

```
In [38]: # importing libraries.
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
In [39]: df = pd.read_csv('mymoviedb.csv', lineterminator='\n')
df.head()
```

```
Out[39]:
```

	Release_Date	Title	Overview	Popularity	Vote_Count	Vote_Average	Original_
--	--------------	-------	----------	------------	------------	--------------	-----------

0	2021-12-15	Spider-Man: No Way Home	Peter Parker is unmasked and no longer able to...	5083.954	8940	8.3	
---	------------	-------------------------	---------------------------------------------------	----------	------	-----	--

1	2022-03-01	The Batman	In his second year of fighting crime, Batman u...	3827.658	1151	8.1	
---	------------	------------	---------------------------------------------------	----------	------	-----	--

2	2022-02-25	No Exit	Stranded at a rest stop in the mountains durin...	2618.087	122	6.3	
---	------------	---------	---------------------------------------------------	----------	-----	-----	--

3	2021-11-24	Encanto	The tale of an extraordinary family, the Madri...	2402.201	5076	7.7	
---	------------	---------	---------------------------------------------------	----------	------	-----	--

4	2021-12-22	The King's Man	As a collection of history's worst tyrants and...	1895.511	1793	7.0	
---	------------	----------------	---------------------------------------------------	----------	------	-----	--



```
In [40]: # viewing dataset info
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9827 entries, 0 to 9826
Data columns (total 9 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Release_Date          9827 non-null   object
1   Title                 9827 non-null   object
2   Overview              9827 non-null   object
3   Popularity            9827 non-null   float64
4   Vote_Count            9827 non-null   int64
5   Vote_Average          9827 non-null   float64
6   Original_Language     9827 non-null   object
7   Genre                 9827 non-null   object
8   Poster_Url           9827 non-null   object
dtypes: float64(2), int64(1), object(6)
memory usage: 691.1+ KB
```

```
In [41]: # exploring genres column
df['Genre'].head()
```

```
Out[41]: 0    Action, Adventure, Science Fiction
1           Crime, Mystery, Thriller
2                      Thriller
3    Animation, Comedy, Family, Fantasy
4    Action, Adventure, Thriller, War
Name: Genre, dtype: object
```

```
In [42]: # check for duplicated rows
df.duplicated().sum()
```

```
Out[42]: np.int64(0)
```

```
In [43]: # exploring summary statistics
df.describe()
```

```
Out[43]:
```

	Popularity	Vote_Count	Vote_Average
<b>count</b>	9827.000000	9827.000000	9827.000000
<b>mean</b>	40.326088	1392.805536	6.439534
<b>std</b>	108.873998	2611.206907	1.129759
<b>min</b>	13.354000	0.000000	0.000000
<b>25%</b>	16.128500	146.000000	5.900000
<b>50%</b>	21.199000	444.000000	6.500000
<b>75%</b>	35.191500	1376.000000	7.100000
<b>max</b>	5083.954000	31077.000000	10.000000

- Exploration Summary • We have a dataframe consisting of 9826 rows and 9 columns.
- Our dataset looks a bit tidy with no NaNs nor duplicated values.
- Release\_Date column needs to be casted into date time and to extract only the year value.
- Overview, Original\_Language and Poster-Url wouldn't be so useful during analysis, so we'll drop them.
- There is noticeable outliers in Popularity column.
- Vote\_Average better be

categorised for proper analysis. • Genre column has comma saperated values and white spaces that needs to be handled and casted into category.

## Data Cleaning

Casting Release\_Date column and extracing year values

In [44]: `df.head()`

Out[44]:

	Release_Date	Title	Overview	Popularity	Vote_Count	Vote_Average	Original_
0	2021-12-15	Spider-Man: No Way Home	Peter Parker is unmasked and no longer able to...	5083.954	8940	8.3	
1	2022-03-01	The Batman	In his second year of fighting crime, Batman u...	3827.658	1151	8.1	
2	2022-02-25	No Exit	Stranded at a rest stop in the mountains durin...	2618.087	122	6.3	
3	2021-11-24	Encanto	The tale of an extraordinary family, the Madri...	2402.201	5076	7.7	
4	2021-12-22	The King's Man	As a collection of history's worst tyrants and...	1895.511	1793	7.0	

0	2021-12-15	Spider-Man: No Way Home	Peter Parker is unmasked and no longer able to...	5083.954	8940	8.3	
1	2022-03-01	The Batman	In his second year of fighting crime, Batman u...	3827.658	1151	8.1	
2	2022-02-25	No Exit	Stranded at a rest stop in the mountains durin...	2618.087	122	6.3	
3	2021-11-24	Encanto	The tale of an extraordinary family, the Madri...	2402.201	5076	7.7	
4	2021-12-22	The King's Man	As a collection of history's worst tyrants and...	1895.511	1793	7.0	



In [45]: `# casting column a  
df['Release_Date'] = pd.to_datetime(df['Release_Date'])  
# confirming changes  
print(df['Release_Date'].dtypes)`

datetime64[ns]

In [46]: `df['Release_Date'] = df['Release_Date'].dt.year  
df['Release_Date'].dtypes`

Out[46]: `dtype('int32')`

In [47]: `df.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9827 entries, 0 to 9826
Data columns (total 9 columns):
#   Column                Non-Null Count  Dtype
---  ---
0   Release_Date          9827 non-null   int32
1   Title                 9827 non-null   object
2   Overview              9827 non-null   object
3   Popularity            9827 non-null   float64
4   Vote_Count           9827 non-null   int64
5   Vote_Average          9827 non-null   float64
6   Original_Language     9827 non-null   object
7   Genre                 9827 non-null   object
8   Poster_Url           9827 non-null   object
dtypes: float64(2), int32(1), int64(1), object(5)
memory usage: 652.7+ KB
```

In [48]: `df.head()`

Out[48]:

	Release_Date	Title	Overview	Popularity	Vote_Count	Vote_Average	Original_
--	--------------	-------	----------	------------	------------	--------------	-----------

0	2021	Spider-Man: No Way Home	Peter Parker is unmasked and no longer able to...	5083.954	8940	8.3	
---	------	-------------------------	---------------------------------------------------	----------	------	-----	--

1	2022	The Batman	In his second year of fighting crime, Batman u...	3827.658	1151	8.1	
---	------	------------	---------------------------------------------------	----------	------	-----	--

2	2022	No Exit	Stranded at a rest stop in the mountains durin...	2618.087	122	6.3	
---	------	---------	---------------------------------------------------	----------	-----	-----	--

3	2021	Encanto	The tale of an extraordinary family, the Madri...	2402.201	5076	7.7	
---	------	---------	---------------------------------------------------	----------	------	-----	--

4	2021	The King's Man	As a collection of history's worst tyrants and...	1895.511	1793	7.0	
---	------	----------------	---------------------------------------------------	----------	------	-----	--



## Dropping Overview, Original\_Language and Poster-Url

In [49]:

```
# making list of column to be dropped
cols = ['Overview', 'Original_Language', 'Poster_Url']
```

```
# dropping columns and confirming changes
df.drop(cols, axis = 1, inplace = True)
df.columns
```

```
Out[49]: Index(['Release_Date', 'Title', 'Popularity', 'Vote_Count', 'Vote_Average',
              'Genre'],
              dtype='object')
```

```
In [50]: df.head()
```

```
Out[50]:
```

	Release_Date	Title	Popularity	Vote_Count	Vote_Average	Genre
0	2021	Spider-Man: No Way Home	5083.954	8940	8.3	Action, Adventure, Science Fiction
1	2022	The Batman	3827.658	1151	8.1	Crime, Mystery, Thriller
2	2022	No Exit	2618.087	122	6.3	Thriller
3	2021	Encanto	2402.201	5076	7.7	Animation, Comedy, Family, Fantasy
4	2021	The King's Man	1895.511	1793	7.0	Action, Adventure, Thriller, War

categorizing Vote\_Average column We would cut the Vote\_Average values and make 4 categories: popular average below\_avg not\_popular to describe it more using catigorize\_col() function provided above

```
In [51]: def catigorize_col (df, col, labels):
        """
        catigorizes a certain column based on its quartiles

        Args:
        (df) df - dataframe we are proccesing
        (col) str - to be catigorized column's name
        (labels) list - list of labels from min to max

        Returns:
        (df) df - dataframe with the categorized col
        """

        # setting the edges to cut the column accordingly
        edges = [df[col].describe()['min'],
                  df[col].describe()['25%'],
                  df[col].describe()['50%'],
                  df[col].describe()['75%'],
                  df[col].describe()['max']]
        df[col] = pd.cut(df[col], edges, labels = labels, duplicates='drop')
        return df
```

```
In [52]: # define labels for edges
        labels = ['not_popular', 'below_avg', 'average', 'popular']
        # categorize column based on labels and edges
        catigorize_col(df, 'Vote_Average', labels)
```

```
# confirming changes
df['Vote_Average'].unique()
```

```
Out[52]: ['popular', 'below_avg', 'average', 'not_popular', NaN]
Categories (4, object): ['not_popular' < 'below_avg' < 'average' < 'popular']
```

```
In [53]: df.head()
```

```
Out[53]:
```

	Release_Date	Title	Popularity	Vote_Count	Vote_Average	Genre
0	2021	Spider-Man: No Way Home	5083.954	8940	popular	Action, Adventure, Science Fiction
1	2022	The Batman	3827.658	1151	popular	Crime, Mystery, Thriller
2	2022	No Exit	2618.087	122	below_avg	Thriller
3	2021	Encanto	2402.201	5076	popular	Animation, Comedy, Family, Fantasy
4	2021	The King's Man	1895.511	1793	average	Action, Adventure, Thriller, War

```
In [54]: # exploring column
df['Vote_Average'].value_counts()
```

```
Out[54]: Vote_Average
not_popular    2467
popular        2450
average        2412
below_avg      2398
Name: count, dtype: int64
```

```
In [55]: # dropping NaNs
df.dropna(inplace = True)
# confirming
df.isna().sum()
```

```
Out[55]: Release_Date    0
Title                  0
Popularity             0
Vote_Count             0
Vote_Average          0
Genre                 0
dtype: int64
```

```
In [56]: df.head()
```

Out[56]:

	Release_Date	Title	Popularity	Vote_Count	Vote_Average	Genre
0	2021	Spider-Man: No Way Home	5083.954	8940	popular	Action, Adventure, Science Fiction
1	2022	The Batman	3827.658	1151	popular	Crime, Mystery, Thriller
2	2022	No Exit	2618.087	122	below_avg	Thriller
3	2021	Encanto	2402.201	5076	popular	Animation, Comedy, Family, Fantasy
4	2021	The King's Man	1895.511	1793	average	Action, Adventure, Thriller, War

we'd split genres into a list and then explode our dataframe to have only one genre per row for each movie

In [57]:

```
# split the strings into lists
df['Genre'] = df['Genre'].str.split(',')
# explode the lists
df = df.explode('Genre').reset_index(drop=True)
df.head()
```

Out[57]:

	Release_Date	Title	Popularity	Vote_Count	Vote_Average	Genre
0	2021	Spider-Man: No Way Home	5083.954	8940	popular	Action
1	2021	Spider-Man: No Way Home	5083.954	8940	popular	Adventure
2	2021	Spider-Man: No Way Home	5083.954	8940	popular	Science Fiction
3	2022	The Batman	3827.658	1151	popular	Crime
4	2022	The Batman	3827.658	1151	popular	Mystery

In [58]:

```
# casting column into category
df['Genre'] = df['Genre'].astype('category')
# confirming changes
df['Genre'].dtypes
```

Out[58]:

```
CategoricalDtype(categories=['Action', 'Adventure', 'Animation', 'Comedy', 'Crime',
                             'Documentary', 'Drama', 'Family', 'Fantasy', 'History',
                             'Horror', 'Music', 'Mystery', 'Romance', 'Science Fiction',
                             'TV Movie', 'Thriller', 'War', 'Western'],
                  ordered=False, categories_dtype=object)
```

```
In [59]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 25552 entries, 0 to 25551
Data columns (total 6 columns):
 #   Column          Non-Null Count  Dtype
---  -
 0   Release_Date    25552 non-null  int32
 1   Title           25552 non-null  object
 2   Popularity      25552 non-null  float64
 3   Vote_Count      25552 non-null  int64
 4   Vote_Average    25552 non-null  category
 5   Genre           25552 non-null  category
dtypes: category(2), float64(1), int32(1), int64(1), object(1)
memory usage: 749.6+ KB
```

```
In [60]: df.nunique()
```

```
Out[60]: Release_Date    100
         Title           9415
         Popularity      8088
         Vote_Count      3265
         Vote_Average     4
         Genre           19
         dtype: int64
```

Now that our dataset is clean and tidy, we are left with a total of 6 columns and 25551 rows to dig into during our analysis

## Data Visualization

here, we'd use Matplotlib and seaborn for making some informative visuals to gain insights about our data.

```
In [61]: # setting up seaborn configurations
sns.set_style('whitegrid')
```

### Q1: What is the most frequent genre in the dataset?

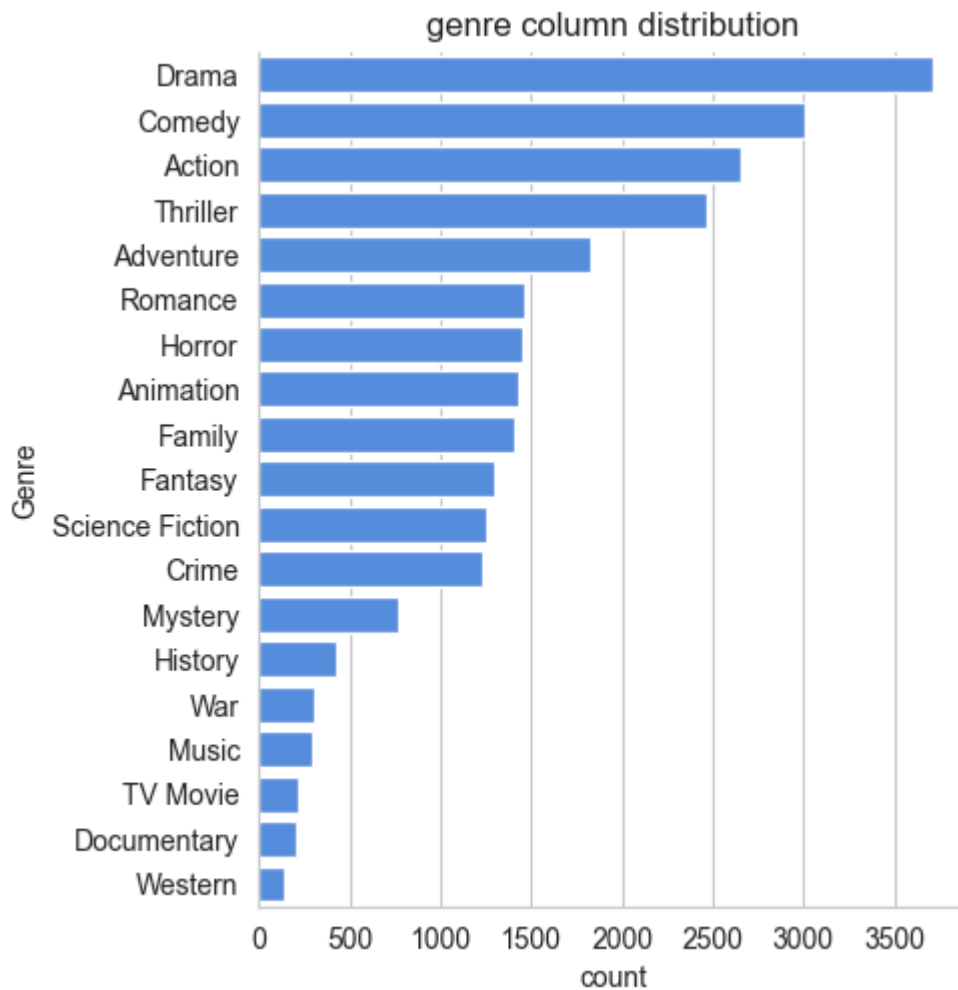
```
In [62]: # showing stats. on genre column
df['Genre'].describe()
```

```
Out[62]: count      25552
         unique       19
         top         Drama
         freq       3715
         Name: Genre, dtype: object
```

```
In [63]: # visualizing genre column
sns.catplot(y = 'Genre', data = df, kind = 'count',
            order = df['Genre'].value_counts().index,
            color = '#4287f5')
```



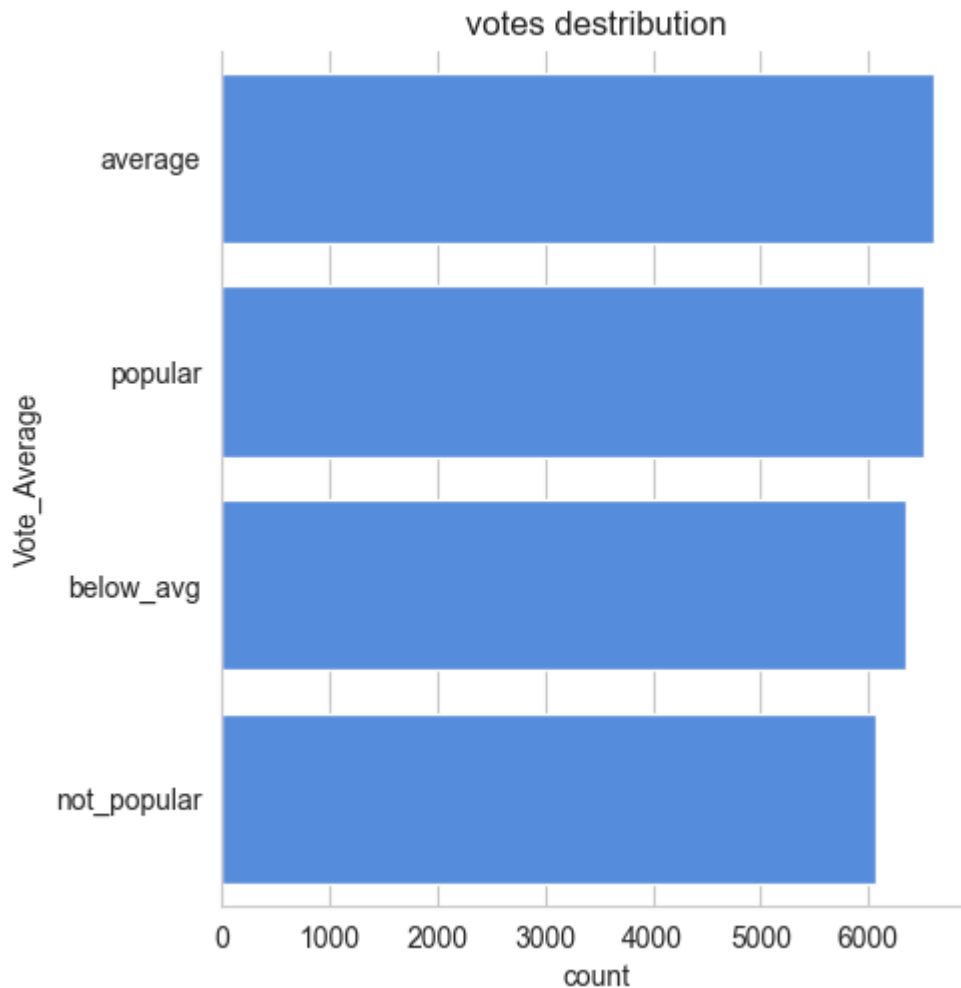
```
plt.title('genre column distribution')  
plt.show()
```



we can notice from the above visual that Drama genre is the most frequent genre in our dataset and has appeared more than 14% of the times among 19 other genres

## Q2: What genres has highest votes ?

```
In [64]: # visualizing vote_average column  
sns.catplot(y = 'Vote_Average', data = df, kind = 'count',  
            order = df['Vote_Average'].value_counts().index,  
            color = '#4287f5')  
plt.title('votes destribution')  
plt.show()
```



### Q3: What movie got the highest popularity ? what's its genre ?

```
In [65]: # checking max popularity in dataset
df[df['Popularity'] == df['Popularity'].max()]
```

	Release_Date	Title	Popularity	Vote_Count	Vote_Average	Genre
0	2021	Spider-Man: No Way Home	5083.954	8940	popular	Action
1	2021	Spider-Man: No Way Home	5083.954	8940	popular	Adventure
2	2021	Spider-Man: No Way Home	5083.954	8940	popular	Science Fiction

### Q4: What movie got the lowest popularity? what's its genre?

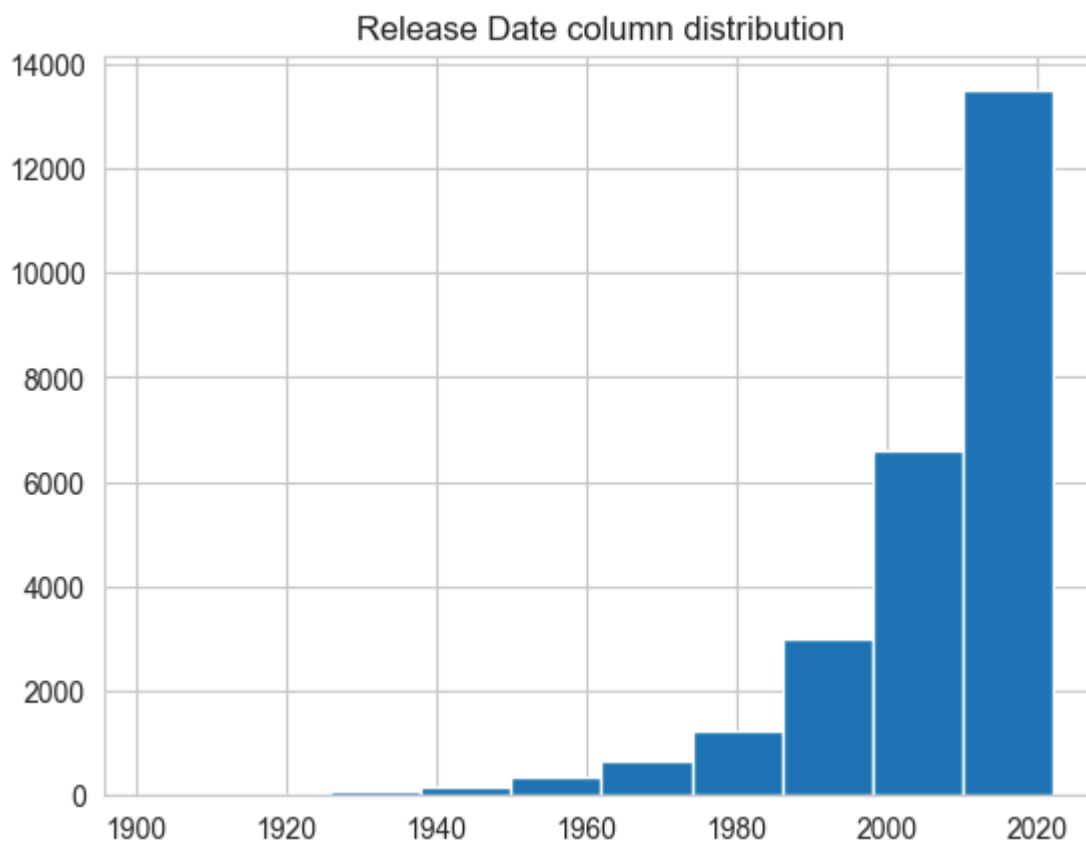
```
In [66]: # checking max popularity in dataset
df[df['Popularity'] == df['Popularity'].min()]
```

Out[66]:

	Release_Date	Title	Popularity	Vote_Count	Vote_Average	Genre
25546	2021	The United States vs. Billie Holiday	13.354	152	average	Music
25547	2021	The United States vs. Billie Holiday	13.354	152	average	Drama
25548	2021	The United States vs. Billie Holiday	13.354	152	average	History
25549	1984	Threads	13.354	186	popular	War
25550	1984	Threads	13.354	186	popular	Drama
25551	1984	Threads	13.354	186	popular	Science Fiction

## Q5: Which year has the most filmed movies?

```
In [67]: df['Release_Date'].hist()  
plt.title("Release Date column distribution")  
plt.show()
```



# Conclusion

## **Q1: What is the most frequent genre in the dataset?**

Drama genre is the most frequent genre in our dataset and has appeared more than 14% of the times among 19 other genres.

## **Q2: What genres has highest votes ?**

We have 25.5% of our dataset with popular vote (6520 rows). Drama again gets the highest popularity among fans by being having more than 18.5% of movies popularities.

## **Q3: What movie got the highest popularity ? what's its genre ?**

Spider-Man: No Way Home has the highest popularity rate in our dataset and it has genres of Action , Adventure and Sience Fiction .

## **Q4: What movie got the lowest popularity ? what's its genre ?**

The united states, thread' has the highest lowest rate in our dataset and it has genres of music , drama , 'war', 'sci-fi' and history`.

## **Q5: Which year has the most filmed movies?**

Year 2020 has the highest filmming rate in our dataset.