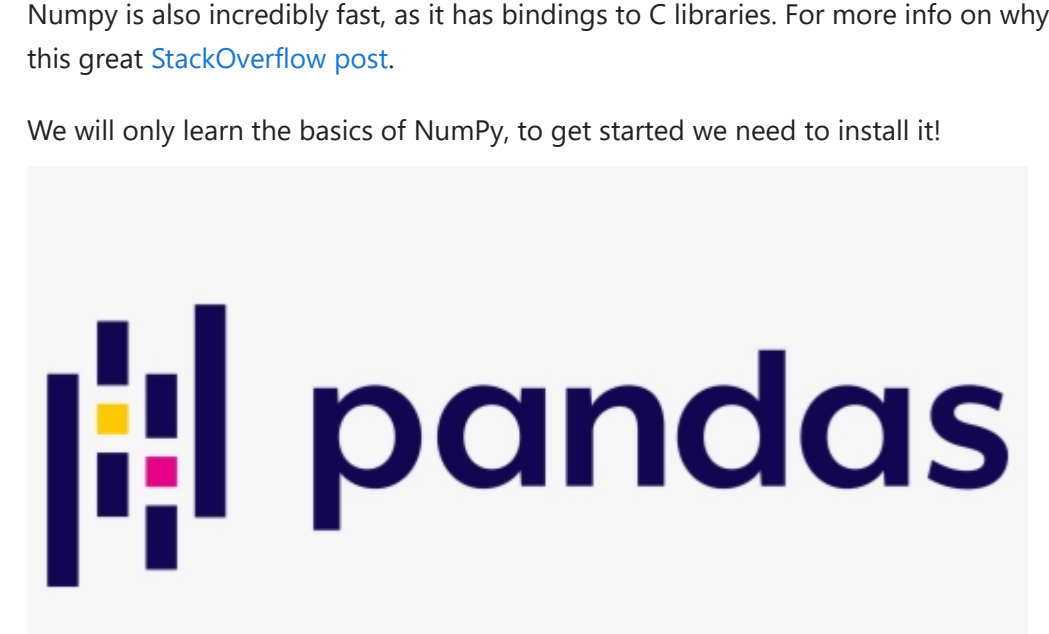
EDA on Netflix Data

NumPy

NumPy (or Numpy) is a Linear Algebra Library for Python, the reason it is so important for Data Science with Python is that almost all of the libraries in the PyData Ecosystem rely on NumPy as one of their main building blocks.

Numpy is also incredibly fast, as it has bindings to C libraries. For more info on why you would want to use Arrays instead of lists, check out this great StackOverflow post.

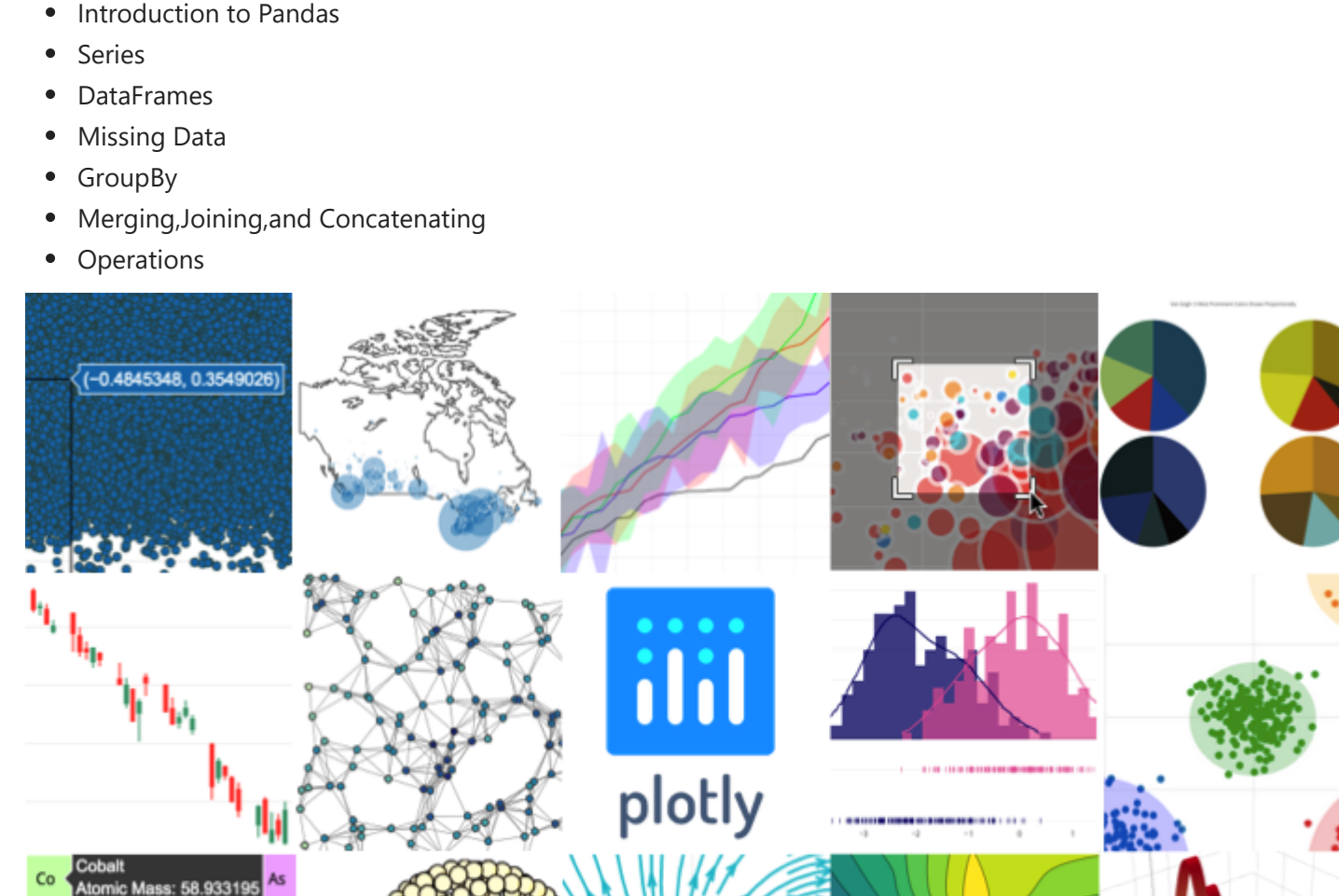
We will only learn the basics of NumPy, to get started we need to install it!



Introduction to Pandas

In this section of the course we will learn how to use pandas for data analysis. You can think of pandas as an extremely powerful version of Excel, with a lot more features. In this section of the course, you should go through the notebooks in this order:

- Introduction to Pandas
- Series
- DataFrames
- Missing Data
- GroupBy
- Merging,Joining,and Concatenating
- Operations

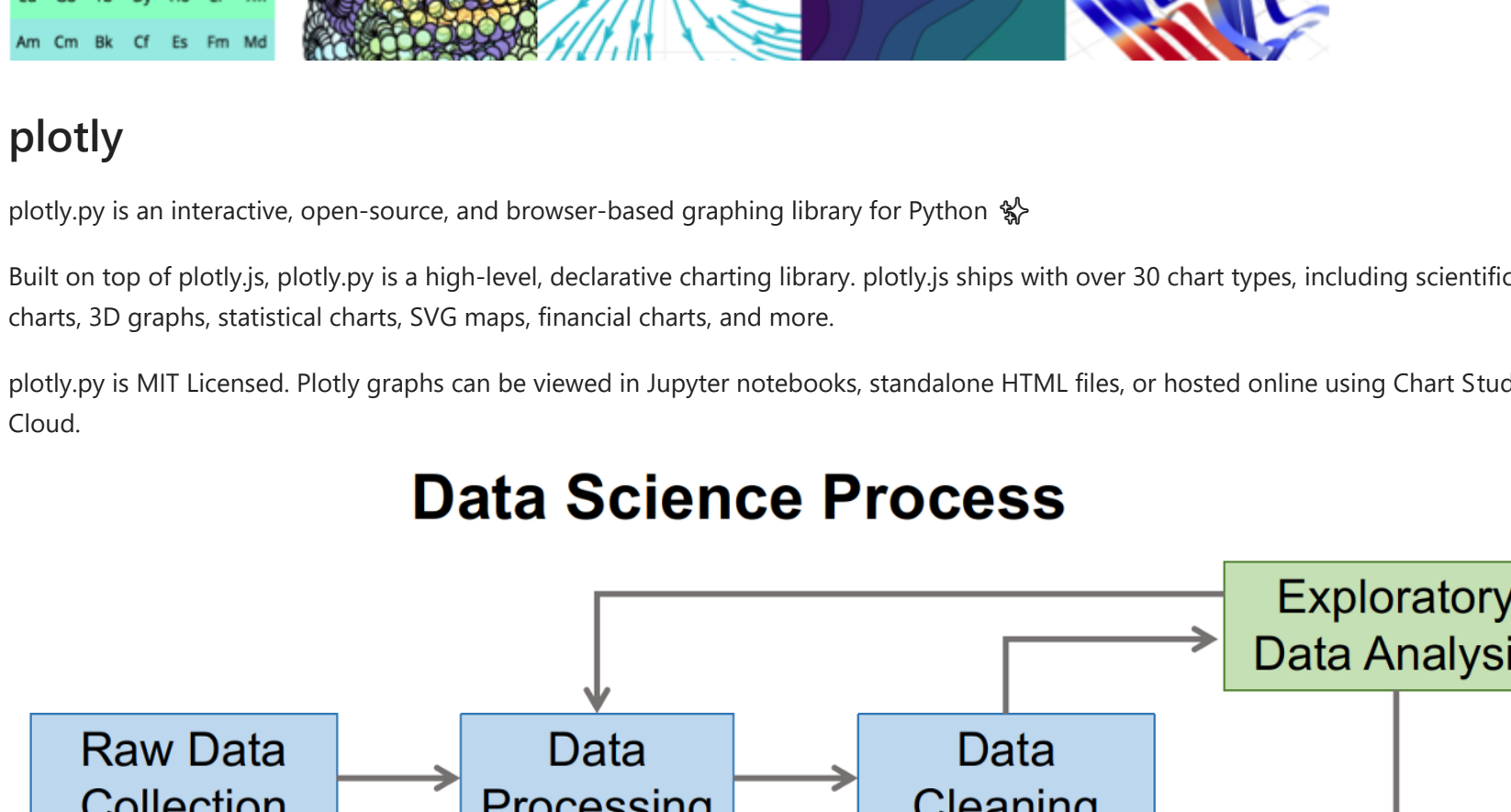


plotly

plotly.py is an interactive, open-source, and browser-based graphing library for Python ✨

Built on top of plotly.js, plotly.py is a high-level, declarative charting library. plotly.js ships with over 30 chart types, including scientific charts, 3D graphs, statistical charts, SVG maps, financial charts, and more.

plotly.py is MIT Licensed. Plotly graphs can be viewed in Jupyter notebooks, standalone HTML files, or hosted online using Chart Studio Cloud.



Netflix Data Analysis with Python

The dataset I have used for the Netflix data analytics task consists of TV shows and movies streamed on Netflix as of 2021. The dataset is provided by Flixable which is an engine of third-party research available on Netflix.

In [1]:
```
import numpy as np # linear algebra
import pandas as pd # for data preparation
import plotly.express as px # for data visualization
from textblob import TextBlob # for sentiment analysis

dff=pd.read_csv('netflix_titles.csv')
dff.shape
```

Out[1]: (8807, 12)

In [2]:
```
dff
```

Out[2]:

	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	NaN	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	NaN	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	NaN	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 l...
...	...	...	...	...	...	...	...	...	...	...	...	...
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A political cartoonist, a crime reporter and a...
8803	s8804	TV Show	Zombie Dumb	NaN	NaN	NaN	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town, a young g...
8804	s8805	Movie	Zombieland	Ruben Fleischer	Jesse Eisenberg, Woody Harrelson, Emma Stone, ...	United States	November 1, 2019	2009	R	88 min	Comedies, Horror Movies	Looking to survive in a world taken over by zo...
8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero...
8806	s8807	Movie	Zubaan	Mozez Singh	Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan...	India	March 2, 2019	2015	TV-14	111 min	Dramas, International Movies, Music & Musicals	A scrappy but poor boy worms his way into a ty...

8807 rows × 12 columns

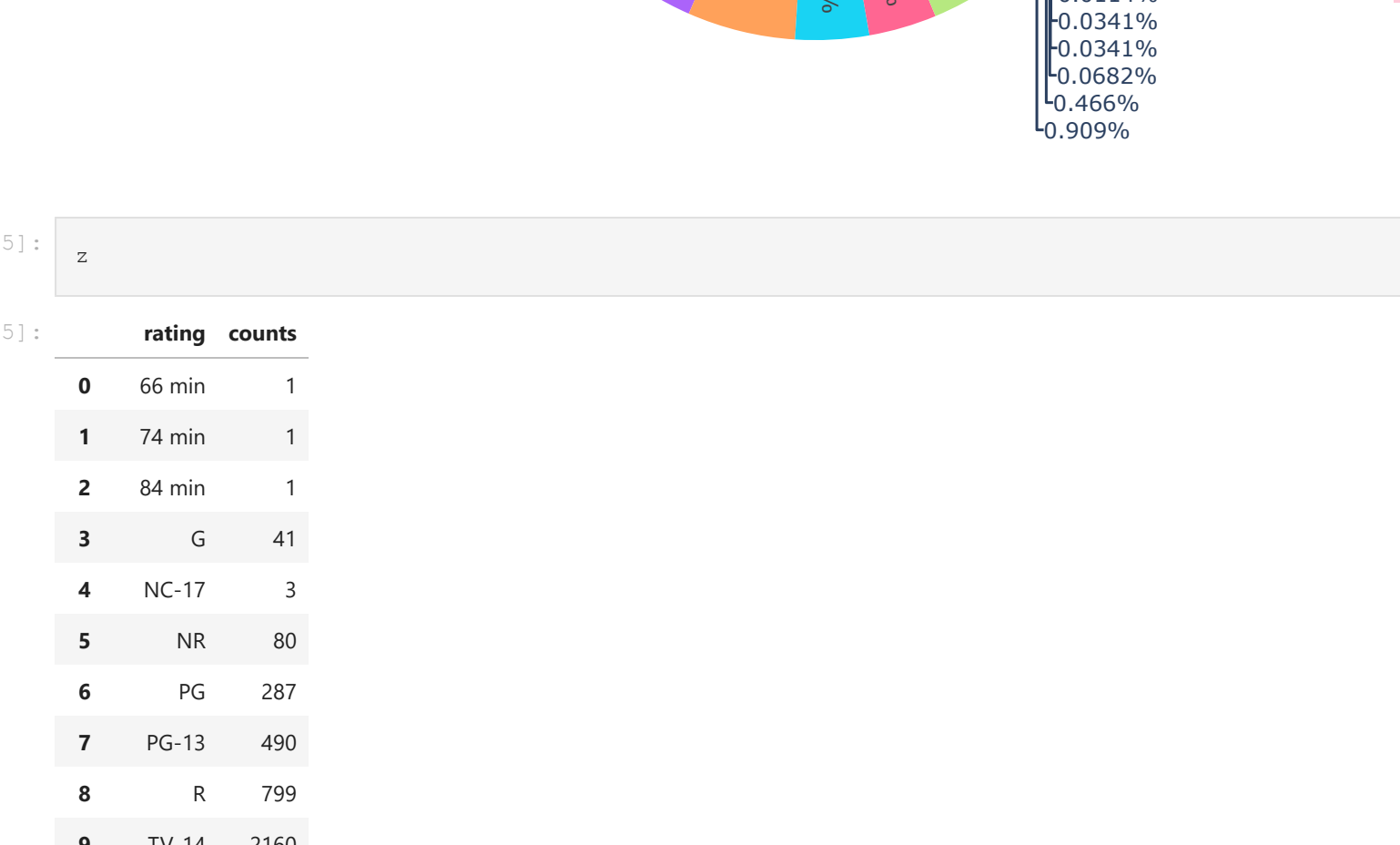
In [3]:
```
dff.columns
```

Out[3]:
```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'listed_in', 'description'],
      dtype='object')
```

Distribution of Content:

To begin the task of analyzing Netflix data, I'll start by looking at the distribution of content ratings on Netflix:

In [4]:
```
z = dff.groupby(['rating']).size().reset_index(name='counts')
pieChart = px.pie(z, values='counts', names='rating',
                  title='Distribution of Content Ratings on Netflix')
pieChart.show()
```



In [5]:
```
z
```

Out[5]:

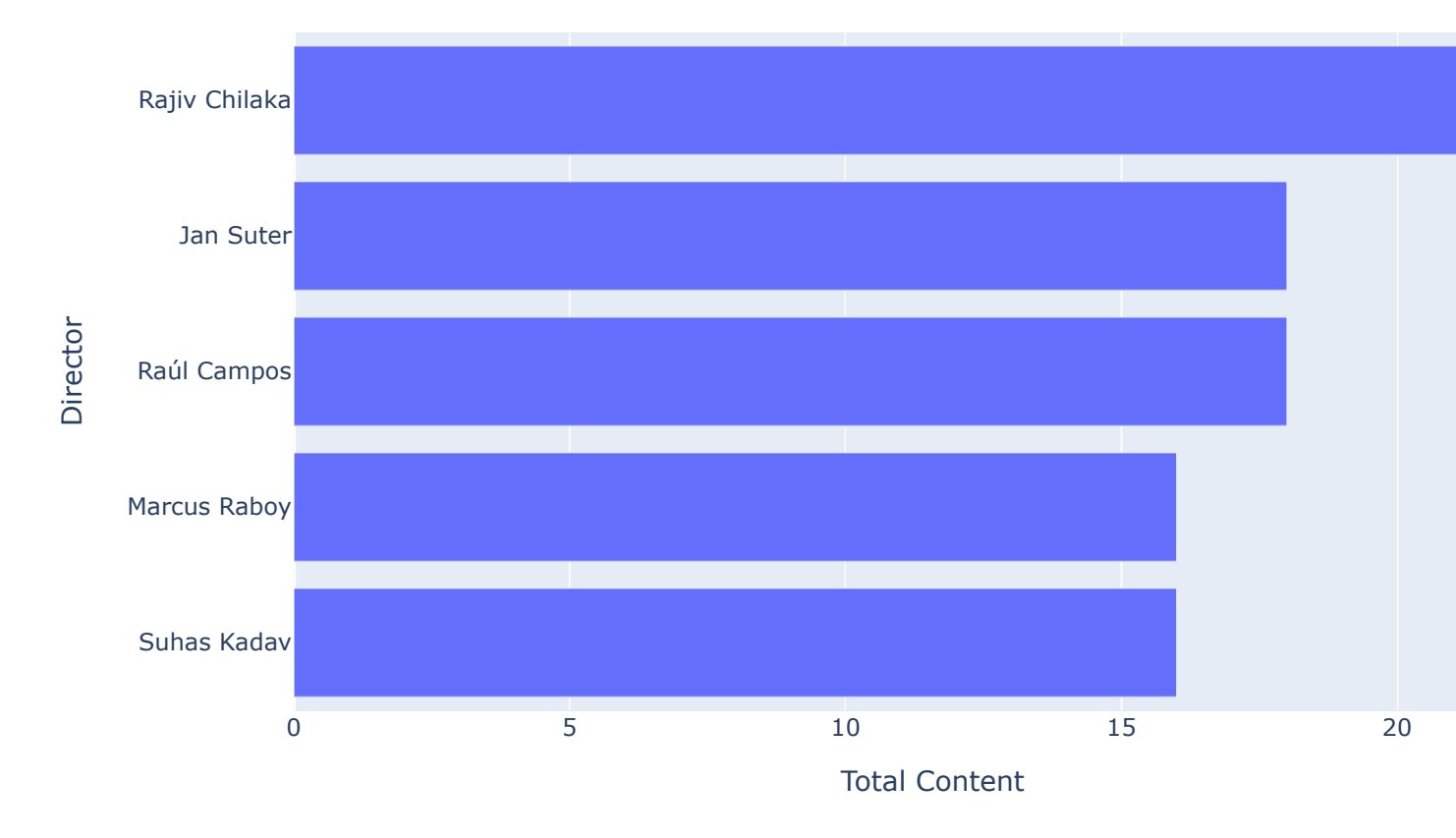
	rating	counts
0	66 min	1
1	74 min	1
2	84 min	1
3	G	41
4	NC-17	3
5	NR	80
6	PG	287
7	PG-13	490
8	R	799
9	TV-14	2160
10	TV-G	220
11	TV-MA	3207
12	TV-PG	863
13	TV-Y	307
14	TV-Y7	334
15	TV-Y7-FV	6
16	UR	3

The graph above shows that the majority of content on Netflix is categorized as "TV-MA", which means that most of the content available on Netflix is intended for viewing by mature and adult audiences.

Top 5 Actors and Directors:

Now let's see the top 5 successful directors on this platform:

In [16]:
```
dff['director']=dff['director'].fillna('No Director Specified')
filtered_directors=pd.DataFrame()
filtered_directors=dff['director'].str.split(',',expand=True).stack()
filtered_directors=filtered_directors.to_frame()
filtered_directors.columns=['Director']
directors=filtered_directors.groupby(['Director']).size().reset_index(name='Total Content')
directors=directors[directors.Director !='No Director Specified']
directors=directors.sort_values(by=['Total Content'],ascending=False)
directorsTop5=directors.head()
directorsTop5=directorsTop5.sort_values(by=['Total Content'])
fig1=px.bar(directorsTop5,x='Total Content',y='Director',title='Top 5 Directors on Netflix')
fig1.show()
```



In [6]:
```
dff['director']=dff['director'].fillna('No Director Specified')
filtered_directors=pd.DataFrame()
filtered_directors=dff['director'].str.split(',',expand=True).stack()
filtered_directors=filtered_directors.to_frame()
filtered_directors.columns=['Director']
directors=filtered_directors.groupby(['Director']).size().reset_index(name='Total Content')
directors=directors[directors.Director !='No Director Specified']
directors=directors.sort_values(by=['Total Content'],ascending=False)
directorsTop5=directors.head()
directorsTop5=directorsTop5.sort_values(by=['Total Content'])
directorsTop5
fig1=px.bar(directorsTop5,x='Total Content',y='Director',title='Top 5 Directors on Netflix')
fig1.show()
```

In [ ]:
```
dff['director']=dff['director'].fillna('No Director Specified')
filtered_directors=pd.DataFrame()
filtered_directors=dff['director'].str.split(',',expand=True).stack()
filtered_directors=filtered_directors.to_frame()
filtered_directors.columns=['Director']
directors=filtered_directors.groupby(['Director']).size().reset_index(name='Total Content')
directors=directors[directors.Director !='No Director Specified']
directors=directors.sort_values(by=['Total Content'],ascending=False)
directorsTop5=directors.head()
directorsTop5=directorsTop5.sort_values(by=['Total Content'])
fig1=px.bar(directorsTop5,x='Total Content',y='Director',title='Top 5 Directors on Netflix')
fig1.show()
```

From the above graph it is derived that the top 5 directors on this platform are:

- Raul Campos
- Jan Suter
- Jay Karas
- Marcus Raboy
- Jay Chapman

Now let's have a look at the top 5 successful actors on this platform

The top 5 successful actors

In [17]:
```
dff['cast']=dff['cast'].fillna('No Cast Specified')
filtered_cast=pd.DataFrame()
filtered_cast=dff['cast'].str.split(',',expand=True).stack()
filtered_cast=filtered_cast.to_frame()
filtered_cast.columns=['Actor']
actors=filtered_cast.groupby(['Actor']).size().reset_index(name='Total Content')
actors=actors[actors.Actor !='No Cast Specified']
actors=actors.sort_values(by=['Total Content'],ascending=False)
actorsTop5=actors.head()
actorsTop5=actorsTop5.sort_values(by=['Total Content'])
actorsTop5
```

Out[17]:

	Actor	Total Content
23624	Om Puri	27
15541	Julie Tejwani	28
30303	Takahiro Sakurai	30
26941	Rupa Bhimani	31
2612	Anupam Kher	39

From the above plot, it is derived that the top 5 actors on Netflix are:

- Anupam Kher
- Om Puri
- Shah Rukh Khan
- Takahira Sakurai
- Boman Irani

Analyzing Content on Netflix:

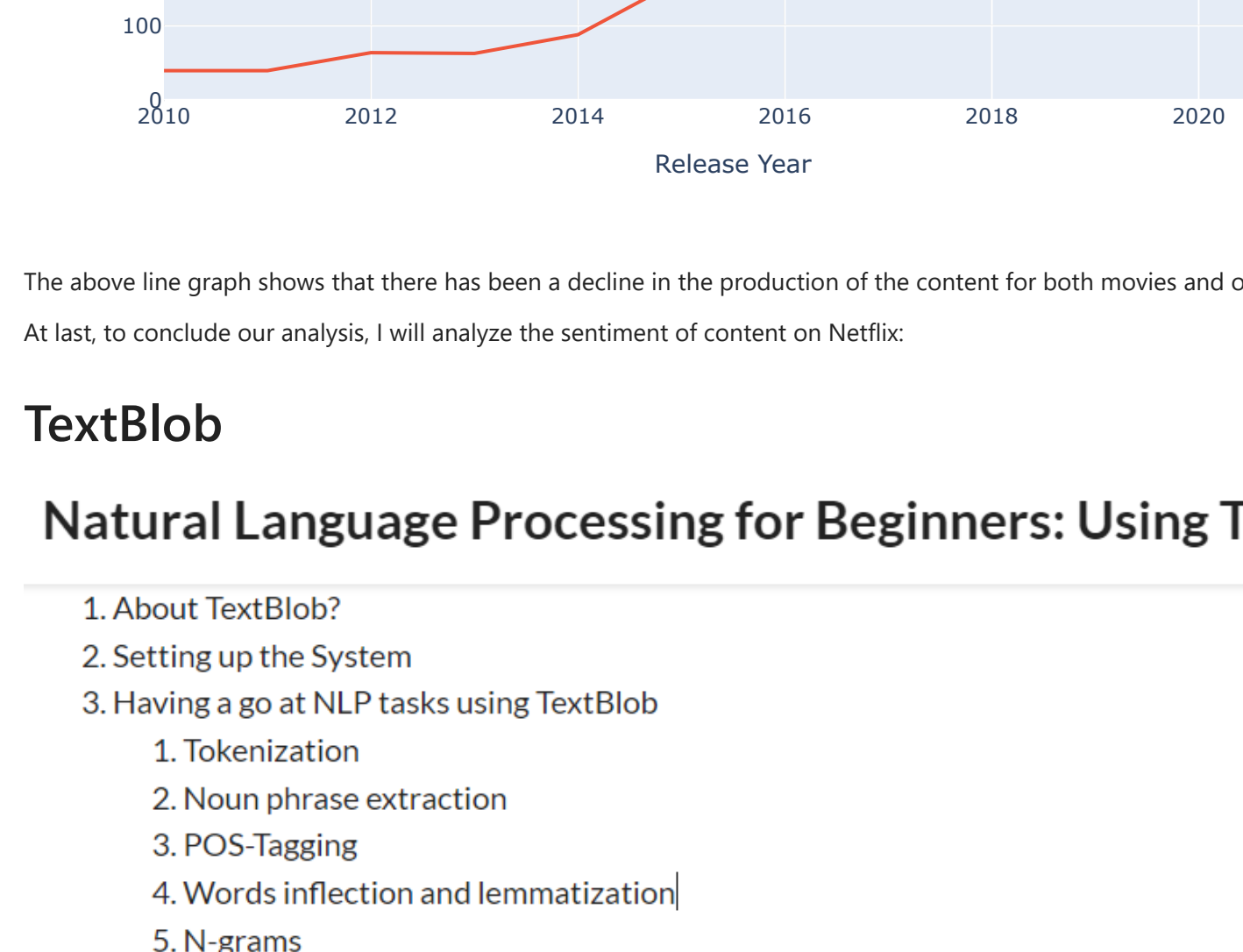
The next thing to analyze from this data is the trend of production over the years on Netflix:

In [23]:
```
df1=dff[['type','release_year']]
df1=df1.rename(columns={"release_year": "Release Year"})
df2=df1.groupby(['Release Year','type']).size().reset_index(name='Total Content')
df2=df2[df2['Release Year']>=2010]
df2
```

Out[23]:

	Release Year	type	Total Content
95	2010	Movie	154
96	2010	TV Show	40
97	2011	Movie	145
98	2011	TV Show	40
99	2012	Movie	173
100	2012	TV Show	64
101	2013	Movie	225
102	2013	TV Show	63
103	2014	Movie	264
104	2014	TV Show	88
105	2015	Movie	398
106	2015	TV Show	162
107	2016	Movie	658
108	2016	TV Show	244
109	2017	Movie	767
110	2017	TV Show	265
111	2018	Movie	767
112	2018	TV Show	380
113	2019	Movie	633
114	2019	TV Show	397
115	2020	Movie	517
116	2020	TV Show	436
117	2021	Movie	277
118	2021	TV Show	315

In [18]:
```
df1=dff[['type','release_year']]
df1=df1.rename(columns={"release_year": "Release Year"})
df2=df1.groupby(['Release Year','type']).size().reset_index(name='Total Content')
df2=df2[df2['Release Year']>=2010]
fig3 = px.line(df2, x="Release Year", y="Total Content", color='type',title='Trend of content produced over the
fig3.show()
```



The above line graph shows that there has been a decline in the production of the content for both movies and other shows since 2018.

At last, to conclude our analysis, I will analyze the sentiment of content on Netflix:

TextBlob

Natural Language Processing for Beginners: Using TextBlob

1. About TextBlob?
2. Setting up the System
3. Having a go at NLP tasks using TextBlob
   1. Tokenization
   2. Noun phrase extraction
   3. POS-Tagging
   4. Words inflection and lemmatization
   5. N-grams
   6. Sentiment Analysis
4. Other cool things to do with TextBlob
   1. Spelling correction
   2. Creating a short summary of a text
   3. Translation and language detection
5. Text classification using TextBlob
6. Pros and Cons

About TextBlob?

TextBlob is a python library and offers a simple API to access its methods and perform basic NLP tasks.

A good thing about TextBlob is that they are just like python strings. So, you can transform and play with it same like we did in python. Below, I have shown you below some basic tasks. Don't worry about the syntax, it is just to give you an intuition about how much-related TextBlob is to Python strings.

6 - Sentiment Analysis

Sentiment analysis is basically the process of determining the attitude or the emotion of the writer, i.e., whether it is positive or negative or neutral.

The sentiment function of textblob returns two properties, polarity, and subjectivity.

Polarity is float which lies in the range of [-1,1] where 1 means positive statement and -1 means a negative statement. Subjective sentences generally refer to personal opinion, emotion or judgment whereas objective refers to factual information. Subjectivity is also a float which lies in the range of [0,1].

Let's check the sentiment of our blob.

```
print (blob)
blob.sentiment
>> Analytics Vidhya is a great platform to learn data science.
Sentiment(polarity=0.8, subjectivity=0.75)
```

We can see that polarity is 0.8, which means that the statement is positive and 0.75 subjectivity refers that mostly it is a public opinion and not a factual information.

Sentiment Analysis

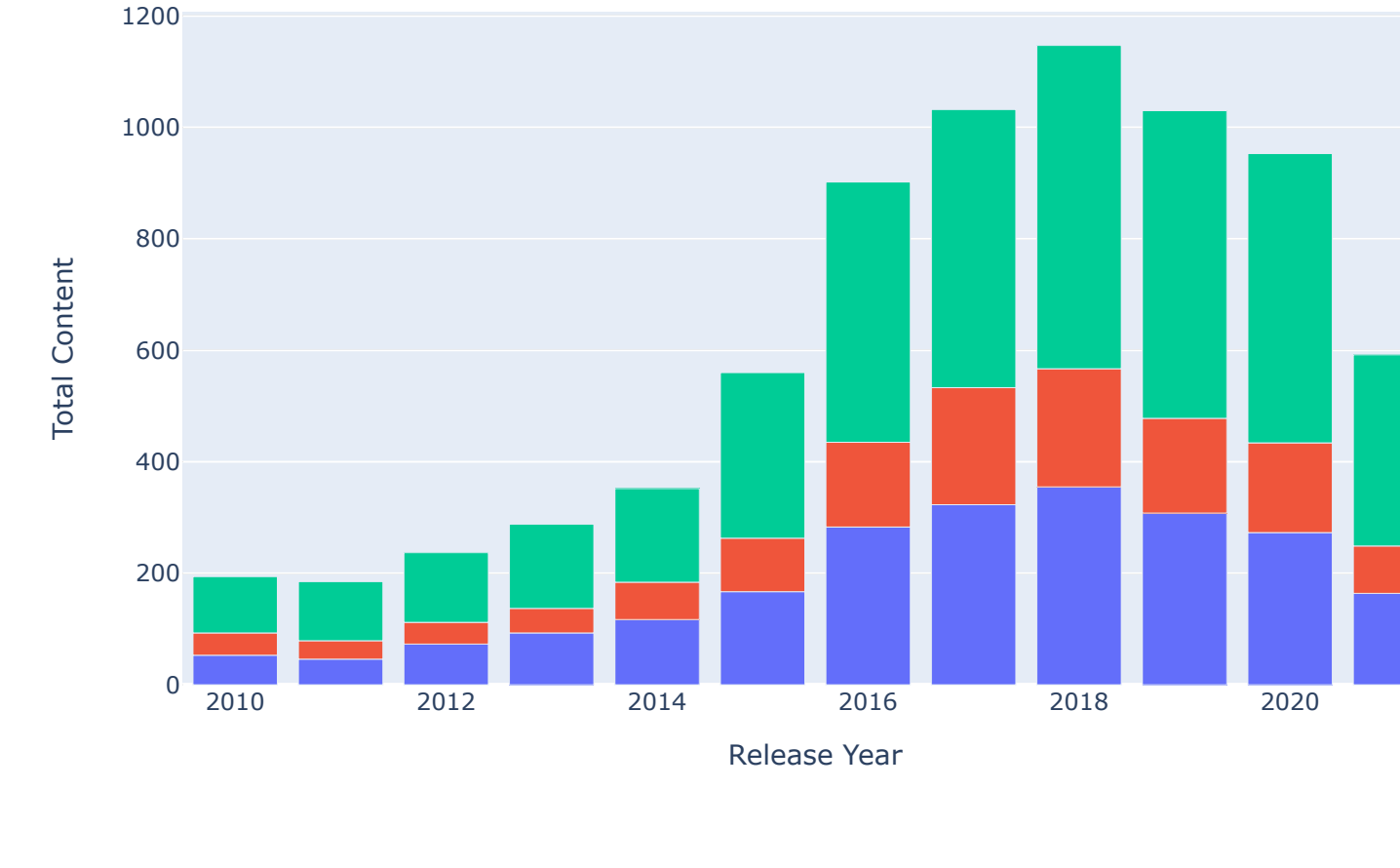
In [24]:
```
dfx=dff[['release_year','description']]
dfx=dfx.rename(columns={'release_year':'Release Year'})
for index,row in dfx.iterrows():
    z=row['description']
    testimonial=TextBlob(z)
    p=testimonial.sentiment.polarity

    if p==0:
        sent='Neutral'
    elif p>0:
        sent='Positive'
    else:
        sent='Negative'
    dfx.loc[[index,2],'Sentiment']=sent


dfx=dfx.groupby(['Release Year','Sentiment']).size().reset_index(name='Total Content')

dfx=dfx[dfx['Release Year']>=2010]

fig4 = px.bar(dfx, x="Release Year", y="Total Content", color="Sentiment", title="Sentiment of content on Netfl
fig4.show()
```



So the above graph shows that the overall positive content is always greater than the neutral and negative content combined.

In [ ]: