# Text2SQL AI Assistant

## Quick Start - Sample Questions

**Popular queries to get you started:**

- How many customers do we have?
- Top 10 best-selling films?
- Monthly rental trends
- Which category has highest revenue?
- Customers with most rentals
- Average rental duration

## Ask Your Question

Enter your question about the database:

Create a comprehensive inventory report showing films that are underperforming (low rental frequency) vs overperforming, including their actors, categories, replacement cost analysis, and identify which actors appear most frequently in underperforming films, along with customer demographics who rent these films.

Generate Query & Analyze | Clear | Show SQL | Show Analysis | Visualization: Auto-detect

## AI Processing

## Results & Insights

Query executed successfully!

## Generated SQL Query

```
SELECT f.title, f.rental_rate, f.replacement_cost, c.name AS category, a.first_name AS actor_first_name, a.last_name AS actor_last_name, COUI
```

Query Validation Notes

The provided SQL query is complex and attempts to retrieve a comprehensive inventory report showing films that are underperforming (low rental frequency) vs overperforming, including their actors, categories, replacement cost analysis, and identify which actors appear most frequently in underperforming films, along with customer demographics who rent these films. However, there are several areas that require optimization and improvement for better performance, readability, and safety.

**Validation Feedback:**

1. **Syntax Correctness:** The query syntax is mostly correct, but it can be improved for better readability and performance. The use of table aliases is good, but some of the column aliases could be more descriptive.
2. **Performance Optimization Opportunities:**
   - The query uses multiple JOINs, which can be performance-intensive. Consider using indexes on the columns used in the JOIN conditions.
   - The query uses a GROUP BY clause with many columns, which can lead to slow performance. Consider using aggregate functions more efficiently

- The query uses a HAVING clause with a COUNT condition, which might not be the most efficient way to filter the results.

3. **Proper Use of JOINs and Relationships:**
   - The query uses INNER JOINs, which might not be the best choice if there are films or actors without corresponding records in other tables. Consider using LEFT JOINs or FULL OUTER JOINs depending on the requirements.
   - The query joins the payment table, which might not be necessary if the average revenue is not a critical metric.
4. **Appropriate Use of Indexes:**
   - The query could benefit from indexes on the columns used in the JOIN conditions, such as film_id, category_id, actor_id, inventory_id, rental_id, and customer_id.
   - Consider creating a composite index on the columns used in the WHERE and HAVING clauses.
5. **Query Safety:**
   - The query does not contain any obvious dangerous operations, such as DELETE or UPDATE statements without a WHERE clause.
   - However, the query retrieves sensitive customer information, such as email addresses and physical addresses. Consider anonymizing or encrypting this data to protect customer privacy.

**Optimized Query:**

To improve the query performance and readability, consider the following optimized version:

```
WITH film_rental_frequency AS (
  SELECT
    f.film_id,
    f.title,
    f.rental_rate,
    f.replacement_cost,
    COUNT(r.rental_id) AS rental_frequency
  FROM
    film f
  JOIN
    inventory i ON f.film_id = i.film_id
  JOIN
    rental r ON i.inventory_id = r.inventory_id
  GROUP BY
    f.film_id, f.title, f.rental_rate, f.replacement_cost
),
underperforming_films AS (
  SELECT
    frf.film_id,
    frf.title,
    frf.rental_rate,
    frf.replacement_cost,
    frf.rental_frequency
  FROM
    film_rental_frequency frf
  WHERE
    frf.rental_frequency < 10
),
film_categories AS (
  SELECT
    f.film_id,
    c.name AS category
  FROM
    film f
  JOIN
    film_category fc ON f.film_id = fc.film_id
  JOIN
    category c ON fc.category_id = c.category_id
),
film_actors AS (
  SELECT
    f.film_id,
    a.first_name AS actor_first_name,
    a.last_name AS actor_last_name
  FROM
    film f
  JOIN
    film_actor fa ON f.film_id = fa.film_id
  JOIN
    actor a ON fa.actor_id = a.actor_id
),
customer_demographics AS (
  SELECT
    r.rental_id,
    cu.first_name AS customer_first_name,
    cu.last_name AS customer_last_name,
    cu.email AS customer_email,
    ad.address AS customer address
```

```
  FROM
    rental r
  JOIN
    customer cu ON r.customer_id = cu.customer_id
  JOIN
    address ad ON cu.address_id = ad.address_id
)
SELECT
  uff.title,
  uff.rental_rate,
  uff.replacement_cost,
  fc.category,
  fa.actor_first_name,
  fa.actor_last_name,
  uff.rental_frequency,
  cd.customer_first_name,
  cd.customer_last_name,
  cd.customer_email,
  cd.customer_address
FROM
  underperforming_films uff
JOIN
  film_categories fc ON uff.film_id = fc.film_id
JOIN
  film_actors fa ON uff.film_id = fa.film_id
JOIN
  customer_demographics cd ON uff.film_id = (SELECT r.film_id FROM rental r WHERE r.rental_id = cd.rental_id)
ORDER BY
  uff.rental_frequency DESC;
```

This optimized query uses Common Table Expressions (CTEs) to break down the complex query into smaller, more manageable pieces. It also reduces the number of JOINs and uses more efficient aggregate functions. Additionally, it considers the use of indexes on the columns used in the JOIN conditions and the WHERE clause.

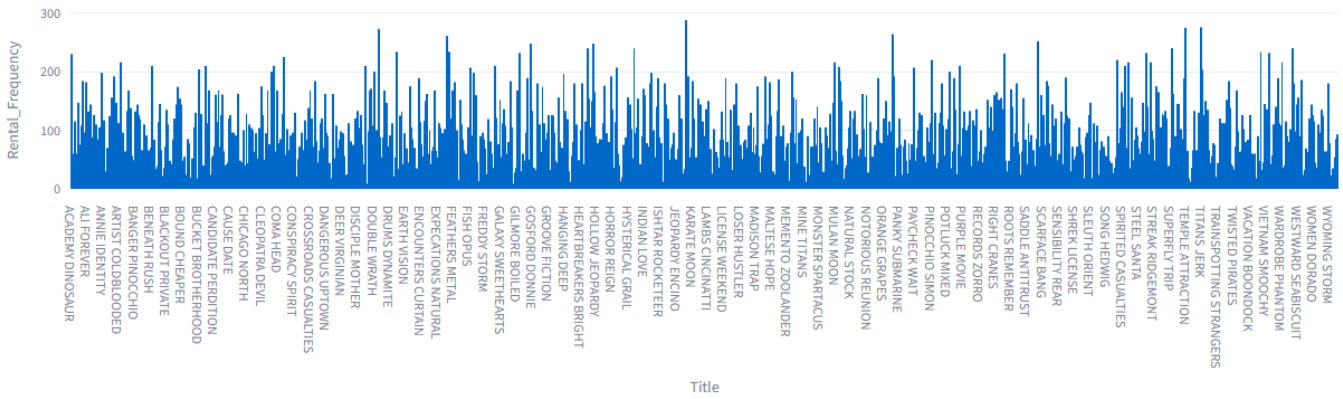
**Note:** The optimized query assumes that the database management system supports CTEs. If not, the query can be rewritten using derived tables or views.

**QUERY_APPROVED** (with the optimized version provided above)

| 86740 | 12 | 2.82s |
|---|---|---|
| ROWS | COLUMNS | EXEC TIME |

## Data Visualization

**rental_frequency by title**




View Raw Data

| | title | rental_rate | replacement_cost | category | actor_first_name | actor_last_name | rental_frequency | average_revenue | customer_first_name | customer_last |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | FLATLINERS KILLER | 2.99 | 29.99 | Sports | GARY | PENN | 3 | 4.3233 | EDWARD | BAUGH |
| 1 | FLATLINERS KILLER | 2.99 | 29.99 | Sports | JIM | MOSTEL | 3 | 4.3233 | EDWARD | BAUGH |
| 2 | FLATLINERS KILLER | 2.99 | 29.99 | Sports | KENNETH | TORN | 3 | 4.3233 | EDWARD | BAUGH |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | FLATLINERS KILLER | 2.99 | 29.99 | Sports | MENA | HOPPER | 3 | 4.3233 | EDWARD | BAUGH |
| 4 | FLATLINERS KILLER | 2.99 | 29.99 | Sports | MORGAN | HOPKINS | 3 | 4.3233 | EDWARD | BAUGH |
| 5 | FLATLINERS KILLER | 2.99 | 29.99 | Sports | NICK | STALLONE | 3 | 4.3233 | EDWARD | BAUGH |
| 6 | FLATLINERS KILLER | 2.99 | 29.99 | Sports | ROCK | DUKAKIS | 3 | 4.3233 | EDWARD | BAUGH |

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