Visualisation with matplotlib

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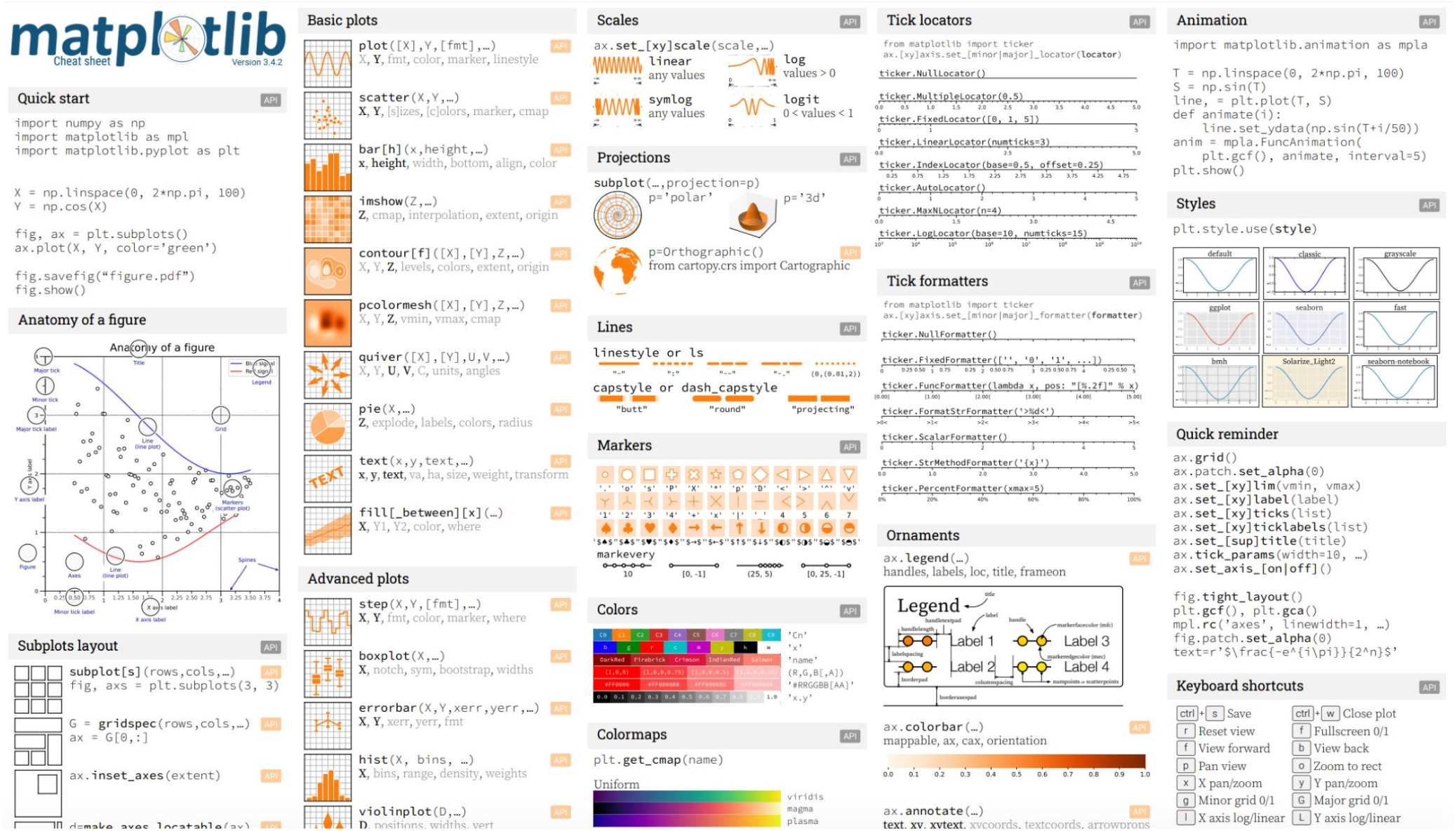


https://matplotlib.org/cheatsheets/cheatsheets.pdf

```
#import the library
import matplotlib.pyplot as plt
```

Different charts

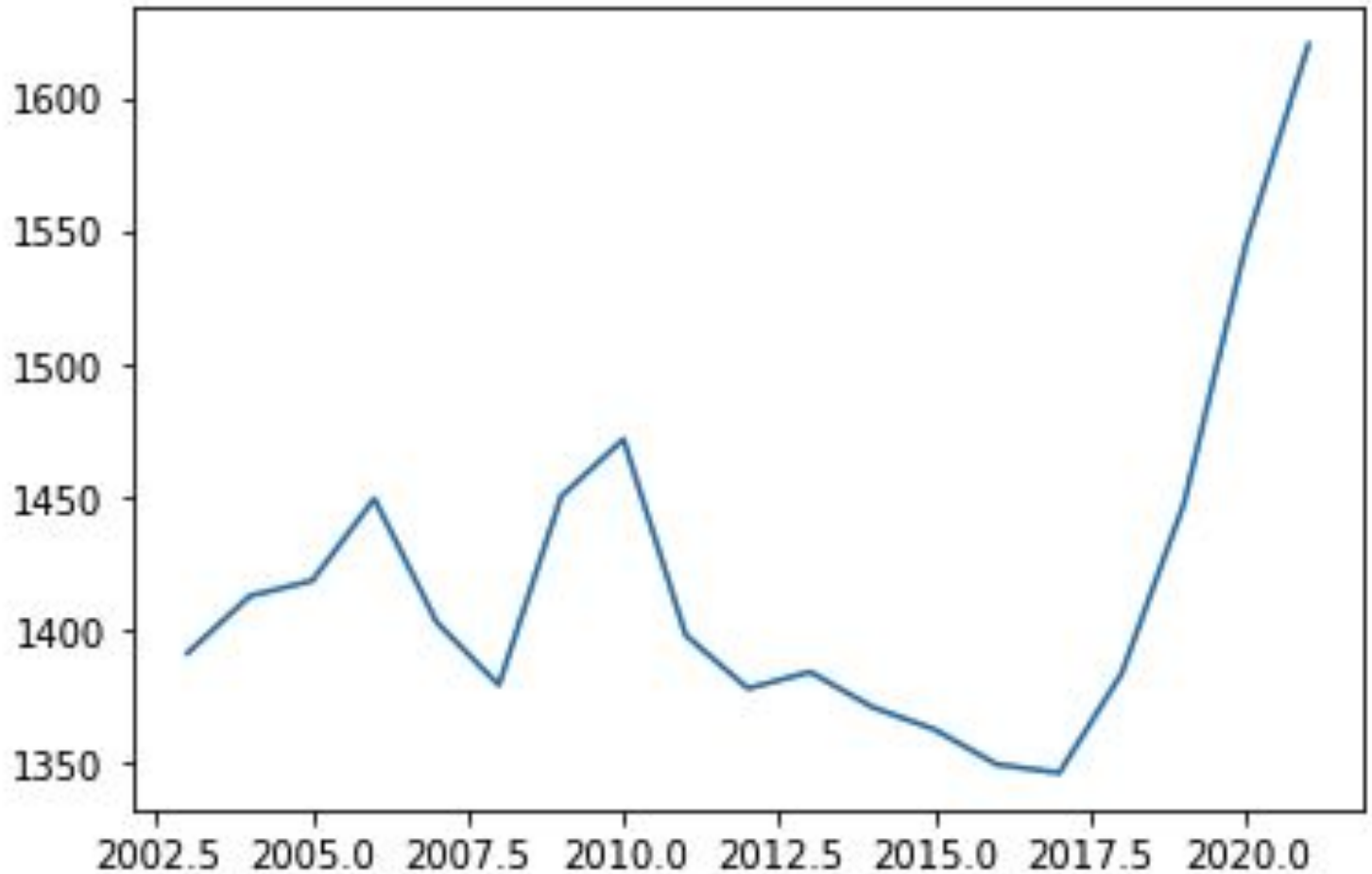
- `plt.plot()` - line charts, scatterplot
- `plt.bar()` - bar charts/histograms
- `plt.barh()` - horizontal bar charts
- `plt.scatter()` - scatterplots
- `plt.pie()` - pie charts
- `plt.imshow()` - heatmaps

```
#plot two lists (line chart)
plt.plot(list1,list2)

#those parameters have names
plt.plot(x = list1,
         height = list2)
```

```
plt.plot(years, row3)
```

```
[<matplotlib.lines.Line2D at 0x7f1df1a56cd0>]
```

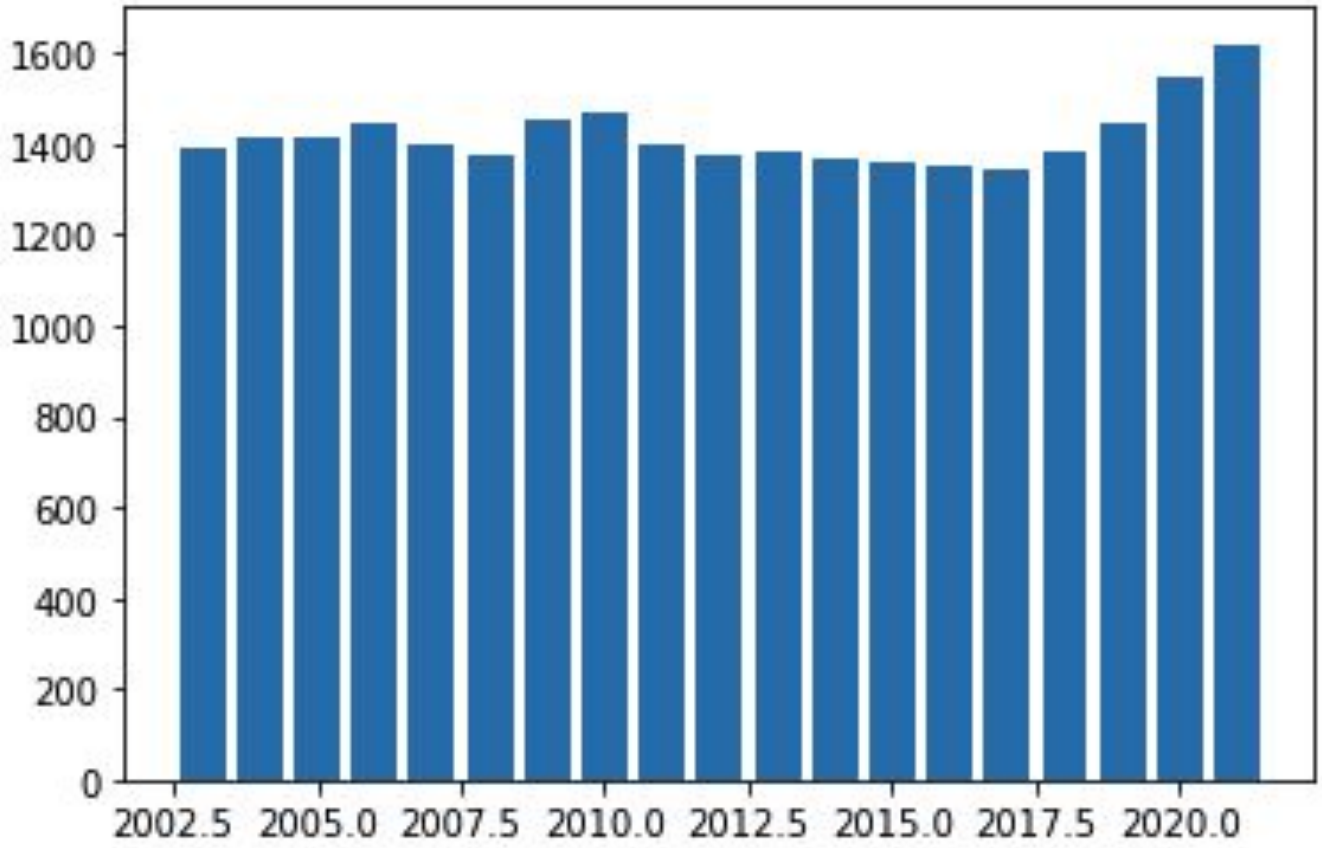


```
#a bar chart works just the same
plt.bar(list1,list2)

#only height needs to be numeric
plt.bar(x = list1,
        height = list2)
```

```
#The x axis is years, the y axis is the staff numbers in row3
plt.bar(years, row3)
```

```
<BarContainer object of 19 artists>
```



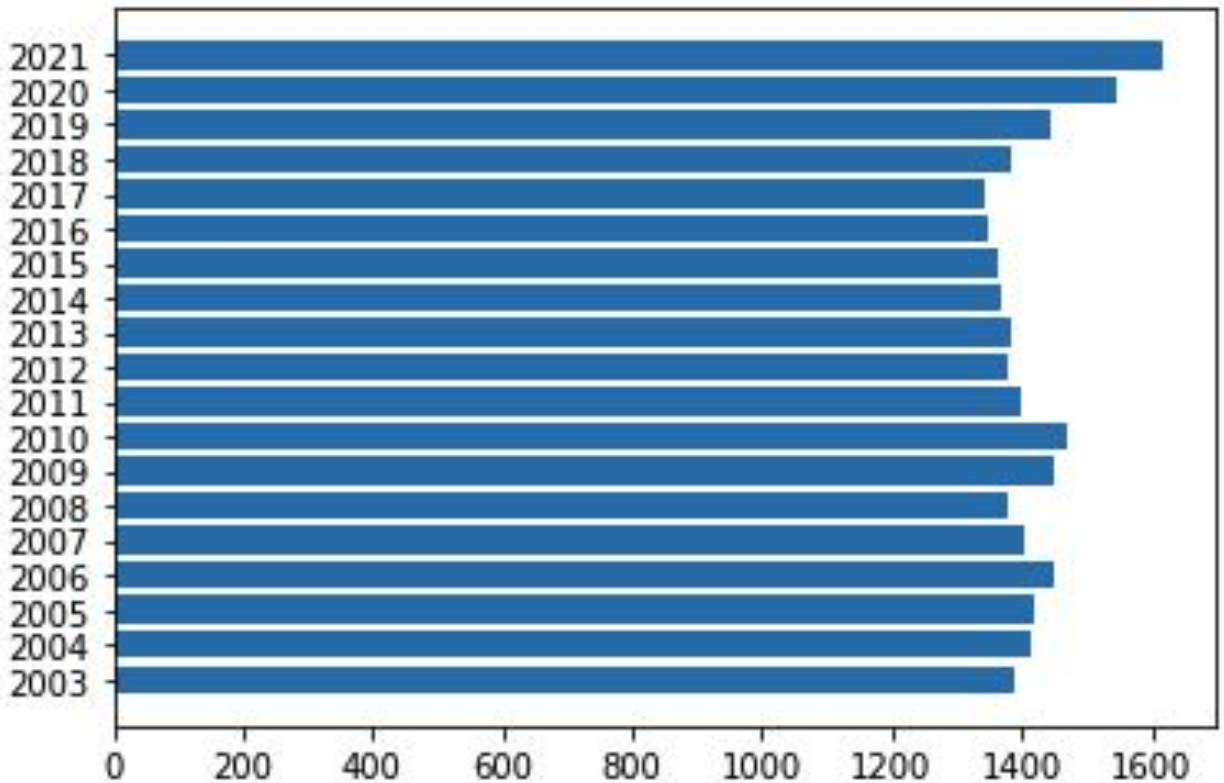
```
#a horizontal bar chart
plt.barh(list1,list2)


#now it’s y and width
plt.barh(y = list1,
         width = list2)
```

```python
#convert years to strings
yearstr = [str(i) for i in years]
yearstr
```

```python
#specify width as 0.8 of full width and other parameters
plt.barh(yearstr,
         row3)
```

```
<BarContainer object of 19 artists>
```



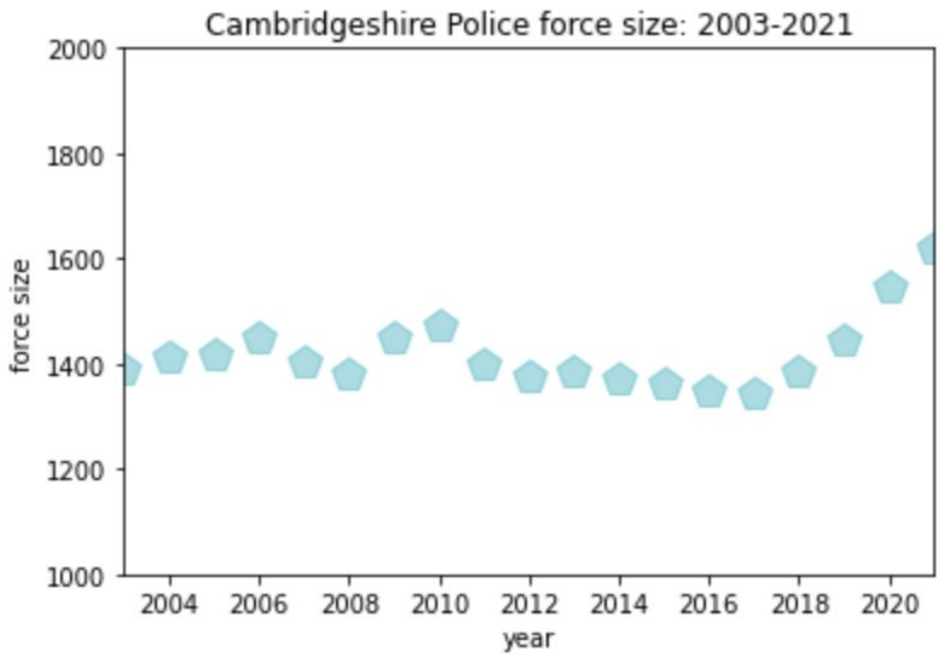
Adding/formatting labels

- `plt.ylabel('stuff')` - add a string
- `plt.xlabel()` - and another
- `plt.title()` - and another
- `plt.axis([2015,2020,0,1000)` - specify axis start and end points: [x start, x end, y start, y end]
- `plt.xticks(rotation=90)` - vertical labels on x axis
- `plt.show()` - show the results

Markers and colour

```
plt.plot(x = list1,
         height = list2,
         color = '#ff0000',
         marker = 'x',
         markersize = 5,
         alpha = 0.5,
         linestyle = 'none')
```

```python
#this time specify a different colour, pentagon markers at 15px and 40% opacity
plt.plot(years, row3, color='#11aabb', marker='p', linestyle='none', markersize=15, alpha=.4)
plt.ylabel('force size')
plt.xlabel('year')
plt.title('Cambridgeshire Police force size: 2003-2021')
plt.axis([2003,2021,1000,2000])
plt.show()
```



Property	Description
agg_filter	a filter function, which takes a (m, n, 3) float array and a dpi value, and returns a (m, n, 3) array
alpha	float (0.0 transparent through 1.0 opaque)
animated	bool
antialiased or aa	[True | False]
clip_box	a Bbox instance
clip_on	bool
clip_path	[(Path, Transform) | Patcl
color or c	any matplotlib color
contains	a callable function
dash_capstyle	['butt' | 'round' | 'projecting'
dash_joinstyle	['miter' | 'round' | 'bevel']
dashes	sequence of on/off ink in pc
drawstyle	['default' | 'steps' | 'steps-p mid' | 'steps-post']
figure	a Figure instance
fillstyle	['full' | 'left' | 'right' | 'bottom' | 'top' | 'none']

The following format string characters are accepted to control the line style or marker:

character	description
'-'	solid line style
'--'	dashed line style
'-.'	dash-dot line style
':'	dotted line style
'.'	point marker
','	pixel marker
'o'	circle marker
'v'	triangle_down marker
'^'	triangle_up marker
'<'	triangle_left marker
'>'	triangle_right marker
'1'	tri_down marker
'2'	tri_up marker
'3'	tri_left marker
'4'	tri_right marker
's'	square marker
'p'	pentagon marker
'*'	star marker
'h'	hexagon1 marker
'H'	hexagon2 marker

https://matplotlib.org/2.1.2/api/_as_gen/matplotlib.pyplot.plot.html

Size: .figure()

```
#must go before plotting
#width, height in inches
plt.figure(figsize=(15,17))
```

Exporting: .savefig()

```
#must go before .show()
plt.savefig('mypic.png',
            transparent = True)
```