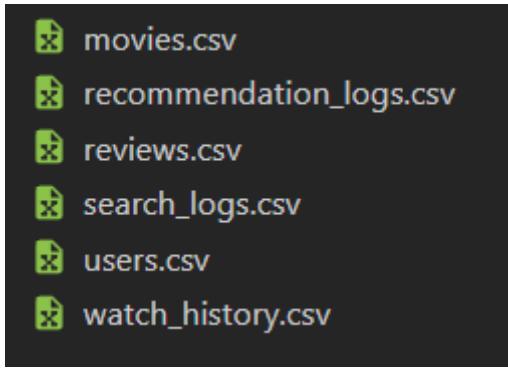


# Netflix User Engagement & Subscription Analysis

## 1. Problem Statement

The objective of this project is to analyze user engagement, subscription behavior, and content performance using SQL. The goal is to identify which subscription plans drive the most engagement and how content quality impacts user retention and revenue.

## 2. Dataset Description



- **users** – Contains user demographics, subscription plans, monthly spend, and activity status.

|    | A          | B                         | C          | D         | E   | F       | G       | H              | I             | J                 | K                       | L         | M             | N              | O              | P                |
|----|------------|---------------------------|------------|-----------|-----|---------|---------|----------------|---------------|-------------------|-------------------------|-----------|---------------|----------------|----------------|------------------|
| 1  | User_id    | Email                     | first_name | last_name | age | gender  | country | state_province | city          | subscription_plan | subscription_start_date | is_active | monthly_spend | primary_device | household_size | created_at       |
| 2  | user_00004 | mitchellclark@example.com | Chetea     | Ferguson  | 11  | Male    | USA     | Ohio           | South Noah    | Standard          | 21-09-2024              | 1         | 28.56         | Laptop         | 2              | 24-01-2026 01:59 |
| 3  | user_00007 | malondonando@example.com  | Daniel     | Moore     | 63  | Unknown | USA     | Maryland       | Teresaburgh   | Premium           | 13-03-2025              | 1         | 27.74         | Desktop        | 1              | 24-01-2026 18:23 |
| 4  | user_00010 | morganbianca@example.org  | Adrian     | Perez     | 24  | Male    | USA     | Pennsylvania   | Chadbury      | Basic             | 04-08-2025              | 1         | 23.18         | Laptop         | 1              | 24-01-2026 04:39 |
| 5  | user_00011 | kristenagirre@example.org | Collin     | Gomez     | 67  | Female  | USA     | Ohio           | Shieldston    | Basic             | 07-10-2022              | 1         | 556.13        | Desktop        | 2              | 24-01-2026 05:50 |
| 6  | user_00016 | medinawilliam@example.org | Nicole     | Wood      | 50  | Female  | USA     | Pennsylvania   | Bassport      | Standard          | 02-08-2024              | 1         | 3.36          | Laptop         | 1              | 24-01-2026 20:29 |
| 7  | user_00017 | josephpreston@example.net | Joseph     | Robbins   | 25  | Female  | USA     | Indiana        | Williamview   | Premium           | 11-11-2022              | 1         | 13.56         | Smart TV       | 1              | 24-01-2026 17:27 |
| 8  | user_00019 | michael05@example.org     | Elizabeth  | Deleon    | 28  | Other   | USA     | Ohio           | East Michelle | Premium           | 25-03-2025              | 1         | 10.28         | Mobile         | 7              | 24-01-2026 23:22 |
| 9  | user_00023 | elizabetht14@example.net  | Elizabeth  | Powell    | 40  | Female  | Canada  | New Brunswick  | East Robert   | Basic             | 13-08-2024              | 1         | 13.56         | Gaming Console | 3              | 24-01-2026 03:36 |
| 10 | user_00025 | cardenaskaren@example.net | Jeffrey    | Hernandez | 36  | Male    | USA     | New York       | South Cheryl  | Premium1          | 14-12-2023              | 0         | 11.97         | Tablet         | 3              | 24-01-2026 14:08 |

- **watch\_history** – Stores user watch sessions including duration, device type, and ratings.

|    | A              | B          | C          | D          | E           | F                      | G                   | H         | I       | J                | K           | L           | M | N | O | P |
|----|----------------|------------|------------|------------|-------------|------------------------|---------------------|-----------|---------|------------------|-------------|-------------|---|---|---|---|
| 1  | session_id     | user_id    | movie_id   | watch_date | device_type | watch_duration_minutes | progress_percentage | action    | quality | location_country | is_download | user_rating |   |   |   |   |
| 2  | session_000001 | user_07271 | movie_0511 | 2025-11-13 | Tablet      | 63.9                   | 34.6                | completed | hd      | USA              | 0           | 3           |   |   |   |   |
| 3  | session_000002 | user_00861 | movie_0588 | 2025-02-26 | Laptop      | 120.1                  | 44.2                | started   | hd      | USA              | 0           | 3           |   |   |   |   |
| 4  | session_000003 | user_05391 | movie_0694 | 2024-12-15 | Desktop     | 572.1                  | 84.7                | started   | hd      | Canada           | 0           | 1           |   |   |   |   |
| 5  | session_000004 | user_05192 | movie_0234 | 2024-09-30 | Desktop     | 395.3                  | 89.9                | completed | sd      | USA              | 0           | 5           |   |   |   |   |
| 6  | session_000005 | user_05735 | movie_0390 | 2024-08-04 | Tablet      | 14.6                   | 6.2                 | completed | hd      | USA              | 0           | 3           |   |   |   |   |
| 7  | session_000006 | user_06266 | movie_0631 | 2024-03-13 | Desktop     | 43.4                   | 63.7                | completed | hd      | Canada           | 0           | 3           |   |   |   |   |
| 8  | session_000007 | user_00467 | movie_0483 | 2025-04-23 | Desktop     | 165.9                  | 63.1                | stopped   | hd      | Canada           | 0           | 3           |   |   |   |   |
| 9  | session_000008 | user_04427 | movie_0139 | 2025-09-13 | Laptop      | 100.4                  | 57.4                | paused    | fk      | USA              | 0           | 3           |   |   |   |   |
| 10 | session_000009 | user_05579 | movie_0769 | 2025-08-26 | Laptop      | 29                     | 9.8                 | paused    | fk      | USA              | 0           | 3           |   |   |   |   |

- **movies** – Contains movie metadata such as genre and title.

|    | A          | B               | C            | D             | E               | F            | G               | H      | I        | J                 | K           | L                | M                  | N                 | O                  | P          | Q                          | R               |       |
|----|------------|-----------------|--------------|---------------|-----------------|--------------|-----------------|--------|----------|-------------------|-------------|------------------|--------------------|-------------------|--------------------|------------|----------------------------|-----------------|-------|
| 1  | movie_id   | title           | content_type | genre_primary | genre_secondary | release_year | duration_minute | rating | language | country_of_origin | imdb_rating | production_budge | box_office_revenue | number_of_seasons | number_of_episodes | is_netflix | original_added_to_platform | content_warning |       |
| 2  | movie_0001 | Dragon Legend   | Stand-up     | Comedy        | History         | Thriller     | 2014            | 35     | TV-Y     | French            | Japan       | 6.4              | 3778470            | 11102590.5        | 7                  | 97         | FALSE                      | 07-08-2023      | FALSE |
| 3  | movie_0002 | Storm Warrior   | Stand-up     | Comedy        | Sci-Fi          | Unknown      | 2017            | 37     | PG       | Japanese          | USA         | 3.3              | 3778470            | 11102590.5        | 7                  | 97         | FALSE                      | 28-01-2022      | TRUE  |
| 4  | movie_0003 | Fire Family     | Movie        | Drama         | Unknown         | 2003         | 142             | TV-MA  | English  | USA               | 8.5         | 2114120          | 11102590.5         | 7                 | 97                 | FALSE      | 04-05-2021                 | TRUE            |       |
| 5  | movie_0004 | Our Princess    | Documentary  | Sci-Fi        | Unknown         | 2011         | 131             | NC-17  | Japanese | USA               | 5.3         | 3778470          | 11102590.5         | 7                 | 97                 | FALSE      | 26-11-2022                 | FALSE           |       |
| 6  | movie_0005 | Warrior Mission | Documentary  | Sport         | Mystery         | 2015         | 91              | TV-G   | English  | USA               | 3.1         | 3778470          | 11102590.5         | 7                 | 97                 | FALSE      | 15-06-2023                 | FALSE           |       |
| 7  | movie_0006 | Kingdom Phoenix | Movie        | Documentary   | Music           | 1997         | 113             | PG-13  | English  | USA               | 8           | 4214426          | 792291             | 7                 | 97                 | FALSE      | 21-01-2021                 | FALSE           |       |
| 8  | movie_0007 | Battle Story    | TV Series    | Sci-Fi        | Unknown         | 2003         | 52              | TV-Y   | English  | USA               | 6.4         | 3778470          | 11102590.5         | 7                 | 158                | FALSE      | 30-11-2021                 | FALSE           |       |
| 9  | movie_0008 | Old House       | Movie        | Horror        | Unknown         | 1991         | 109             | TV-Y   | Spanish  | South Korea       | 7.7         | 629216           | 3995303            | 7                 | 97                 | FALSE      | 04-10-2020                 | FALSE           |       |
| 10 | movie_0009 | Dragon Empire   | Movie        | Biography     | Unknown         | 2013         | 123             | PG     | Spanish  | USA               | 8.4         | 3778470          | 11102590.5         | 7                 | 97                 | FALSE      | 09-05-2024                 | FALSE           |       |

- **search\_logs** – Records user search activity.

| A         | B             | C            | D                            | E                | F                       | G           | H                       | I        | J            | K                |
|-----------|---------------|--------------|------------------------------|------------------|-------------------------|-------------|-------------------------|----------|--------------|------------------|
| search_id | user_id       | search_query | search_date                  | results_returned | clicked_result_position | device_type | search_duration_seconds | had_typo | used_filters | location_country |
| 1         | search_000001 | user_09864   | classic movies               | 22-03-2024       | 20                      | 2 Tablet    | 12.4                    | 0        | 0            | Canada           |
| 2         | search_000002 | user_08038   | stand up comedy              | 22-11-2025       | 24                      | 4 Tablet    | 63.5                    | 1        | 0            | USA              |
| 3         | search_000003 | user_02009   | music documentaries          | 09-10-2024       | 86                      | 1 Tablet    | 24.7                    | 1        | 0            | USA              |
| 4         | search_000004 | user_01083   | comedy shows                 | 14-12-2024       | 70                      | 4 Mobile    | 53.7                    | 0        | 0            | USA              |
| 5         | search_000005 | user_04269   | movies based on true stories | 10-01-2025       | 48                      | 6 Tablet    | 69.6                    | 1        | 0            | USA              |
| 6         | search_000006 | user_03478   | thriller series              | 18-09-2024       | 76                      | 4 Laptop    | 7.2                     | 0        | 1            | USA              |
| 7         | search_000007 | user_03800   | travel documentaries         | 03-10-2025       | 70                      | 6 Laptop    | 12.3                    | 0        | 0            | USA              |
| 8         | search_000008 | user_00191   | superhero movies             | 24-05-2024       | 50                      | 1 Laptop    | 17.4                    | 0        | 1            | USA              |
| 9         | search_000009 | user_03999   | biographies                  | 18-07-2025       | 7                       | 6 Laptop    | 7                       | 0        | 0            | USA              |

- **recommendation\_logs** – Tracks recommendation interactions.

| A                 | B          | C          | D                   | E                        | F                    | G           | H                | I           | J           | K                 |
|-------------------|------------|------------|---------------------|--------------------------|----------------------|-------------|------------------|-------------|-------------|-------------------|
| recommendation_id | user_id    | movie_id   | recommendation_date | recommendation_type      | recommendation_score | was_clicked | position_in_list | device_type | time_of_day | algorithm_version |
| 1                 | rec_000001 | user_06326 | movie_0771          | 03-07-2025 new_releases  | 0.553                | 0           | 10 Tablet        | evening     | v1.4        |                   |
| 2                 | rec_000002 | user_02180 | movie_0985          | 07-11-2024 genre_based   | 0.916                | 0           | 9 Mobile         | evening     | v1.4        |                   |
| 3                 | rec_000003 | user_03535 | movie_0834          | 22-08-2024 personalized  | 0.816                | 0           | 2 Tablet         | evening     | v1.4        |                   |
| 4                 | rec_000004 | user_05025 | movie_0718          | 12-04-2024 trending      | 0.771                | 0           | 16 Mobile        | evening     | v1.2        |                   |
| 5                 | rec_000005 | user_06794 | movie_0718          | 30-10-2025 similar_users | 0.251                | 0           | 9 Tablet         | evening     | v1.3        |                   |
| 6                 | rec_000006 | user_03345 | movie_0346          | 01-09-2024 personalized  | 0.975                | 0           | 13 Smart TV      | morning     | v2.0        |                   |
| 7                 | rec_000007 | user_01519 | movie_0264          | 28-06-2024 similar_users | 0.722                | 0           | 20 Mobile        | night       | v1.2        |                   |
| 8                 | rec_000008 | user_03328 | movie_0385          | 09-10-2024 personalized  | 0.755                | 0           | 11 Tablet        | night       | v1.4        |                   |
| 9                 | rec_000009 | user_04944 | movie_0957          | 13-11-2025 new_releases  | 0.59                 | 0           | 14 Tablet        | night       | v1.4        |                   |

- **movie\_reviews** – Stores movie ratings and review data.

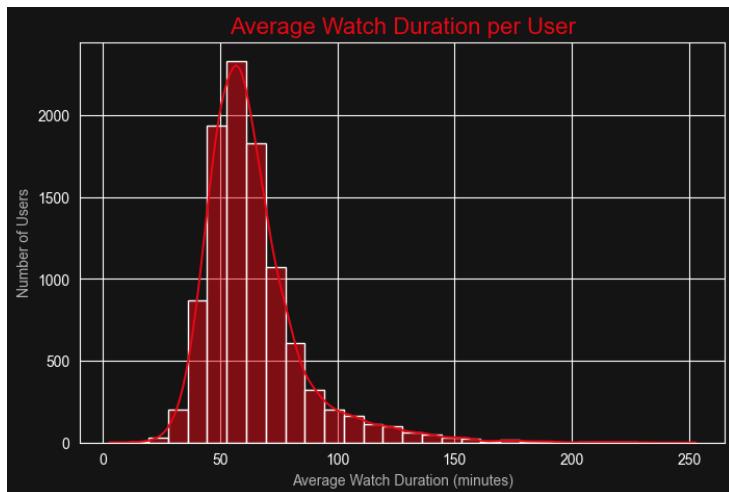
| A         | B             | C          | D          | E           | F                   | G                 | H             | I           | J   | K         | L               |
|-----------|---------------|------------|------------|-------------|---------------------|-------------------|---------------|-------------|---|-----------|-----------------|
| review_id | user_id       | movie_id   | rating     | review_date | device_type         | is_verified_watch | helpful_votes | total_votes | review_text   | sentiment | sentiment_score |
| 1         | review_000001 | user_07066 | movie_0360 | 4           | 29-03-2025 Mobile   | 0                 | 3             | 5           | Fantastic cinematography and plot twists.                   | positive  | 0.711           |
| 2         | review_000002 | user_02953 | movie_0095 | 5           | 19-07-2024 Mobile   | 1                 | 2             | 2           | This series is a masterpiece!                               | positive  | 0.645           |
| 3         | review_000003 | user_05528 | movie_0518 | 4           | 11-02-2025 Tablet   | 1                 | 2             | 5           | Fantastic cinematography and plot twists.                   | positive  | 0.73            |
| 4         | review_000004 | user_07612 | movie_0672 | 5           | 26-11-2025 Mobile   | 1                 | 7             | 7           | One of the best series I've ever watched. Highly recommend! | positive  | 0.798           |
| 5         | review_000005 | user_03424 | movie_0580 | 3           | 11-07-2025 Mobile   | 1                 | 1             | 5           | Mixed feelings about this one.                              | neutral   | 0.41            |
| 6         | review_000006 | user_07263 | movie_0708 | 3           | 06-01-2025 Tablet   | 1                 | 4             | 5           | Okay for a one-time watch.                                  | neutral   | 0.669           |
| 7         | review_000007 | user_07818 | movie_0081 | 2           | 18-01-2025 Smart TV | 1                 | 4             | 7           | Not worth the time. Very predictable.                       | negative  | 0.106           |
| 8         | review_000008 | user_03744 | movie_0526 | 1           | 26-09-2025 Smart TV | 1                 | 1             | 4           | Unknown   | negative  | 0.251           |
| 9         | review_000009 | user_04454 | movie_0551 | 4           | 02-02-2024 Mobile   | 1                 | 1             | 5           | This movie exceeded my expectations.                        | positive  | 0.737           |

### 3. Key Metrics

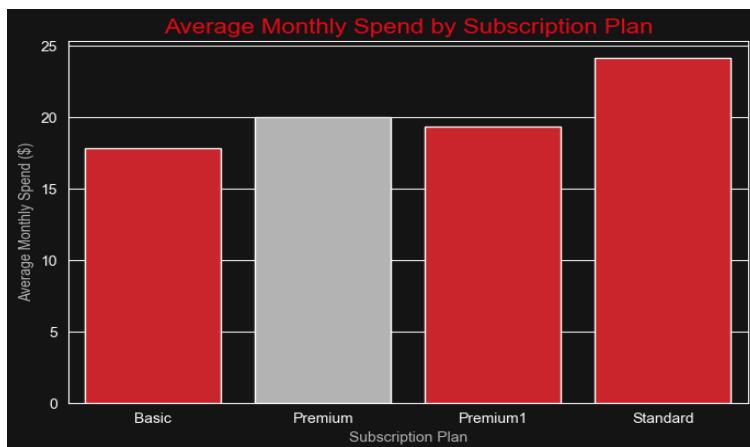
- Total Watch Minutes by Subscription Plan



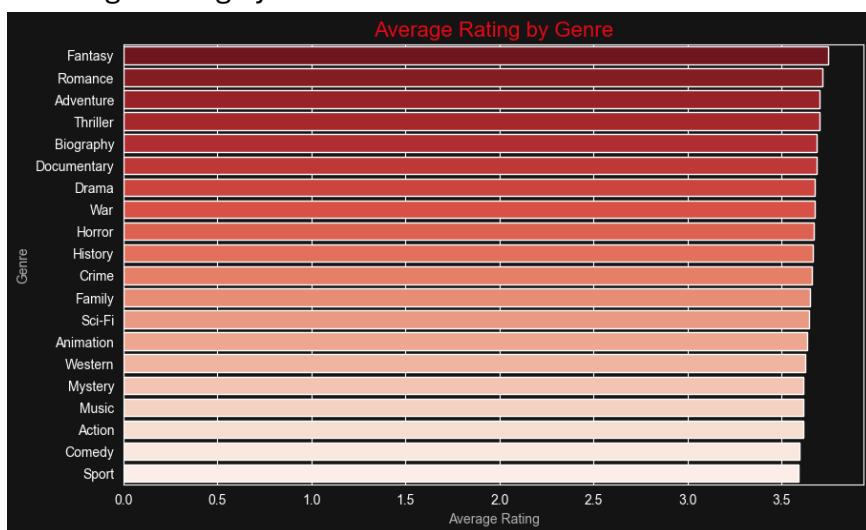
- Average Watch Duration per User



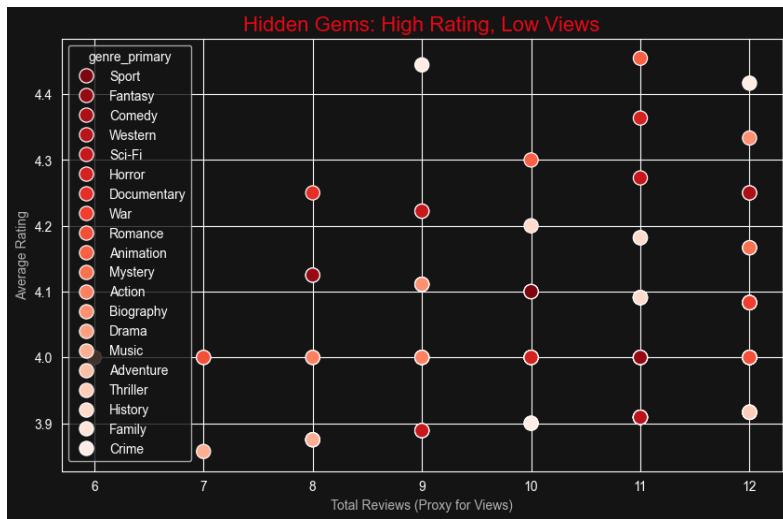
- Average Monthly Spend by Subscription



- Average Rating by Genre



- High Rating + Low Views (Hidden Gems)



## 4. Exploratory Data Analysis

Several analyses were conducted to understand the dataset's structure and trends.

### Movies vs TV Shows Distribution

The first step was to compare the number of movies and TV shows available on Netflix. The analysis revealed that movies make up the majority of the platform's content, significantly exceeding TV shows.

### Content Added Over the Years

A year-wise analysis of content additions showed a sharp increase after 2016. The platform experienced rapid expansion between 2016 and 2019, suggesting aggressive content acquisition and production during that period.

### Top Contributing Countries

The United States contributes the most titles to Netflix's library. India also ranks among the top contributors, indicating Netflix's focus on international markets.

### Most Common Genres

Drama appears to be the most common genre, followed by International Movies and Comedies. This highlights Netflix's preference for widely appealing storytelling formats.

### Rating Distribution

The majority of content falls under the TV-MA rating, indicating a strong focus on mature audiences. Family-oriented content represents a smaller share in comparison.

## 5. Analysis Performed:

**Subscription vs Engagement** analysis was performed to determine which plans generate the **highest watch time**. Content quality analysis identified **highly rated movies** that receive **low views**, highlighting potential promotion opportunities. Engagement patterns were evaluated across device types and active users to understand behavior trends.

---

## 6. Key Insights

- Premium subscription users show higher engagement levels.

```
1 •  use netflix;
2
3 •  SELECT
4      u.subscription_plan,
5      COUNT(DISTINCT u.user_id) AS total_users,
6      SUM(w.watch_duration_minutes) AS total_watch_minutes,
7      AVG(w.watch_duration_minutes) AS avg_watch_minutes
8      FROM vw_user_engagement u
9      JOIN watch_history w
10     ON u.user_id = w.user_id
11    GROUP BY u.subscription_plan
12   ORDER BY avg_watch_minutes DESC;
13
```

|   | subscription_plan | total_users | total_watch_minutes | avg_watch_minutes |
|---|-------------------|-------------|---------------------|-------------------|
| ▶ | Basic             | 755         | 500979.40           | 65.547481         |
|   | Premium1          | 400         | 252635.00           | 64.546500         |
|   | Standard          | 1324        | 844185.90           | 63.895391         |
|   | Premium           | 1380        | 871188.70           | 63.391450         |

- Certain high-rated movies have relatively low view counts.

```
15 •  SELECT
16      m.movie_id,
17      m.title,
18      AVG(w.user_rating) AS avg_rating,
19      COUNT(w.movie_id) AS total_views
20      FROM movies m
21      JOIN watch_history w
22      ON m.movie_id = w.movie_id
23      WHERE w.user_rating IS NOT NULL
24      GROUP BY m.movie_id, m.title
25      HAVING AVG(w.user_rating) >= 3.20
26      AND COUNT(w.movie_id) < 90
27      ORDER BY avg_rating DESC;
```

|   | movie_id   | title            | avg_rating | total_views |
|---|------------|------------------|------------|-------------|
| ▶ | movie_0085 | Mission Secret   | 3.2353     | 85          |
|   | movie_0199 | A Love           | 3.2338     | 77          |
|   | movie_0073 | House Family     | 3.2273     | 88          |
|   | movie_0675 | Phoenix Princess | 3.2069     | 87          |

- Active users contribute significantly more to total watch time.

```

1 •   use netflix;
2 •   WITH user_watch AS (
3     SELECT
4       u.is_active,
5       SUM(w.watch_duration_minutes) AS total_watch
6     FROM vw_user_engagement u
7     JOIN watch_history w
8       ON u.user_id = w.user_id
9     GROUP BY u.is_active
10   )
11   SELECT
12     CASE
13       WHEN is_active = 1 THEN 'Active'
14       ELSE 'Inactive'
15     END AS user_status,
16     total_watch,
17     ROUND(100 * total_watch / SUM(total_watch) OVER (), 2)
18     AS percentage_contribution
19   FROM user_watch;

```

|   | user_status | total_watch | percentage_contribution |
|---|-------------|-------------|-------------------------|
| ▶ | Active      | 2091711.30  | 84.72                   |
|   | Inactive    | 377277.70   | 15.28                   |

- Measure Engagement by Device

```

3 •   SELECT
4     device_type,
5     COUNT(session_id) AS total_sessions,
6     SUM(watch_duration_minutes) AS total_watch_minutes,
7     AVG(watch_duration_minutes) AS avg_watch_per_session
8   FROM watch_history
9   GROUP BY device_type
10  ORDER BY total_watch_minutes DESC;

```

|   | device_type | total_sessions | total_watch_minutes | avg_watch_per_session |
|---|-------------|----------------|---------------------|-----------------------|
| ▶ | Desktop     | 20104          | 1300244.50          | 64.675910             |
|   | Smart TV    | 20003          | 1296863.00          | 64.833425             |
|   | Tablet      | 20109          | 1271208.80          | 63.215913             |
|   | Mobile      | 19984          | 1265556.90          | 63.328508             |
|   | Laptop      | 19800          | 1265544.40          | 63.916384             |

- Measure Engagement by Region

```

3 •   SELECT
4       location_country,
5       COUNT(session_id) AS total_sessions,
6       SUM(watch_duration_minutes) AS total_watch_minutes,
7       AVG(watch_duration_minutes) AS avg_watch_per_session
8   FROM watch_history
9   GROUP BY location_country
10  ORDER BY total_watch_minutes DESC;

```

|   | location_country | total_sessions | total_watch_minutes | avg_watch_per_session |
|---|------------------|----------------|---------------------|-----------------------|
| ▶ | USA              | 69667          | 4448707.50          | 63.856740             |
|   | Canada           | 30333          | 1950710.10          | 64.309831             |

- Promote high-rated but under-viewed movies to increase visibility.

```

1 •   SELECT
2       m.movie_id,
3       m.title,
4       AVG(w.user_rating) AS avg_rating,
5       COUNT(w.session_id) AS total_views
6   FROM movies m
7   JOIN watch_history w
8       ON m.movie_id = w.movie_id
9   WHERE w.user_rating IS NOT NULL
10  GROUP BY m.movie_id, m.title
11  HAVING AVG(w.user_rating) > (
12      SELECT AVG(user_rating)
13      FROM watch_history
14      WHERE user_rating IS NOT NULL
15  )
16  AND COUNT(w.session_id) < (
17      SELECT AVG(view_count)
18      FROM (
19          SELECT COUNT(*) AS view_count
20          FROM watch_history
21          GROUP BY movie_id
22      ) AS sub
23  )
24  ORDER BY avg_rating DESC
25  limit 10;
26

```

|   | movie_id   | title            | avg_rating | total_views |
|---|------------|------------------|------------|-------------|
| ▶ | movie_0884 | Queen King       | 3.2747     | 91          |
|   | movie_0270 | Secret Ice       | 3.2527     | 91          |
|   | movie_0516 | Dragon Storm     | 3.2391     | 92          |
|   | movie_0085 | Mission Secret   | 3.2353     | 85          |
|   | movie_0199 | A Love           | 3.2338     | 77          |
|   | movie_0073 | House Family     | 3.2273     | 88          |
|   | movie_0232 | Kingdom War      | 3.2165     | 97          |
|   | movie_0299 | Quest Mystery    | 3.2143     | 98          |
|   | movie_0675 | Phoenix Princess | 3.2069     | 87          |
|   | movie_0547 | Fire Mission     | 3.1882     | 85          |

- Check Engagement by Subscription Plan

```

48 •   SELECT
49       u.subscription_plan,
50       COUNT(DISTINCT u.user_id) AS total_users,
51       SUM(w.watch_duration_minutes) AS total_watch_minutes,
52       AVG(w.watch_duration_minutes) AS avg_watch_per_session
53   FROM vu_user_engagement u
54   JOIN watch_history w
55       ON u.user_id = w.user_id
56   GROUP BY u.subscription_plan
57  ORDER BY total_watch_minutes DESC;

```

|   | subscription_plan | total_users | total_watch_minutes | avg_watch_per_session |
|---|-------------------|-------------|---------------------|-----------------------|
| ▶ | Premium           | 1380        | 871188.70           | 63.391450             |
|   | Standard          | 1324        | 844185.90           | 63.895391             |
|   | Basic             | 755         | 500979.40           | 65.547481             |
|   | Premium1          | 400         | 252635.00           | 64.546500             |

- Revenue + Engagement Check

```

59 •   SELECT
60     subscription_plan,
61     COUNT(*) AS total_users,
62     AVG(monthly_spend) AS avg_monthly_spend
63   FROM vw_user_engagement
64   GROUP BY subscription_plan;

```

|   | subscription_plan | total_users | avg_monthly_spend |
|---|-------------------|-------------|-------------------|
| ▶ | Premium           | 1380        | 20.172435         |
|   | Basic             | 755         | 17.875033         |
|   | Standard          | 1324        | 24.377168         |
|   | Premium1          | 400         | 19.327925         |

- Focus marketing efforts on high-engagement regions.

|   | location_country | total_users | total_sessions | total_watch_minutes | avg_watch_per_session |
|---|------------------|-------------|----------------|---------------------|-----------------------|
| ▶ | USA              | 9991        | 69667          | 4448707.50          | 63.856740             |
|   | Canada           | 9500        | 30333          | 1950710.10          | 64.309831             |

```

66 •   SELECT
67     location_country,
68     COUNT(DISTINCT user_id) AS total_users,
69     COUNT(session_id) AS total_sessions,
70     SUM(watch_duration_minutes) AS total_watch_minutes,
71     AVG(watch_duration_minutes) AS avg_watch_per_session
72   FROM watch_history
73   GROUP BY location_country
74   ORDER BY total_watch_minutes DESC;

```

- Improve personalization in recommendation systems.

|   | user_id    | total_watch |
|---|------------|-------------|
| ▶ | user_03869 | 2535.90     |
|   | user_01134 | 2130.70     |
|   | user_00811 | 2088.40     |
|   | user_02222 | 2086.60     |
|   | user_06269 | 2079.90     |
|   | user_08824 | 2023.70     |
|   | user_07191 | 1973.40     |
|   | user_04103 | 1972.00     |
|   | user_00206 | 1955.20     |
|   | user_02416 | 1953.90     |

|   | avg_completion_rate |
|---|---------------------|
| ▶ | 49.954156           |

The average content completion rate is **approximately 50%**, indicating moderate relevance between recommendations and user preferences. Additionally, watch time distribution is heavily concentrated among the top 10 users, suggesting limited engagement activation across the broader user base. Enhancing personalization using

behavioral signals such as watch duration, completion rate, and rating patterns could improve session quality and expand engagement across mid- and low-activity users.

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## 7. Conclusion

### 1. Subscription & Engagement Performance

Premium subscription users demonstrate higher overall engagement levels, generating greater total watch minutes compared to lower-tier plans. This suggests that higher-value plans are associated with stronger content consumption behavior and deeper platform usage.

However, engagement is not evenly distributed across all users within each plan, indicating opportunities for improving activation among mid-tier and lower-tier subscribers.

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### 2. Content Performance & Discovery Gaps

The analysis identified movies with above-average ratings but relatively low view counts. This indicates a content discovery inefficiency — high-quality titles are not receiving proportional visibility.

This suggests that the recommendation system may be biased toward already popular titles rather than surfacing quality-driven content.

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### 3. Engagement Distribution & User Behavior

The average content completion rate is approximately **50%**, meaning users complete only half of the content they start. This indicates moderate alignment between recommendations and user preferences.

Additionally, watch time is heavily concentrated among a small group of top users, revealing engagement imbalance. A limited segment of power users drives a disproportionate share of total watch time, while mid- and low-activity users contribute significantly less.

This indicates untapped engagement potential.

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#### **4. Device & Regional Variations**

Engagement varies across device types and regions, suggesting differences in viewing behavior patterns. Large-screen devices likely encourage longer sessions, while regional differences highlight varying market depth and content resonance.

These variations indicate opportunities for device-aware optimization and region-specific strategies.

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#### **Strategic Business Implications**

Based on the findings:

1. Promote high-rated but under-viewed content to improve content utilization efficiency.
  2. Offer targeted upgrade incentives for lower-tier users showing strong engagement potential.
  3. Focus marketing investment on high-engagement regions with stronger watch intensity.
  4. Enhance personalization algorithms using behavioral signals such as watch duration, completion rate, and ratings.
  5. Optimize recommendations to activate mid-tier users and reduce over-reliance on heavy users.
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#### **Overall Strategic Conclusion**

The platform demonstrates strong engagement among premium subscribers and power users, but overall engagement efficiency can be improved. Content discovery gaps, moderate completion rates, and engagement concentration suggest that personalization optimization and targeted promotion strategies could significantly enhance retention, revenue growth, and content utilization.

This analysis highlights that while Netflix's engagement foundation is strong, there remains substantial opportunity to unlock additional value through smarter recommendation systems and strategic segmentation.