in rentals of films
  - More daylight hours for activities and travel leading to film rentals
- **Shoulder season (May and June):**
  - Beginning of summer, the weather improving
  - Some schools ending, early vacations starting which could reason in more free time and thus an increased need for renting films
  - Lower prices compared to peak season may attract budget-conscious
- **Winter low (February):**
  - Cold weather in many regions discourages travel and communal activities
  - Shorter daylight hours resulting in less free time between family members and friends
  - Post-holiday season, many people have less disposable income
  - Children that belong to the household are in usually in school meaning there's a decrease demand for rental films
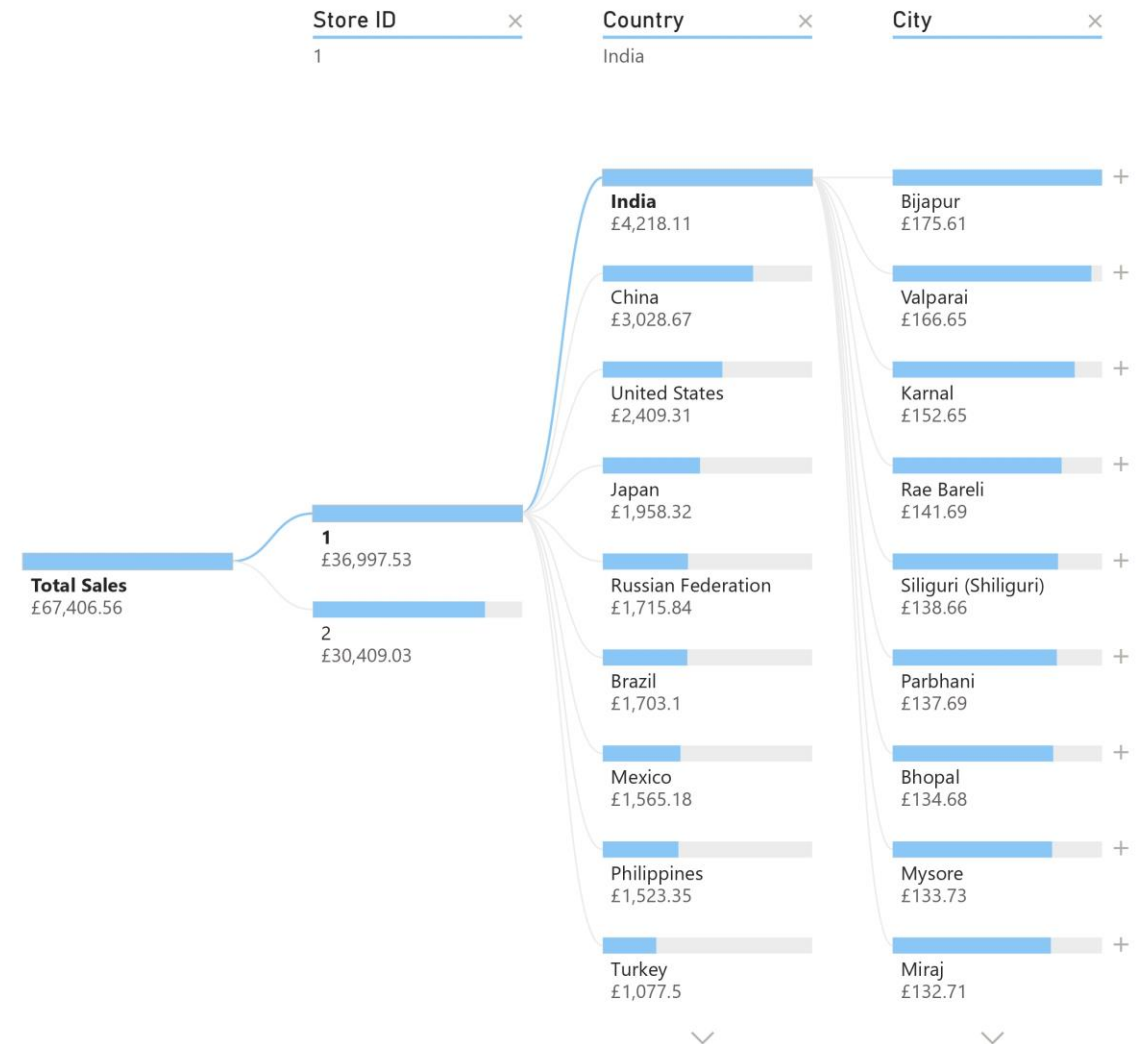
# Key Findings
Diagnostic Analysis

## Key Observations:

- Store 1 has the highest revenue input compared to Store 2 at £36,997.53 and £30,409.03 respectively.

- The highest proportion of spenders come from **India** with £4,218.11. Followed by **China** with £3,028.67 and the United States with £2,409.31.

- The **top 9 cities** in **India** contribute to 31% of the revenue and on average spend £146.



Revenue Payment Organised by City, Country and Store

| Store ID | Country | City |
|---|---|---|
| 1 | India | |

| Total Sales £67,406.56 | 1 £36,997.53 | India £4,218.11 | Bijapur £175.61 |
| | 2 £30,409.03 | China £3,028.67 | Valparai £166.65 |
| | | United States £2,409.31 | Karnal £152.65 |
| | | Japan £1,958.32 | Rae Bareli £141.69 |
| | | Russian Federation £1,715.84 | Siliguri (Shiliguri) £138.66 |
| | | Brazil £1,703.1 | Parbhani £137.69 |
| | | Mexico £1,565.18 | Bhopal £134.68 |
| | | Philippines £1,523.35 | Mysore £133.73 |
| | | Turkey £1,077.5 | Miraj £132.71 |

# Key Findings
## Diagnostic Analysis

## Key Observations:

- Store 2 has a revenue output of £30,409.03.

- The highest proportion of spenders come from **China** with £2,770.07. Followed by **India** with £2,410.17 and **Mexico** with £1,701.01.

- The **top 9 cities** in **China** contribute to 43% of the revenue and on average spend £131.



Revenue Payment Organised by City, Country and Store
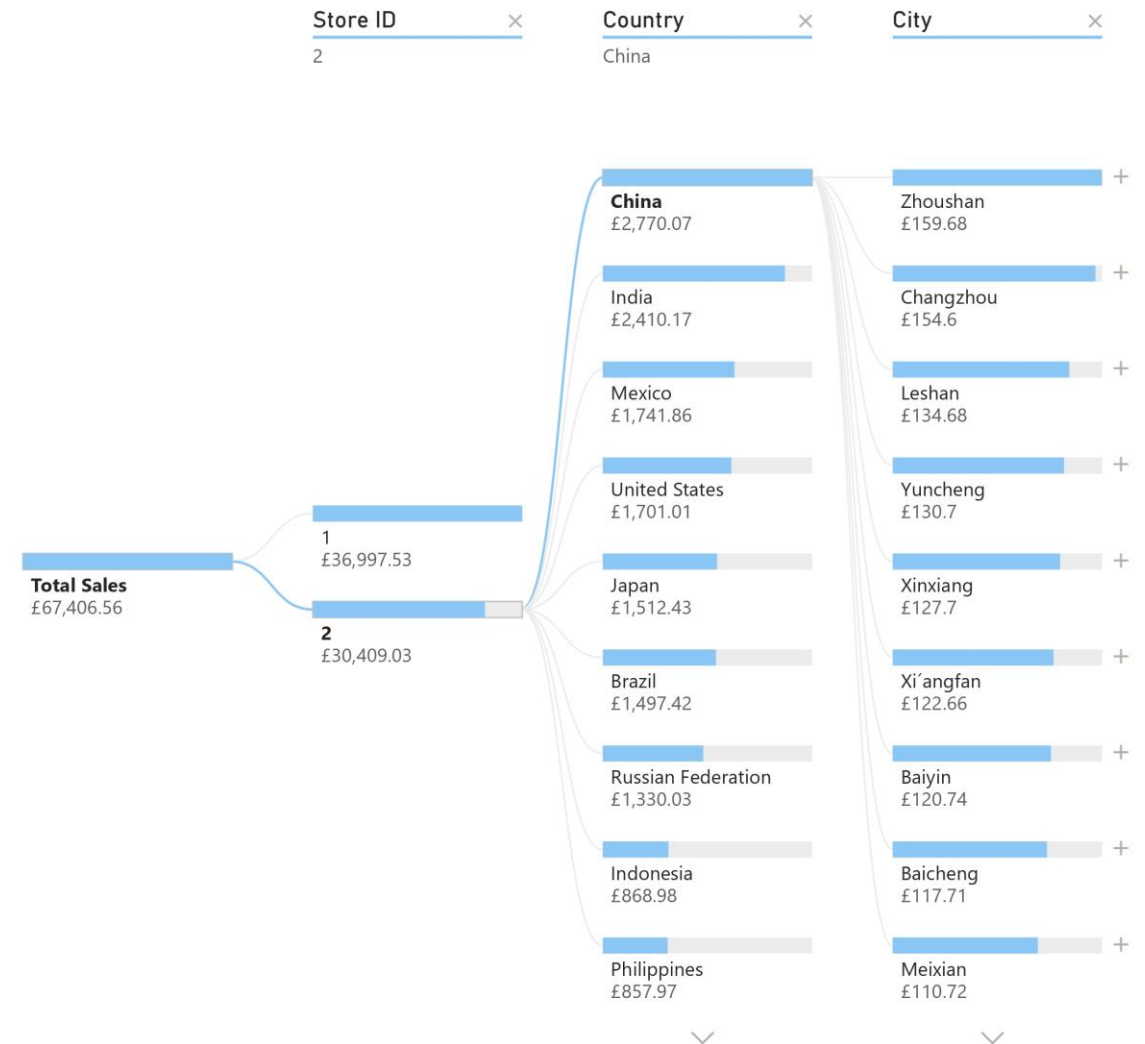
# Key Findings

Diagnostic Analysis

**Global Reach:**

- The countries listed in the revenue breakdown highlight both India and China dominate in both storefronts.
- Although the top 9 cities in India spend more on rental films in Store 1 at £146 compared the top 9 cities in China in Store 2 spending £131 on average.
- The difference in contributing of revenue in both these two countries is notable with spenders in India in Stores contributing to 31% whilst spenders in China contribute to 41%.
- The next 5 countries (excluding Turkey in Store 1 and Indonesia in Store 2) have a strong foothold between the two storefront a highlighting consistency present.

# Key Findings
Predictive Analysis

## Observed Trends:

- Overall Increasing Trend: The linear regression line in the graph shows an overall upward trend in sales from May to August 2005.



Total Sales by Year, Quarter, Month and Day
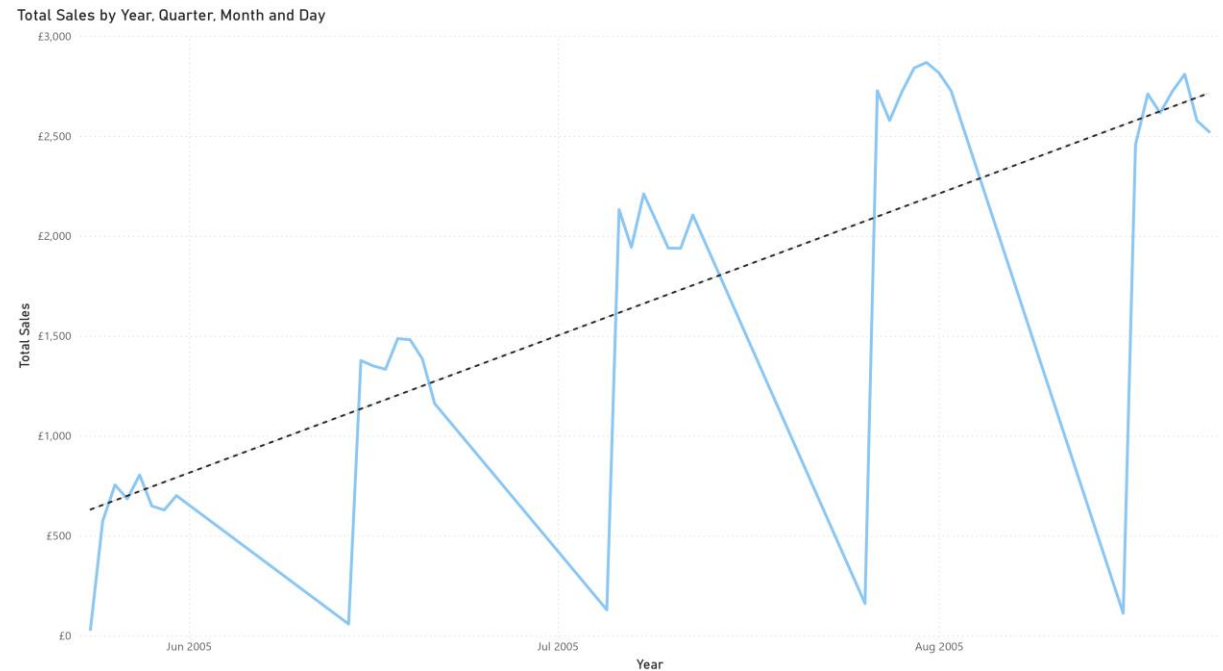
# Key Findings

Predictive Analysis

**Observed Trends:**

- Cyclical Sales Pattern:

- The data indicates a distinct cyclical pattern in sales within each month. For instance, in the second quarter of 2005, sales began at a notably low point, with a recorded value of £29.92 on May 24th.

- This trend of initial low sales is also observed in subsequent months: £57.84 on June 14th.

- However, as the months progress, there is a noticeable increase in sales activity, as evidenced by higher values in the third quarter, such as £128.73 on July 5th, £160.67 on July 26th, and £111.77 on August 16th.

- This pattern suggests that sales consistently start low at the beginning of each period and increase as the period progresses.

# Key Findings

Predictive Analysis

**Observed Trends:**

- Increasing Peak Sales: The peak sales for each month seem to be increasing. July's peak is higher than June's, and August's peak is higher than July's.

- Longer Sales Periods: The periods of high sales appear to be getting longer as migration towards August from May.

- Higher Sales Floor: The lowest points in each cycle seem to be increasing slightly over time as previously mentioned

# Key Findings

Predictive Analysis

**Revenue Forecast for the Next Quarter:**

- Based on these observations, the next quarter (Q4 2005) will see:
  - Continued Overall Growth: The general upward trend is likely to continue. As the likelihood of seeing the average daily sales in Q4 to be higher than Q3.
  - Persistence of Cyclical Pattern: The monthly cycle of low start, rapid rise, peak, and gradual decline is likely to continue. This pattern seems to be a fundamental characteristic of the business.
  - Higher Peaks: Following the trend, we can expect the peak daily sales in each month of Q4 to be higher than those in Q3. We might see peak daily sales reaching or exceeding £3,000.

# Key Findings

Predictive Analysis

**Revenue Forecast for the Next Quarter:**

- Based on these observations, the next quarter (Q4 2005) will see:
  - Extended High Sales Periods: The periods of high sales within each month may continue to lengthen, possibly resulting in more days with sales above £2,500.
  - Higher Minimum Sales: The minimum sales at the start of each monthly cycle may continue to increase slightly, possibly reaching around £200-£250.
  - Potential Holiday Effect: As Q4 includes the Winters there could be higher peaks and possibly disruptions to the usual pattern in late December.
  - Quarterly Revenue Estimate: Based on the growth trend, if Q3 showed total sales of £52,439.05, we might expect Q4 to reach £55,000-£60,000 in total sales.

# Key Findings
Predictive Analysis

**Changes to Foresee:**

- Potential Plateau: The growth rate might start to slow down as the business reaches market saturation or operational capacity limits.

- Seasonal Factors: Q4 often sees different consumer behaviours due to holidays, which could amplify or disrupt the observed patterns.

- External Factors: Any changes in marketing strategies, competition, or economic conditions could impact the forecast.

# Strategic Recommendations

**Expand and Diversify Film Inventory**

- Issue:
  - The current film inventory is limited, with only one film per category per store. This restricts customer choice and may lead to dissatisfaction.

- Recommendation:
  - Increase the number of films per category, particularly in high-demand categories.
  - Consider introducing a wider variety of films to cater to diverse customer tastes, which could attract more customers and encourage repeat rentals.
  - Additionally, monitor rental trends to ensure that inventory aligns with customer preferences, avoiding overstocking in low-demand categories

# Strategic Recommendations

**Enhance Marketing Efforts During Peak Seasons**

- Issue:
  - Rental activities peak during the summer months (July and August), driven by factors such as school holidays and increased family time

- Recommendation:
  - Capitalise on these peak seasons by launching targeted marketing campaigns that promote summer-themed movies, family collections, and discounted rental packages.
  - Additionally, consider introducing loyalty programs during these periods to increase customer retention and drive up sales.

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# Strategic Recommendations

**Target High-Revenue Customer Groups with Personalised Offers**

- Issue:
  - Customers from India and China contribute significantly to the revenue, especially in specific cities.

- Recommendation:
  - Develop personalised marketing strategies targeting these high-revenue customer groups. This could include offering exclusive deals, tailored movie recommendations based on previous rentals, and early access to new releases.
  - Leveraging data analytics to further understand customer preferences in these regions can help fine-tune these strategies.

# Strategic Recommendations

**Optimise Store Operations Based on Revenue Contribution**

- Issue:
  - Store 1 generates higher revenue compared to Store 2, with significant contributions from customers in specific cities.

- Recommendation:
  - Allocate resources and inventory strategically between the stores to maximize revenue. For example, consider enhancing the movie selection and customer experience in Store 1 to maintain its lead, while implementing promotional activities in Store 2 to boost its performance.
  - Additionally, consider experimenting with different pricing strategies in Store 2 to attract more customers.

# Strategic Recommendations

**Prepare for Seasonal Revenue Fluctuations**

- Issue:
  - There is a cyclical sales pattern with low sales at the beginning of each month, rising to a peak before tapering off.

- Recommendation:
  - To manage cash flow and inventory effectively, prepare for these fluctuations by aligning marketing efforts with the sales cycle. For instance, offer early-month discounts to boost sales during typically slow periods.
  - Additionally, prepare for the holiday season (Q4) by stocking up on popular titles and increasing marketing efforts to capture higher sales during this time.

# Strategic Recommendations

**Improve Customer Distribution Strategy**

- Issue:
  - Customer distribution is very even across numerous cities, with no significant concentrations in any particular location.

- Recommendation:
  - Focus on building a deeper customer base in cities with existing customer presence but untapped potential.
  - This could involve opening new stores, increasing online marketing efforts, or creating local partnerships to raise brand awareness and customer engagement in these areas.

# Conclusion

CineMax Rentals is well-positioned to dominate the Asian markets, particularly in China and India. To drive growth, CineMax should focus on expanding its inventory, targeting high-revenue customer groups with personalised marketing, optimising store operations, and preparing for seasonal sales fluctuations.

Moreover, by implementing these strategies and expanding into the European, African, and North American markets while consolidating its foothold in China and India, CineMax can enhance customer satisfaction and achieve sustained growth in a competitive global market.