Import Libraries

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
from wordcloud import WordCloud
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.metrics.pairwise import cosine_similarity
import ipywidgets as widgets
from IPython.display import display
```

Read Data

```
df = pd.read_csv("/content/dataset.csv")
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 9 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   id                 10000 non-null  int64
 1   title              10000 non-null  object
 2   genre              9997 non-null   object
 3   original_language  10000 non-null  object
 4   overview           9987 non-null   object
 5   popularity         10000 non-null  float64
 6   release_date       10000 non-null  object
 7   vote_average       10000 non-null  float64
 8   vote_count         10000 non-null  int64
dtypes: float64(2), int64(2), object(5)
memory usage: 703.3+ KB
```

Data Cleaning

```
df.dropna(subset=['genre', 'overview'], inplace=True)
df['release_year'] = pd.to_datetime(df['release_date'], errors='coerce').dt.year
```

```
df['genre'] = df['genre'].apply(lambda x: x.split(',') if isinstance(x, str) else [])
```

TF-IDF Vectorization

```
tfidf = TfidfVectorizer(stop_words='english')
tfidf_matrix = tfidf.fit_transform(df['overview'])
cosine_sim = cosine_similarity(tfidf_matrix, tfidf_matrix)
```

Building Recomendation System

```
def recommend_movies(title, num_recommendations=5):
    idx = df[df['title'].str.lower() == title.lower()].index
    if len(idx) == 0:
        return "Movie not found. Try another title."
    idx = idx[0]
    sim_scores = list(enumerate(cosine_sim[idx]))
    sim_scores = sorted(sim_scores, key=lambda x: x[1], reverse=True)[1:num_recommendations+1]
    movie_indices = [i[0] for i in sim_scores]
    return df.iloc[movie_indices][['title', 'genre', 'release_year']]
```

Interactive widget for recommendations

```
def on_movie_selection(change):
    movie_title = change['new']
```

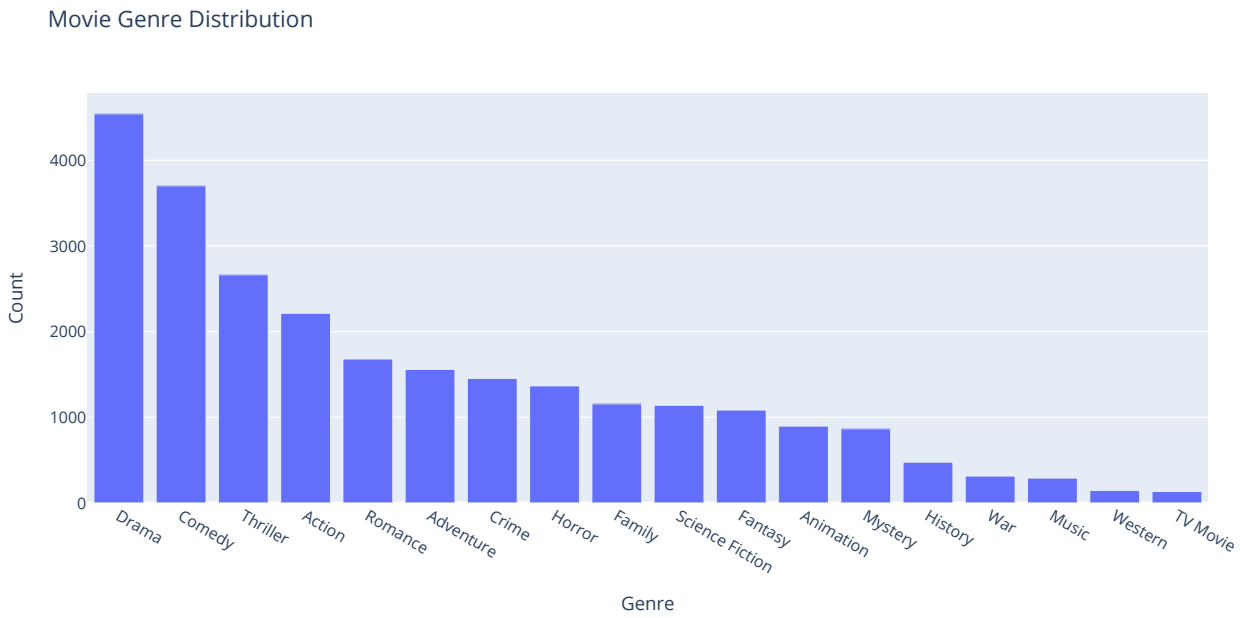
```
    display(recommend_movies(movie_title))

movie_dropdown = widgets.Dropdown(
    options=df['title'].unique(),
    description='Movie:',
    continuous_update=False
)
movie_dropdown.observe(on_movie_selection, names='value')
display(movie_dropdown)
```

Movie: Pulp Fiction

	title	genre	release_year
263	The Sting	[Comedy, Crime, Drama]	1973
5096	Sliding Doors	[Comedy, Drama, Fantasy, Romance]	1998
4332	First Love	[Crime, Action, Comedy, Thriller]	2019
3235	As Tears Go By	[Drama, Crime, Romance]	1988
7312	Kill Your Friends	[Comedy, Crime, Thriller]	2015

Interactive Plot - Genre Distribution

```
genre_counts = df.explode('genre')['genre'].value_counts().reset_index()
genre_counts.columns = ['Genre', 'Count']
fig = px.bar(genre_counts, x='Genre', y='Count', title='Movie Genre Distribution', width=1000, height=500)
fig.show()
```



WordCloud for Most Common Words in Overviews

```
text = " ".join(df['overview'].dropna())
wordcloud = WordCloud(width=800, height=400, background_color='black').generate(text)
plt.figure(figsize=(10, 5))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off')
plt.show()
```


life
find
family
one
new
world
take
two
live
will
time
make
must
friend
man
become
love
turn
discover
father
young
help
wife
begin
woman
mother
set
home
back
group
story
way
now
meet
daughter
mysterious
escape
first
son
murder
return
decide
people
house
save
work
girl
death
city
want
forced
lead
year old
order
secret
former
three
face
boy
start
New York
together
dream
end
plan
fall
learn
town
past
soon
job
team
day
come
gets