Netflix Data Analysis Project (Python)

Netflix is a leading global streaming platform offering a vast library of movies, TV shows, documentaries, and original content across various genres. With millions of subscribers worldwide, it continues to shape the entertainment industry through its vast data on user preferences and viewing habits.

This document presents an analysis of Netflix's streaming data using Python in Google Colab, incorporating sentiment analysis. The analysis aims to uncover insights into viewing trends, user preferences, and content performance, providing a data-driven approach to understanding audience sentiment and engagement.

Google Colab Code and Its Result

Importing Necessary Libraries

```
#Importing the Necessary Libraries

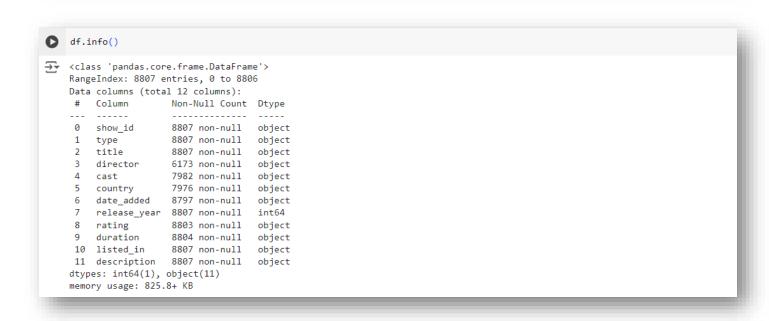
import numpy as np #For Algebra Operations
import pandas as pd #For Data Preparation
import plotly.express as px #For Data Visualization
from textblob import TextBlob #For Sentiment Analysis
```

Importing the Dataset

```
#Importing The Dataset
df = pd.read_csv('netflix_titles.csv')
```

Previewing the Dataset

[8] #Previewing the Dataset df.shape → (8807, 12) df.head() show_id type title director cast country date_added release_year rating duration listed_in description As her father nears Dick Johnson Kirsten United September s1 Movie NaN 2020 PG-13 90 min Documentaries the end of his life. Is Dead Johnson States 25, 2021 filmm... 2 International TV Shows, Ama Qamata, Khosi After crossing paths TV Blood & South September 2021 TV-MA s2 NaN Ngema, Gail TV Dramas, TV at a party, a Cape Show Water Africa 24, 2021 Seasons Mabalane, Thaban... Mysteries Town t... Sami Bouajila, Tracy Crime TV Shows, To protect his family TV Julien September 2 Ganglands Gotoas, Samuel NaN 2021 TV-MA 1 Season International TV Shows, from a powerful drug Show Leclercq 24, 2021 TV Act... Jouy, Nabi... Feuds, flirtations and TV Jailbirds New September NaN NaN NaN 2021 TV-MA 1 Season Docuseries, Reality TV toilet talk go down Show Orleans 24, 2021 amo... Mayur More, 2 International TV Shows, In a city of coaching TV Jitendra Kumar September Kota Factory NaN 2021 TV-MA Romantic TV Shows, centers known to Show Ranjan Raj, Alam Seasons 24, 2021 train I... K...

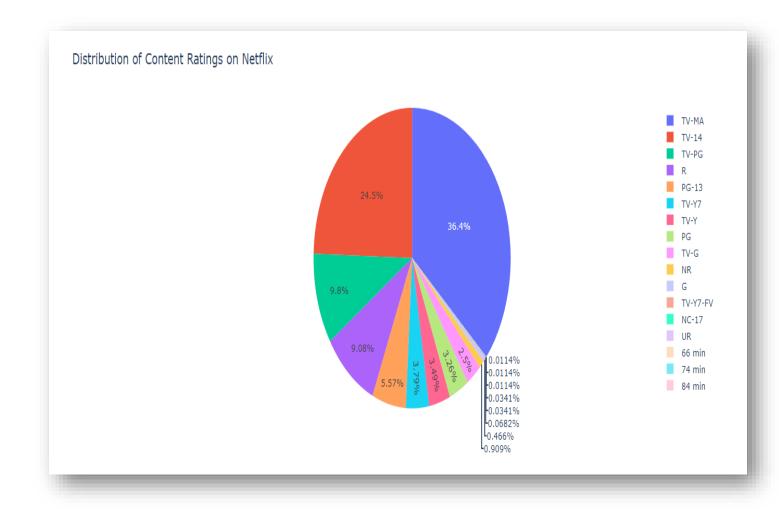


Creating a Group of Ratings to use it in Pie Chart

```
[17] x = df.groupby(['rating']).size().reset_index(name='counts')
₹
          rating counts
         66 min
                    1
        74 min 1
84 min 1
G 41
NC-17 3
NR 80
PG 287
PG-13 490
    2
     3
     5
     6
     7
                     799
     8
             R
         TV-14 2160
TV-G 220
TV-MA 3207
     9
     10
                  3207
     11
          TV-PG
                     863
            TV-Y
                     307
     13
          TV-Y7
     14
                     334
     15 TV-Y7-FV
                      6
              UR
                        3
```

Creating the Pie Chart

```
piechart = px.pie(x, values="counts", names="rating", title= "Distribution of Content Ratings on Netflix")
piechart.show()
```



Replacing the Null Values in the Director's Column

_	_	director ead()	']= df['director'].fi	llna('Directo	r Not Specified')							
}	5	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
	0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm
	1	s2	TV Show	Blood & Water	Director Not Specified	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t
	2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi	NaN	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act	To protect his family from a powerful drug lor
	3	s4	TV Show	Jailbirds New Orleans	Director Not Specified	NaN	NaN	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo
	4	s5	TV Show	Kota Factory	Director Not Specified	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K	India	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, Romantic TV Shows, TV	In a city of coaching centers known to train I

Creating Director List

```
directors_list = pd.DataFrame
    directors_list = df['director'].str.split(',', expand=True).stack()
    directors_list = directors_list.to_frame()
    print(directors_list)
₹
       0
                 Kirsten Johnson
    1 0 Director Not Specified
    2
       0 Julien Leclercq
    3
       0 Director Not Specified
    4
       0 Director Not Specified
    . . .
    8802 0
                   David Fincher
    8803 0 Director Not Specified
           Ruben Fleischer
    8804 0
    8805 0
                     Peter Hewitt
    8806 0
                     Mozez Singh
    [9612 rows \times 1 columns]
```

Counting the no. of Times one director has appeared by grouping them

```
directors = directors_list.groupby(['Director']).size().reset_index(name='Total Count')

Director Total Count

Aaron Moorhead 2

Aaron Woolf 1

Abdus Alibhai Burmawalla 1

Abdullah Al Noor 1

Abhinav Shiv Tiwari 1

... ... ...

5116 Cagan Irmak 1

5117 Isold Uggadóttir 1

5118 Óskar Thór Axelsson 1

5119 Ömer Faruk Sorak 2

5120 Şenol Sönmez 2

[5121 rows x 2 columns]
```

Removing Director not specified value

```
directors = directors[directors.Director != 'Director Not Specified']
    print(directors)
₹
                          Director Total Count
                   Aaron Moorhead
                      Aaron Woolf
       Abbas Alibhai Burmawalla
                Abdullah Al Noor
           Abdullah Al Noor
Abhinav Shiv Tiwari
    4
                                            1
                      ...
Çagan Irmak
    5116
                Ísold Uggadóttir
    5118
5119
              Óskar Thór Axelsson
              Ömer Faruk Sorak
    5120
                     Şenol Sönmez
    [5120 rows x 2 columns]
```

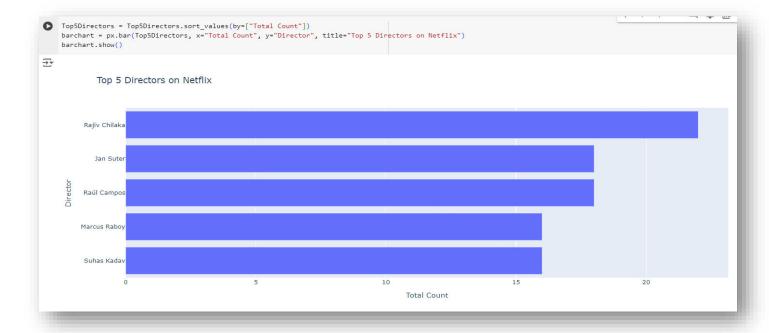
Sorting Directors in Descending Order by their Total Count of Shows/Movies

```
directors = directors.sort_values(by=['Total Count'], ascending=False)
     print(directors)
⋽₹
                  Director Total Count
    4021 Rajiv Chilaka 22
4068 Raúl Campos 18
            Raúl Campos
                Jan Suter
    261
    4652 Suhas Kadav
3236 Marcus Raboy
                                       16
              Suhas Kadav
                                        16
            J. Davis
    2341 J. Davis
2342 J. Lee Thompson
2343 J. Michael Long
                                        1
1
1
     609 Smriti Keshari
2561 Joaquín Mazón
                                        1
1
     [5120 rows x 2 columns]
```

Sorting out Top 5 Directors

```
Top5Directors = directors.head(5)
    print(Top5Directors)
₹
               Director Total Count
    4021 Rajiv Chilaka
                                  22
    4068
           Raúl Campos
                                  18
    261
              Jan Suter
                                  18
    4652
           Suhas Kadav
                                  16
    3236
         Marcus Raboy
                                  16
```

Bar Chart for Top 5 Directors



Replacing Null Values from Cast, grouping them by Content and Then Sorting out the Top 5 Actors

```
#Replacing the Null Values from cast, Grouping the cast by Content and Sorting top 5 Actors

df['cast'] = df['cast'].fillna('Cast Not Specified')

cast_df = pd.DataFrame()

cast_df = df['cast'].str.split(',', expand=True).stack()

cast_df = cast_df.to_frame()

cast_df.columns = ['Actor']

actors = cast_df.groupby(['Actor']).size().reset_index(name='Total Count')

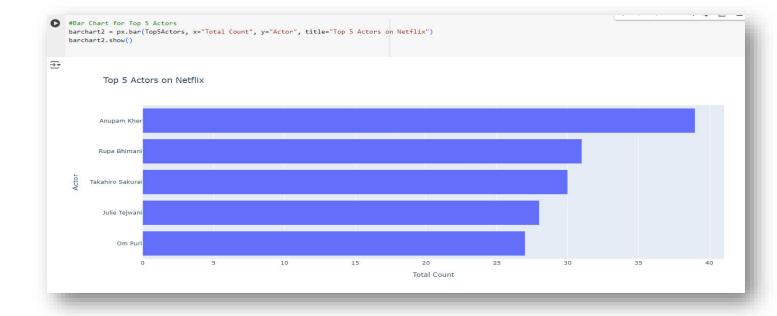
actors = actors[actors.Actor != 'Cast Not Specified']

actors = actors.sort_values(by=['Total Count'], ascending=False)

Top5Actors = actors.head(5)

Top5Actors = Top5Actors.sort_values(by=["Total Count"])
```

Bar Chart for Top 5 Actors



Creating a data frame for Content produced Every Year on Netflixb

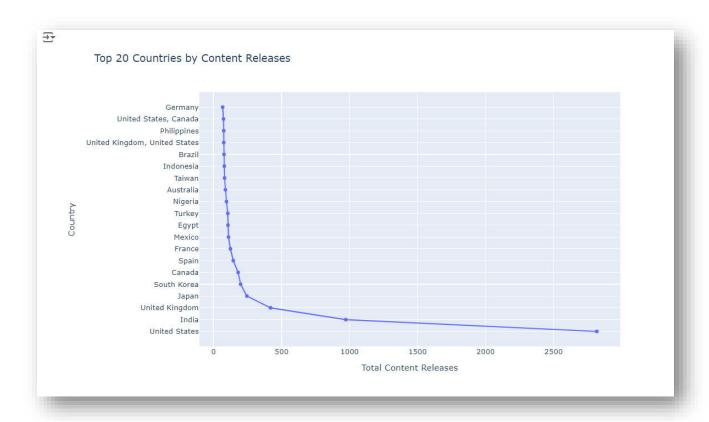
```
[55] #Analyzing the Content Produced on Netflix Based on Years
     df1 = df[['type', 'release_year']]
     df1 = df1.rename(columns={"release_year": "Release Year", "type": "Type"})
     df2 = df1.groupby(['Release Year', 'Type']).size().reset_index(name='Total Content')
     df2 = df2.sort_values(by=['Total Content'], ascending=True)
     print(df2)
                         Type Total Content
₹
         Release Year
                 1925 TV Show
1989 TV Show
    a
                                    1
     54
                                            1
                 1963 TV Show
                1963 Movie
1972 TV Show
                                           1
     17
     29
     115
                 2020
                         Movie
                                          517
    113
                 2019
                       Movie
                                         633
                 2016
                        Movie
    107
                                          658
     111
                 2018
                         Movie
                                          767
    109
                 2017
                        Movie
                                          767
     [119 rows x 3 columns]
```

Creating line Chart for the Type of Content released from Year 2000



Grouping the Countries and Finding out Total Releases by them

Creating a Line Chart for Top 20 Countries in releasing content



Sentiment Analysis of Netflix Content

Creating Data frame and categorizing Content Into neutral Positive and Negative and Creating the BAR Graph

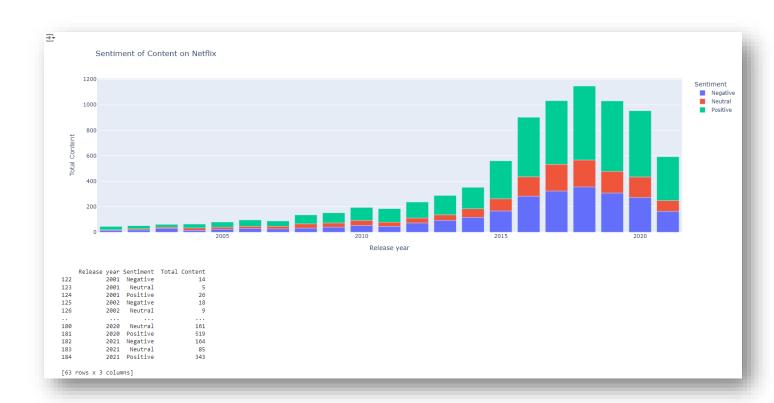
```
#Entiment Analysis of Netflix Content
#Creating Dataframe and categorizing Content Into neutral Positive and Negative and Creating the BAR Graph
df3 = df[['release_year', 'description']]  # Select relevant columns
df3 = df3.rename(columns-("release_year": "Release year", "description": "Description"})  # Rename for clarity

sentiments = []
for index, row in df3.iterrows():
    description = row['Description']
    testimonial = TextBlob(description)
    polarity = estimonial = TextBlob(description)
    polarity = 0:
        sentiment = "Neutral"
    elif polarity < 0:
        sentiment = "Negative"
    else:
        sentiment = "Positive"
        sentiment = "Positive"
        sentiments.append(sentiment)

df3['Sentiment'] = sentiments
df3_grouped = df3_grouped[ff3_grouped['Release year'] > 2000]  # Filter for years greater than 2000

BarGraph = px.bar(df3_grouped, x="Release year", y="Total Content", color="Sentiment", title="Sentiment of Content on Netflix")

BarGraph.show()
    print(df3_grouped)
```



Netflix Data Analysis Project (SQL)

This part of the document explores SQL-based data analysis using PostgreSQL. It addresses 15 diverse queries, providing the corresponding SQL code and detailed results for each. The project aims to demonstrate practical problemsolving and data manipulation techniques in a relational database.

PostgreSQL Queries and Results

1. Count the no. of Movies and TV Shows

Query

```
-- Problem 1 Count the Number of Movies and TV shows
select
   type,
   count (*) as total_content
from Netflix
group by type
```

Result

	type character varying (10)	total_content bigint
1	Movie	6131
2	TV Show	2676

2. Result Find the Most common rating for Movies and TV Shows

Query

```
-- Problem 2 Find the most common rating for Movies and TV Shows
SELECT
    type,
    rating
FROM
(SELECT
    type,
    rating,
    COUNT(*) AS count,
    RANK() OVER (PARTITION BY type ORDER BY COUNT(*) DESC) AS ranking
FROM Netflix
GROUP BY type, rating
) as t1
where
ranking = 1
```

Result

	type character varying (10)	rating character varying (10)
1	Movie	TV-MA
2	TV Show	TV-MA

3. List all Movies released in the year 2020

Query

```
-- Problem 3 List all the Movies released in 2020
select * from Netflix
where
    type = 'Movie'
    and
    release_year = 2020
```

Result

show_id character varying (6)	type character varying (10)	title character varying (150)	director character varying (250)	casts character varying (1000)
s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	[null]
s17	Movie	Europe's Most Dangerous Man: Otto Skorzeny in Spain	Pedro de Echave García, Pablo Azorín Williams	[null]
s79	Movie	Tughlaq Durbar	Delhiprasad Deenadayalan	Vijay Sethupathi, Parthiban, Raashi Khanna
s85	Movie	Omo Ghetto: the Saga	JJC Skillz, Funke Akindele	Funke Akindele, Ayo Makun, Chioma Chukwuka Akpotha, Yemi Ebereci
s104	Movie	Shadow Parties	Yemi Amodu	Jide Kosoko, Omotola Jalade-Ekeinde, Yemi Blaq, Sola Sobowale, Ken
s120	Movie	Here and There	IP Hahar	Ianine Gutierrez I.C. Santos, Victor Anastacio, Vesh Burce, Lotlot De I

4. Find the Top 5 Countries with Most Content on Netflix

Query

```
UNNEST(string_to_array(country, ',')) AS new_country,
COUNT(show_id) AS total_content
FROM Netflix
GROUP BY new_country
order by total_content desc
limit 5
```

	new_country text	total_content bigint
1	United States	3211
2	India	1008
3	United Kingdo	628
4	United States	479
5	Canada	271

5. Identify the Longest Movie

Query

```
-- Problem 5 Identify the longest Movie

SELECT *

FROM Netflix

WHERE

type = 'Movie'

AND

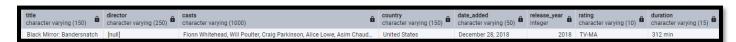
CAST(SPLIT_PART(duration, ' ', 1) AS INTEGER) = (
    SELECT MAX(CAST(SPLIT_PART(duration, ' ', 1) AS INTEGER))

FROM Netflix

WHERE type = 'Movie'

);
```

Result



6. Find the content added in the last 5 years

Query

```
-- Problem 6 Find the content added in the last 5 years

select * from Netflix

where

TO_DATE(date_added, 'Month dd, YYYY') >= CURRENT_DATE - INTERVAL '5 years'
```

	show_id character varying (6)	type character varying (10)	title character varying (150)
9	s9	TV Show	The Great British Baking Show
10	s10	Movie	The Starling
11	s11	TV Show	Vendetta: Truth, Lies and The Mafia
12	s12	TV Show	Bangkok Breaking
13	s13	Movie	Je Suis Karl
14	s14	Movie	Confessions of an Invisible Girl

date_added character varying (50)	release_year integer	rating character varying (10)	duration character varying (15)
September 24, 2021	2021	TV-14	9 Seasons
September 24, 2021	2021	PG-13	104 min
September 24, 2021	2021	TV-MA	1 Season
September 23, 2021	2021	TV-MA	1 Season
September 23, 2021	2021	TV-MA	127 min
September 22, 2021	2021	TV-PG	91 min

7. Find all the Movies/TV Shows By Director "Rajiv Chilaka"

Query

```
-- Problem 7 Find all the Movie/TV Shows by Director 'Rajiv Chilaka' select * from Netflix where director LIKE '%Rajiv Chilaka%'
```

Result

	show_id character varying (6)	type character varying (10)	title character varying (150)	director character varying (250)
1	s407	Movie	Chhota Bheem - Neeli Pahaadi	Rajiv Chilaka
2	s408	Movie	Chhota Bheem & Ganesh	Rajiv Chilaka
3	s409	Movie	Chhota Bheem & Krishna: Mayanagari	Rajiv Chilaka
4	s410	Movie	Chhota Bheem & Krishna: Pataliputra- City of the De	Rajiv Chilaka
5	s411	Movie	Chhota Bheem And The Broken Amulet	Rajiv Chilaka
6	s412	Movie	Chhota Bheem And The Crown of Valhalla	Rajiv Chilaka
7	s413	Movie	Chhota Bheem and the Incan Adventure	Rajiv Chilaka
8	s414	Movie	Chhota Bheem and The ShiNobi Secret	Rajiv Chilaka
9	s415	Movie	Chhota Bheem Aur Hanuman	Rajiv Chilaka
10	s416	Movie	Chhota Bheem aur Krishna	Rajiv Chilaka
11	s417	Movie	Chhota Bheem aur Krishna vs Zimbara	Rajiv Chilaka
12	s420	Movie	Chhota Bheem: Bheem vs Aliens	Rajiv Chilaka
13	s421	Movie	Chhota Bheem: Dholakpur to Kathmandu	Rajiv Chilaka
14	s422	Movie	Chhota Bheem: Dus Pe Dus	Rajiv Chilaka, Owll Mina
15	e/172	Movie	Chhota Rheem- Tourney to Petra	Raiiv Chilaka

8. List all TV Shows with more than 5 Seasons

Query

```
-- Problem 8 List all TV Shows with more than 5 seasons
select * from Netflix
where
    type = 'TV Show'
    and
    SPLIT_PART(duration, ' ', 1):: numeric > 5
```

	show_id character varying (6)	type character varying (10)	title character varying (150)
1	s9	TV Show	The Great British Baking Show
2	s56	TV Show	Nailed It
3	s66	TV Show	Numberblocks
4	s68	TV Show	Saved by the Bell
5	s83	TV Show	Lucifer
6	s275	TV Show	Grace and Frankie
7	s324	TV Show	30 Rock
8	s339	TV Show	Hunter X Hunter (2011)
9	s381	TV Show	The Flash
10	s391	TV Show	The Walking Dead
11	s526	TV Show	My Little Pony: Friendship Is Magic
12	s527	TV Show	Orange Is the New Black
13	s538	TV Show	Terrace House: Opening New Doo
14	s549	TV Show	Grey's Anatomy



9. Count the number of content items in each genre

Query

```
-- Problem 9 Count the number of Content items in each genre
select
   unnest (string_to_array(listed_in, ',')) as genre,
   count(show_id) as total_content
   from Netflix
   group by genre
```

Result

	genre text	total_content bigint
1	International TV Shows	774
2	Stand-Up Comedy	9
3	Spanish-Language TV Shows	172
4	Romantic Movies	613
5	Anime Features	21
6	TV Horror	11
7	Stand-Up Comedy & Talk Shows	34
8	Kids' TV	63
9	Docuseries	221
10	Children & Family Movies	605
11	Movies	57
12	Horror Movies	82
13	International Movies	2624
14	Music & Musicals	18
15	Reality TV	120

10. Find each year and the average number of content release by india on netflix return top 5 year with highest avg content release

<mark>Query</mark>

Result

	country character varying (150)	release_year integer	total_release bigint	avg_release numeric
1	India	2017	101	10.39
2	India	2018	94	9.67
3	India	2019	87	8.95
4	India	2020	75	7.72
5	India	2016	73	7.51

11. List all the content which is a Documentary

Query

```
-- Problem 11 List all the Content which is a documentary SELECT *
FROM netflix
WHERE listed_in LIKE '%Documentaries'
```

Result

	show_id character varying (6)	type character varying (10)	title character varying (150)	director character varying (250)	casts character varying (1000)
1	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	[null]
2	s46	Movie	My Heroes Were Cowboys	Tyler Greco	[null]
3	s118	Movie	Final Account	Luke Holland	[null]
4	s7603	Movie	NOVA: Chinese Chariot Revealed	Giulia Clark	Eric Meyers
5	s222	Movie	Bob Ross: Happy Accidents, Betrayal & Greed	Joshua Rofé	Bob Ross
6	s305	Movie	Lady Boss: The Jackie Collins Story	Laura Fairrie	Jackie Collins
7	s7604	Movie	NOVA: Day the Dinosaurs Died	Sarah Holt	Craig Sechler
8	c270	Movie	Fantastic Fundi	Louie Schwartzhern	fould

12. Find all the content with no director

Query

```
-- Problem 12 Find all the content without Director SELECT *
FROM netflix
WHERE director IS NULL
```

	show_id character varying (6)	type character varying (10)	title character varying (150)	director character varying (250)
1	s2	TV Show	Blood & Water	[null]
2	s4	TV Show	Jailbirds New Orleans	[null]
3	s5	TV Show	Kota Factory	[null]
4	s11	TV Show	Vendetta: Truth, Lies and The Mafia	[null]
5	s15	TV Show	Crime Stories: India Detectives	[null]
6	s16	TV Show	Dear White People	[null]
7	s369	TV Show	Khawatir	[null]
8	g18	TV Show	Falsa identidad	fnull

13. Find out in how many movies salman khan appeared in last 10 years

Query

```
-- Problem 13 Find out in how many movies salman khan appeared in last 10 years SELECT *
FROM netflix
WHERE casts LIKE '%Salman Khan%'
AND release_year > EXTRACT(YEAR FROM CURRENT_DATE) - 10
```

Result



14. Find the Top 10 Actors Who Have Appeared in the Highest Number of Movies Produced in India

Query

```
-- Problem 14 Find the Top 10 Actors Who Have Appeared in the Highest Number of Movies Produced in India SELECT

UNNEST(STRING_TO_ARRAY(casts, ',')) AS actor,

COUNT(*)
FROM netflix
WHERE country = 'India'
GROUP BY actor
ORDER BY COUNT(*) DESC
LIMIT 10;
```

	actor text	count bigint
1	Anupam Kher	36
2	Paresh Rawal	24
3	Shah Rukh Khan	24
4	Om Puri	23
5	Akshay Kumar	22
6	Boman Irani	21
7	Amitabh Bachchan	20
8	Kareena Kapoor	19
9	Naseeruddin Shah	19
10	Asrani	17

15. Categorize content as Parental Guidance Content when there is Presence of keywords like 'Kill' and 'Violence'

Query

