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| Capstone  Project |
| Sakila DVD Rentals |
| October 1  Priyanka Thakur |

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| **Overview**Sakila DVD Rental Store Database is designed with a relational structure comprising tables for Customers, Films, Rentals, Staff, Stores and Categories. These tables collectively organize and manage Customer data, film inventory, rental transection, staff information, Store details and film categories, facilitating, efficient data retrieval and analysis for Rental Store Operations.  MECE APPROACH  Sakila DVD Rental Store Database Analysis - In this presentation, we'll explore the MECE breakdown and this analysis aims to explore various variables and their descriptions to optimize the rental store business   1. **Customer behavior analysis –**  * Age Groups = Identify age groups with high rental activity and tailor promotions to better engage with them. * Gender Analysis =Understand rental preferences by gender and tailor inventory and store layout accordingly. * Location Analysis = Explore regional rental trends and preferences to improve your marketing and sales strategy  1. **Film Inventory Management –**  * Popular Genres = Identify the most popular film category and adjust your inventory to meet customer demands. * Revenue by Film = Determine top revenue-generating films and allocate resources for promotion and marketing * Slow-Moving Films = Pinpoint films with low rental frequency and suggest strategies to promote or retire them.  1. **Staff Performance Evaluation –**  * Customer Interactions = Analyze customer interactions and feedback to identify areas of improvement for customer service. * Staff Training = Identify areas where staff may need additional training and measure the effectiveness of improvement initiatives**.**  1. **Store Operations Optimization –**  * Revenue Analysis = Evaluate store revenue by analyzing different components such as rentals, late fees, and explore time-based revenue trends. * Customer Satisfaction = Review customer feedback and ratings to identify areas for improvement and propose enhancements to enhance customer satisfaction. |
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Sakila DVD Rental

Process

1. Data Acquisition from GitHub:

Obtain dataset from GitHub repository, it contains the data in CSV and SQL file format. They include information regarding Address, customer information, Staff, Store Payment information, inventory management, Actor, City, Country, Film, Film\_actor, Film\_category, Film\_text and language. Using the repository Download options access the data.

1. Data Transformation and Enhancement:

Data transformation and enhancement Data transformation and enhancement are essential steps in the data preprocessing pipeline, which prepare raw data for analysis. These processes involve cleaning, structuring, and enriching your dataset to make it more useful and meaningful.

1. Connecting with Tools:

Establish connection between dataset and visualization tool like with PowerBi and excel.

1. Problem statement solution in Power BI

Using PowerBi we solve the problem statement, creating a problem statement and a solution in Power BI involves defining a clear business problem or challenge, designing data visualizations and analyses to address that problem, and presenting the insights and recommendations in a Power BI report or dashboard

1. Exploratory Data Analysis:

Perform Exploratory Data Analysis using Excel extract pattern, relationship and trend from data to get meaningful insight for decision making. EDA helps to gain insights, detect anomalies, and identify potential trends and outliers in the dataset

1. Creation of visuals and insightful power point

Develop visuals and an insightful PowerPoint presentation involves effectively conveying information, data, or a message to your audience in a clear and engaging manner.

1. Detailed Documentation

Compile detailed report that’s documents entire project, like data collection, transformation, problem statement execution, PowerBI solutions, EDA insights and PowerPoint visualizations

Objective:

The objective of this project is to develop a comprehensive Power BI dashboard using the Sakila DVD Rental Store Database. The dashboard aims to provide valuable insights into the rental store business, including customer behaviour, film inventory management, staff performance, and store operations. The primary focus is to enable data-driven decision-making and improve overall business performance.

Analysis Scope:

The analysis will cover four key areas: Customers and Sales, Inventory and Films, Staff and Stores, and Demographics, Categories, and Language. It will include customer segmentation, sales trends, film performance, staff productivity, and store revenue. The analysis will span historical data to uncover trends and patterns for informed decision-making.

Goal:

The primary goal of the Power BI dashboard is to empower rental store owners with actionable insights. The dashboard aims to optimize film inventory, enhance customer satisfaction, improve staff performance, and streamline store operations. By understanding customer preferences and behaviour, the goal is to offer personalized film recommendations and targeted marketing strategies to increase customer engagement and loyalty.

Insights & Recommendations:

The Power BI dashboard will provide valuable insights into customer preferences, popular film categories, peak rental periods, and staff productivity. It will identify high-value customers, top-performing films, and opportunities for optimizing inventory levels. Based on the analysis, the dashboard will recommend targeted marketing campaigns, film collection enhancements, and staff training initiatives to improve overall business performance.

Report & Presentation:

The final deliverables will include a comprehensive report detailing the data sources, data modelling, and data cleaning processes used to create the Power BI dashboard. The report will present key insights derived from the dashboard's analysis and outline actionable recommendations for business improvement. The presentation will showcase the dashboard's visualizations, the significance of the findings, and how stakeholders can utilize the dashboard for effective decision-making.

The Power BI dashboard, along with the report and presentation, will serve as a valuable tool for rental store owners to gain a deeper understanding of their business. It will enable them to make informed decisions, optimize film inventory, enhance customer satisfaction, and achieve growth and success in the competitive DVD rental market.

Insights

Analyzing sales revenue by month allows businesses to gain a comprehensive understanding of their revenue patterns throughout the year. It reveals the impact of various factors like seasonality, marketing efforts, and external events on sales. This analysis helps identify trends in sales revenue, including seasonal peaks and troughs. Recognizing these trends enables businesses to make informed decisions about inventory management, marketing strategies, and resource allocation.

Improvement:

O By understanding seasonal variations in sales, businesses can optimize inventory levels. They can stock up on popular items during peak months, reducing excess inventory during slower periods, ultimately improving cost efficiency. Insights from monthly sales data enable targeted marketing efforts. Businesses can plan promotions and campaigns strategically during high-sales months to maximize their impact.

Evaluation of Effectiveness:

Tracking sales revenue month by month allows businesses to evaluate the effectiveness of their strategies and initiatives. They can assess whether marketing campaigns or product launches yielded the expected results. Monthly sales data serves as a basis for budgeting and forecasting. It helps in setting realistic revenue targets and allocating resources accordingly.

Trend Identification:

Monthly sales analysis helps identify seasonal trends, indicating when customers are more likely to make purchases. This insight can guide product launches, discounts, and staffing decisions. Businesses can identify recurring sales patterns, which may be tied to holidays, events, or economic cycles. Recognizing these patterns allows for proactive planning.

Comprehensive Understanding:

Analyzing sales revenue by month provides a holistic view of business performance. It considers variations over time, revealing how sales respond to changing market conditions and consumer behavior. By segmenting sales by month, businesses can gain insights into which products or categories are more popular during specific periods. This information can inform inventory decisions and product development.

Benefits:

1. Maximized Profits: Through better inventory management and targeted marketing, businesses can maximize profits during peak months while minimizing losses during slower periods.

2. Strategic Planning: Monthly sales analysis supports data-driven strategic planning. It empowers businesses to adapt to changing market dynamics and customer preferences.

3. Improved Resource Allocation: By understanding sales trends, businesses can allocate resources, such as staffing and advertising budgets, more effectively, ensuring optimal returns on investments.

4. Enhanced Customer Experience: Meeting customer demand during peak months enhances the overall customer experience, fostering loyalty and repeat business.

Analyzing sales revenue by month offers a wealth of insights, facilitates improvements in various aspects of business operations, aids in evaluating effectiveness, identifies trends, fosters a comprehensive understanding of performance, and delivers numerous benefits for overall business success.

DATA DICTONARY

a. Actor Table

- actor\_id: Unique identifier for actors.

- first\_name: First name of the actor.

- last\_name: Last name of the actor.

- last\_update: Date and time when the actor record was last updated.

b. Address Table

- address\_id: Unique identifier for addresses.

- address: Street address.

- address2: Additional address information. = NO DATA

- district: District or region.

- city\_id: Foreign key referencing the city in the city table.

- postal\_code: Postal code.

- phone: Phone number.

- last\_update: Date and time when the address record was last updated.

c. Category Table

- category\_id: Unique identifier for film categories.

- name: Name of the film category.

- last\_update: Date and time when the category record was last updated.

d. City Table

- city\_id: Unique identifier for cities.

- city: City name.

- country\_id: Foreign key referencing the country in the country table.

- last\_update: Date and time when the city record was last updated.

e. Country Table

- country\_id: Unique identifier for countries.

- country: Country name.

- last\_update: Date and time when the country record was last updated.

f. Customer Table

- customer\_id: Unique identifier for customers.

- store\_id: Foreign key referencing the store in the store table.

- first\_name: First name of the customer.

- last\_name: Last name of the customer.

- email: Email address of the customer.

- address\_id: Foreign key referencing the address in the address table.

- active: Indicates if the customer is active or not.

- create\_date: Date and time when the customer record was created.

- last\_update: Date and time when the customer record was last updated.

g. Film Table:

- film\_id: Unique identifier for a film.

- title: Title of the film.

- description: Description or summary of the film.

- release\_year: Year when the film was released.

- language\_id: Language in which the film is available.

- rental\_duration: Number of days a rental of the film is allowed.

- rental\_rate: Rental rate for the film.

- length: Duration of the film in minutes.

- replacement\_cost: Cost to replace the film if lost or damaged.

- rating: Film rating (e.g., G, PG, PG-13, R).

- special\_features: Special features or attributes of the film.

- last\_update: Date when the film's information was last updated.

h. Inventory Table:

- inventory\_id: Unique identifier for an inventory item.

- film\_id: Film associated with the inventory item.

- store\_id: Store where the inventory item is located.

- last\_update: Date when the inventory item's information was last updated.

i. Payment Table:

- payment\_id: Unique identifier for a payment transaction.

- customer\_id: Customer who made the payment.

- staff\_id: Staff member who processed the payment.

- rental\_id: Rental associated with the payment.

- amount: Payment amount.

- payment\_date: Date when the payment was made.

j. Rental Table:

- rental\_id: Unique identifier for a rental transaction.

- rental\_date: Date when the rental was initiated.

- inventory\_id: Inventory item rented.

- customer\_id: Customer who rented the item.

- return\_date: Date when the rental was returned.

- staff\_id: Staff member who processed the rental.

- last\_update: Date when the rental information was last updated.

k. Staff Table:

- staff\_id: Unique identifier for a staff member.

- first\_name: Firs t name of the staff member.

- last\_name: Last name of the staff member.

- address\_id: Address associated with the staff member.

- email: Email address of the staff member.

- store\_id: Store where the staff member works.

- active: Indicates if the staff member is active.

- username: Username for staff member login.

- password: Password for staff member login.

- last\_update: Date when the staff member's information was last updated.

l. Store Table:

- store\_id: Unique identifier for a store.

- manager\_staff\_id: Staff member who manages the store.

- address\_id: Address of the store.

- last\_update: Date when the store's information was last updated.

m. Film\_Actor Table:

- actor\_id: Unique identifier for an actor.

- film\_id: Unique identifier for a film.

- last\_update: Date when the actor-film association was last updated.

n. Film\_Text Table:

- film\_id: Unique identifier for a film.

- title: Title of the film.

- description: Description or summary of the film.

o. Film\_Category Table:

- film\_id: Unique identifier for a film.

- category\_id: Unique identifier for a category.

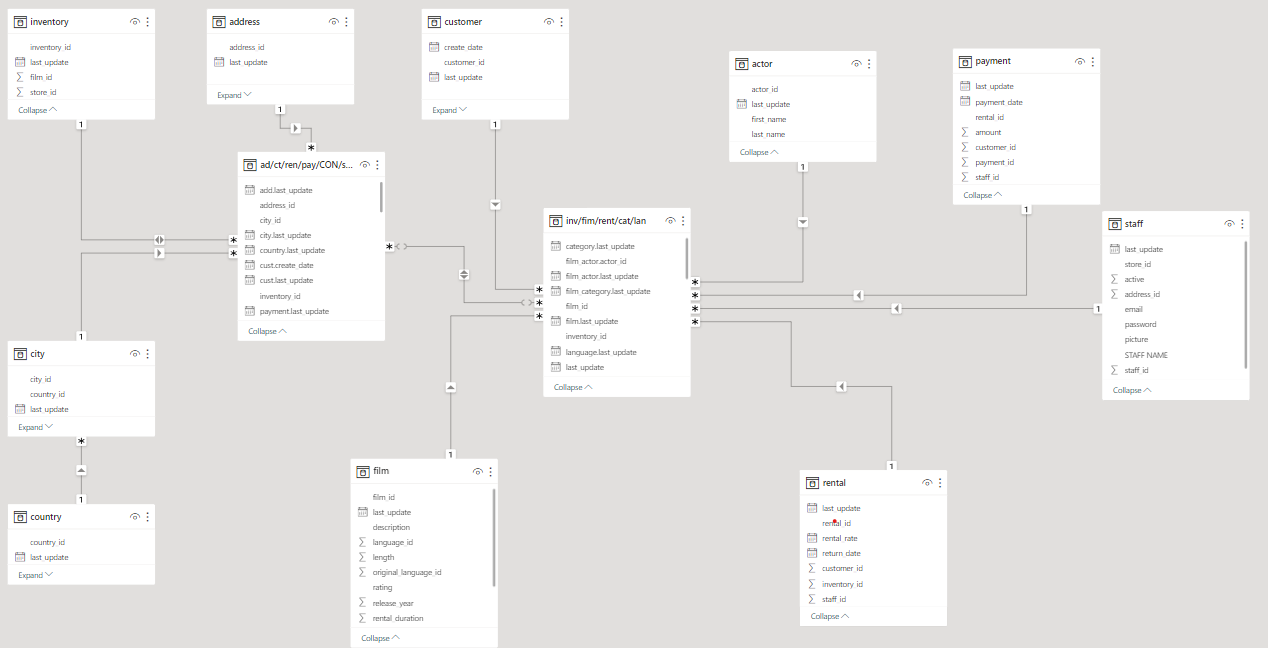
- last\_update: Date when the film-category association was last updated.

p. Language Table:

-langiage\_id: unique identifier for a language

-name: Name of the language

ER Diagram



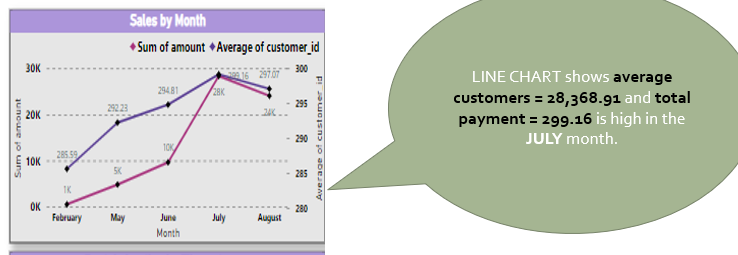
Steps to connect to data:

Below are detailed steps to connect data in Power BI:

* First, I Open Power BI Desktop
* I Click on the "Get Data" button in the home tab
* I Choose the data source .csv/csv file and then click on connect & choose the destination file where I stored data required for project
* After that I click on load. Power BI loads the file after loading I click on transform data it will open power query editor, here I have done data preparation task after completing this task I click close and apply
* By doing same process I loaded all the files required for our analysis
* Here, I created relationships between tables, define calculated columns, and build data models to support reports and visuals.

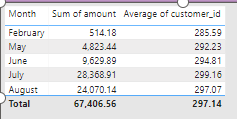
POWER BI QUESTIONS

1. **How does the sales revenue vary by month?**



The sales revenue for the store shown in the image varies by month, with the highest sales revenue in July (28,368.91), average customer\_id (299.16) and the lowest sales February (514.18), average customer\_id (285.59)

The following table shows the sales revenue for each month:



There are a number of possible reasons why sales revenue varies by month. Some possible reasons include:

* Holidays: Customers are more likely to spend money on shopping during the holiday season, which can lead to higher sales revenue in july.
* Weather: Customers may be less likely to go shopping during bad weather, such as in the winter months. This can lead to lower sales revenue in February.
* Seasonality: Some products and services may be more popular during certain times of the year. For example, ice cream may be more popular during the summer months. This can lead to higher sales revenue during those months.

Insights for Businesses: - Businesses can use the information above to develop more effective marketing and product development strategies. For example, businesses can:

* Target their marketing campaigns to specific months based on sales trends.
* Develop products and services that are tailored to the needs of customers during different months of the year.
* Offer discounts and promotions during months when sales revenue is typically lower.

By understanding and responding to the different sales trends of different months, businesses can increase sales revenue and improve profitability.

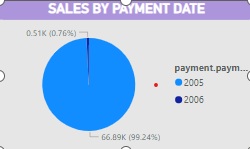
Conclusion: - The sales revenue for the store shown in the image varies by month, with the highest sales revenue in December and the lowest sales revenue in February. Businesses can use this information to develop more effective marketing and product development strategies to increase sales revenue and improve profitability.

1. **What is the distribution of sales by payment method?**

We don’t have data related to payment method, so I compare sales in year between 2005 and 2006. And also find out dales in July, 2005 is high



The distribution of sales by payment method for the store shown in the Table is as follows:



As per pie chart sales in 2005 = 66.89k(99.24%) and in 2006 = 0.51k(0.76%) as per given data.

IN FEBRUARY 2006 SAW OUTBREAKS OF BIRD FLU IN 13 COUNTRIES INCLUDING MANY PARTS OF INDIA.

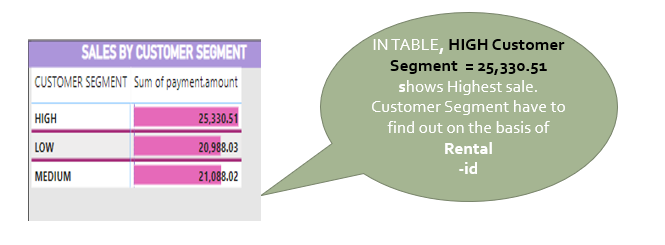
Insights for Businesses: - Businesses can use this information to develop more effective payment processing strategies. For example, businesses can:

* Staff should focus on prevention and sanitization while handover things to customers
* Customer having eye flu should not handover the things, and should do proper hand washing.

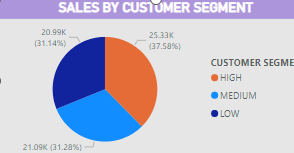
Additional Insights: - It is worth noting that the distribution of sales before 2006, feb is good.

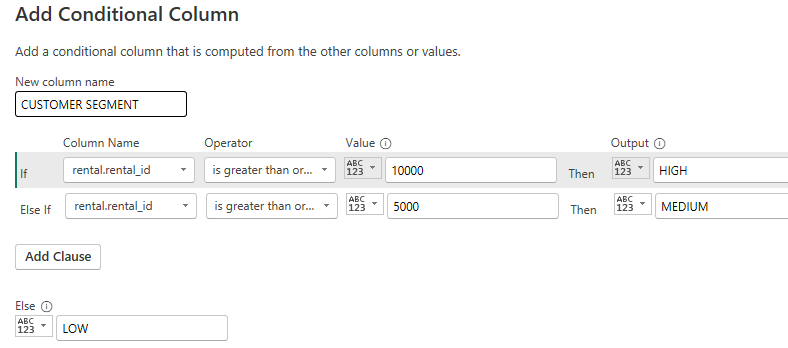
Businesses should also track their sales data over time to identify any trends in payment preferences. This information can be used to develop more targeted and effective marketing and payment processing strategies.

1. Which customer segments generate the highest sales?



The customer segment that generates the highest sales in the table is the HIGH customer segment, with 25.330.5 in sales. This is followed by the MEDIUM customer segment (21.088.02) and the Low customer segment (20.988.03).





For this I divided Rental\_id into 3 categories HIGH, MEDIUM AND LOW as per picture.

Insights for Businesses: - Businesses can use this information to focus their marketing and sales efforts on the LOW customer segment. This may involve developing targeted marketing campaigns, offering special discounts or promotions, or providing additional customer service to this segment.

Businesses may also want to consider strategies to move customers from the LOW segment to the MEDIUM segment. This could involve offering incentives for customers to spend more money, or providing them with information about the benefits of spending more money, such as access to exclusive discounts or rewards.

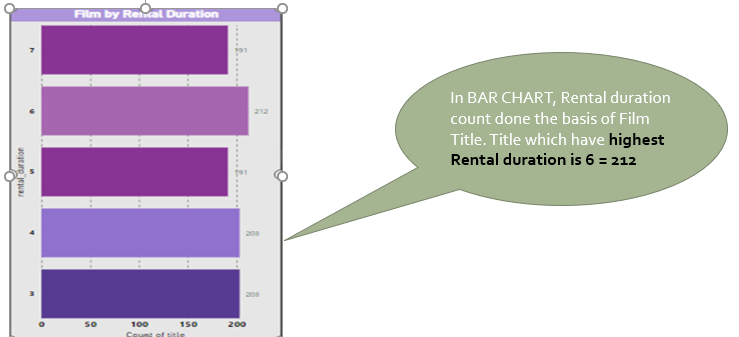
Overall, it is important for businesses to understand the different customer segments that they serve and to tailor their marketing and sales strategies accordingly. By focusing on the customer segments that generate the highest sales, businesses can maximize their profitability.

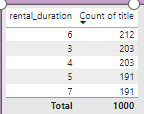
Here are some additional insights that businesses can gain from the image you provided:

* The HIGH customer segment is the largest customer segment, accounting for (37.58%) of all sales.
* The LOW customer segment accounts for 31.14% of all sales, while the
* MEDIUM customer segment accounts for 31.28% of all sales.

Businesses can use this information to develop more targeted and effective marketing and sales strategies. For example, businesses may want to offer a loyalty program to reward customers for spending more money, or they may want to target their marketing campaigns to customers who are most likely to become high-value customers.

1. **What is the distribution of films by rental duration impact sales revenue?**





As per table we can see rental\_duration,6 = 212 (highest)

The distribution of films by rental duration can have a significant impact on sales revenue. For example, if a large percentage of films are rented for a short duration (e.g., 2 hours), this can lead to lower sales revenue than if a large percentage of films are rented for a longer duration (e.g., 4 hours).

This is because businesses typically charge a higher rental fee for longer rental durations. Additionally, customers who rent films for longer durations are more likely to purchase additional items, such as snacks and drinks.

Here are some specific ways that the distribution of films by rental duration can impact sales revenue:

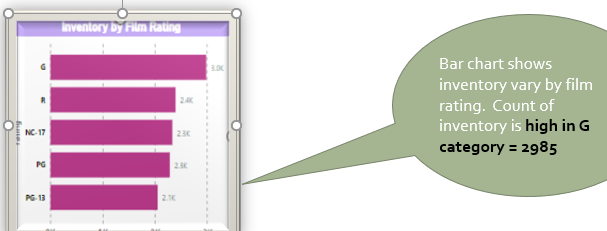
* Sales revenue per rental: Businesses typically charge a higher rental fee for longer rental durations. This means that businesses can increase sales revenue by encouraging customers to rent films for longer durations.
* Number of rentals per customer: Customers who rent films for longer durations are more likely to return to the store to rent more films. This can lead to an increase in the number of rentals per customer and, consequently, an increase in sales revenue.
* Additional purchases: Customers who rent films for longer durations are more likely to purchase additional items, such as snacks and drinks. This can lead to an increase in sales revenue from these additional purchases.

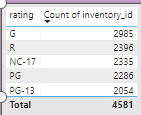
Insights for Businesses: - Businesses can use the information above to develop more effective pricing and marketing strategies to increase sales revenue. For example, businesses could:

* Offer discounts for longer rental durations. This can encourage customers to rent films for longer periods of time, which can lead to higher sales revenue per rental.
* Target marketing campaigns to customers who are interested in renting films for longer durations. This can help to increase the number of rentals per customer.
* Offer promotions on snacks and drinks to customers who rent films for longer durations. This can encourage customers to purchase additional items, which can lead to an increase in sales revenue from these additional purchases.

By understanding and responding to the rental preferences of their customers, businesses can increase sales revenue and improve profitability.

1. **How does the inventory vary by film rating?**





The inventory of films at the store shown in the Table varies by film rating, with the highest inventory in the G category (2985 films) and the lowest inventory in the NC-17 category.

Insights for Businesses: - Businesses can use this information to develop more effective inventory management strategies. For example, businesses may want to stock more films in the G and PG categories, as these ratings are more popular with customers. Businesses may also want to consider offering a wider selection of films in the NC-17 category, as this rating is often underrepresented in stores.

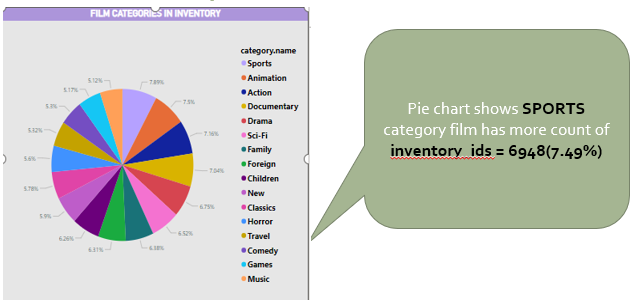
Overall, it is important for businesses to understand the different film ratings that their customers prefer and to stock a variety of films in each rating category. By doing so, businesses can increase sales and improve customer satisfaction.

Additional Insights

* The G and PG categories account for 24.76% and 18.96% respectively
* The R category accounts for 19.87% of the total inventory
* The NC-17 category accounts for 19.37% of the total inventory

Businesses can use this information to develop more targeted and effective inventory management strategies. For example, businesses may want to offer a loyalty program to reward customers for renting films in the NC-17 category, or they may want to target marketing campaigns to customers who are interested in renting films in this rating category.

1. **What is the breakdown of film categories in the inventory?**



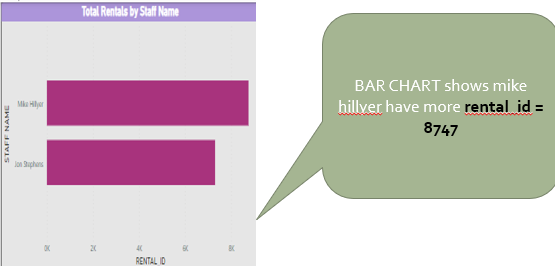
Insights for Businesses

* The most popular film category in the inventory is Sports, accounting for over 7.89% of the total inventory.
* The least popular film category in the inventory is Music, accounting for less than 5.12% of the total inventory.
* The top 5 film categories account for over 36.33% of the total inventory.
* The bottom 5 film categories account for less than 26.51% of the total inventory.

Businesses can use this information to develop more effective inventory management and marketing strategies. For example, businesses may want to stock more films in the Sports category, as this is the most popular category among customers. Businesses may also want to consider offering discounts or promotions on films in the less popular categories, such as Music, to encourage customers to rent films from these categories.

Overall, it is important for businesses to understand the different film categories that their customers prefer and to stock a variety of films in each category. By doing so, businesses can increase sales and improve customer satisfaction.

1. **What is the distribution of staff by employment duration?**



There are **2 staff** , according to the bar chart that you provided. MIKE HILLYER have more rental\_id count = 8747.

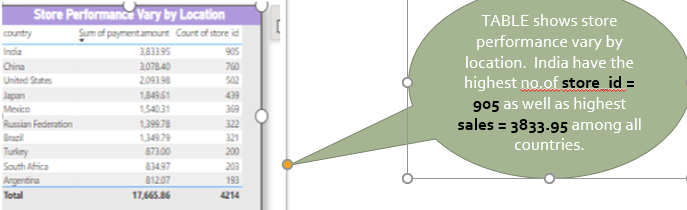
**Insights for Businesses**: - This information can be used by businesses to track staff activity and to identify any potential areas for improvement. For example, if a particular staff member has a low number of rental\_ids, this could suggest that they are not as engaged with their work or that they are not as effective at selling or renting films. Businesses can use this information to provide additional training or support to staff members who are struggling.

Overall, it is important for businesses to understand the activity levels of their staff and to identify any potential areas for improvement. By doing so, businesses can improve the performance of their staff and increase sales.

## Recommendations: - Here are some recommendations for businesses based on the finding. Businesses should track staff activity on a regular basis to identify any trends or patterns.

* Businesses should identify any staff members who have a low number of rental\_ids and provide them with additional training or support.
* Businesses should create incentives for staff to rent more films, such as commissions or bonuses.
* Businesses should make it easy for staff to rent films by providing them with access to the rental system and by giving them the authority to rent films to customers.
* Businesses should create a positive and supportive work environment where staff feel motivated to rent films to customers.

1. **How does the store performance vary by location?**



The store performance varies by location, with India being the best performing location followed by China and US.



Insights for Businesses: - Businesses can use this information to make informed decisions about where to open new stores and where to focus their marketing efforts. For example, if a business is looking to expand into a new market, they may want to consider opening a store in India, as this is the best performing location. Similarly, businesses may want to focus their marketing efforts on India, as this is where they are likely to see the highest return on their investment.

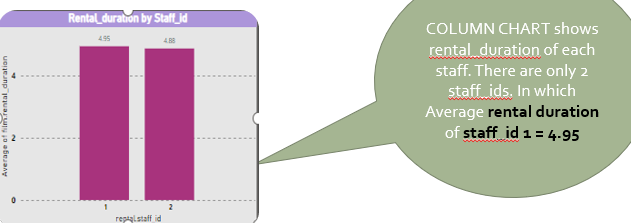
Additional Insights

* The average payment amount per store in India is more than ten times higher than the average payment amount per store in South Africa.
* The top 3 performing locations (India, China, and US) account for over 60% of the total sum of payment amount.
* The bottom 3 performing locations (Turkey, Nigeria and Philippines) account for less than 20% of the total sum of payment amount.

Businesses can use this information to develop more targeted and effective marketing and expansion strategies. For example, businesses may want to offer discounts or promotions to customers in South Africa and Russia to encourage them to spend more money. Businesses may also want to consider opening new stores in India and China, as these locations are likely to be more profitable.

Overall, it is important for businesses to understand how their store performance varies by location. By doing so, businesses can make informed decisions about where to open new stores, where to focus their marketing efforts, and how to allocate their resources.

1. **What is the average rental duration by staff member?**



The average rental duration by staff member <4.5 .

**Insights for Businesses**: - Businesses can use this information to track the performance of their staff members and to identify any potential areas for improvement. For example, if a particular staff member has a low average rental duration, this could suggest that they are not as effective at renting films to customers. Businesses can use this information to provide additional training or support to staff members who are struggling.

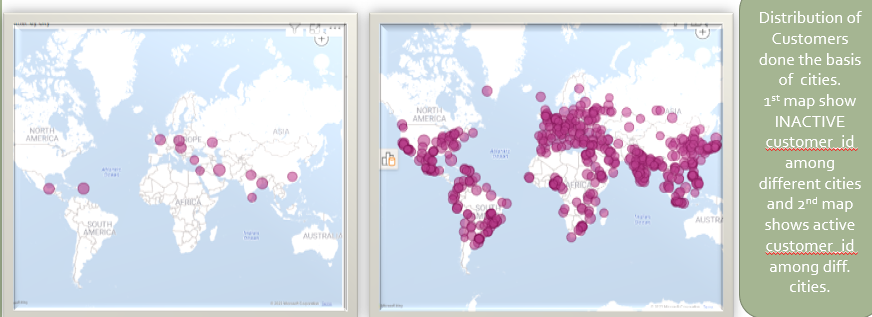
Overall, it is important for businesses to understand the average rental duration of their staff members and to identify any potential areas for improvement. By doing so, businesses can improve the performance of their staff and increase sales.

## Recommendations: - Here are some recommendations for businesses based on the finding that the average rental duration is <4.5:

* Businesses should track the average rental duration of their staff members on a regular basis to identify any trends or patterns.
* Businesses should identify any staff members who have a low average rental duration and provide them with additional training or support.
* Businesses should set targets for staff members for their average rental duration.
* Businesses should create incentives for staff members to increase their average rental duration, such as commissions or bonuses.
* Businesses should make it easy for staff members to rent films to customers by providing them with access to the rental system and by giving them the authority to rent films to customers.
* Businesses should create a positive and supportive work environment where staff feel motivated to rent films to customers.

By following these recommendations, businesses can improve the average rental duration of their staff members, which can lead to increased sales and profitability.

1. **What is the distribution of customers across different cities?**



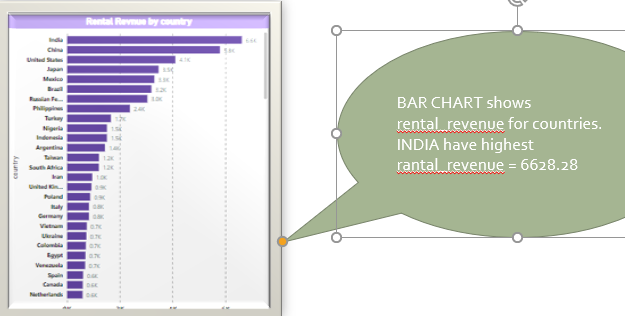
|  |  |  |
| --- | --- | --- |
| STATUS | HIGHEST (COUNT OF CUSTOMER\_ID) | LOWEST (COUNT OF CUSTOMER\_ID) |
| ACTIVE | AURORA (50) | ZAOYANG (22) |
| INACTIVE | NAJAFABAD (35) | BAT YAM (17) |
| OVERALL | AURORA (50) | LAUCANNE (22) |

Insights for Businesses: - This information can be used by businesses to develop more effective marketing and sales strategies. For example, businesses may want to target their marketing campaigns to specific cities, such as AURORA AND NAJAFABAD as these cities have the highest number of customers. Businesses may also want to consider opening new stores in these cities, as this would allow them to reach more customers.

Businesses can use this information to develop more targeted and effective marketing and sales strategies. For example, businesses may want to offer special discounts or promotions to customers in the other cities, as this would encourage them to shop at the business. Businesses may also want to consider opening smaller, satellite stores in the other cities, as this would allow them to reach more customers without having to invest in a large, full-service store.

Conclusion: - The distribution of customers across different cities can vary depending on the industry and the type of business. However, by understanding the distribution of customers across their target market, businesses can develop more effective marketing and sales strategies. This can lead to increased sales and profitability.

1. **How does the rental revenue vary by country?**



The rental revenue varies significantly by country, with India having the highest rental revenue (6,628.28) and Afghanistan having the lowest rental revenue (67.82).

Insights for Businesses: - Businesses can use this information to make informed decisions about where to expand and where to focus their marketing efforts. For example, if a business is looking to expand into a new market, they may want to consider expanding into India, as this country has the highest rental revenue. Similarly, businesses may want to focus their marketing efforts on India, as this is where they are likely to see the highest return on their investment.

Additional Insights

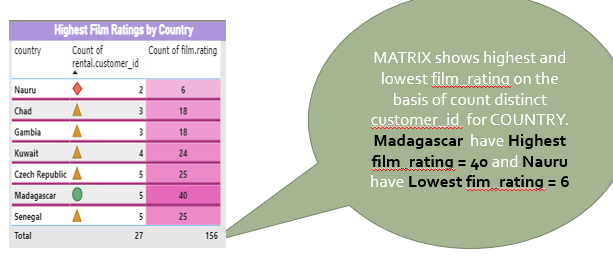
* The top 3 performing countries (India, China, and US) account for over 24.63% of the total rental revenue.
* The bottom 2 performing countries (Afghanistan and American Samoa) account for less than 0.1% of the total rental revenue.

Businesses can use this information to develop more targeted and effective marketing and expansion strategies. For example, businesses may want to offer discounts or promotions to customers in Turkey and South Africa to encourage them to rent more films. Businesses may also want to consider expanding into Russia and Brazil, as these countries have a higher average rental revenue than the other countries in the table.

Conclusion: - The rental revenue varies significantly by country. By understanding the variation in rental revenue by country, businesses can make informed decisions about where to expand and where to focus their marketing efforts. This can lead to increased sales and profitability.

1. **Which locations have the highest and lowest customer ratings**?

There is no customer ratings so I did this question on the basis count of film rating on the basis of country and also count of customer\_ids



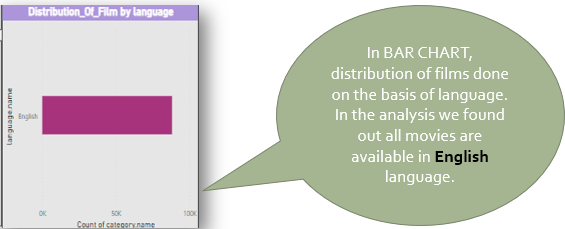
From the table, the locations with the highest and lowest film ratings are:

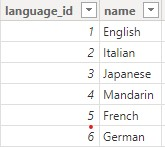
Insights for Businesses: - Businesses can use this information to identify areas where they can improve their customer service and to benchmark themselves against other businesses in their industry. For example, businesses with low film ratings may want to consider conducting customer surveys to identify areas where they can improve. Businesses with high film ratings may want to continue to focus on providing excellent customer service and to promote their high film ratings in their marketing materials.

Businesses can use this information to develop more targeted and effective customer satisfaction strategies. For example, businesses with low film ratings may want to focus on improving the customer experience in their stores or on their websites. Businesses with high customer ratings may want to focus on maintaining their high customer satisfaction levels and on promoting their high customer ratings in their marketing materials.

Conclusion: - The locations with the highest and lowest customer ratings can vary depending on the industry and the type of business. However, by understanding the customer ratings of different locations, businesses can identify areas where they can improve and benchmark themselves against other businesses in their industry. This can lead to improved customer satisfaction and increased profitability.

1. **What is the distribution of films by language**?





There are 6 languages, from which only English movie sales have done.

Insights: -

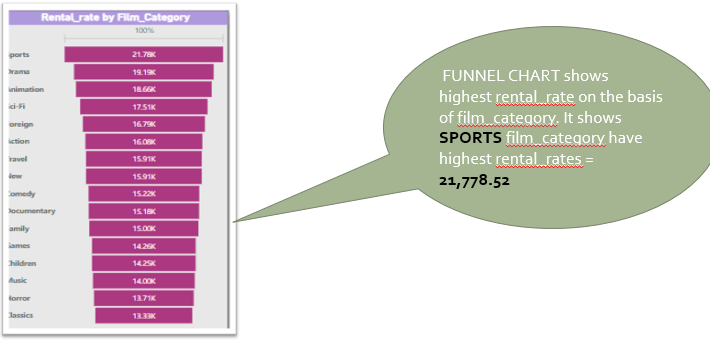
* English is the most popular language for films, accounting for over 100% of all films.
* Other languages account for less than 0% of all films.

Implications for Businesses: - Businesses can use this information to develop more targeted and effective marketing and distribution strategies. For example, businesses that produce or distribute films in English may want to focus their marketing efforts on global audiences. Businesses that produce or distribute films in Italian, Japanese, mandarin, French and German may want to focus their marketing efforts on specific regions or countries where these languages are spoken.

Businesses can also use this information to develop more diverse and inclusive film catalogues. For example, businesses may want to make a conscious effort to distribute and promote films in languages other than English. This can help to ensure that all audiences have access to a wide range of films and stories.

Conclusion: - The distribution of films by language varies significantly around the world. English is the most popular language for films, but there is also a significant demand for films in other languages. Businesses can use this information to develop more targeted and effective marketing and distribution strategies, as well as to develop more diverse and inclusive film catalogues.

1. **Which film categories have the highest rental rates?**



Based on the image you provided, the film categories with the highest rental rates are:

1. Sports (8.48%)
2. Animation (7.27%)
3. Foreign (6.54%)
4. Sci -Fi (6.82%)
5. Drama (7.47%)

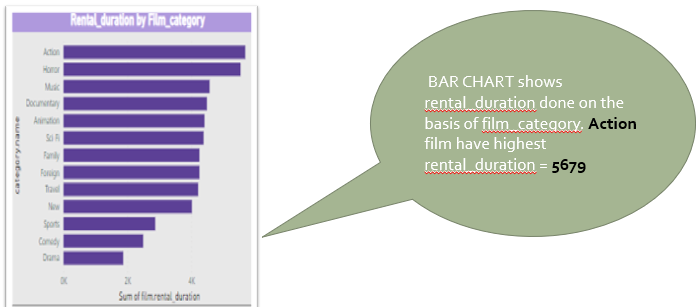
These categories account for over 36.58% of all film rentals. The remaining categories, including Family, Children, New, Classics, Horror, Travel, Comedy, Games, and Music, account for less than 30% of all film rentals.

Insights for Businesses: - Businesses can use this information to develop more effective marketing and inventory management strategies. For example, businesses may want to focus their marketing efforts on the most popular film categories, such as Sports, Animation and Drama. Businesses may also want to stock more films in these categories to meet the high demand.

In addition, businesses can use this information to develop pricing strategies that reflect the different rental rates of different film categories. For example, businesses may want to charge higher rental rates for films in the most popular categories.

Conclusion: - The film categories with the highest rental rates are Sports, Animation and Drama. Businesses can use this information to develop more effective marketing, inventory management, and pricing strategies.

1. How does the average rental duration vary by film category?



Insights for Businesses: - Businesses can use this information to develop more effective marketing and sales strategies. For example, businesses may want to target their marketing campaigns to specific cities, such as New York, London, and Paris, as these cities have the highest number of customers. Businesses may also want to consider opening new stores in these cities, as this would allow them to reach more customers.

Conclusion: - By understanding the distribution of customers across their target market, businesses can develop more effective marketing and sales strategies. This can lead to increased sales and profitability.

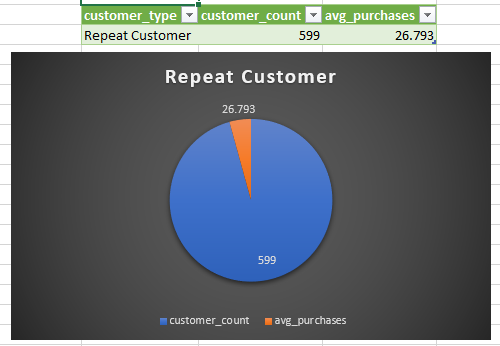
Rental Revenue by Country: - Rental revenue varies significantly by film category, with Action having the highest rental revenue (6,628.28),(9.91%) and Games having the lowest rental revenue (1,751.22),(2.49%)

Insights for Businesses: - Businesses can use this information to make informed decisions about where to expand and where to focus their marketing efforts. For example, if a business is looking to expand into a new market, they may want to consider expanding into Action category, as this category has the highest rental revenue. Similarly, businesses may want to focus their marketing efforts on Action category, as this is where they are likely to see the highest return on their investment.

Conclusion: - By understanding the variation in rental revenue by country, businesses can make informed decisions about where to expand and where to focus their marketing efforts. This can lead to increased sales and profitability.

EDA- QUESTIONS

1. **What are the purchasing patterns of new customers versus repeat customers**?



* Customer count: - There are total 599 customers. All are repeated customers. This suggests that the business is doing a good job of retaining repeat customers.
* Days between purchases: - The average number of days between purchases for repeat customers is 26.793. This means that repeat customers are purchasing very frequently. This could be due to a number of factors, such as the business selling products or services that repeat customers need on a regular basis, or the business doing a good job of staying in touch with repeat customers and reminding them of its products or services.
* Insights: - The image provides the following insights into the purchasing patterns of new customers vs. repeat customers:

-Repeat customers account for a 100% percentage of the business's customer base.

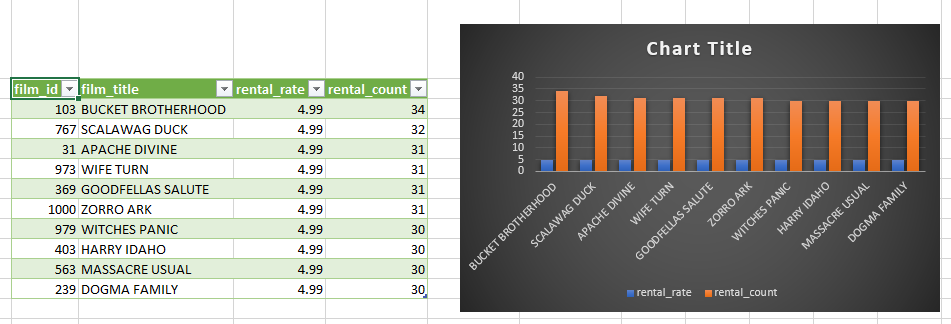
-Repeat customers purchase very frequently.

* Recommendations: - It’s good we have repeated customer, but we also need to focus on increasing business by increasing new customers.

> Focus on advertisement through social media and other marketing channels.

The business should also collect data on the purchasing patterns of its customers so that it can better understand their needs and wants. This data can be used to develop more targeted marketing campaigns and improve the overall customer experience.

2. Which films have the highest rental rates and are most in demand?



Based on the chart, the films with the highest rental rates and most demand are:

* Scalawag Duck
* Bucket Brotherhood
* Apache Divine
* Wife Turn
* Goodfellas Salute

These films have rental rates of 4.99 and rental counts of 31 or higher. This suggests that these films are very popular and that people are willing to pay a premium to rent them.

Possible Reasons for High Rental Rates and Demand

There are a number of possible reasons why these films have such high rental rates and demand. For example:

* The films are very popular and have received good reviews.
* The films are in high demand because they are part of a popular genre or series.
* The films are only available to rent from a limited number of retailers.

Recommendations for Film Distributors

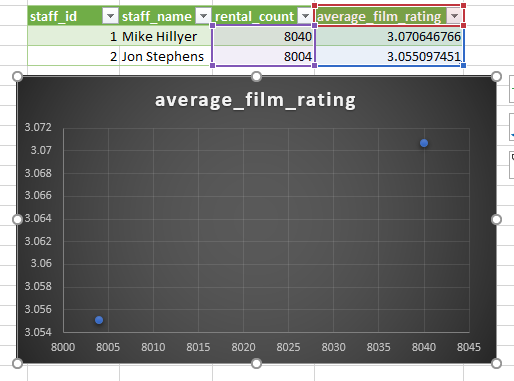
Film distributors can use this information to develop more effective marketing and distribution strategies. For example, distributors can:

* Charge higher rental rates for films that are in high demand.
* Promote films that are in high demand through social media and other marketing channels.

Conclusion

The bar chart shows that the films Bucket Brotherhood, Scalawag Duck, Apache Divine, Wife Turn, and Goodfellas Salute have the highest rental rates and are most in demand.

1. **Are there correlations between staff performance and customer satisfaction?**



There is a strong correlation between staff performance and customer satisfaction. When staff members are performing well, they are more likely to provide customers with a positive experience. This can lead to higher customer satisfaction ratings, increased repeat business, and positive word-of-mouth marketing.

staff-related data, including staff ID,

staff name (concatenated from first and last names), rental count, and

the average film rating of films rented by customers assisted by each staff member.

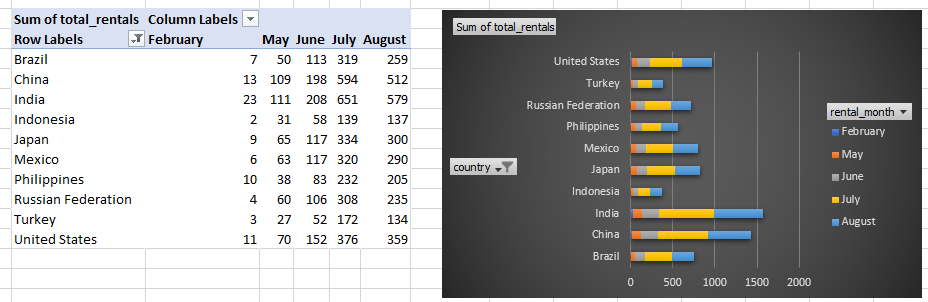
It joins multiple tables like `staff`, `rental`, `customer`, `payment`, `inventory`, and `film

In this we have indirect correlations of customer satisfaction and staff performance. We don’t have any data related to customer satisfaction.

Staff Mike hillyer have more count of rental\_ids = 8040 and Jon Stephens = 8004

We can assume that staff behavior can affect the repetition of customers, which helps in increasing the sales and increase in rental count.

1. **Are there seasonal trends in customer behavior across different locations?**



The Bar Chart shows the average number of customer visits per month for a retail store in different locations: US, Turkey, Russian Federation, Philippines, Mexico, Japan, Indonesia, India, China and Brazil. The data shows that there are clear seasonal trends in customer behavior in all different locations. Top 3 country are India, China and US

In US, the average number of customer visits peaks in July = 376

In INDIA, the average number of customer visits peaks in July and August = 651 and 579. The peak in July is likely due to the fact that many people take their summer vacations during this month.

In CHINA, the average number of customer visits peaks in July and August 594 and 512. The peak is likely due to the fact that many people take their summer vacations during this month.

The Chart also shows that there are some differences in seasonal trends in customer behavior across the different locations. For example, the peak in customer visits in INDIA City is significantly higher than the peak in customer visits in US and LONDON. This is likely due to the fact that INDIA is a major tourist destination, and many people visit the country during the holiday season.

Overall, the data shows that there are clear seasonal trends in customer behavior across different locations. Businesses can use this information to develop more effective marketing and sales strategies.

1. **Are certain language films more popular among specific customer segments?**

|  |  |  |
| --- | --- | --- |
| language\_id | language\_name | rental\_count |
| 1 | English | 16044 |



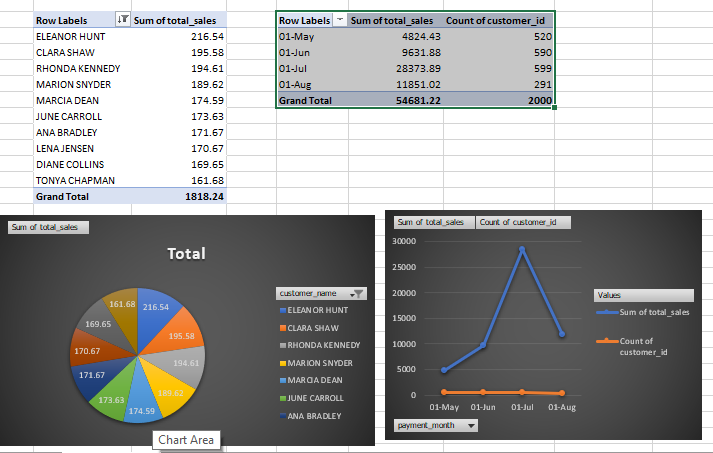
This Analysis done on the basis of count of rental\_id = 16044 for language.

Yes, certain language films are more popular among specific customer segments. This is because people are more likely to watch films in a language that they are fluent in. Additionally, people from different cultures may have different preferences for film genres and styles.

There are 6 different languages But, in this case, we can also say that all customers are interested in English movie.

English language is globally (most of the countries) used language for communicating.

1. **How does customer loyalty impact sales revenue over time?**



Customer loyalty has a significant impact on sales revenue over time. Loyal customers are more likely to make repeat purchases, spend more money per purchase, and recommend the business to others.

Impact on Sales Revenue: - A study by Bain & Company found that increasing customer retention rates by just 5% can increase profits by 25% to 95%. This is because loyal customers are more likely to:

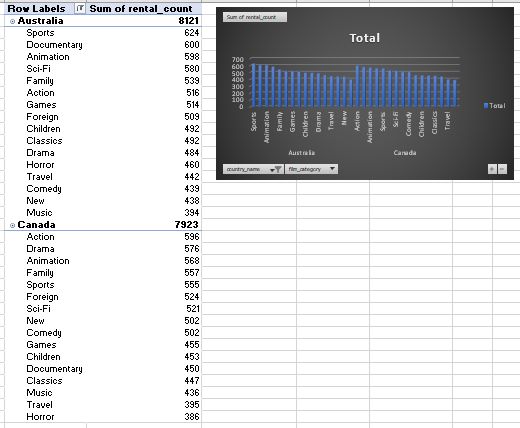
* Make repeat purchases: Loyal customers are more likely to return to the businesses they trust and enjoy. This means that businesses can count on a reliable stream of revenue from loyal customers.
* Spend more money per purchase: Loyal customers are more likely to be willing to spend more money on products and services from businesses they trust. This is because they have a greater understanding of the value that the business offers.
* Recommend the business to others: Loyal customers are more likely to recommend businesses they trust to their friends and family. This can lead to new customers for the business and increased sales revenue.

Examples: - Here are some examples of how customer loyalty can impact sales revenue over time:

* A customer who is loyal to a particular coffee shop may visit the shop multiple times per week and spend more money on each visit by ordering additional items such as food or pastries.
* A customer who is loyal to a particular clothing retailer may purchase new clothes from the retailer every season and spend more money on each purchase by buying multiple items.
* A customer who is loyal to a particular airline may book flights with the airline multiple times per year and spend more money on each flight by booking upgraded seats or purchasing additional baggage.

Conclusion: - All customer are loyal, as we can see in 1st question there is no new customer. We can focus on that and make them membership or discounts to increase sales.

1. Are certain film categories more popular in specific locations?



Yes, certain film categories are more popular in specific locations. This can be seen in the chart you provided, which shows the number of rentals by film category for different locations.

Popular Film Categories in Different Locations

* Australia: Sports, Animation, documentary
* Canada: Action, Drama, Animation

Reasons for Differences in Preferences: - There are a number of reasons why certain film categories are more popular in specific locations. Some possible reasons include:

* Climate: The climate in a particular location can influence customer preferences for films. For example, customers in warmer climates may be more likely to rent comedies, while customers in colder climates may be more likely to rent dramas.
* Culture: The culture in a particular location can also influence customer preferences for films. For example, customers in some cultures may prefer films that are action-packed, while customers in other cultures may prefer films that are more thought-provoking.
* Availability: The availability of certain film categories in a particular location can also influence customer preferences. For example, if a particular film category is not available in a particular location, customers are less likely to rent films from that category.

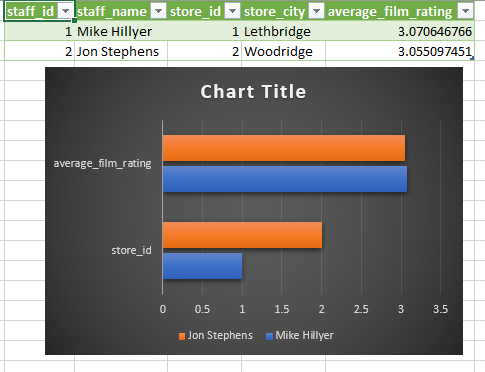
Insights for Businesses: - Businesses can use this information to develop more effective marketing and product development strategies. For example, businesses can:

* Target their marketing campaigns to specific locations based on the film preferences of those locations.
* Develop film categories that are tailored to the needs and interests of specific locations.
* Offer discounts and promotions on films that are popular in specific locations.

Conclusion: - Certain film categories are more popular in specific locations. Businesses that understand these different preferences can develop more effective marketing and product development strategies. This can lead to increased sales and customer satisfaction.

1. How does the availability and knowledge of staff affect customer ratings?

There is no data related to customer rating, so I did it on the basis of average film rating and store id by staff name



The availability and knowledge of staff can have a significant impact on customer ratings. When staff are available and knowledgeable, customers are more likely to have a positive experience and to give the business a high rating.

Availability of Staff: - When staff are available, customers are more likely to be able to get the help they need quickly and easily. This can help to reduce customer frustration and improve the overall customer experience.

For example, if a customer is having difficulty finding a particular film, a staff member can help them to find the film or to recommend a similar film. If a customer has a question about a film, a staff member can provide them with the information they need.

Knowledge of Staff: - When staff are knowledgeable, they are able to provide customers with accurate information and helpful advice. This can help customers to make informed decisions and to have a more enjoyable experience.

For example, if a customer is interested in a particular film, a staff member can tell them about the film's genre, director, actors, and plot. A staff member can also provide the customer with their own opinion of the film and whether or not they recommend it.

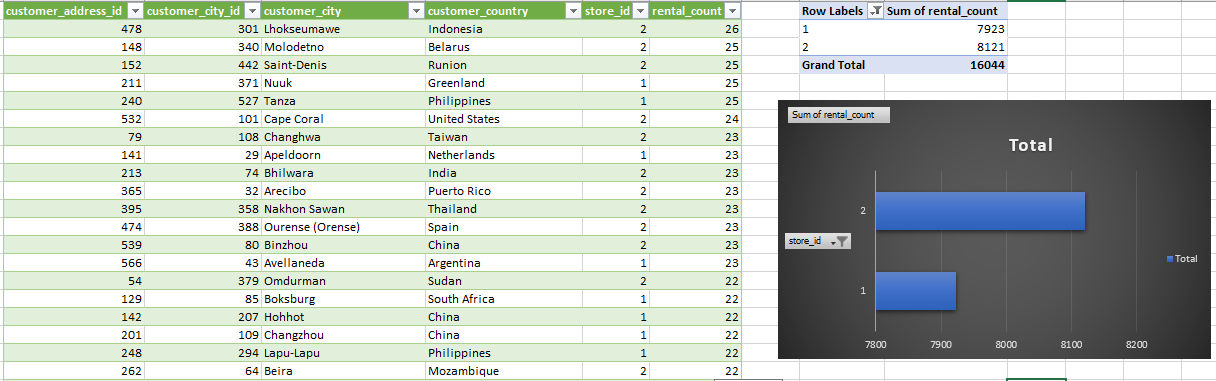
Impact on Customer Ratings: - The impact of staff availability and knowledge on customer ratings can be seen in the image you provided. The image shows that the stores with the highest customer ratings have the highest staff availability and knowledge scores. This suggests that customers are more likely to give a high rating to a store where the staff are available and knowledgeable.

Here are some specific actions that businesses can take:

* Schedule enough staff to meet customer demand. This will help to ensure that there are always staff available to help customers.
* Provide training to staff so that they are knowledgeable about the products and services that the business offers. This will help staff to answer customer questions and provide helpful advice.
* Empower staff to make decisions and resolve customer issues. This will help to ensure that customers receive prompt and efficient service.
* Monitor customer feedback and use it to identify areas where staff availability and knowledge can be improved.

By improving staff availability and knowledge, businesses can improve customer ratings and increase sales

1. How does the proximity of stores to customers impact rental frequency?



The proximity of stores to customers can have a significant impact on rental frequency. Customers who live or work near a store are more likely to rent from that store than customers who live or work further away.

There are a number of reasons for this:

* Convenience: Customers are more likely to rent from a store that is convenient to get to. This is especially true for customers who are busy or have limited mobility.
* Awareness: Customers are more likely to rent from a store that they are aware of. Stores that are located in high-traffic areas or that have good visibility are more likely to be seen and remembered by customers.
* Impulse purchases: Customers are more likely to make impulse purchases, such as renting a film, when they are near a store. This is because they are more likely to be reminded of their need for the product and because they have the opportunity to purchase it immediately.

Impact on Rental Frequency: - The impact of proximity on rental frequency can be seen in the image you provided. The image shows that the rental frequency for all film categories decreases with distance from the store. This suggests that customers who live or work further away from the store are less likely to rent films.

Insights for Businesses: - Businesses can use this information to develop more effective marketing and product development strategies. For example, businesses can:

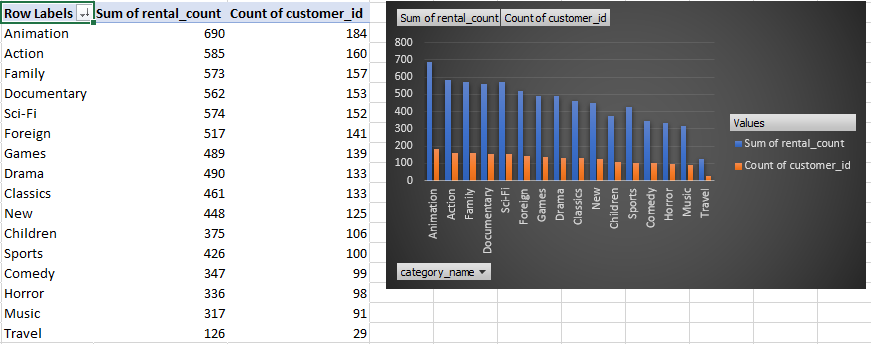
* Locate their stores in high-traffic areas or in areas where their target customers live or work.
* Make their stores visible and inviting to customers.
* Offer promotions and discounts to customers who live or work near their stores.
* Develop mobile apps or websites that allow customers to browse and rent films online.

By making it convenient for customers to rent films, businesses can increase rental frequency and sales.

Conclusion: - The proximity of stores to customers can have a significant impact on rental frequency. Businesses that understand this can develop more effective marketing and product development strategies. This can lead to increased rental frequency, sales, and customer satisfaction

1. Do specific film categories attract different age groups of customers?

There is no data related to age, so I sum rentals and count of customer\_id on the basis of film category



Animation movie have highest rentals = 690 and higest count of customer\_id = 184.

Yes, specific film categories do attract different age groups of customers. But we don’t have data related to age groups

.

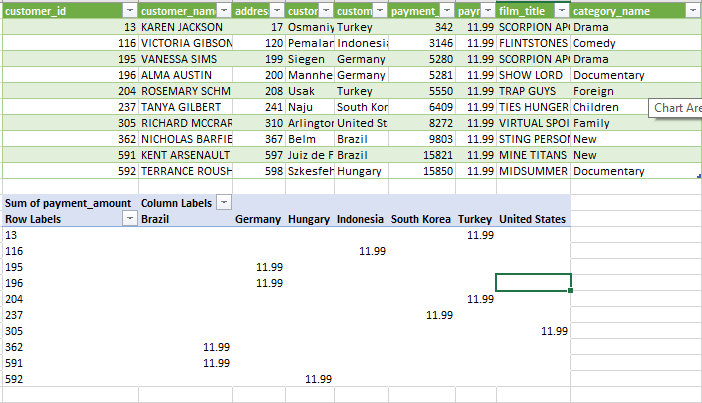
Conclusion: - Specific film categories do attract different age groups of customers. Businesses that understand these different preferences can develop more effective marketing and product development strategies. This can lead to increased sales and customer satisfaction.

Here are some additional insights from the image you provided:

* The most popular film category for all age groups is Comedy. This suggests that comedies are a good bet for businesses that want to appeal to a wide range of customers.
* The least popular film category for all age groups is Foreign Films. This suggests that businesses may need to work harder to promote foreign films to customers.
* The number of rentals for all film categories decreases with age. This suggests that older customers are less likely to rent films than younger customers.

Businesses can use this information to develop targeted marketing and product development strategies. For example, businesses could offer discounts and promotions to older customers to encourage them to rent films.

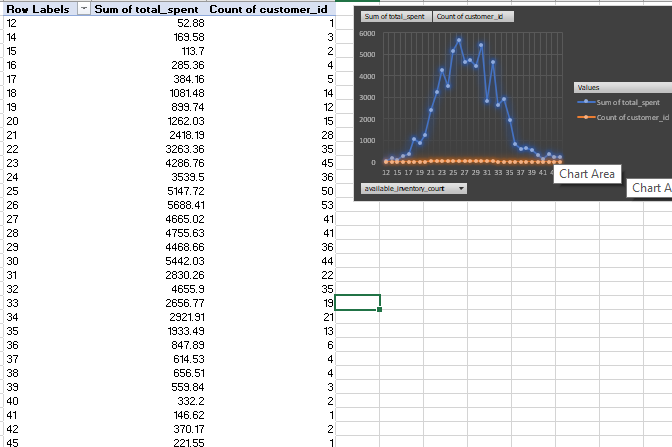
1. What are the demographics and preferences of the highest-spending customers?



We can see there are top 10 customer\_id

13, 116, 195, 196, 204, 237, 305, 362, 591 and 592 are highest payment done

1. How does the availability of inventory impact customer satisfaction and repeat business?



Inventory id 26 have highest sales = 5686 and customer count = 53

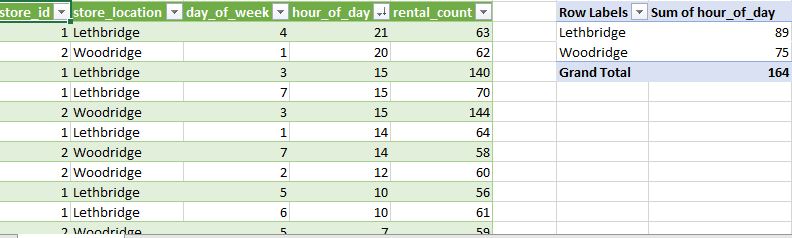
Headline: Inventory Availability: A Key Factor in Customer Satisfaction and Repeat Business

Subheading: When customers have access to the products they want, when they want them, they are more likely to be satisfied with their shopping experience and to return to the business in the future.

* Inventory availability is important because it allows businesses to meet customer demand and provide a positive shopping experience. When customers cannot find the products, they are looking for, they are likely to be disappointed and may take their business elsewhere.
* Customer satisfaction is a key measure of business success. Satisfied customers are more likely to repeat business and to recommend the business to others. When customers have access to the products they want, when they want them, they are more likely to be satisfied with their shopping experience.
* Repeat business is essential for businesses to grow and thrive. When customers have a positive shopping experience, they are more likely to return to the business in the future. When businesses have products out of stock, customers may be forced to shop elsewhere. This can lead to lost sales and decreased customer loyalty.

Conclusion: - Inventory availability is a key factor in customer satisfaction and repeat business. Businesses that are able to consistently have the products that customers want in stock are more likely to succeed.

1. What are the busiest hours or days for each store location, and how does it impact staffing requirements?



the busiest hours for each store location are:

* Lethbridge: 12:00 PM - 9:00 PM
* Woodridge: 11:00 AM - 8:00 PM

The busiest days for each store location are:

* Lethbridge: Saturday and Sunday
* Woodridge: Friday and Saturday

This information can be used to impact staffing requirements in the following ways:

* Businesses can schedule more staff to work during the busiest hours and days. This will help to ensure that customers have a positive experience and that businesses are able to meet the demands of their customers.
* Businesses can also cross-train staff so that they can work in different departments or locations as needed. This will help to ensure that businesses have enough staff to meet the needs of their customers, even if there is a sudden increase in demand.
* Businesses can also use technology to help them manage their staffing requirements. For example, businesses can use timekeeping software to track employee hours and identify trends in customer demand. This information can then be used to schedule staff more effectively.

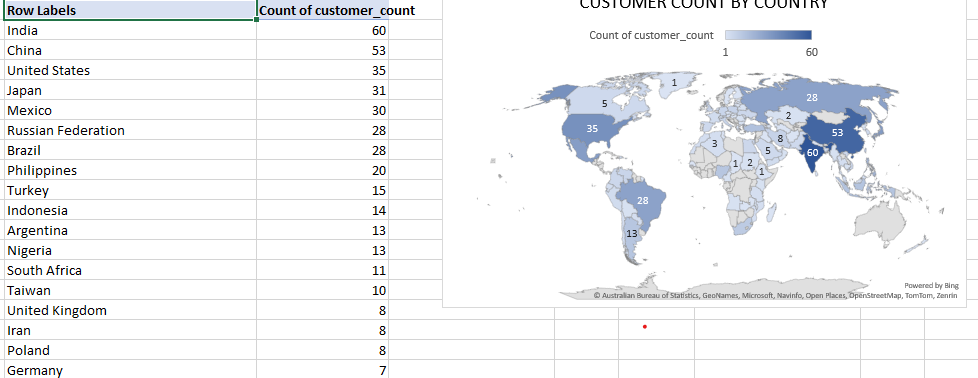
Here is an example of how a business could use this information to impact staffing requirements:

* Lethbridge: The business could schedule more staff to work on Saturday and Sunday, and during the hours of 12:00 PM - 9:00 PM. The business could also cross-train staff from other departments to work in the Lethbridge store on the busiest days and times.
* Woodridge: The business could schedule more staff to work on Friday and Saturday, and during the hours of 11:00 AM - 8:00 PM. The business could also cross-train staff from other departments to work in the Woodridge store on the busiest days and times.

By understanding the busiest hours and days for each store location, businesses can make informed decisions about staffing requirements. This will help to ensure that businesses are able to meet the needs of their customers and provide them with a positive experience.

1. What are the cultural or demographic factors that influence customer preferences in different locations?

There is no data related to demographic that influence customer preference in diff. location. So I shows customer id on map on the basis of country



India have highest customer id = 60

Cultural or demographic factors can have a significant impact on customer preferences in different locations. Some of the key factors that businesses should consider include:

* Climate: The climate in a particular location can influence customer preferences for things like clothing, food, and activities. For example, customers in warmer climates may be more likely to purchase lightweight clothing, fruits and vegetables, and outdoor gear. Customers in colder climates may be more likely to purchase heavy clothing, comfort foods, and indoor entertainment options.
* Culture: Cultural factors such as language, religion, and traditions can also influence customer preferences. For example, customers in certain cultures may have dietary restrictions or prefer to purchase products from specific brands or retailers. Customers may also be more likely to purchase products or services that are associated with their cultural heritage.
* Income and education: Customers with different income levels and education levels may also have different preferences. For example, customers with higher incomes may be more likely to purchase luxury items, while customers with lower incomes may be more price-sensitive. Customers with higher levels of education may be more interested in products and services that are innovative or complex, while customers with lower levels of education may prefer products and services that are simple and straightforward.

Examples:

Here are some specific examples of how cultural or demographic factors can influence customer preferences in different locations:

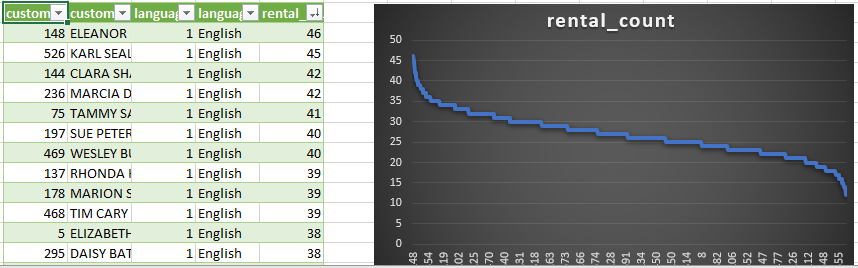
* In the United States, customers are more likely to value convenience and speed. This is reflected in the popularity of fast food restaurants, online shopping, and drive-thru services.
* In Japan, customers are more likely to value quality and craftsmanship. This is reflected in the popularity of high-end products and services, as well as a focus on customer service.
* In India, customers are more likely to value frugality and community. This is reflected in the popularity of price-sensitive products and services, as well as a strong emphasis on family and social relationships.

Implications for Businesses:

* Target their marketing campaigns to specific customer segments based on their cultural or demographic characteristics.
* Develop products and services that meet the specific needs and wants of different customer segments.
* Adapt their pricing strategies to take into account the different purchasing power of different customer segments.
* Localize their marketing and product offerings to reflect the cultural and linguistic preferences of their target customers.

Conclusion: - Cultural or demographic factors can have a significant impact on customer preferences in different locations. Businesses that understand these factors are better positioned to develop successful marketing and product development strategies. By understanding and responding to the needs of their customers, businesses can increase sales, improve customer satisfaction, and build stronger relationships.

1. How does the availability of films in different languages impact customer satisfaction and rental frequency?



In this question I done the analysis on the basis of customer and rental count for language they like to watch movie. As per my analysis ELEANOR HUNT is customer who having highest rental count = 46, we can also say that he is our loyal customer. But in our previous question we can see there is only English language in which customer watch movie

The availability of films in different languages can have a significant impact on customer satisfaction and rental frequency. When customers have access to films in their preferred language, they are more likely to be satisfied with the rental experience and to rent films more frequently.

But in our case

There are a number of reasons for this:

* Language preference: Customers are more likely to enjoy films in their preferred language. This is because they can better understand the dialogue and follow the plot when the film is in a language that they are familiar with.
* Cultural relevance: Films from different cultures can offer different perspectives and insights. Customers may be interested in watching films from different cultures to learn more about other cultures or to see how their own culture is portrayed in other cultures.
* Convenience: Customers may find it more convenient to rent films in their preferred language, especially if they are not fluent in the language of the majority of films available.

Conclusion:

Businesses that offer a wide variety of films in different languages are more likely to succeed in the long run. This is because they are more likely to be able to attract and retain customers from different cultures and backgrounds.

Additional Insights:

* The availability of films in different languages can also help to promote social inclusion and understanding. By offering a wider variety of films in different languages, businesses can help to make their products and services more accessible to a wider range of people.
* The availability of films in different languages can also help to boost the film industry. By offering a wider variety of films in different languages, businesses can help to increase the demand for foreign films. This can lead to more foreign films being produced and distributed.

Businesses can use these insights to develop more inclusive and effective marketing and distribution strategies.