

Boolean Indexing

(1) Calculating Boolean Statistics

```
In [20]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

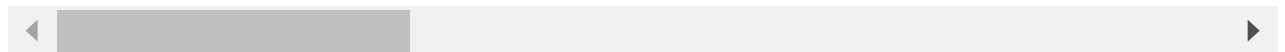
```
In [21]: movie = pd.read_csv('movie.csv', index_col = 'movie_title')
movie.head()
```

```
Out[21]:
```

	color	director_name	num_critic_for_reviews	duration	director_facebook_likes	actor_3_facebook_likes
	movie_title					

Avatar	Color	James Cameron	723.0	178.0	0.0	
Pirates of the Caribbean: At World's End	Color	Gore Verbinski	302.0	169.0	563.0	
Spectre	Color	Sam Mendes	602.0	148.0	0.0	
The Dark Knight Rises	Color	Christopher Nolan	813.0	164.0	22000.0	
Star Wars: Episode VII - The Force Awakens	NaN	Doug Walker	NaN	NaN	131.0	

5 rows × 27 columns



```
In [22]: movie_2_hours = movie['duration'] > 120
movie_2_hours.head()
```

```
Out[22]:
```

movie_title	
Avatar	True
Pirates of the Caribbean: At World's End	True
Spectre	True
The Dark Knight Rises	True
Star Wars: Episode VII - The Force Awakens	False
Name: duration, dtype: bool	

```
In [23]: movie_3_hours = movie['duration'].gt(120)
movie_3_hours.head()
```

```
Out[23]: movie_title
Avatar                                         True
Pirates of the Caribbean: At World's End     True
Spectre                                       True
The Dark Knight Rises                        True
Star Wars: Episode VII - The Force Awakens  False
Name: duration, dtype: bool
```

```
In [24]: movie['duration'] == 120
```

```
Out[24]: movie_title
Avatar                                         False
Pirates of the Caribbean: At World's End     False
Spectre                                       False
The Dark Knight Rises                        False
Star Wars: Episode VII - The Force Awakens  False
...
Signed Sealed Delivered                      False
The Following                               False
A Plague So Pleasant                        False
Shanghai Calling                           False
My Date with Drew                           False
Name: duration, Length: 4916, dtype: bool
```

```
In [25]: movie['duration'].eq(120)
```

```
Out[25]: movie_title
Avatar                                         False
Pirates of the Caribbean: At World's End     False
Spectre                                       False
The Dark Knight Rises                        False
Star Wars: Episode VII - The Force Awakens  False
...
Signed Sealed Delivered                      False
The Following                               False
A Plague So Pleasant                        False
Shanghai Calling                           False
My Date with Drew                           False
Name: duration, Length: 4916, dtype: bool
```

```
In [26]: movie['duration'] != 120
```

```
Out[26]: movie_title
Avatar                                         True
Pirates of the Caribbean: At World's End     True
Spectre                                       True
The Dark Knight Rises                        True
Star Wars: Episode VII - The Force Awakens  True
...
Signed Sealed Delivered                      True
The Following                               True
A Plague So Pleasant                        True
Shanghai Calling                           True
My Date with Drew                           True
Name: duration, Length: 4916, dtype: bool
```

```
In [27]: movie['duration'].ne(120)
```

```
Out[27]: movie_title
Avatar                                         True
Pirates of the Caribbean: At World's End     True
Spectre                                       True
The Dark Knight Rises                         True
Star Wars: Episode VII - The Force Awakens   True
...
Signed Sealed Delivered                       True
The Following                                True
A Plague So Pleasant                          True
Shanghai Calling                             True
My Date with Drew                             True
Name: duration, Length: 4916, dtype: bool
```

```
In [28]: movie['language'] == 'English'
```

```
Out[28]: movie_title
Avatar                                         True
Pirates of the Caribbean: At World's End     True
Spectre                                       True
The Dark Knight Rises                         True
Star Wars: Episode VII - The Force Awakens   False
...
Signed Sealed Delivered                       True
The Following                                True
A Plague So Pleasant                          True
Shanghai Calling                             True
My Date with Drew                             True
Name: language, Length: 4916, dtype: bool
```

```
In [29]: movie['language'].str.contains('Eng')
```

```
Out[29]: movie_title
Avatar                                         True
Pirates of the Caribbean: At World's End     True
Spectre                                       True
The Dark Knight Rises                         True
Star Wars: Episode VII - The Force Awakens   NaN
...
Signed Sealed Delivered                       True
The Following                                True
A Plague So Pleasant                          True
Shanghai Calling                             True
My Date with Drew                             True
Name: language, Length: 4916, dtype: object
```

```
In [30]: movie['imdb_score'].between(7, 9)
```

```
Out[30]: movie_title
Avatar                                         True
Pirates of the Caribbean: At World's End     True
Spectre                                       False
The Dark Knight Rises                         True
Star Wars: Episode VII - The Force Awakens   True
...
Signed Sealed Delivered                       True
The Following                                True
```

```
A Plague So Pleasant      False
Shanghai Calling          False
My Date with Drew         False
Name: imdb_score, Length: 4916, dtype: bool
```

(2) Constructing Multiple Boolean Conditions

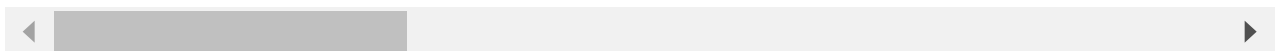
```
In [31]: movie = pd.read_csv('movie.csv', index_col = 'movie_title')
movie.head()
```

```
Out[31]:
```

	color	director_name	num_critic_for_reviews	duration	director_facebook_likes	actor_3_facebook_likes
movie_title						

Avatar	Color	James Cameron	723.0	178.0	0.0
Pirates of the Caribbean: At World's End	Color	Gore Verbinski	302.0	169.0	563.0
Spectre	Color	Sam Mendes	602.0	148.0	0.0
The Dark Knight Rises	Color	Christopher Nolan	813.0	164.0	22000.0
Star Wars: Episode VII - The Force Awakens	NaN	Doug Walker	NaN	NaN	131.0

5 rows × 27 columns



```
In [32]: criterial = movie['imdb_score'] > 8
criterial
```

```
Out[32]: movie_title
Avatar                                         False
Pirates of the Caribbean: At World's End     False
Spectre                                       False
The Dark Knight Rises                        True
Star Wars: Episode VII - The Force Awakens   False
...
Signed Sealed Delivered                      False
The Following                               False
A Plague So Pleasant                        False
Shanghai Calling                           False
My Date with Drew                          False
Name: imdb_score, Length: 4916, dtype: bool
```

```
In [33]: criteria2 = movie['content_rating'] == 'PG-13'
criteria2
```

```
Out[33]: movie_title
Avatar True
Pirates of the Caribbean: At World's End True
Spectre True
The Dark Knight Rises True
Star Wars: Episode VII - The Force Awakens False
...
Signed Sealed Delivered False
The Following False
A Plague So Pleasant False
Shanghai Calling True
My Date with Drew False
Name: content_rating, Length: 4916, dtype: bool
```

```
In [34]: criteria3 = (movie['imdb_score'] > 8) & (movie['content_rating'] == 'PG-13')
criteria3
```

```
Out[34]: movie_title
Avatar False
Pirates of the Caribbean: At World's End False
Spectre False
The Dark Knight Rises True
Star Wars: Episode VII - The Force Awakens False
...
Signed Sealed Delivered False
The Following False
A Plague So Pleasant False
Shanghai Calling False
My Date with Drew False
Length: 4916, dtype: bool
```

```
In [36]: criteria4 = (movie['imdb_score'] > 8) | (movie['content_rating'] == 'PG-13')
criteria4
```

```
Out[36]: movie_title
Avatar True
Pirates of the Caribbean: At World's End True
Spectre True
The Dark Knight Rises True
Star Wars: Episode VII - The Force Awakens False
...
Signed Sealed Delivered False
The Following False
A Plague So Pleasant False
Shanghai Calling True
My Date with Drew False
Length: 4916, dtype: bool
```

```
In [37]: criteria5 = (movie['imdb_score'].gt(8)) | (movie['content_rating'].eq('PG-13'))
criteria5
```

```
Out[37]: movie_title
Avatar True
Pirates of the Caribbean: At World's End True
Spectre True
The Dark Knight Rises True
Star Wars: Episode VII - The Force Awakens False
...
Signed Sealed Delivered False
The Following False
```

A Plague So Pleasant
Shanghai Calling
My Date with Drew
Length: 4916, dtype: bool

False
True
False

(3) Filtering With Boolean Indexing

```
In [38]: criteria3.value_counts()
```

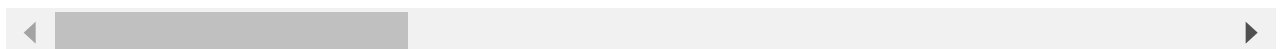
```
Out[38]: False    3292  
        True     1624  
        dtype: int64
```

```
In [39]: movie[criteria3]
```

```
Out[39]:
```

	color	director_name	num_critic_for_reviews	duration	director_facebook_likes	actor_3_facebook_likes
movie_title						
Avatar	Color	James Cameron	723.0	178.0	0.0	
Pirates of the Caribbean: At World's End	Color	Gore Verbinski	302.0	169.0	563.0	
Spectre	Color	Sam Mendes	602.0	148.0	0.0	
The Dark Knight Rises	Color	Christopher Nolan	813.0	164.0	22000.0	
John Carter	Color	Andrew Stanton	462.0	132.0	475.0	
...	
The Signal	Color	William Eubank	161.0	97.0	18.0	
The Last Waltz	Color	Martin Scorsese	71.0	117.0	17000.0	
Primer	Color	Shane Carruth	143.0	77.0	291.0	
The Mongol King	Color	Anthony Vallone	NaN	84.0	2.0	
Shanghai Calling	Color	Daniel Hsia	14.0	100.0	0.0	

1624 rows × 7 columns

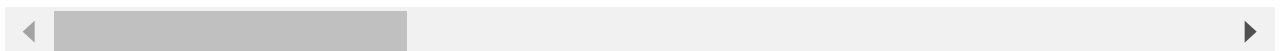


```
In [40]: movie.loc[criteria3]
```

Out[40]:

	color	director_name	num_critic_for_reviews	duration	director_facebook_likes	actor_3_facebook_likes
movie_title						
Avatar	Color	James Cameron	723.0	178.0	0.0	
Pirates of the Caribbean: At World's End	Color	Gore Verbinski	302.0	169.0	563.0	
Spectre	Color	Sam Mendes	602.0	148.0	0.0	
The Dark Knight Rises	Color	Christopher Nolan	813.0	164.0	22000.0	
John Carter	Color	Andrew Stanton	462.0	132.0	475.0	
...	
The Signal	Color	William Eubank	161.0	97.0	18.0	
The Last Waltz	Color	Martin Scorsese	71.0	117.0	17000.0	
Primer	Color	Shane Carruth	143.0	77.0	291.0	
The Mongol King	Color	Anthony Vallone	NaN	84.0	2.0	
Shanghai Calling	Color	Daniel Hsia	14.0	100.0	0.0	

1624 rows × 7 columns



In [41]:

```
movie_filtered = movie[criteria3][['imdb_score', 'content_rating']]
movie_filtered
```

Out[41]:

	imdb_score	content_rating
movie_title		
Avatar	7.9	PG-13
Pirates of the Caribbean: At World's End	7.1	PG-13
Spectre	6.8	PG-13
The Dark Knight Rises	8.5	PG-13
John Carter	6.6	PG-13
...

	imdb_score	content_rating
movie_title		
The Signal	6.1	PG-13
The Last Waltz	8.2	PG
Primer	7.0	PG-13
The Mongol King	7.8	PG-13
Shanghai Calling	6.3	PG-13

1624 rows × 2 columns

```
In [42]: movie_filtered = movie.loc[criteria3, ['imdb_score', 'content_rating']]
movie_filtered
```

```
Out[42]:
```

	imdb_score	content_rating
movie_title		
Avatar	7.9	PG-13
Pirates of the Caribbean: At World's End	7.1	PG-13
Spectre	6.8	PG-13
The Dark Knight Rises	8.5	PG-13
John Carter	6.6	PG-13
...
The Signal	6.1	PG-13
The Last Waltz	8.2	PG
Primer	7.0	PG-13
The Mongol King	7.8	PG-13
Shanghai Calling	6.3	PG-13

1624 rows × 2 columns