In [1]:

```
import pandas as pd
import numpy as np
```

In [2]:

```
data = pd.read_csv('movie_metadata.csv')
```

In [3]:

```
data.head(10)
```

Out[3]:

	color	director_name	num_critic_for_reviews	duration	director_facebook_likes	actor_3_facebook_likes	actor_2_name	acto
0	Color	James Cameron	723.0	178.0	0.0	855.0	Joel David Moore	
1	Color	Gore Verbinski	302.0	169.0	563.0	1000.0	Orlando Bloom	
2	Color	Sam Mendes	602.0	148.0	0.0	161.0	Rory Kinnear	
3	Color	Christopher Nolan	813.0	164.0	22000.0	23000.0	Christian Bale	
4	NaN	Doug Walker	NaN	NaN	131.0	NaN	Rob Walker	
5	Color	Andrew Stanton	462.0	132.0	475.0	530.0	Samantha Morton	
6	Color	Sam Raimi	392.0	156.0	0.0	4000.0	James Franco	
7	Color	Nathan Greno	324.0	100.0	15.0	284.0	Donna Murphy	
8	Color	Joss Whedon	635.0	141.0	0.0	19000.0	Robert Downey Jr.	
9	Color	David Yates	375.0	153.0	282.0	10000.0	Daniel Radcliffe	

10 rows × 28 columns

In [4]:

```
data.shape
```

Out[4]:

```
(5043, 28)
```

In [5]:

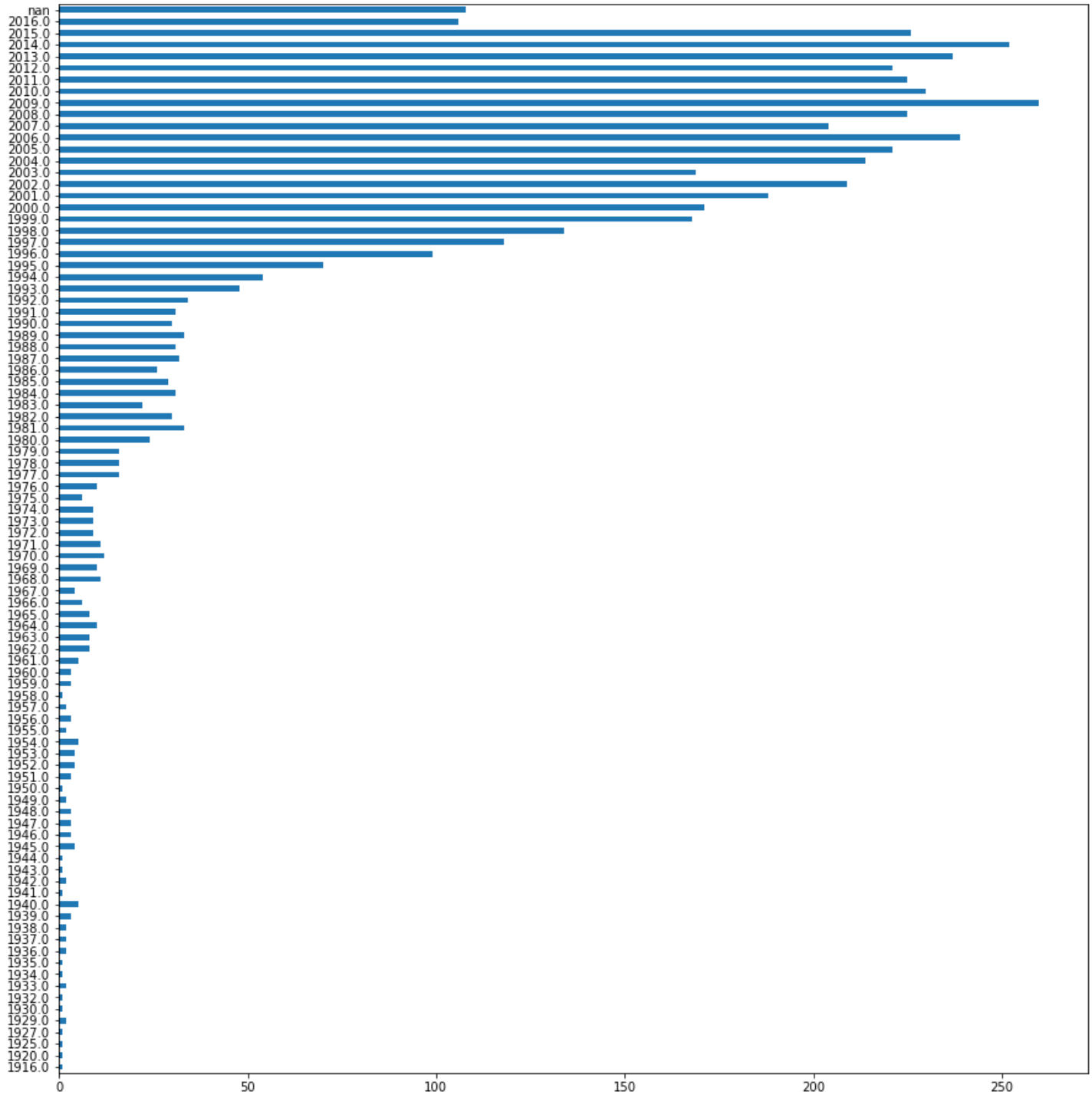
```
data.columns
```

Out[5]:

```
Index(['color', 'director_name', 'num_critic_for_reviews', 'duration',
       'director_facebook_likes', 'actor_3_facebook_likes', 'actor_2_name',
       'actor_1_facebook_likes', 'gross', 'genres', 'actor_1_name',
       'movie_title', 'num_voted_users', 'cast_total_facebook_likes',
       'actor_3_name', 'facenumber_in_poster', 'plot_keywords',
       'movie_imdb_link', 'num_user_for_reviews', 'language', 'country',
       'content_rating', 'budget', 'title_year', 'actor_2_facebook_likes',
       'imdb_score', 'aspect_ratio', 'movie_facebook_likes'],
      dtype='object')
```

In [6]:

```
# we have movies only upto 2016
import matplotlib.pyplot as plt
data.title_year.value_counts(dropna=False).sort_index().plot(kind='barh',figsize=(15,16)
)
plt.show()
```



In [8]:

```
# recommendation will be based on these features only
data = data.loc[:,['director_name','actor_1_name','actor_2_name','actor_3_name','genres',
'movie_title']]
```

In [9]:

```
data.head(10)
```

Out[9]:

	director_name	actor_1_name	actor_2_name	actor_3_name	genres	movie_title
0	James Cameron	CCH Pounder	Joel David Moore	Wes Studi	Action|Adventure|Fantasy|Sci-Fi	Avatar

	director_name	actor_1_name	actor_2_name	actor_3_name	genres	movie_title
1	Gore Verbinski	Johnny Depp	Orlando Bloom	Jack Davenport	Action|Adventure|Fantasy	Pirates of the Caribbean: At World's End
2	Sam Mendes	Christoph Waltz	Rory Kinnear	Stephanie Sigman	Action|Adventure|Thriller	Spectre
3	Christopher Nolan	Tom Hardy	Christian Bale	Joseph Gordon-Levitt	Action|Thriller	The Dark Knight Rises
4	Doug Walker	Doug Walker	Rob Walker	NaN	Documentary	Star Wars: Episode VII - The Force Awakens ...
5	Andrew Stanton	Daryl Sabara	Samantha Morton	Polly Walker	Action|Adventure|Sci-Fi	John Carter
6	Sam Raimi	J.K. Simmons	James Franco	Kirsten Dunst	Action|Adventure|Romance	Spider-Man 3
7	Nathan Greno	Brad Garrett	Donna Murphy	M.C. Gainey	Adventure|Animation|Comedy|Family|Fantasy|Musi...	Tangled
8	Joss Whedon	Chris Hemsworth	Robert Downey Jr.	Scarlett Johansson	Action|Adventure|Sci-Fi	Avengers: Age of Ultron
9	David Yates	Alan Rickman	Daniel Radcliffe	Rupert Grint	Adventure|Family|Fantasy|Mystery	Harry Potter and the Half-Blood Prince

In [11]:

```
data['actor_1_name'] = data['actor_1_name'].replace(np.nan, 'unknown')
data['actor_2_name'] = data['actor_2_name'].replace(np.nan, 'unknown')
data['actor_3_name'] = data['actor_3_name'].replace(np.nan, 'unknown')
data['director_name'] = data['director_name'].replace(np.nan, 'unknown')
```

In [12]:

```
data
```

Out[12]:

	director_name	actor_1_name	actor_2_name	actor_3_name	genres	movie_title
0	James Cameron	CCH Pounder	Joel David Moore	Wes Studi	Action|Adventure|Fantasy|Sci-Fi	Avatar
1	Gore Verbinski	Johnny Depp	Orlando Bloom	Jack Davenport	Action|Adventure|Fantasy	Pirates of the Caribbean: At World's End
2	Sam Mendes	Christoph Waltz	Rory Kinnear	Stephanie Sigman	Action|Adventure|Thriller	Spectre
3	Christopher Nolan	Tom Hardy	Christian Bale	Joseph Gordon-Levitt	Action|Thriller	The Dark Knight Rises
4	Doug Walker	Doug Walker	Rob Walker	unknown	Documentary	Star Wars: Episode VII - The Force Awakens ...
...	...	...	...	...	...	...
5038	Scott Smith	Eric Mabius	Daphne Zuniga	Crystal Lowe	Comedy|Drama	Signed Sealed Delivered
5039	unknown	Natalie Zea	Valorie Curry	Sam Underwood	Crime|Drama|Mystery|Thriller	The Following
5040	Benjamin Roberds	Eva Boehnke	Maxwell Moody	David Chandler	Drama|Horror|Thriller	A Plague So Pleasant

5041	Daniel Hsia	Alan Ruck	Daniel Henney	Eliza Coupe	Comedy|Drama|Romance	Shanghai Calling
5042	Jon Gunn	John August	Brian Herzlinger	Jon Gunn	Documentary	My Date with Drew

5043 rows × 6 columns

In [15]:

```
data['genres'] = data['genres'].str.replace('|', ' ')
```

In [16]:

```
data
```

Out[16]:

	director_name	actor_1_name	actor_2_name	actor_3_name	genres	movie_title
0	James Cameron	CCH Pounder	Joel David Moore	Wes Studi	Action Adventure Fantasy Sci-Fi	Avatar
1	Gore Verbinski	Johnny Depp	Orlando Bloom	Jack Davenport	Action Adventure Fantasy	Pirates of the Caribbean: At World's End
2	Sam Mendes	Christoph Waltz	Rory Kinnear	Stephanie Sigman	Action Adventure Thriller	Spectre
3	Christopher Nolan	Tom Hardy	Christian Bale	Joseph Gordon-Levitt	Action Thriller	The Dark Knight Rises
4	Doug Walker	Doug Walker	Rob Walker	unknown	Documentary	Star Wars: Episode VII - The Force Awakens ...
...	...	...	...	...	...	...
5038	Scott Smith	Eric Mabius	Daphne Zuniga	Crystal Lowe	Comedy Drama	Signed Sealed Delivered
5039	unknown	Natalie Zea	Valorie Curry	Sam Underwood	Crime Drama Mystery Thriller	The Following
5040	Benjamin Roberds	Eva Boehnke	Maxwell Moody	David Chandler	Drama Horror Thriller	A Plague So Pleasant
5041	Daniel Hsia	Alan Ruck	Daniel Henney	Eliza Coupe	Comedy Drama Romance	Shanghai Calling
5042	Jon Gunn	John August	Brian Herzlinger	Jon Gunn	Documentary	My Date with Drew

5043 rows × 6 columns

In [17]:

```
data['movie_title'] = data['movie_title'].str.lower()
```

In [18]:

```
# null terminating char at the end
data['movie_title'][1]
```

Out[18]:

```
"pirates of the caribbean: at world's end\xa0"
```

In [19]:

```
# removing the null terminating char at the end
data['movie_title'] = data['movie_title'].apply(lambda x : x[:-1])
```

In [20]:

```
data['movie_title'][1]
```

Out[20]:

"pirates of the caribbean: at world's end"

In [21]:

```
data.to_csv('data.csv',index=False)
```