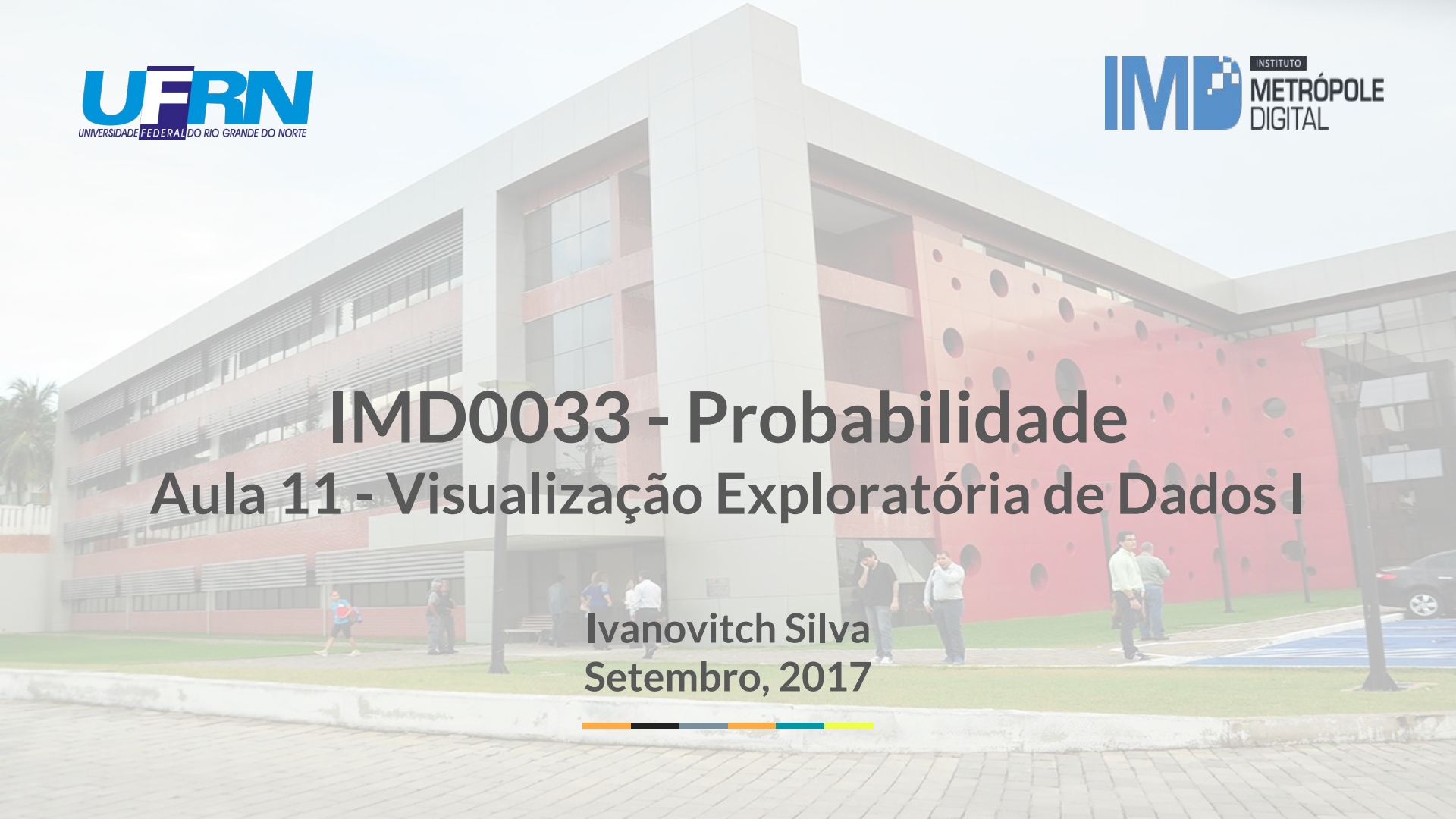


IMD0033 - Probabilidade

Aula 11 - Visualização Exploratória de Dados I

Ivanovitch Silva

Setembro, 2017

Agenda

- Interface entre Pandas & Matplotlib
- Motivação
- Estudo de caso: diferença entre gêneros para cursos STEM

Atualizar o repositório

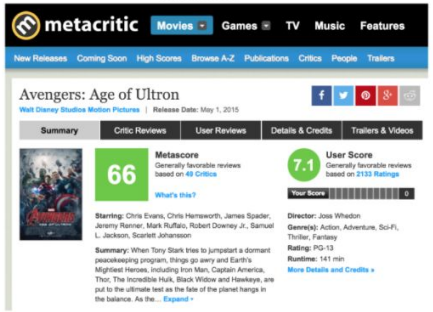
```
git clone https://github.com/ivanovitchm/IMD0033_Probabilidade.git
```

Ou ....

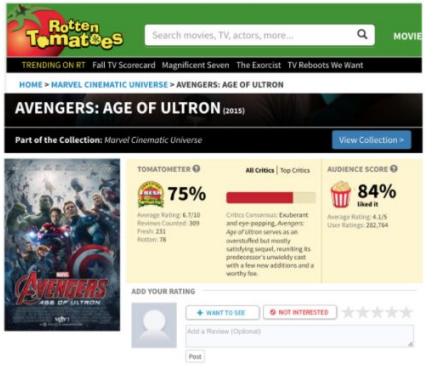
```
git pull
```

Estudo de caso: avaliando filmes

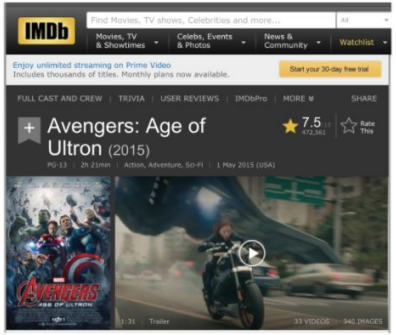
Metacritic



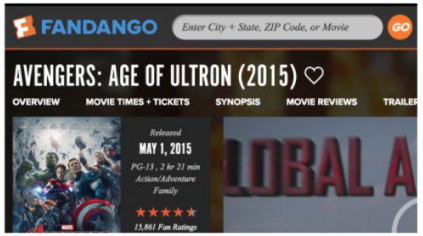
Rotten Tomatoes



IMDB



Fandango



Enviesamento de dados

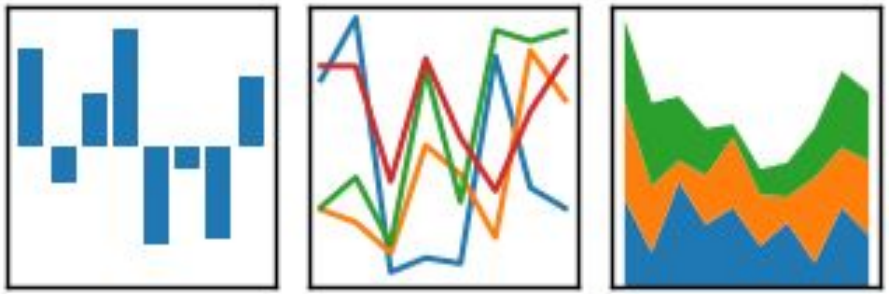
Conjunto de dados

	FILM	RT_user_norm	Metacritic_user_nom	IMDB_norm	Fandango_Ratingvalue	Fandango_Stars
0	Avengers: Age of Ultron (2015)	4.3	3.55	3.90	4.5	5.0
1	Cinderella (2015)	4.0	3.75	3.55	4.5	5.0
2	Ant-Man (2015)	4.5	4.05	3.90	4.5	5.0
3	Do You Believe? (2015)	4.2	2.35	2.70	4.5	5.0
4	Hot Tub Time Machine 2 (2015)	1.4	1.70	2.55	3.0	3.5

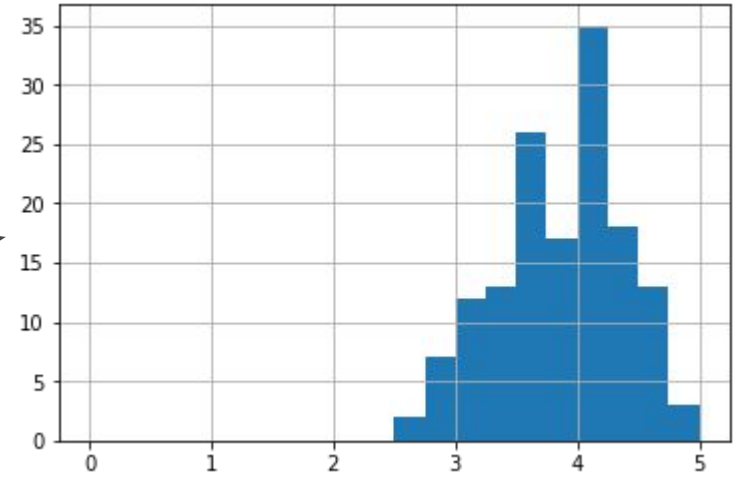
https://github.com/fivethirtyeight/data/tree/master/fandango

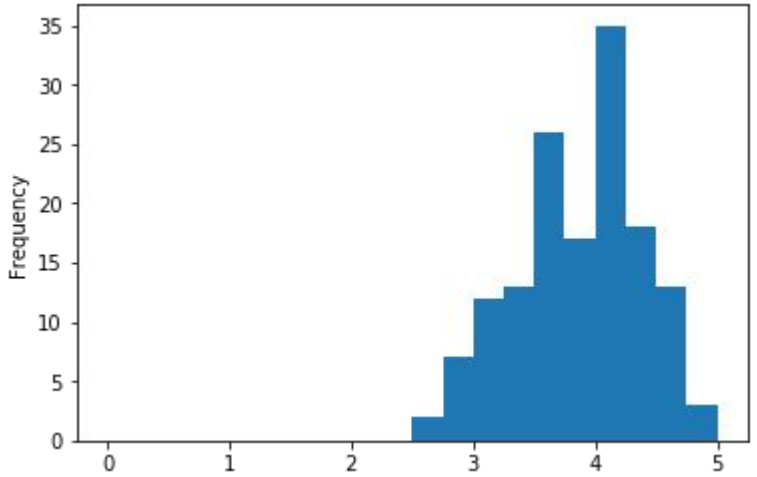
pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



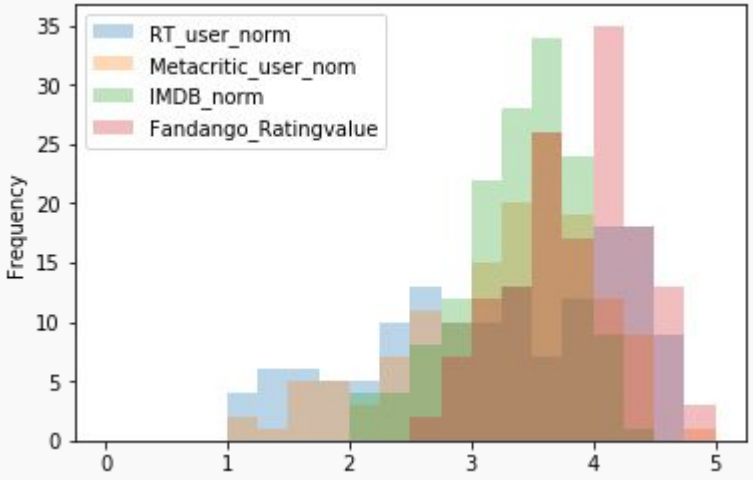
matplotlib

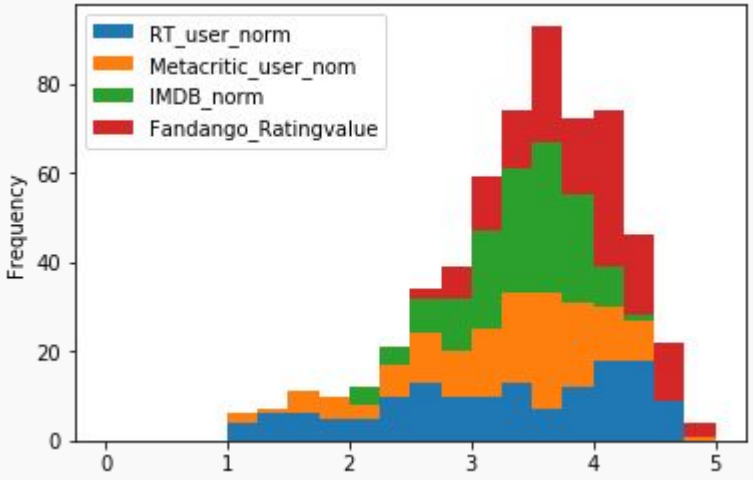





```
# Enable matplotlib plot inline
%matplotlib inline
norm_reviews.Fandango_Ratingvalue.hist(bins=20, range=(0,5))
```

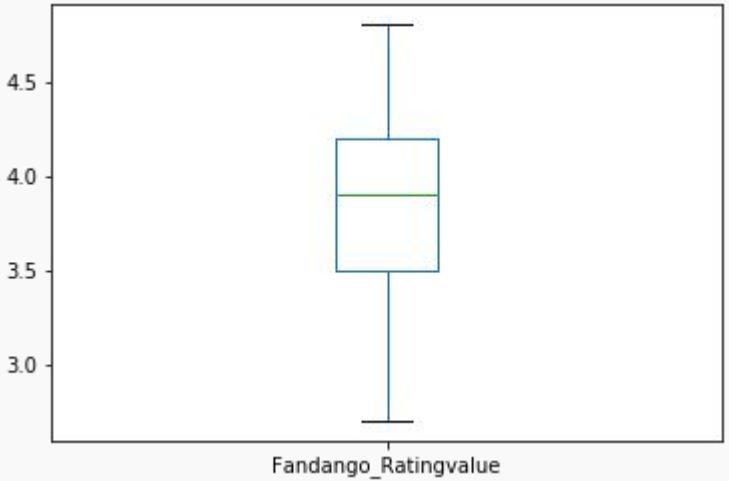
```
# other way to do the same thing
norm_reviews.Fandango_Ratingvalue.plot(kind='hist', bins=20, range=(0,5));
```

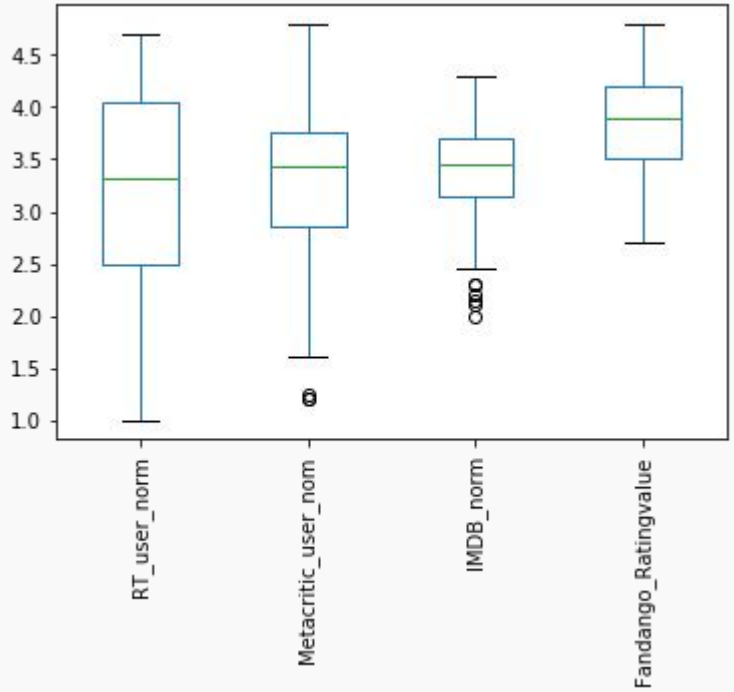





```
norm_reviews.plot(kind='hist', bins=20, range=(0,5), alpha=0.3);
```

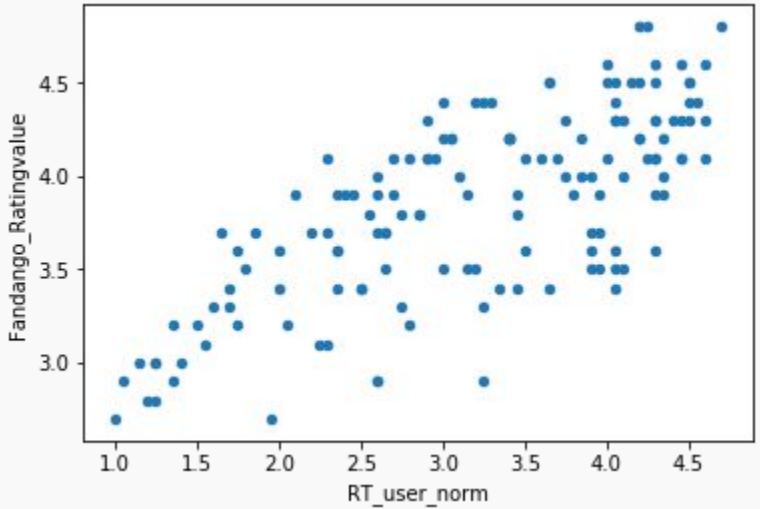
```
norm_reviews.plot(kind='hist', bins=20, range=(0,5), stacked=True);
```






```
norm_reviews.Fandango_Ratingvalue.plot(kind='box')
```

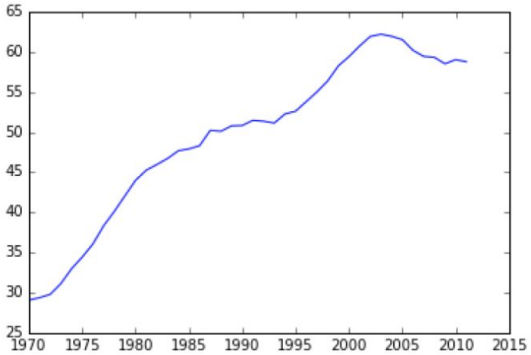
```
norm_reviews.plot(kind='box',rot=90)
```

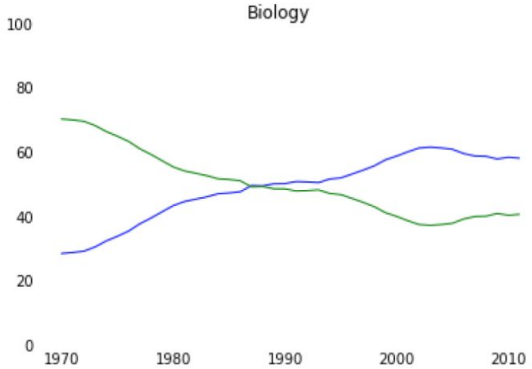


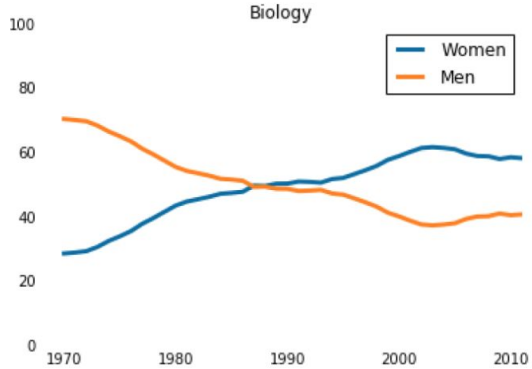

```
norm_reviews.plot(kind='scatter',x='RT_user_norm', y='Fandango_Ratingvalue')
```

Exploratory Data Analysis V - Plotting with Pandas.ipynb

Estética


65
60
55
50
45
40
35
30
25
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015


Biology
100
80
60
40
20
0
1970
1980
1990
2000
2010

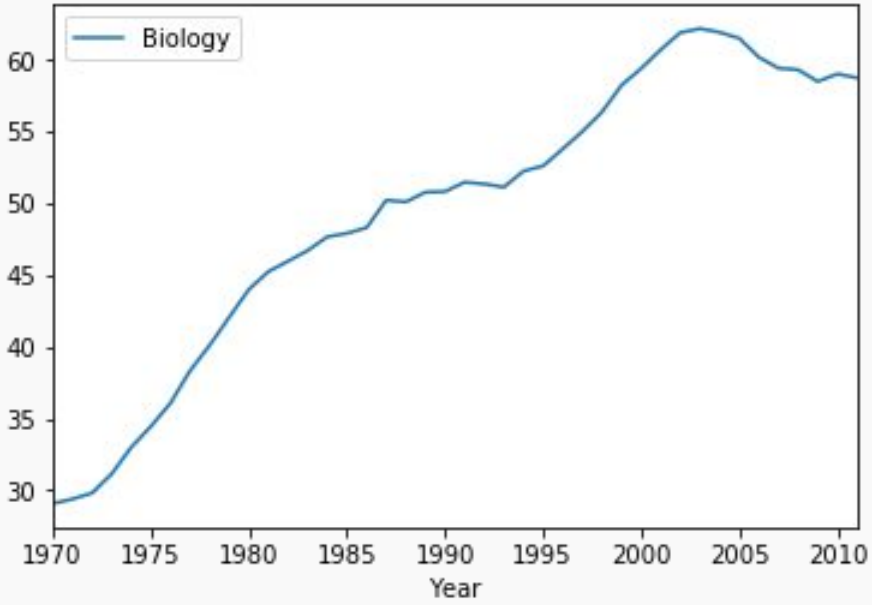

Biology
Women
Men
100
80
60
40
20
0
1970
1980
1990
2000
2010

Introdução ao dataset

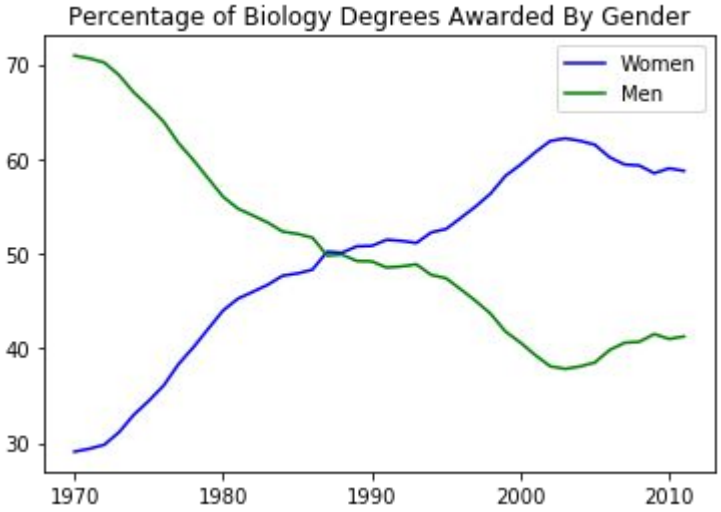
Year	Agriculture	Architecture	Art and Performance	Biology	Business	Communications and Journalism	Computer Science	Education	Engineering
1970	4.229798	11.921005	59.7	29.088363	9.064439	35.3	13.6	74.535328	0.8
1971	5.452797	12.003106	59.9	29.394403	9.503187	35.5	13.6	74.149204	1.0
1972	7.420710	13.214594	60.4	29.810221	10.558962	36.6	14.9	73.554520	1.2

- Porcentagem de mulheres que se formaram entre 1970 a 2012
- Departamento Americano para Estatísticas Educacionais

Visualizando a diferença de gênero



Visualizando a diferença de gênero




```
import matplotlib.pyplot as plt

plt.plot(women_degrees['Year'],
         women_degrees['Biology'], c='blue', label='Women')
plt.plot(women_degrees['Year'],
         100-women_degrees['Biology'], c='green', label='Men')
plt.legend(loc='upper right')
plt.title('Percentage of Biology Degrees Awarded By Gender')
plt.show()
```

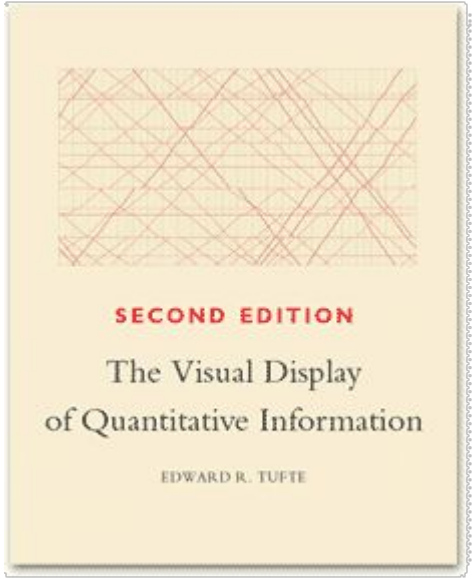
Visualizando a diferença de gênero

```
%matplotlib inline
women_degrees['men_bio'] = 100-women_degrees['Biology']
women_degrees.plot(kind='line',x='Year',y=['Biology','men_bio'],
                   title='Percentage of Biology Degrees Awarded By Gender',
                   color=['blue','green']).\
                        legend(loc='best',
                               labels=['Women','Men'])
```

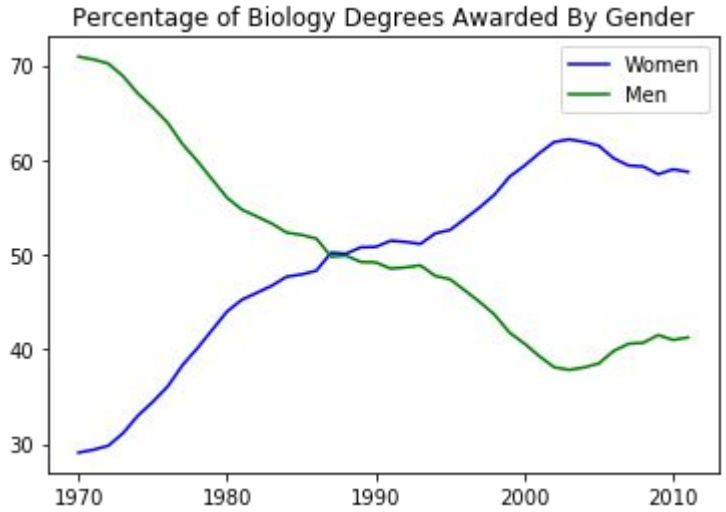
```
ax = women_degrees.plot(kind='line',x='Year',y=['Biology','men_bio'],
                   title='Percentage of Biology Degrees Awarded By Gender',
                   color=['blue','green'])
ax.legend(loc='best',labels=['Women','Men'])
```

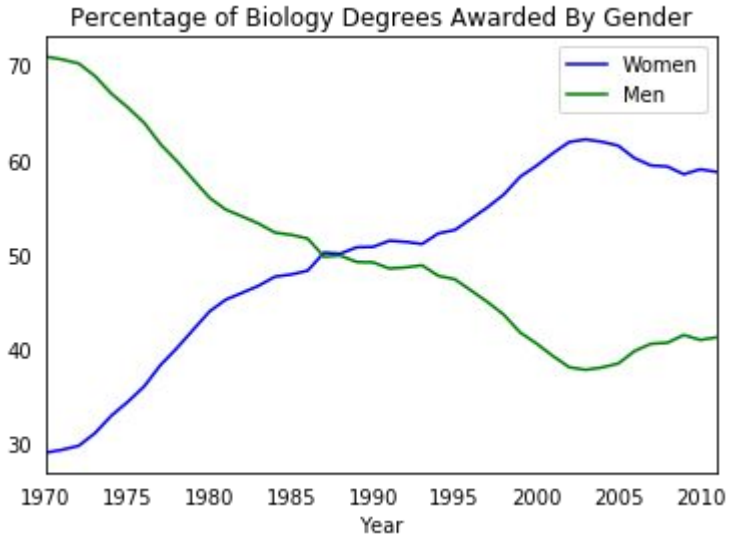
Menos é mais

Remove
to improve
(the **data-ink** ratio)



Ocultar as marcas dos eixos

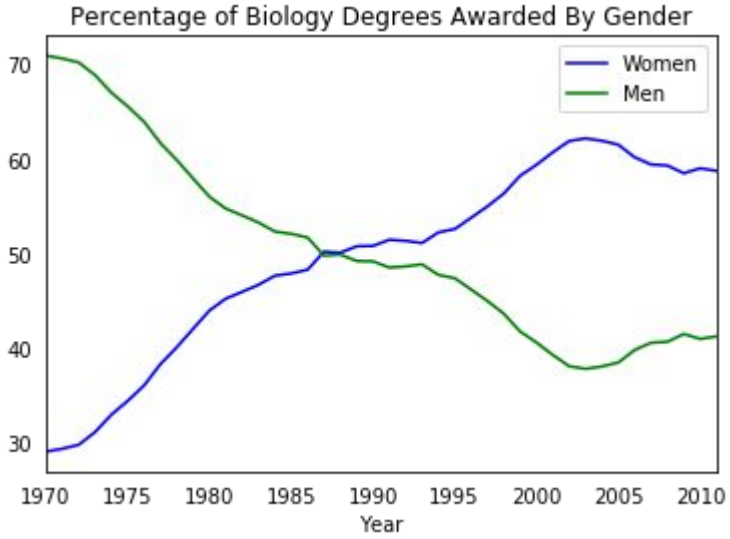


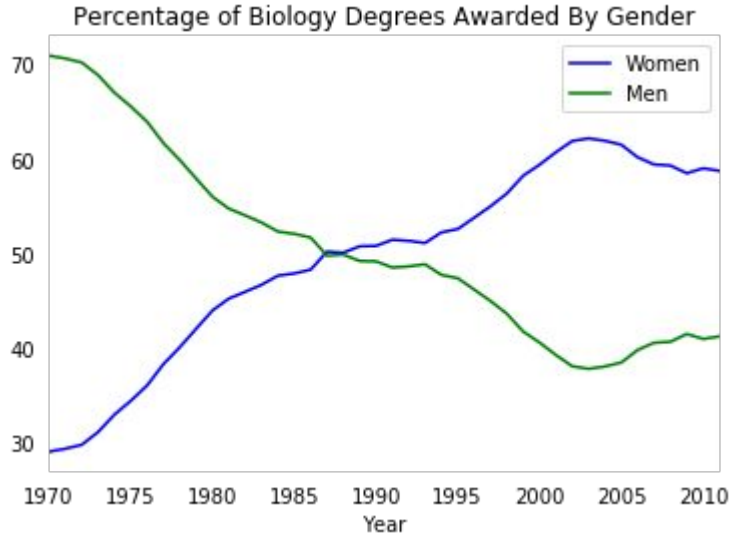



```
ax.tick_params(bottom="off", top="off", left="off", right="off")
```

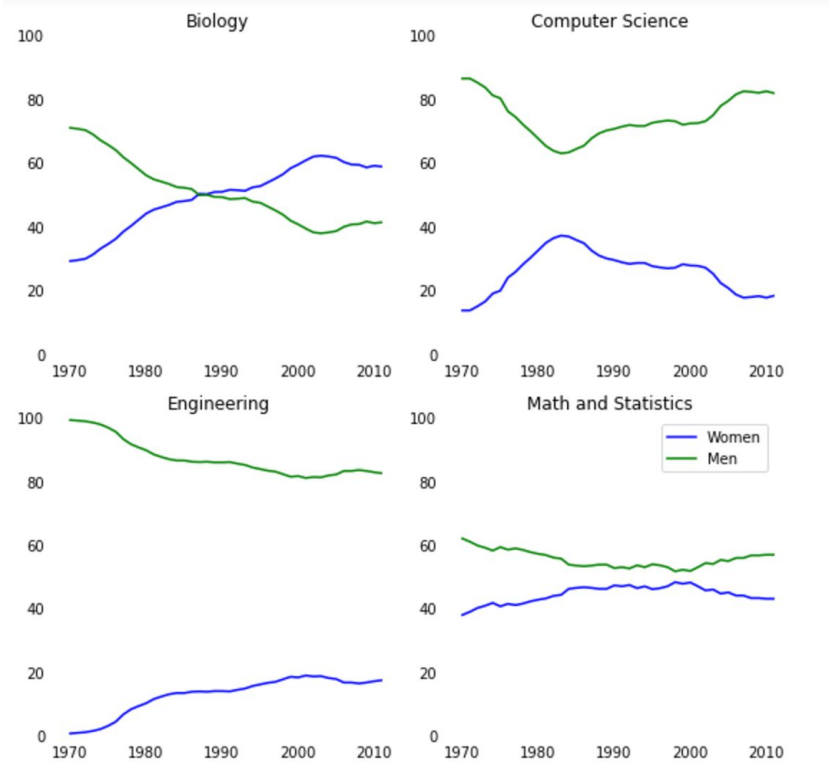
Ocultar os contornos

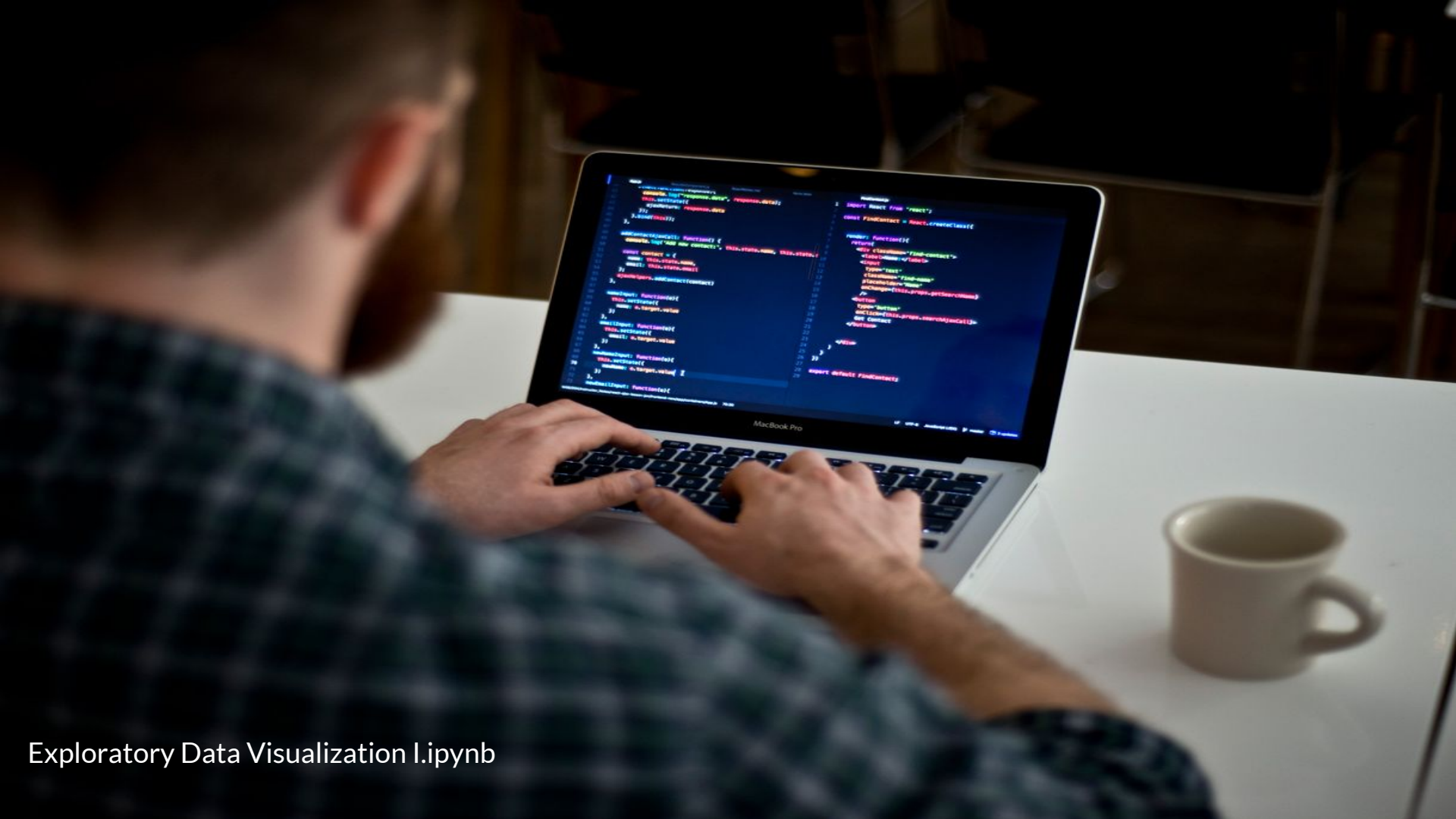
```
ax.spines["right"].set_visible(False)
ax.spines["left"].set_visible(False)
ax.spines["bottom"].set_visible(False)
ax.spines["top"].set_visible(False)
```





Comparação final





Exploratory Data Visualization I.ipynb