

# assignment 14 (old)

March 8, 2022

1 I ended up not using this data set in the end, as the correlations were very weak

```
[2]: import pandas as pd
```

```
[1]: import seaborn as sns
```

```
[3]: df = pd.read_csv('steam.csv', sep=',')
```

```
[4]: df.pop('appid')
# Convert english too boolean
df['english'] = df['english'].astype('bool')
# set release date to datetime
df['release_date'] = pd.to_datetime(df['release_date'])
# create 3 separate platform fields instead of 1
df['windows'], df['mac'], df['linux'] = df['platforms'].apply(lambda x:
    ↪ 'windows' in x), df['platforms'].apply(lambda x: 'mac' in x), df['platforms'].
    ↪ apply(lambda x: 'linux' in x)
df.drop(columns='platforms', inplace=True)
df['owners_low'] = df['owners'].apply(lambda x: x.split('-')[0]).astype('int')
df['owners_high'] = df['owners'].apply(lambda x: x.split('-')[1]).astype('int')
df['release_year'] = df['release_date'].dt.year
df.drop(columns='owners', inplace=True)
genres = df['genres'].apply(lambda x: x.split(';')[0])
```

```
[5]: medianPlaytimeFilter = df['median_playtime'] > 0.5
ownersFilter = df['owners_low'] > 20000 #lowest range above 0
reviewFilter = df['positive_ratings'] > 5
noFreeGameFilter = df['price'] > 0.1
```

```
[6]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 27075 entries, 0 to 27074
Data columns (total 21 columns):
#   Column                Non-Null Count  Dtype
---  -
#   Column                Non-Null Count  Dtype
```

```

0   name                27075 non-null  object
1   release_date        27075 non-null  datetime64[ns]
2   english             27075 non-null  bool
3   developer           27075 non-null  object
4   publisher            27075 non-null  object
5   required_age        27075 non-null  int64
6   categories          27075 non-null  object
7   genres              27075 non-null  object
8   steamspy_tags       27075 non-null  object
9   achievements        27075 non-null  int64
10  positive_ratings    27075 non-null  int64
11  negative_ratings    27075 non-null  int64
12  average_playtime    27075 non-null  int64
13  median_playtime     27075 non-null  int64
14  price               27075 non-null  float64
15  windows             27075 non-null  bool
16  mac                 27075 non-null  bool
17  linux               27075 non-null  bool
18  owners_low          27075 non-null  int32
19  owners_high         27075 non-null  int32
20  release_year        27075 non-null  int64
dtypes: bool(4), datetime64[ns](1), float64(1), int32(2), int64(7), object(6)
memory usage: 3.4+ MB

```

Average playtime vs publisher I expect there to be a difference publisher and playtime. I expect there to be a heavy correlation between publisher and playtime.

```

[7]: sortedDataset = df[df['average_playtime'] > 200][df['average_playtime'] < 5000].
      ↪sort_values(by='average_playtime',ascending=False).head(10000)
sortedDataset

```

C:\Users\Stijn\AppData\Local\Temp\ipykernel\_7240\483420109.py:1: UserWarning: Boolean Series key will be reindexed to match DataFrame index.

```
sortedDataset = df[df['average_playtime'] > 200][df['average_playtime'] <
5000].sort_values(by='average_playtime',ascending=False).head(10000)
```

```

[7]:
      name release_date  english \
493  Europa Universalis: Rome - Gold Edition  2008-12-18    True
1596                                Euro Truck Simulator 2  2012-10-12    True
3504                                Call of Duty®: Black Ops III  2015-11-05    True
5312                                Tree of Life  2017-08-17    True
8004                                Friday the 13th: The Game  2017-05-25    True
...                                ...
8453                                Catch a Falling Star  2016-03-30    True
998                                The Bureau: XCOM Declassified  2013-08-22    True
6293                                The Tape  2015-11-19    True
1792                                Wanderlust Adventures  2015-08-10    True
10253                                Spikit  2016-08-09    True

```

	developer		publisher	required_age	\	
493	Paradox Development Studio		Paradox Interactive	0		
1596	SCS Software		SCS Software	0		
3504	Treyarch;Aspyr (Mac)		Activision;Aspyr (Mac)	18		
5312	oddonegames		oddonegames	0		
8004	IllFonic		Gun Media	18		
...	...		...	...		
8453	Alister Software	Back To Basics Gaming		0		
998	2K Marin		2K	16		
6293	Kazakov Oleg		Kazakov Oleg	18		
1792	Yeti Trunk		Chucklefish	0		
10253	Blastoid Entertainment	Back To Basics Gaming		0		
			categories	\		
493			Single-player;Multi-player;Co-op			
1596			Single-player;Steam Achievements;Steam Trading...			
3504			Single-player;Multi-player;Co-op;Steam Achieve...			
5312			Multi-player;Online Multi-Player;MMO;Co-op;Onl...			
8004			Multi-player;Steam Achievements;Full controlle...			
...			...			
8453			Single-player;Steam Achievements;Steam Trading...			
998			Single-player;Steam Achievements;Full controll...			
6293			Single-player;Steam Achievements;Steam Trading...			
1792			Single-player;Multi-player;Online Multi-Player...			
10253			Single-player;Steam Achievements;Steam Trading...			
	genres		steamspy_tags	\		
493	Strategy		Strategy;Grand Strategy;Historical			
1596	Indie;Simulation		Simulation;Driving;Open World			
3504	Action;Adventure		Multiplayer;FPS;Zombies			
5312	Indie;Massively Multiplayer;RPG		Survival;Sandbox;Open World			
8004	Action		Horror;Multiplayer;Survival Horror			
...	...		...			
8453	Casual;Indie		Casual;Indie;Relaxing			
998	Action		Action;Tactical;Sci-fi			
6293	Indie		Indie;Horror;First-Person			
1792	Action;Adventure;Indie;RPG		Adventure;Indie;RPG			
10253	Casual;Indie		Casual;Indie;Bullet Hell			
	achievements	...	negative_ratings	average_playtime	median_playtime	\
493	0	...	52	4975	4975	
1596	67	...	5825	4942	1413	
3504	98	...	23157	4925	2513	
5312	0	...	2203	4866	4866	
8004	53	...	8304	4823	4944	
...	...	...	...	...	...	

8453	45	...	137	201	215
998	41	...	2923	201	168
6293	4	...	139	201	230
1792	37	...	86	201	201
10253	6	...	70	201	209

	price	windows	mac	linux	owners_low	owners_high	release_year
493	7.99	True	False	False	50000	100000	2008
1596	14.99	True	True	True	5000000	10000000	2012
3504	44.99	True	True	False	1000000	2000000	2015
5312	14.99	True	False	False	100000	200000	2017
8004	15.49	True	False	False	500000	1000000	2017
...	...	...	...	...	...	...	...
8453	0.79	True	False	False	200000	500000	2016
998	14.99	True	True	False	2000000	5000000	2013
6293	0.79	True	False	False	100000	200000	2015
1792	6.99	True	False	False	20000	50000	2015
10253	0.79	True	False	False	500000	1000000	2016

[3341 rows x 21 columns]

```
[ ]: sortedDataset['developer']
```

```
[9]: plot = sns.barplot(x="developer", y="average_playtime", data=sortedDataset)
      plot.set_xticklabels(plot.get_xticklabels(), rotation=45,
      ↪horizontalalignment='right')
```

```
[9]: <AxesSubplot:xlabel='developer', ylabel='average_playtime'>
```

```
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 19978 (\N{CJK UNIFIED IDEOGRAPH-4E0A}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 28023 (\N{CJK UNIFIED IDEOGRAPH-6D77}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 28891 (\N{CJK UNIFIED IDEOGRAPH-70DB}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 40857 (\N{CJK UNIFIED IDEOGRAPH-9F99}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 20449 (\N{CJK UNIFIED IDEOGRAPH-4FE1}) missing from current
font.
```

```

func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 24687 (\N{CJK UNIFIED IDEOGRAPH-606F}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 31185 (\N{CJK UNIFIED IDEOGRAPH-79D1}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 25216 (\N{CJK UNIFIED IDEOGRAPH-6280}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 26377 (\N{CJK UNIFIED IDEOGRAPH-6709}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 38480 (\N{CJK UNIFIED IDEOGRAPH-9650}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 20844 (\N{CJK UNIFIED IDEOGRAPH-516C}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 21496 (\N{CJK UNIFIED IDEOGRAPH-53F8}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 27224 (\N{CJK UNIFIED IDEOGRAPH-6A58}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 23376 (\N{CJK UNIFIED IDEOGRAPH-5B50}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 29677 (\N{CJK UNIFIED IDEOGRAPH-73ED}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 22823 (\N{CJK UNIFIED IDEOGRAPH-5927}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 22909 (\N{CJK UNIFIED IDEOGRAPH-597D}) missing from current
font.

```

```

func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 32593 (\N{CJK UNIFIED IDEOGRAPH-7F51}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 30002 (\N{CJK UNIFIED IDEOGRAPH-7532}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 23665 (\N{CJK UNIFIED IDEOGRAPH-5C71}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 26519 (\N{CJK UNIFIED IDEOGRAPH-6797}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 23067 (\N{CJK UNIFIED IDEOGRAPH-5A1B}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 27138 (\N{CJK UNIFIED IDEOGRAPH-6A02}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 32929 (\N{CJK UNIFIED IDEOGRAPH-80A1}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 20221 (\N{CJK UNIFIED IDEOGRAPH-4EFD}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 26460 (\N{CJK UNIFIED IDEOGRAPH-675C}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 26114 (\N{CJK UNIFIED IDEOGRAPH-6602}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 32476 (\N{CJK UNIFIED IDEOGRAPH-7EDC}) missing from current
font.
func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 22696 (\N{CJK UNIFIED IDEOGRAPH-58A8}) missing from current
font.

```

```

    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 40060 (\N{CJK UNIFIED IDEOGRAPH-9C7C}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 29609 (\N{CJK UNIFIED IDEOGRAPH-73A9}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 28216 (\N{CJK UNIFIED IDEOGRAPH-6E38}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 25103 (\N{CJK UNIFIED IDEOGRAPH-620F}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 26481 (\N{CJK UNIFIED IDEOGRAPH-6771}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 26041 (\N{CJK UNIFIED IDEOGRAPH-65B9}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 24149 (\N{CJK UNIFIED IDEOGRAPH-5E55}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 33775 (\N{CJK UNIFIED IDEOGRAPH-83EF}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 31085 (\N{CJK UNIFIED IDEOGRAPH-796D}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 21046 (\N{CJK UNIFIED IDEOGRAPH-5236}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 20316 (\N{CJK UNIFIED IDEOGRAPH-4F5C}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 32452 (\N{CJK UNIFIED IDEOGRAPH-7EC4}) missing from current
font.

```

```

    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12450 (\N{KATAKANA LETTER A}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12522 (\N{KATAKANA LETTER RI}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12473 (\N{KATAKANA LETTER SU}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 24187 (\N{CJK UNIFIED IDEOGRAPH-5E7B}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 22243 (\N{CJK UNIFIED IDEOGRAPH-56E3}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 31456 (\N{CJK UNIFIED IDEOGRAPH-7AE0}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 32592 (\N{CJK UNIFIED IDEOGRAPH-7F50}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 22836 (\N{CJK UNIFIED IDEOGRAPH-5934}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 30707 (\N{CJK UNIFIED IDEOGRAPH-77F3}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 40644 (\N{CJK UNIFIED IDEOGRAPH-9EC4}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 26127 (\N{CJK UNIFIED IDEOGRAPH-660F}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12501 (\N{KATAKANA LETTER HU}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12525 (\N{KATAKANA LETTER RO}) missing from current font.
    func(*args, **kwargs)

```



```

C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12531 (\N{KATAKANA LETTER N}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12486 (\N{KATAKANA LETTER TE}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12451 (\N{KATAKANA LETTER SMALL I}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12452 (\N{KATAKANA LETTER I}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12524 (\N{KATAKANA LETTER RE}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12392 (\N{HIRAGANA LETTER TO}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12425 (\N{HIRAGANA LETTER RA}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12356 (\N{HIRAGANA LETTER I}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12354 (\N{HIRAGANA LETTER A}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12435 (\N{HIRAGANA LETTER N}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12368 (\N{HIRAGANA LETTER GU}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 12427 (\N{HIRAGANA LETTER RU}) missing from current font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\events.py:89:
UserWarning: Glyph 65281 (\N{FULLWIDTH EXCLAMATION MARK}) missing from current
font.
    func(*args, **kwargs)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 19978 (\N{CJK UNIFIED IDEOGRAPH-4E0A}) missing from current
font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 28023 (\N{CJK UNIFIED IDEOGRAPH-6D77}) missing from current
font.

```

```

fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 28891 (\N{CJK UNIFIED IDEOGRAPH-70DB}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 40857 (\N{CJK UNIFIED IDEOGRAPH-9F99}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 20449 (\N{CJK UNIFIED IDEOGRAPH-4FE1}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 24687 (\N{CJK UNIFIED IDEOGRAPH-606F}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 31185 (\N{CJK UNIFIED IDEOGRAPH-79D1}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 25216 (\N{CJK UNIFIED IDEOGRAPH-6280}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 26377 (\N{CJK UNIFIED IDEOGRAPH-6709}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 38480 (\N{CJK UNIFIED IDEOGRAPH-9650}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 20844 (\N{CJK UNIFIED IDEOGRAPH-516C}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 21496 (\N{CJK UNIFIED IDEOGRAPH-53F8}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 27224 (\N{CJK UNIFIED IDEOGRAPH-6A58}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 23376 (\N{CJK UNIFIED IDEOGRAPH-5B50}) missing from current
font.

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fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 29677 (\N{CJK UNIFIED IDEOGRAPH-73ED}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 22823 (\N{CJK UNIFIED IDEOGRAPH-5927}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 22909 (\N{CJK UNIFIED IDEOGRAPH-597D}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 32593 (\N{CJK UNIFIED IDEOGRAPH-7F51}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 30002 (\N{CJK UNIFIED IDEOGRAPH-7532}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 23665 (\N{CJK UNIFIED IDEOGRAPH-5C71}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 26519 (\N{CJK UNIFIED IDEOGRAPH-6797}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 23067 (\N{CJK UNIFIED IDEOGRAPH-5A1B}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 27138 (\N{CJK UNIFIED IDEOGRAPH-6A02}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 32929 (\N{CJK UNIFIED IDEOGRAPH-80A1}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 20221 (\N{CJK UNIFIED IDEOGRAPH-4EFD}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 26460 (\N{CJK UNIFIED IDEOGRAPH-675C}) missing from current
font.

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fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 26114 (\N{CJK UNIFIED IDEOGRAPH-6602}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 32476 (\N{CJK UNIFIED IDEOGRAPH-7EDC}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 22696 (\N{CJK UNIFIED IDEOGRAPH-58A8}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 40060 (\N{CJK UNIFIED IDEOGRAPH-9C7C}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 29609 (\N{CJK UNIFIED IDEOGRAPH-73A9}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 28216 (\N{CJK UNIFIED IDEOGRAPH-6E38}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 25103 (\N{CJK UNIFIED IDEOGRAPH-620F}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 26481 (\N{CJK UNIFIED IDEOGRAPH-6771}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 26041 (\N{CJK UNIFIED IDEOGRAPH-65B9}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 24149 (\N{CJK UNIFIED IDEOGRAPH-5E55}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 33775 (\N{CJK UNIFIED IDEOGRAPH-83EF}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 31085 (\N{CJK UNIFIED IDEOGRAPH-796D}) missing from current
font.

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fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 21046 (\N{CJK UNIFIED IDEOGRAPH-5236}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 20316 (\N{CJK UNIFIED IDEOGRAPH-4F5C}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 32452 (\N{CJK UNIFIED IDEOGRAPH-7EC4}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12450 (\N{KATAKANA LETTER A}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12522 (\N{KATAKANA LETTER RI}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12473 (\N{KATAKANA LETTER SU}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 24187 (\N{CJK UNIFIED IDEOGRAPH-5E7B}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 22243 (\N{CJK UNIFIED IDEOGRAPH-56E3}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 31456 (\N{CJK UNIFIED IDEOGRAPH-7AE0}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 32592 (\N{CJK UNIFIED IDEOGRAPH-7F50}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 22836 (\N{CJK UNIFIED IDEOGRAPH-5934}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 30707 (\N{CJK UNIFIED IDEOGRAPH-77F3}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 40644 (\N{CJK UNIFIED IDEOGRAPH-9EC4}) missing from current

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font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 26127 (\N{CJK UNIFIED IDEOGRAPH-660F}) missing from current
font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12501 (\N{KATAKANA LETTER HU}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12525 (\N{KATAKANA LETTER RO}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12531 (\N{KATAKANA LETTER N}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12486 (\N{KATAKANA LETTER TE}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12451 (\N{KATAKANA LETTER SMALL I}) missing from current
font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12452 (\N{KATAKANA LETTER I}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12524 (\N{KATAKANA LETTER RE}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12392 (\N{HIRAGANA LETTER TO}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12425 (\N{HIRAGANA LETTER RA}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12356 (\N{HIRAGANA LETTER I}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12354 (\N{HIRAGANA LETTER A}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12435 (\N{HIRAGANA LETTER N}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12368 (\N{HIRAGANA LETTER GU}) missing from current font.
    fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 12427 (\N{HIRAGANA LETTER RU}) missing from current font.

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fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Stijn\miniconda3\lib\site-packages\IPython\core\pylabtools.py:151:
UserWarning: Glyph 65281 (\N{FULLWIDTH EXCLAMATION MARK}) missing from current
font.
fig.canvas.print_figure(bytes_io, **kw)
```