Simon Business School, University of Rochester

Spring A 2025

CIS 467: Final Project

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March 3, 2025

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1.

customer_id	first_name	last_name	total_rentals	total_spent	film_id	film_title	category_name	film_rental_count	film_revenue	rental_month
130	CHARLOTTE	HUNTER	1	2.99	80	BLANKET BEVERLY	Family	1	2.99	5
459	TOMMY	COLLAZO	1	2.99	333	FREAKY POCUS	Music	1	2.99	5
408	MANUEL	MURRELL	1	3.99	373	GRADUATE LORD	Children	1	3.99	5
333	ANDREW	PURDY	1	4.99	535	LOVE SUICIDES	Horror	1	4.99	5
222	DELORES	HANSEN	1	6.99	450	IDOLS SNATCHERS	Children	1	6.99	5
549	NELSON	CHRISTENSON	1	0.99	613	MYSTIC TRUMAN	Comedy	1	0.99	5
269	CASSANDRA	WALTERS	1	1.99	870	SWARM GOLD	Horror	1	1.99	5
239	MINNIE	ROMERO	1	4.99	510	LAWLESS VISION	Animation	1	4.99	5
126	ELLEN	SIMPSON	1	4.99	565	MATRIX SNOWMAN	Foreign	1	4.99	5
399	DANNY	ISOM	1	5.99	396	HANGING DEEP	Drama	1	5.99	5
142	APRIL	BURNS	1	8.99	971	WHALE BIKINI	Foreign	1	8.99	5
261	DEANNA	BYRD	1	4.99	347	GAMES BOWFINGER	Travel	1	4.99	5
334	RAYMOND	MCWHORTER	1	6.99	499	KING EVOLUTION	Family	1	6.99	5
446	THEODORE	CULP	1	0.99	593	MONTEREY LABYRINTH	Horror	1	0.99	5
319	RONALD	WEINER	1	9.99	670	PELICAN COMFORTS	Documentary	1	9.99	5
316	STEVEN	CURLEY	1	4.99	86	BOOGIE AMELIE	Music	1	4.99	5
575	ISAAC	OGLESBY	1	2.99	181	CONTACT ANONYMOUS	Travel	1	2.99	5
19	RUTH	MARTINEZ	1	0.99	741	ROMAN PUNK	Music	1	0.99	5
456	RONNIE	RICKETTS	1	4.99	422	HOLLOW JEOPARDY	Sci-Fi	1	4.99	5
185	ROBERTA	HARPER	1	2.99	770	SCISSORHANDS SLUMS	Foreign	1	2.99	5
388	CRAIG	MORRELL	1	4.99	31	APACHE DIVINE	Family	1	4.99	5
509	RAUL	FORTIER	1	4.99	159	CLOSER BANG	Comedy	1	4.99	5
438	BARRY	LOVELACE	1	4.99	971	WHALE BIKINI	Foreign	1	4.99	5
350	JUAN	FRALEY	1	4.99	721	REDS POCUS	Music	1	4.99	5
37	PAMELA	BAKER	1	0.99	863	SUN CONFESSIONS	Sci-Fi	1	0.99	5

```
CREATE TABLE customer_film_analytics AS
SELECT
    c.customer_id,
    c.first_name,
    c.last_name,
    COUNT(r.rental_id) AS total_rentals,
    SUM(p.amount) AS total_spent,
    f.film_id,
    f.title AS film_title,
    cat.name AS category_name,
    COUNT(r.rental_id) AS film_rental_count,
    SUM(p.amount) AS film_revenue,
    MONTH(r.rental_date) AS rental_month
FROM customer c
JOIN rental r ON c.customer_id = r.customer_id
JOIN payment p ON r.rental_id = p.rental_id
JOIN inventory i ON r.inventory_id = i.inventory_id
JOIN film f ON i.film_id = f.film_id
JOIN film_category fc ON f.film_id = fc.film_id
JOIN category cat ON fc.category_id = cat.category_id
GROUP BY c.customer_id, c.first_name, c.last_name, f.film_id, f.title, cat.name, rental_month;

SELECT * FROM customer_film_analytics LIMIT 25;
```

Business Case: Customer-Film Analytics for Rental Insights

Introduction

The Customer-Film Analytics table is designed to track and analyze customer rental behavior, film performance, and revenue generation in a movie rental business. By integrating customer transactions with film metadata, this analysis helps the company understand rental trends, customer spending habits, and the profitability of different films and genres.

The insights derived from this table can be leveraged to optimize inventory, refine pricing strategies, and personalize marketing campaigns for increased customer retention and profitability.

Key Business Objectives

The Customer-Film Analytics table will help the company:

Analyze customer spending patterns: Identify high-value customers based on their total rental transactions and spending.

Determine popular films and genres: Track which movies and categories generate the most revenue and rentals.

Understand seasonal rental trends: Identify peak months for rentals to adjust stock levels and marketing efforts accordingly.

Optimize film selection: Provide insights into customer film preferences to stock high-demand titles.

Increase revenue per customer: Target frequent renters with personalized promotions and recommendations.

Data Warehouse Design

The Customer-Film Analytics table aggregates rental and payment data from the Sakila database, integrating information from multiple tables such as:

customer (Customer details)

rental (Rental transactions)

payment (Payments made)

film (Movie details)

film_category & category (Film categorization)

inventory (Stock availability)

Fact Table: customer_film_analytics

Column Name	Description
customer_id	Unique customer identifier
first_name & last_name	Customer's name
total_rentals	Number of movies rented by the customer
total_spent	Total amount spent by the customer
film_id	Unique film identifier
film_title	Title of the rented film
category_name	Genre/category of the film
film_rental_count	Number of times this film was rented by the customer
film_revenue	Total revenue generated by the film
rental_month	Month in which the rental occurred

Business Insights & Use Cases

The Customer-Film Analytics table enables the company to answer key business questions, such as:

Customer Behavior & Revenue Analysis

Who are the highest-spending customers?

Which customers rent the most frequently?

What are the average spending patterns per customer?

Film & Genre Popularity

Which movies are rented the most?

What genres perform best in terms of revenue and rental count?

How does film rental revenue vary by month?

Seasonal Rental Trends

What are the peak rental months for specific films and genres?

How does customer spending fluctuate throughout the year?

Marketing & Inventory Optimization

How can the company use rental trends to stock the right movies?

Can targeted promotions increase customer retention?

Benefits to the Business

Revenue Optimization: Identifying top-performing films and genres helps maximize profits.

Customer Retention Strategies: Personalized recommendations and promotions increase loyalty.

Inventory Management: Stocking high-demand films ensures availability.

Seasonal Demand Forecasting: Preparing for peak rental periods prevents stock shortages.

Data-Driven Decision Making: Helps refine pricing models and promotional strategies.

Conclusion

The Customer-Film Analytics table provides valuable insights into customer rental behavior, film performance, and revenue trends. With this data, the company can enhance customer engagement, optimize inventory, and maximize revenue, making data-driven decisions that improve operational efficiency and profitability.

2.

#1 Which movie categories generate the highest total revenue and have the most rentals?

```
SELECT
    category_name,
    COUNT(DISTINCT film_id) AS unique_films,
    SUM(film_revenue) AS total_revenue,
    SUM(film_rental_count) AS total_rentals,
    ROUND(AVG(film_revenue / NULLIF(film_rental_count, 0)), 2) AS avg_revenue_per_rental
FROM customer_film_analytics
GROUP BY category_name
ORDER BY total_revenue DESC, total_rentals DESC
LIMIT 10;
```

category_name	unique_films	total_revenue	total_rentals	avg_revenue_per_rental
Sports	73	5314.21	1179	4.50
Sci-Fi	59	4756.98	1101	4.32
Animation	64	4656.30	1166	3.99
Drama	61	4587.39	1060	4.32
Comedy	56	4383.58	941	4.66
Action	61	4375.85	1112	3.94
New	60	4351.62	940	4.63
Games	58	4281.33	969	4.42
Foreign	67	4270.67	1033	4.14
Family	67	4226.07	1096	3.86

Business Insights:

1. **Identifying high-revenue categories helps the company adjust inventory purchases and focus on promoting high-profit movie types.**
2. **If certain categories have high rental counts but low revenue, the company could consider adjusting rental prices or promoting higher-priced content.**

#2 Who are the most valuable customers by total spending?

```
SELECT
    customer_id,
    first_name,
```

```
    last_name,
    COUNT(DISTINCT film_id) AS unique_films_rented,
    SUM(total_spent) AS total_spent,
    ROUND(SUM(total_spent) / COUNT(DISTINCT film_id), 2) AS avg_spending_per_film
FROM customer_film_analytics
GROUP BY customer_id, first_name, last_name
ORDER BY total_spent DESC, unique_films_rented DESC
LIMIT 10;
```

customer_id	first_name	last_name	unique_films_rented	total_spent	avg_spending_per_film
526	KARL	SEAL	44	221.55	5.04
148	ELEANOR	HUNT	46	216.54	4.71
144	CLARA	SHAW	42	195.58	4.66
137	RHONDA	KENNEDY	38	194.61	5.12
178	MARION	SNYDER	38	194.61	5.12
459	TOMMY	COLLAZO	38	186.62	4.91
469	WESLEY	BULL	38	177.60	4.67
468	TIM	CARY	38	175.61	4.62
236	MARCIA	DEAN	42	175.58	4.18
181	ANA	BRADLEY	32	174.66	5.46

Business Insights:

1. **Identifying VIP customers allows the company to create exclusive promotions and membership programs to enhance customer loyalty.**
2. **Analyzing customers' average spending helps optimize movie recommendations and increase per-rental revenue.**

#3 Are there seasonal trends in movie rental revenue?

```
SELECT
    rental_month,
    COUNT(DISTINCT customer_id) AS unique_customers,
    SUM(film_revenue) AS total_revenue,
    SUM(film_rental_count) AS total_rentals,
    ROUND(AVG(film_revenue / NULLIF(film_rental_count, 0)), 2) AS avg_revenue_per_rental
FROM customer_film_analytics
GROUP BY rental_month
```

```
ORDER BY rental_month;
```

rental_month	unique_customers	total_revenue	total_rentals	avg_revenue_per_rental
2	158	514.18	182	2.83
5	520	4823.44	1156	4.18
6	590	9629.89	2311	4.17
7	599	28368.91	6709	4.23
8	599	24070.14	5686	4.23

Business Insights:

1. **Identifying peak and off-peak seasons allows for early promotion planning, such as holiday special offers.**
2. **Recognizing low-demand periods can lead to discount offers or subscription plans to boost off-season revenue.**

#4 How do different movie categories perform across different seasons?

```
SELECT
    category_name,
    rental_month,
    COUNT(DISTINCT film_id) AS unique_films,
    SUM(film_revenue) AS total_revenue,
    SUM(film_rental_count) AS total_rentals,
    ROUND(AVG(film_revenue / NULLIF(film_rental_count, 0)), 2) AS avg_revenue_per_rental
FROM customer_film_analytics
GROUP BY category_name, rental_month
ORDER BY category_name, rental_month;
```

category_name	rental_month	unique_films	total_revenue	total_rentals	avg_revenue_per_rental
Action	2	15	55.80	17	3.28
Action	5	50	371.13	87	4.27
Action	6	59	681.40	160	4.26
Action	7	61	1804.36	464	3.88
Action	8	61	1463.16	384	3.82
Animation	2	16	66.75	21	3.18
Animation	5	49	289.26	74	3.91
Animation	6	63	691.26	174	3.97
Animation	7	64	1954.11	489	3.99
Animation	8	64	1654.92	408	4.06
Children	2	6	15.94	6	2.66
Children	5	40	288.29	71	4.06
Children	6	53	495.70	130	3.81
Children	7	58	1539.94	406	3.79
Children	8	58	1315.68	332	3.96
Classics	2	9	24.89	9	2.77
Classics	5	40	227.38	62	3.67
Classics	6	52	518.64	136	3.81
Classics	7	54	1497.16	384	3.90
Classics	8	54	1371.52	348	3.93

Business Insights:

1. **Understanding the popularity of certain genres in specific periods (e.g., increased demand for animated movies during Christmas).**
2. **Launching advertisements and promotions at the right time enhances marketing precision.**

#5 Which movies have the highest number of rentals?

```
SELECT
    film_title,
    category_name,
    COUNT(DISTINCT customer_id) AS unique_customers,
    SUM(film_rental_count) AS total_rentals,
    SUM(film_revenue) AS total_revenue,
    ROUND(AVG(film_revenue / NULLIF(film_rental_count, 0)), 2) AS avg_revenue_per_rental
FROM customer_film_analytics
GROUP BY film_title, category_name
ORDER BY total_rentals DESC, total_revenue DESC
```

```
LIMIT 10;
```

film_title	category_name	unique_customers	total_rentals	total_revenue	avg_revenue_per_rental
BUCKET BROTHERHOOD	Travel	33	34	180.66	5.31
ROCKETEER MOTHER	Foreign	31	33	116.67	3.54
SCALAWAG DUCK	Music	32	32	172.68	5.40
RIDGEMONT SUBMARINE	New	32	32	130.68	4.08
FORWARD TEMPLE	Games	32	32	128.68	4.02
GRIT CLOCKWORK	Games	32	32	110.68	3.46
JUGGLER HARDLY	Animation	31	32	96.68	3.02
WIFE TURN	Documentary	28	31	223.69	7.22
ZORRO ARK	Comedy	30	31	214.69	6.93
GOODFELLAS SALUTE	Sci-Fi	31	31	209.69	6.76

Business Insights:

1. **Identifying the most in-demand movies helps in increasing inventory or promoting similar genres.**
2. **Detecting movies with high rentals but low revenue allows for pricing optimization to increase profitability.**

#6 Which customers contribute the most to specific movie categories?

```
SELECT
    customer_id,
    first_name,
    last_name,
    category_name,
    COUNT(DISTINCT film_id) AS unique_films_rented,
    SUM(film_revenue) AS total_spent_on_category,
    ROUND(SUM(film_revenue) / COUNT(DISTINCT film_id), 2) AS avg_spent_per_film
FROM customer_film_analytics
GROUP BY customer_id, first_name, last_name, category_name
ORDER BY total_spent_on_category DESC, unique_films_rented DESC
LIMIT 10;
```

customer_id	first_name	last_name	category_name	unique_films_rented	total_spent_on_category	avg_spent_per_
459	TOMMY	COLLAZO	Comedy	5	38.95	7.79
494	RAMON	CHOATE	Sports	6	38.94	6.49
526	KARL	SEAL	Animation	8	38.92	4.87
550	GUY	BROWNLEE	Family	6	36.94	6.16
504	NATHANIEL	ADAM	Drama	5	34.95	6.99
522	ARNOLD	HAVENS	Games	7	34.93	4.99
204	ROSEMARY	SCHMIDT	Foreign	5	33.95	6.79
513	DUANE	TUBBS	Horror	4	33.95	8.49
363	ROY	WHITING	Action	6	32.94	5.49
472	GREG	ROBINS	Music	6	32.94	5.49

Business Insights:

1. **Sending personalized recommendations to specific customer segments enhances engagement.**
2. **Offering additional discounts or subscription services to high-value customers increases repeat purchases.**

#7 Which customers have the highest rental frequency?

```
SELECT
    customer_id,
    first_name,
    last_name,
    COUNT(DISTINCT rental_month) AS months_active,
    SUM(total_rentals) AS total_rental_count,
    ROUND(SUM(total_rentals) / NULLIF(COUNT(DISTINCT rental_month), 0), 2) AS
avg_rentals_per_month
FROM customer_film_analytics
GROUP BY customer_id, first_name, last_name
ORDER BY total_rental_count DESC, months_active DESC
LIMIT 10;
```

customer_id	first_name	last_name	months_active	total_rental_count	avg_rentals_per_month
148	ELEANOR	HUNT	4	46	11.50
526	KARL	SEAL	4	45	11.25
236	MARCIA	DEAN	5	42	8.40
144	CLARA	SHAW	4	42	10.50
75	TAMMY	SANDERS	5	41	8.20
197	SUE	PETERS	4	40	10.00
469	WESLEY	BULL	4	40	10.00
137	RHONDA	KENNEDY	4	39	9.75
468	TIM	CARY	4	39	9.75
178	MARION	SNYDER	4	39	9.75

Business Insights:

1. **Identifying highly active users enables the company to offer membership plans or subscription models to improve retention.**
2. **Offering promotions to low-frequency renters can boost their engagement.**

#8 Which movie categories have the highest revenue per rental?

```
SELECT
    category_name,
    COUNT(DISTINCT film_id) AS unique_films,
    SUM(film_revenue) AS total_revenue,
    SUM(film_rental_count) AS total_rentals,
    ROUND(SUM(film_revenue) / NULLIF(SUM(film_rental_count), 0), 2) AS
avg_revenue_per_rental
FROM customer_film_analytics
GROUP BY category_name
ORDER BY avg_revenue_per_rental DESC, total_revenue DESC
LIMIT 10;
```

category_name	unique_films	total_revenue	total_rentals	avg_revenue_per_rental
Comedy	56	4383.58	941	4.66
New	60	4351.62	940	4.63
Sports	73	5314.21	1179	4.51
Games	58	4281.33	969	4.42
Horror	53	3722.54	846	4.40
Drama	61	4587.39	1060	4.33
Sci-Fi	59	4756.98	1101	4.32
Travel	53	3549.64	837	4.24
Foreign	67	4270.67	1033	4.13
Music	51	3417.72	830	4.12

Business Insights:

1. **Identifying high-profit categories helps in increasing marketing efforts for those movies.**
2. **Adjusting rental prices for low-revenue categories improves overall profitability.**

#9 How can we categorize customers into high spenders, medium spenders, and low spenders based on their total spending?

```
SELECT
        c.customer_id,
        c.first_name,
        c.last_name,
        cf.total_spent,
        CASE
        WHEN cf.total_spent >= 100 THEN 'High Spender'
        WHEN cf.total_spent BETWEEN 50 AND 99 THEN 'Medium Spender'
        ELSE 'Low Spender'
        END AS spending_category
FROM customer_film_analytics cf
JOIN customer c ON cf.customer_id = c.customer_id
ORDER BY cf.total_spent DESC;
```

customer_id	first_name	last_name	total_spe...	spending_categ...
310	DANIEL	CABRAL	16.98	Low Spender
260	CHRISTY	VARGAS	16.98	Low Spender
90	RUBY	WASHINGTON	15.98	Low Spender
482	MAURICE	CRAWLEY	15.98	Low Spender
403	MIKE	WAY	13.98	Low Spender
80	MARILYN	ROSS	13.98	Low Spender
532	NEIL	RENNER	12.98	Low Spender
211	STACEY	MONTGOMERY	12.98	Low Spender
334	RAYMOND	MCWHORTER	12.98	Low Spender
237	TANYA	GILBERT	11.99	Low Spender
116	VICTORIA	GIBSON	11.99	Low Spender
592	TERRANCE	ROUSH	11.99	Low Spender
196	ALMA	AUSTIN	11.99	Low Spender
13	KAREN	JACKSON	11.99	Low Spender
195	VANESSA	SIMS	11.99	Low Spender
305	RICHARD	MCCRARY	11.99	Low Spender
204	ROSEMA...	SCHMIDT	11.99	Low Spender
591	KENT	ARSENAULT	11.99	Low Spender
362	NICHOLAS	BARFIELD	11.99	Low Spender
446	THEODO...	CULP	11.98	Low Spender
499	MARC	OUTLAW	11.98	Low Spender
132	ESTHER	CRAWFORD	11.98	Low Spender
304	DAVID	ROYAL	10.99	Low Spender
148	ELEANOR	HUNT	10.99	Low Spender
545	JULIO	NOLAND	10.99	Low Spender
468	TIM	CARY	10.99	Low Spender
78	LORI	WOOD	10.99	Low Spender
289	VIOLET	RODRIQUEZ	10.99	Low Spender
104	RITA	GRAHAM	10.99	Low Spender
163	CATHY	SPENCER	10.99	Low Spender
276	BRANDY	GRAVES	10.99	Low Spender

Business Insights:

1. **The majority of customers fall into the "Low Spender" category (spending under $50). Few customers qualify as "High Spenders" (over $100).**
2. **Offer discounts, loyalty programs, or subscription plans to encourage Low Spenders to rent more frequently. Provide special offers, early access to new releases, or bundled rental deals for High Spenders to retain their loyalty. Use email campaigns and in-store promotions to convert Medium Spenders into High Spenders by offering bundle pricing or unlimited rental memberships.**

#10 Which films generate higher revenue in one store compared to another, and by how much?

```
SELECT
	f.title,
	store_1_revenue,
	store_2_revenue,
	(store_1_revenue - store_2_revenue) AS revenue_difference,
	CASE
	WHEN store_1_revenue > store_2_revenue THEN 'Store 1 Performs Better'
	WHEN store_1_revenue < store_2_revenue THEN 'Store 2 Performs Better'
	ELSE 'Equal Performance'
	END AS store_performance
FROM (
	-- Summarize revenue per store for each film
	SELECT
	cf.film_id,
	SUM(CASE WHEN i.store_id = 1 THEN cf.film_revenue ELSE 0 END) AS
store_1_revenue,
	SUM(CASE WHEN i.store_id = 2 THEN cf.film_revenue ELSE 0 END) AS
store_2_revenue
	FROM customer_film_analytics cf
	JOIN inventory i ON cf.film_id = i.film_id  -- Get the store_id from inventory
	GROUP BY cf.film_id
) AS store_comparison
```

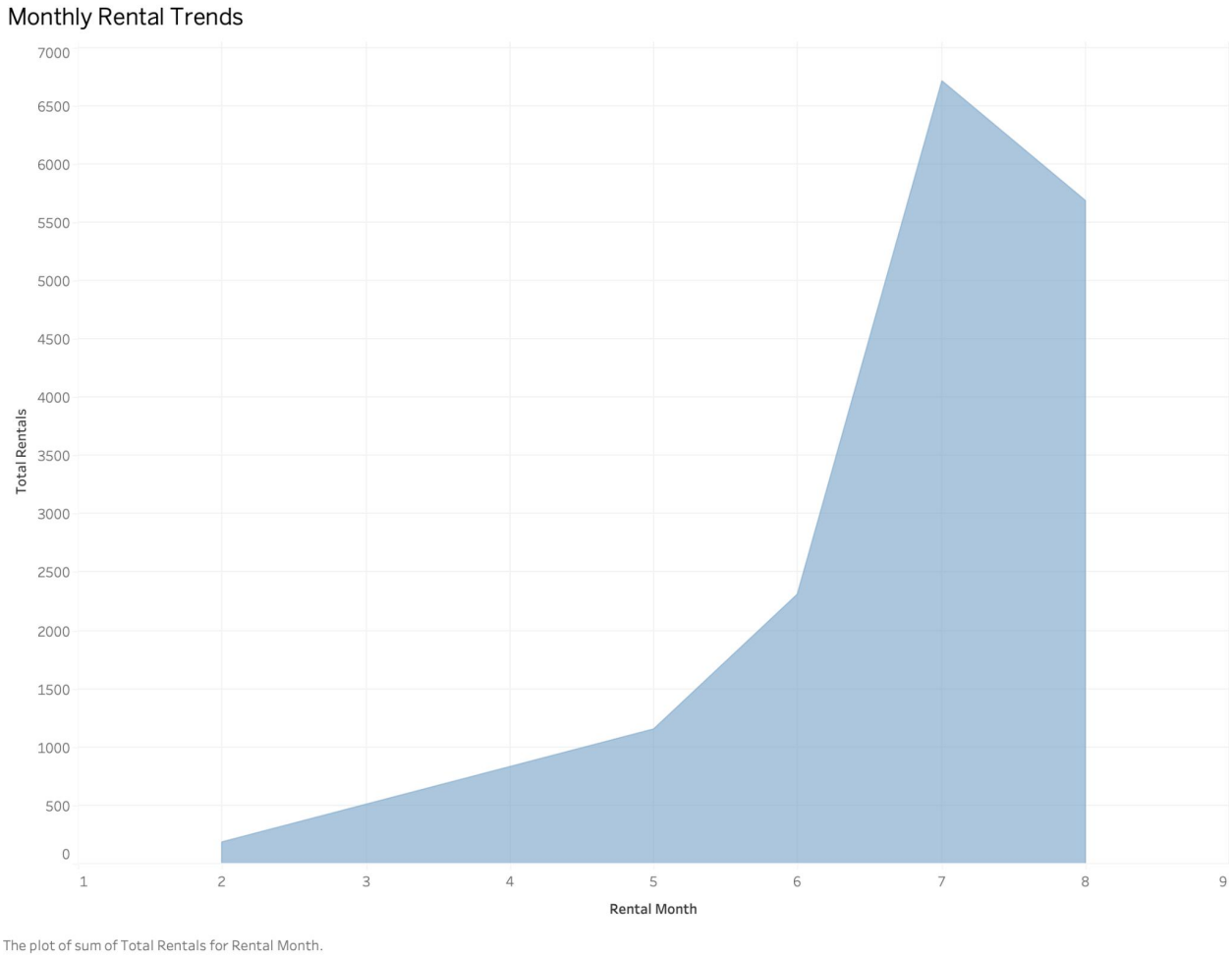
```
JOIN film f ON store_comparison.film_id = f.film_id

ORDER BY revenue_difference DESC;
```

title	store_1_revenue	store_2_reven...	revenue_differen...	store_performance
WHALE BIKINI	539.28	0.00	539.28	Store 1 Performs Better
WEST LION	419.36	0.00	419.36	Store 1 Performs Better
TYCOON GATHERING	415.52	0.00	415.52	Store 1 Performs Better
CONQUERER NUTS	399.36	0.00	399.36	Store 1 Performs Better
PICKUP DRIVING	395.36	0.00	395.36	Store 1 Performs Better
DYING MAKER	375.32	0.00	375.32	Store 1 Performs Better
FLASH WARS	371.48	0.00	371.48	Store 1 Performs Better
EDGE KISSING	371.40	0.00	371.40	Store 1 Performs Better
VELVET TERMINATOR	710.96	355.48	355.48	Store 1 Performs Better
PLUTO OLEANDER	355.36	0.00	355.36	Store 1 Performs Better
FOOL MOCKINGBIRD	703.08	351.54	351.54	Store 1 Performs Better
SUPER WYOMING	347.48	0.00	347.48	Store 1 Performs Better
LAWLESS VISION	347.36	0.00	347.36	Store 1 Performs Better
WANDA CHAMBER	347.36	0.00	347.36	Store 1 Performs Better
SUNRISE LEAGUE	683.04	341.52	341.52	Store 1 Performs Better
WORKING MICROCO...	655.00	327.50	327.50	Store 1 Performs Better
DEEP CRUSADE	323.44	0.00	323.44	Store 1 Performs Better
LONELY ELEPHANT	311.40	0.00	311.40	Store 1 Performs Better
BOILED DARES	311.40	0.00	311.40	Store 1 Performs Better
MINE TITANS	615.24	307.62	307.62	Store 1 Performs Better
BLINDNESS GUN	307.44	0.00	307.44	Store 1 Performs Better
SECRETS PARADISE	611.20	305.60	305.60	Store 1 Performs Better
EAGLES PANKY	611.12	305.56	305.56	Store 1 Performs Better
SEARCHERS WAIT	303.44	0.00	303.44	Store 1 Performs Better
IMPOSSIBLE PREJU...	299.44	0.00	299.44	Store 1 Performs Better
THIN SAGEBRUSH	295.56	0.00	295.56	Store 1 Performs Better
ATTRACTION NEWT...	587.04	293.52	293.52	Store 1 Performs Better
MOVIE SHAKESPEARE	582.96	291.48	291.48	Store 1 Performs Better
PAST SUICIDES	291.48	0.00	291.48	Store 1 Performs Better
GAMES BOWFINGER	291.44	0.00	291.44	Store 1 Performs Better
DRIFTER COMMAND...	567.04	283.52	283.52	Store 1 Performs Better

Business Insights:

1. **Some films perform significantly better in Store 1 compared to Store 2 (or vice versa). Store 1 has higher revenue for most films, while Store 2 has lower or no revenue for several titles.**
2. **Move underperforming films from Store 2 to Store 1 if demand is concentrated there. Identifies genre trends in each store and adjust film stock accordingly (e.g., more action movies in one store, more dramas in another). If Store 2 is underperforming, offer special discounts, promotions, or exclusive releases to attract more customers.**

3.

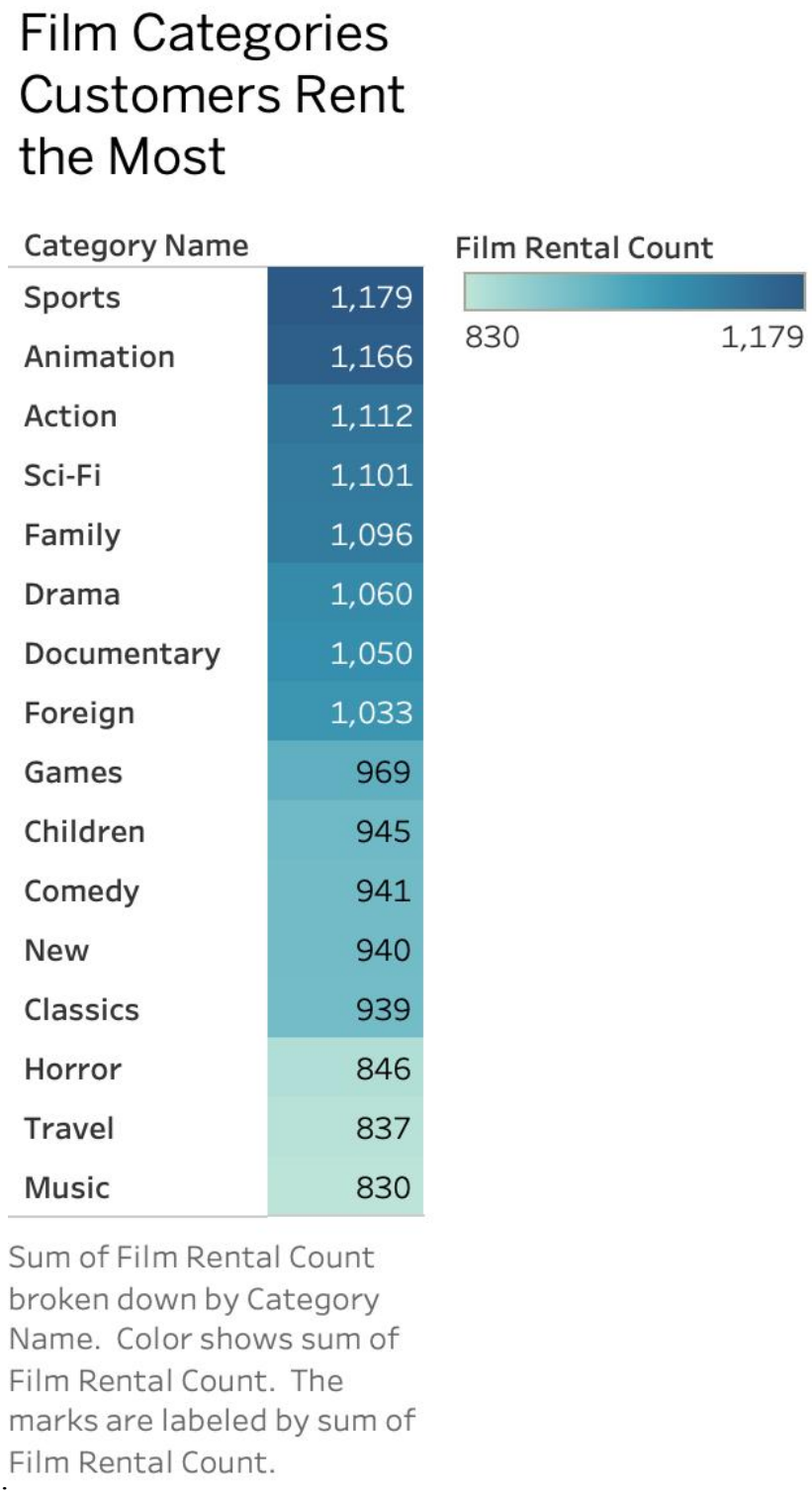


A notable trend in the data is the significant surge in rentals between months 6 and 7, where the total number of rentals rises sharply from 2,311 to 6,709. This suggests a seasonal peak, where customer engagement with the rental service is at its highest. The increase could be attributed to various factors, such as holiday seasons, promotional campaigns, or the release of popular films. However, following this peak, the rental volume slightly declines in month 8 to 5,686, indicating a possible return to normal levels.

From a business perspective, understanding these trends allows the company to optimize its operations effectively. During peak months, ensuring sufficient inventory for in-demand films can help prevent stock shortages and maintain customer satisfaction. Additionally, strategic marketing campaigns during these months can further capitalize on high customer engagement.

Conversely, during months with lower rentals, introducing discounts, promotions, or special incentives could encourage more rentals and maintain steady revenue.

By aligning marketing strategies with peak months, the company can maximize revenue while also addressing periods of lower demand through targeted customer

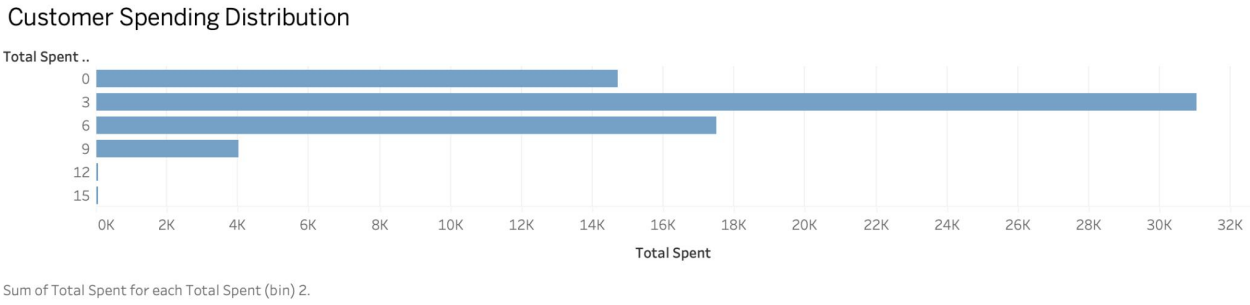


incentives.

The figure above illustrates the most rented film categories, ranked by the total number of rentals. The x-axis represents different film genres, while the color intensity and numerical values indicate the total rentals for each category. Darker shades correspond to categories with higher rental counts, making it easier to identify the most popular genres among customers.

Among the categories, Sports films have the highest rental count (1,179 rentals), followed closely by Animation (1,166) and Action (1,112). This suggests that customers have a strong preference for energetic and visually engaging films. Additionally, Sci-Fi (1,101) and Family (1,096) films are also highly popular, indicating demand for both futuristic entertainment and family-friendly content. On the other hand, Music (830) and Travel (837) are the least rented categories, suggesting lower customer interest in these genres.

Given the popularity of Sports, Animation, and Action films, the company can increase stock levels of these genres to ensure availability. Furthermore, targeted promotional campaigns, such as discounted rental bundles for top genres, can enhance customer engagement and boost revenue. Additionally, promoting underperforming categories, such as Music and Travel, through special deals or recommendations may help drive rentals in those areas. By leveraging these insights, the company can align its offerings with customer demand, ensuring a more effective and profitable rental strategy.

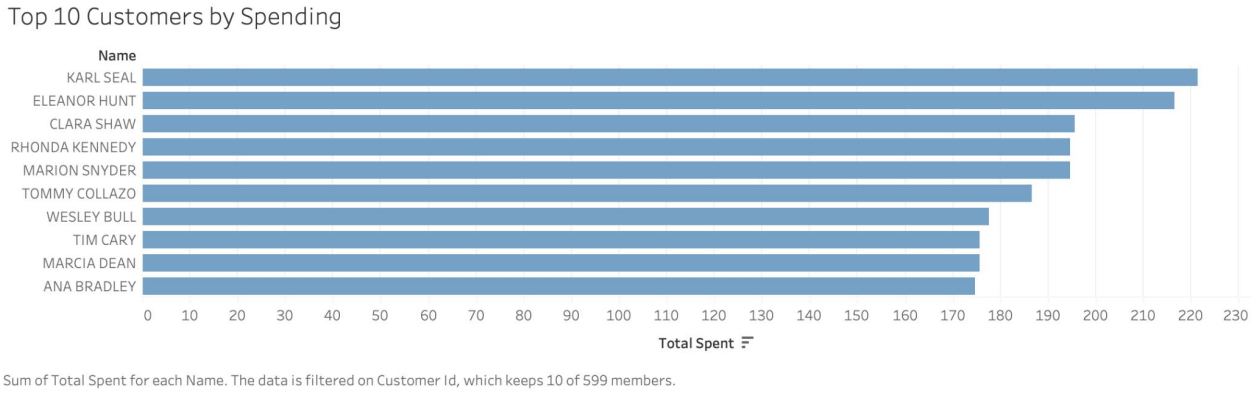


The figure above represents the distribution of customer spending, showing how rental expenditures are spread across different spending groups. The x-axis indicates total spending, while the y-axis represents different spending ranges (binned values). The horizontal bars display the number of customers within each spending category, with longer bars signifying a higher number of customers in that range.

The majority of customers fall within the lower to mid-range spending categories, indicating that most renters tend to spend modest amounts on rentals. The largest spending group appears to be between $3 and $6, which suggests that a significant portion of customers make only a few transactions. Additionally, the number of customers decreases as spending increases, highlighting that high-value customers (those spending more than $9) are relatively rare.

From a business perspective, this distribution can guide pricing strategies and promotional efforts. Since most customers belong to the lower spending tiers, introducing bundle deals, loyalty discounts, or targeted promotions could encourage them to rent more frequently. Additionally, focusing on retaining and rewarding high-value customers through personalized incentives could further maximize revenue.

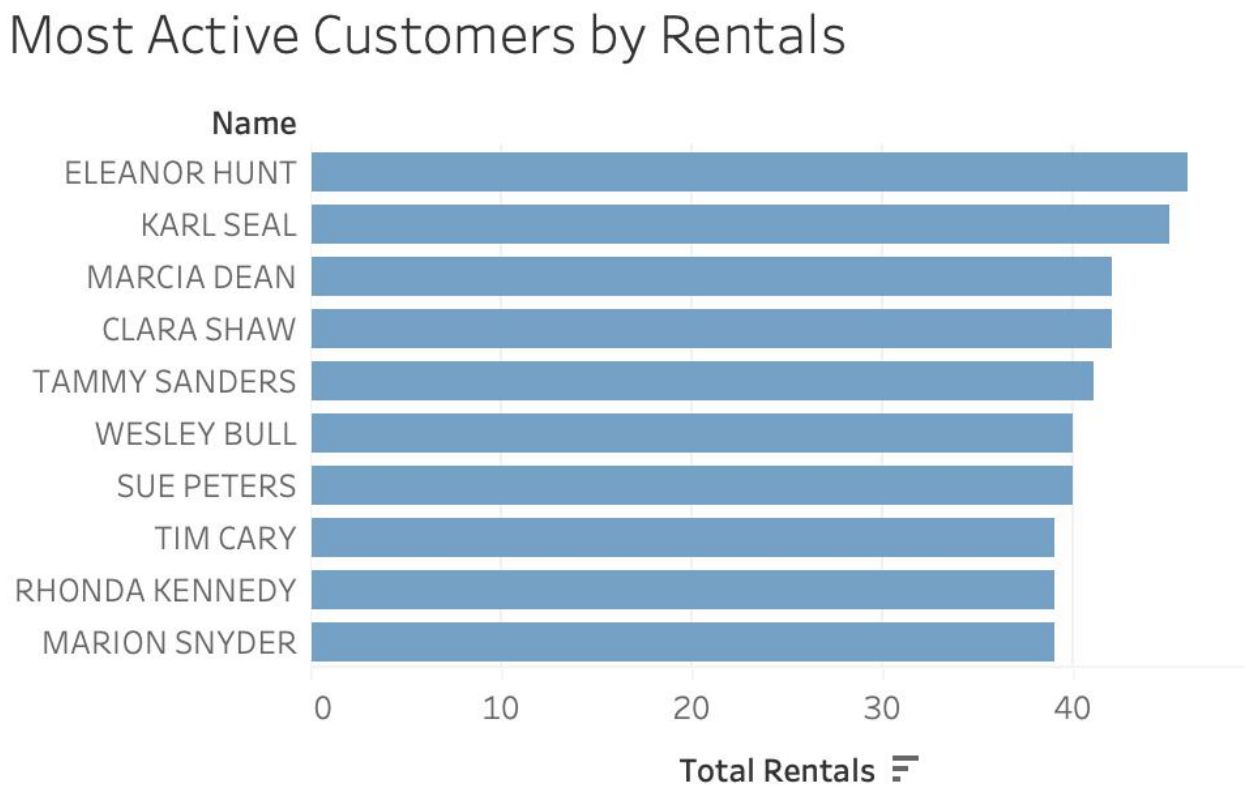
For management decision-making, this insight enables more effective customer segmentation. By identifying different spending behaviors, the company can tailor its marketing efforts, ensuring that promotions and offers align with customer habits.



It highlights the top 10 customers ranked by total spending on rentals. The x-axis represents the total amount spent, while the y-axis lists the names of the highest-spending customers. The length of each bar corresponds to the total expenditure, making it easy to identify the most valuable customers.

Among all customers, Karl Seal stands out as the highest spender, followed closely by Eleanor Hunt and Clara Shaw. These customers contribute significantly to the company's revenue, making them prime candidates for VIP loyalty programs, exclusive discounts, or personalized promotions.

From a business perspective, identifying high-value customers enables the company to enhance customer retention strategies. By offering incentives such as early access to new rentals, discounts on bulk rentals, or personalized recommendations, the company can further encourage repeat engagement. For management decision-making, this insight is crucial for revenue optimization. The company can focus retention efforts on high-spending customers while also implementing strategies to encourage mid-tier customers to increase their spending. Moreover, understanding what drives these customers' rental behaviors can help improve service offerings and overall customer satisfaction.



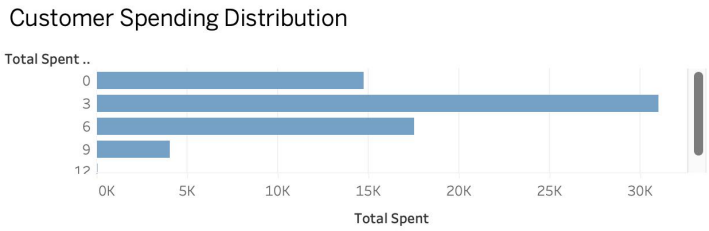
The figure highlights the top 10 most active customers based on the total number of rentals. The x-axis represents the total number of rentals, while the y-axis lists the most frequent renters by name. The longer the bar, the more rentals a customer has made, making it easy to identify the most engaged users.

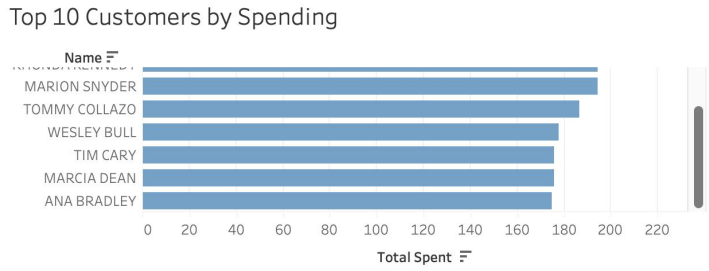
Among all customers, Eleanor Hunt is the most active renter, followed closely by Karl Seal and Marcia Dean. These customers have consistently rented a high volume of movies, indicating strong engagement with the rental service. Their behavior suggests that they are frequent users who likely value access to a diverse selection of films.

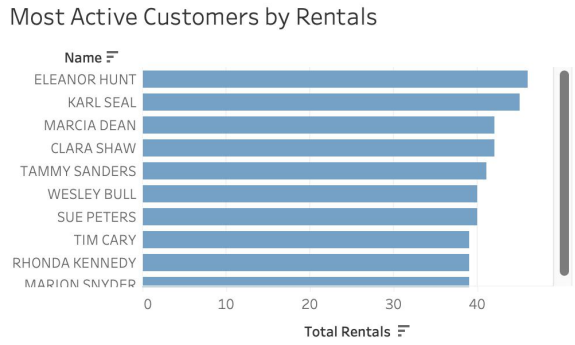
From a business perspective, offering loyalty rewards, exclusive access to new releases, or personalized recommendations could further enhance their experience and encourage continued rentals. Additionally, understanding their preferred genres and rental patterns could help tailor promotions to maintain their engagement.

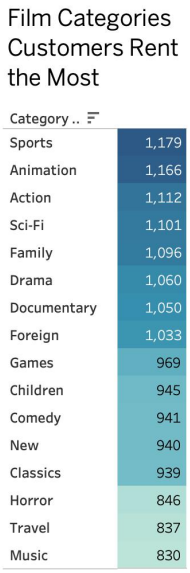
For management decision-making, this insight is valuable for optimizing customer experience strategies. Encouraging less active customers to increase their rental frequency through targeted marketing campaigns, such as discounted bundles or subscription-based rental plans, could help boost overall rental activity. Additionally, identifying trends among frequent renters could inform future content acquisitions and promotional

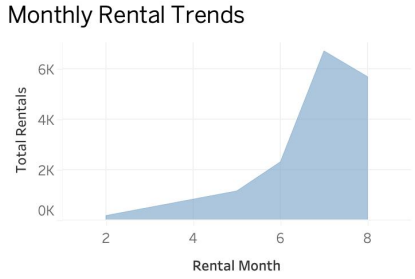
strategies.


Customer Spending Distribution
Total Spent ..
0
3
6
9
12
0K
5K
10K
15K
20K
25K
30K
Total Spent


Top 10 Customers by Spending
Name
MARION SNYDER
TOMMY COLLAZO
WESLEY BULL
TIM CARY
MARCIA DEAN
ANA BRADLEY
0
20
40
60
80
100
120
140
160
180
200
220
Total Spent


Most Active Customers by Rentals
Name
ELEANOR HUNT
KARL SEAL
MARCIA DEAN
CLARA SHAW
TAMMY SANDERS
WESLEY BULL
SUE PETERS
TIM CARY
RHONDA KENNEDY
0
10
20
30
40
Total Rentals


Film Categories Customers Rent the Most
Category ..
Sports 1,179
Animation 1,166
Action 1,112
Sci-Fi 1,101
Family 1,096
Drama 1,060
Documentary 1,050
Foreign 1,033
Games 969
Children 945
Comedy 941
New 940
Classics 939
Horror 846
Travel 837
Music 830


Monthly Rental Trends
6K
4K
2K
0K
Total Rentals
2
4
6
8
Rental Month