In [1]:
```
# importing lib.
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
df = pd.read_csv('mymoviedb.csv', lineterminator='\n')
df.head()
```

Out[2]:

| | 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 [3]:
```
# 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
```

• looks like our dataset has no NaNs! • Overview, Original_Language and Poster-Url wouldn't be so useful during analysis • Release_Date column needs to be casted into date time and to extract only the year value

In [8]:
```
# exploring genres column
df['Genre'].head()
```

Out[8]:
```
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
```

• genres are saperated by commas followed by whitespaces.

In [11]:
```
# check for duplicated rows
df.duplicated().sum()
```

Out[11]:
```
0
```

• our dataset has no duplicated rows either.

In [15]:
```
# exploring summary statistics
df.describe()
```

Out[15]:

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

In [ ]:

```
• Exploration Summary

• we have a dataframe consisting of 9827 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
• Overview, Original_Languege and Poster-Url wouldn't be so useful during analys
• there is noticable outliers in Popularity column
• Vote_Average bettter be categorised for proper analysis.
• Genre column has comma saperated values and white spaces that needs to be hand
```

In [18]:

```
# Data Cleaning
```

Casting Release_Date column and extracing year values

In [21]:

```
df.head()
```

Out[21]:

| | 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 [23]:
```
# casting column a
df['Release_Date'] = pd.to_datetime(df['Release_Date'])

# confirming changes
print(df['Release_Date'].dtypes)
```

```
datetime64[ns]
```

In [25]:
```
df['Release_Date'] = df['Release_Date'].dt.year
df['Release_Date'].dtypes
```

Out[25]:
```
dtype('int32')
```

In [27]:
```
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 [29]:
```
df.head()
```

Out[29]:

| | 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_Languege and Poster-Url

In [32]:
```
# 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[32]:
```
Index(['Release_Date', 'Title', 'Popularity', 'Vote_Count', 'Vote_Average',
       'Genre'],
      dtype='object')
```

In [34]:
```
df.head()
```

Out[34]:

| | 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 [37]:
```
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 [39]:
```
# 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[39]:
```
['popular', 'below_avg', 'average', 'not_popular', NaN]
Categories (4, object): ['not_popular' < 'below_avg' < 'average' < 'popular']
```

In [41]:
```
df.head()
```

Out[41]:

| | 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 [43]:
```
# exploring column
df['Vote_Average'].value_counts()
```

Out[43]:
```
Vote_Average
not_popular    2467
popular        2450
average        2412
below_avg      2398
Name: count, dtype: int64
```

In [45]:
```
# dropping NaNs
df.dropna(inplace = True)

# confirming
df.isna().sum()
```

Out[45]:
```
Release_Date    0
Title           0
Popularity      0
Vote_Count      0
Vote_Average    0
Genre           0
dtype: int64
```

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

Out[47]:

| | 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 ezch movie

In [52]:
```
# 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[52]:

| | 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 [55]:
```
# casting column into category
df['Genre'] = df['Genre'].astype('category')

# confirming changes
df['Genre'].dtypes
```

Out[55]:
```
CategoricalDtype(categories=['Action', 'Adventure', 'Animation', 'Comedy', 'Cri
me',
                  'Documentary', 'Drama', 'Family', 'Fantasy', 'History',
                  'Horror', 'Music', 'Mystery', 'Romance', 'Science Fiction',
                  'TV Movie', 'Thriller', 'War', 'Western'],
, ordered=False, categories_dtype=object)
```

In [57]:
```
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 [59]:
```
df.nunique()
```

Out[59]:
```
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 abut our data.

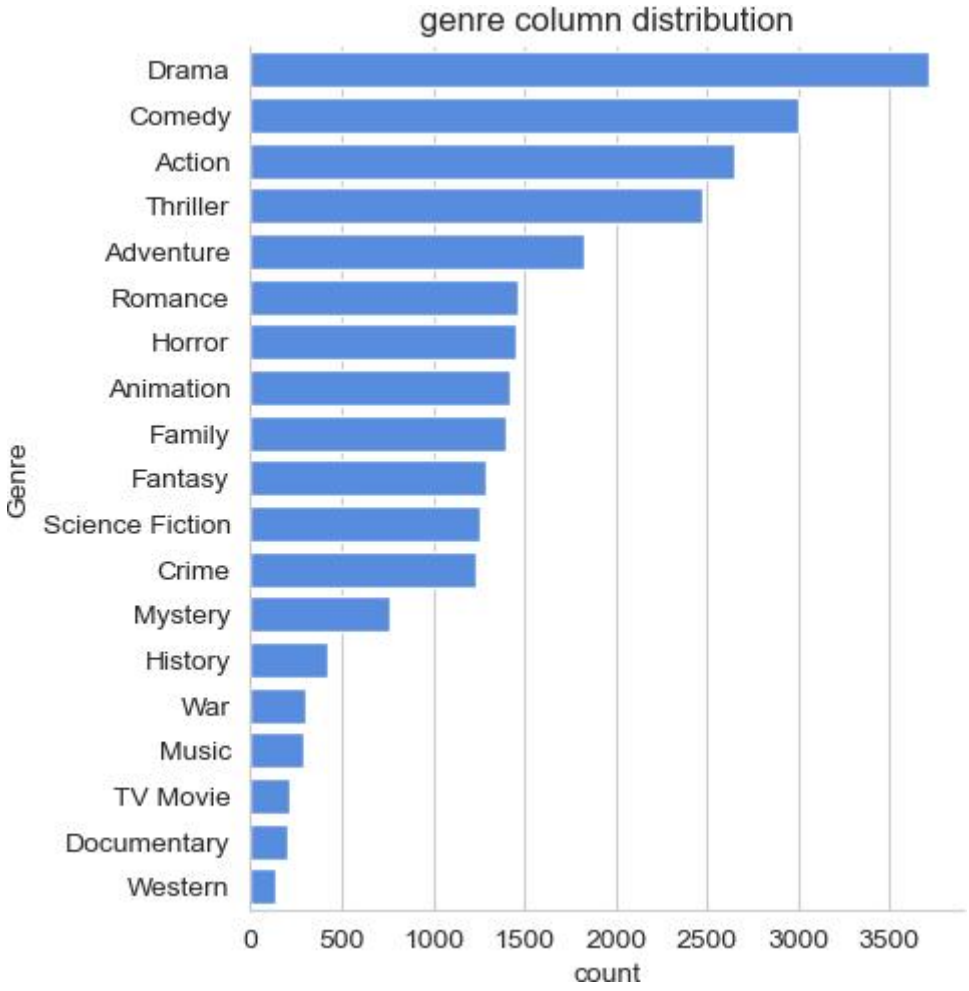
In [62]:
```
# setting up seaborn configurations
sns.set_style('whitegrid')
```

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

In [65]:
```
# showing stats. on genre column
df['Genre'].describe()
```

Out[65]:
```
count      25552
unique        19
top        Drama
freq        3715
Name: Genre, dtype: object
```

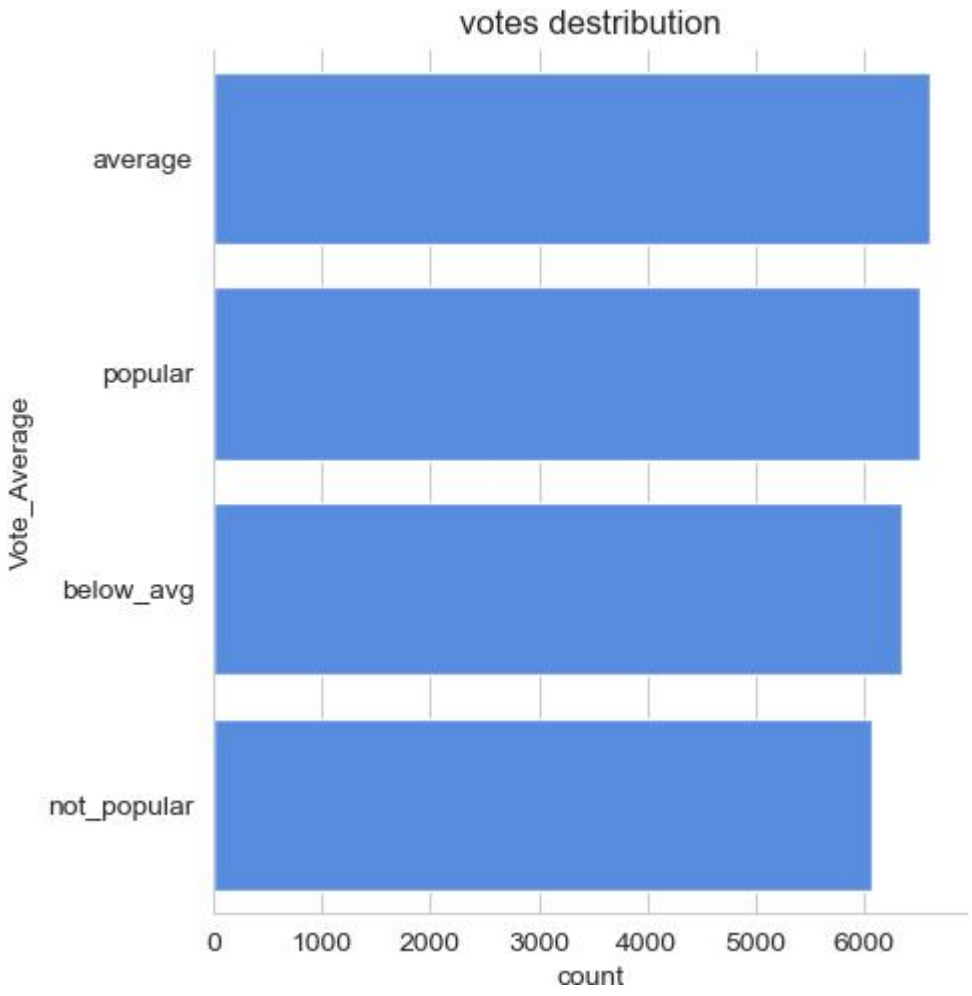
In [67]:
```
# visualizing genre column
sns.catplot(y = 'Genre', data = df, kind = 'count',
            order = df['Genre'].value_counts().index,
            color = '#4287f5')
plt.title('genre column distribution')
plt.show()
```




- 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 [71]:
```
# 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 [74]:
```
# checking max popularity in dataset
df[df['Popularity'] == df['Popularity'].max()]
```

Out[74]:

| | 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?

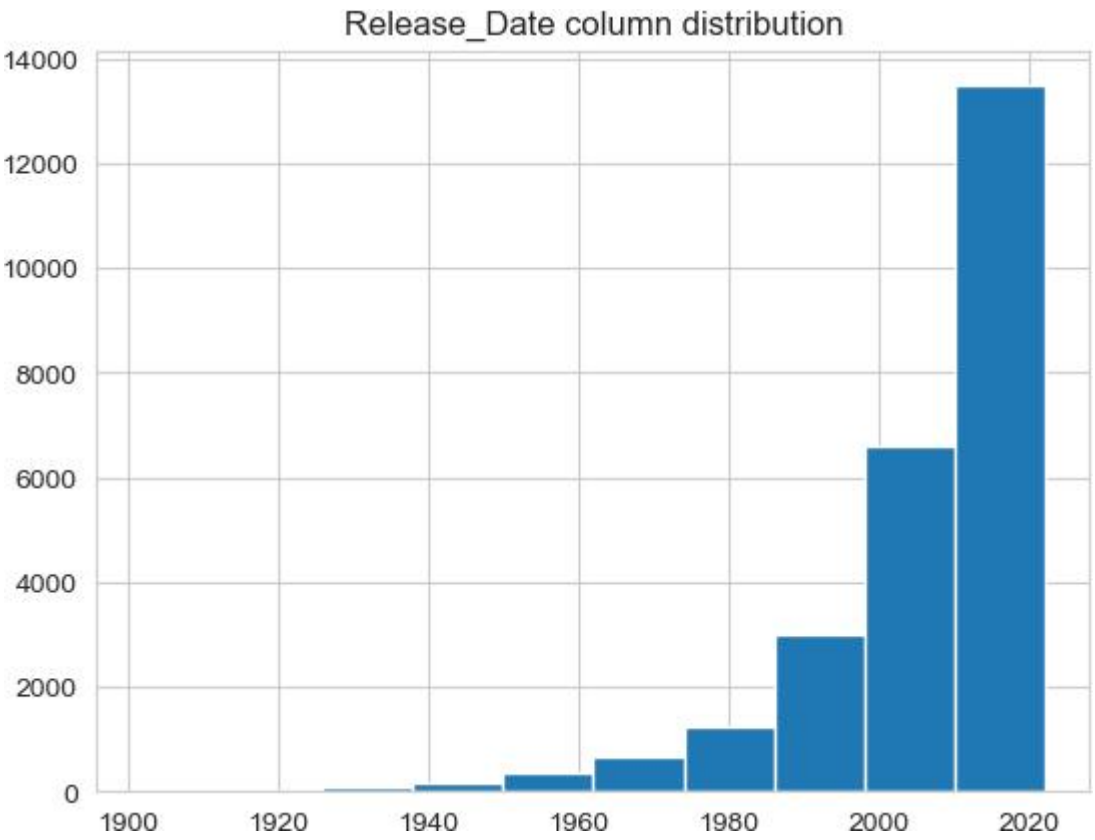
In [86]:
```
# checking max popularity in dataset
df[df['Popularity'] == df['Popularity'].min()]
```

Out[86]:

| | 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 filmmed movies?

In [82]:
```
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`.

### Q3: 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`.

### Q4: Which year has the most filmmed movies?

year `2020` has the highest filmming rate in our dataset.

In [ ]: