Final Project Submission

Please fill out:

- Student name: Samuel Marder
- Student pace: self paced
- Scheduled project review date/time:
- Instructor name: Matt Carr
- Blog post URL: https://medium.com/@samuel.s.marder/slight-right-onto-data-science-64912ef3bd67

Set up standard imports for data

In [1]:
```
import pandas as pd
import seaborn as sns
import sqlite3
import matplotlib.pyplot as plt
%matplotlib inline
```

In [2]:
```
conn = sqlite3.connect("data/im.db")
```

In [3]:
```
q = """SELECT p.primary_name,
mb.primary_title
FROM persons as p
JOIN directors USING (person_id)
JOIN movie_basics as mb USING (movie_id)"""
director_movie_df = pd.read_sql(q, conn).drop_duplicates()
director_movie_df.head()
```

Out[3]:

	primary_name	primary_title
0	Ruel S. Bayani	Paano na kaya
4	Ruel S. Bayani	No Other Woman
7	Ruel S. Bayani	One More Try
8	Ruel S. Bayani	Kasal

In [4]:
```
q = """SELECT mb.primary_title,
mb.original_title,
mb.start_year,
mb.runtime_minutes,
mb.genres
FROM movie_basics as mb"""
movie_df = pd.read_sql(q, conn).drop_duplicates()
movie_df['genres'] = movie_df['genres'].str.split(pat=",")
movie_df.head()
```

Out[4]:

	primary_title	original_title	start_year	runtime_minutes	genres
0	Sunghursh	Sunghursh	2013	175.0	[Action, Crime, Drama]
1	One Day Before the Rainy Season	Ashad Ka Ek Din	2019	114.0	[Biography, Drama]
2	The Other Side of the Wind	The Other Side of the Wind	2018	122.0	[Drama]
3	Sabse Bada Sukh	Sabse Bada Sukh	2018	NaN	[Comedy, Drama]
4	The Wandering Soap Opera	La Telenovela Errante	2017	80.0	[Comedy, Drama, Fantasy]

In [5]:
```
genre_df = movie_df.explode('genres')
genre_df['genres'].value_counts().head()
```

Out[5]:
```
Documentary    51590
Drama          49859
Comedy         25303
Thriller       11879
Horror         10798
Name: genres, dtype: int64
```

Create a dataframe for movie budgets

I chose to read in the movie budgets csv file to find that the information in it was very string based. With some help from Yoni, I was able to clean the strings away in favor of numbers so I could calculate the ROI.

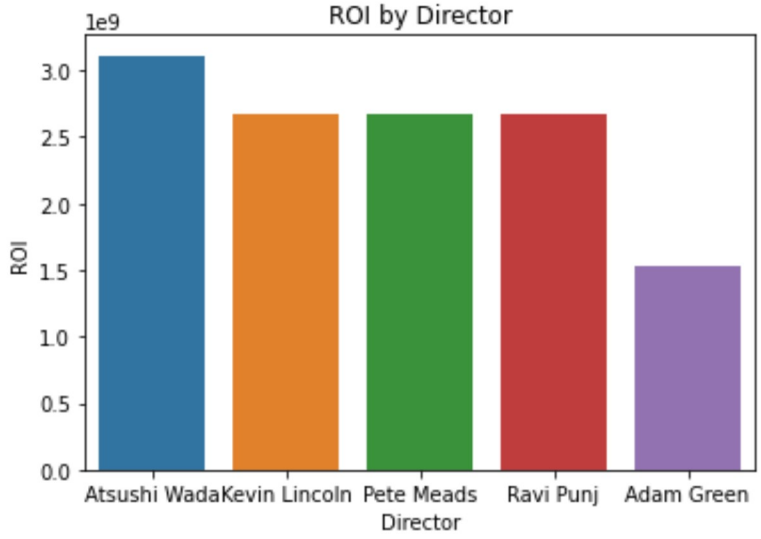
In [12]:
```
mb_df = pd.read_csv("data/tn.movie_budgets.csv")
mb_df = mb_df.set_index('movie')

mb_df['production_budget'].replace(to_replace=r'\D', value=r'', regex=True, inplace=True)
mb_df['production_budget'] = mb_df['production_budget'].astype(int)

mb_df['domestic_gross'].replace(to_replace=r'\D', value=r'', regex=True, inplace=True)
mb_df['domestic_gross'] = mb_df['domestic_gross'].astype(int)

mb_df['worldwide_gross'].replace(to_replace=r'\D', value=r'', regex=True, inplace=True)
mb_df['worldwide_gross'] = mb_df['worldwide_gross'].astype(float) #Turns out, int is too small here

mb_df['roi'] = mb_df['domestic_gross'] + mb_df['worldwide_gross'] - mb_df['production_budget']

mb_df.head()
```

Out[12]:

movie	id	release_date	production_budget	domestic_gross	worldwide_gross	roi
Avatar	1	Dec 18, 2009	425000000	760507625	2.776345e+09	3.111853e+09
Pirates of the Caribbean: On Stranger Tides	2	May 20, 2011	410600000	241063875	1.045664e+09	8.761278e+08
Dark Phoenix	3	Jun 7, 2019	350000000	42762350	1.497624e+08	-1.574753e+08
Avengers: Age of Ultron	4	May 1, 2015	330600000	459005868	1.403014e+09	1.531420e+09
Star Wars Ep. VIII: The Last Jedi	5	Dec 15, 2017	317000000	620181382	1.316722e+09	1.619903e+09

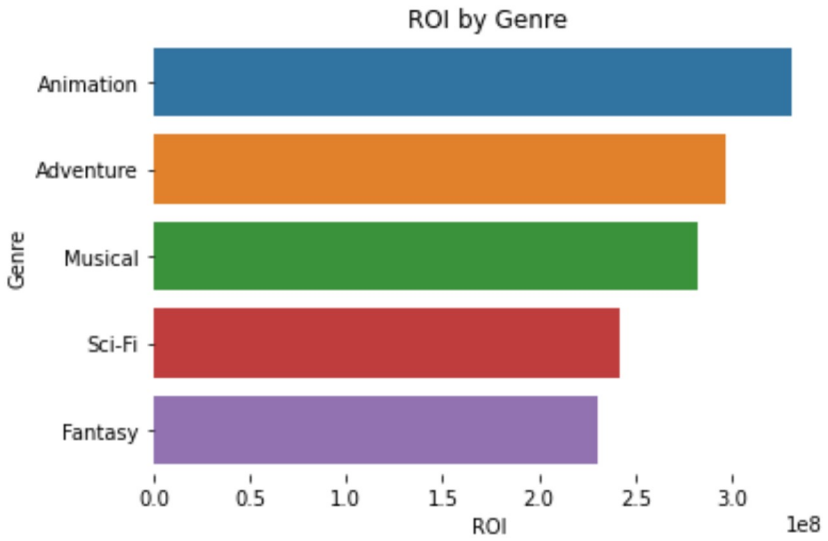
Create and visualize Director ROI Dataframe

In [13]:
```
director_roi_df = mb_df.join(director_movie_df.set_index('primary_title'), how="inner")\
    .groupby(['primary_name']).mean()
director_roi_df.sort_values(['roi'], ascending=False, inplace=True)
director_roi_df.reset_index(inplace=True)

f, ax = plt.subplots()
sns.barplot(x="primary_name", y="roi", data=director_roi_df.head())
ax.set(xlabel="Director", ylabel="ROI", title="ROI by Director");
```



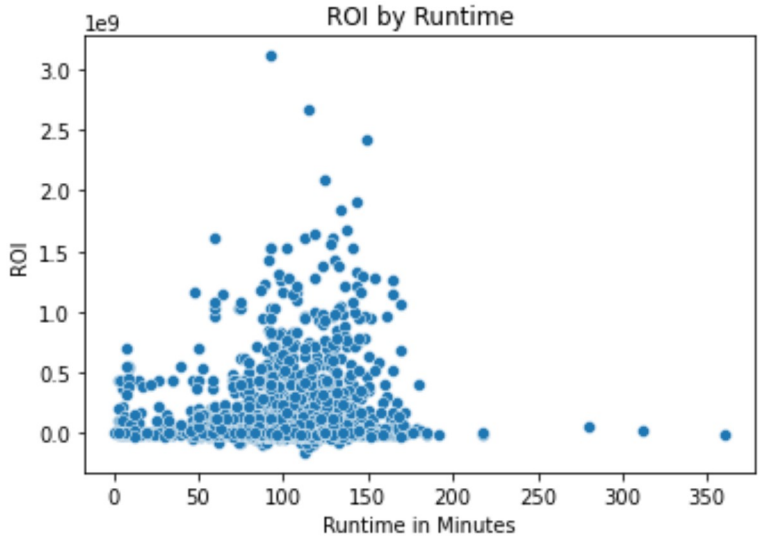
Create and visualize the Genre ROI Dataframe

In [8]:
```
genre_roi_df = mb_df.join(genre_df.set_index('primary_title'), how="inner")\
    .groupby(['genres']).mean()
genre_roi_df.sort_values(['roi'], ascending=False, inplace=True)
genre_roi_df.reset_index(inplace=True)

f, ax = plt.subplots()
sns.barplot(x="roi", y="genres", data=genre_roi_df.head())
ax.set(ylabel="Genre", xlabel="ROI", title="ROI by Genre")
sns.despine(left=True, bottom=True)
```



Create and visualize Runtime ROI Dataframe

In [9]:
```
rt_roi_df = mb_df.join(movie_df.set_index("primary_title"), how="inner")
rt_roi_df.dropna(subset=["runtime_minutes"], inplace=True)

f, ax = plt.subplots()
sns.scatterplot(x="runtime_minutes", y="roi", data=rt_roi_df);
ax.set(xlabel="Runtime in Minutes", ylabel="ROI", title="ROI by Runtime");
```



Recommendations:

1. Do an animated film
2. Hire Atsushi Wada to direct
3. The best seems to be around 100 minutes in runtime so I would go for that