

Matplotlib Practice - Solutions - Unibs 2021

Import matplotlib.pyplot package under name `plt` and print version

```
hint: import ... as, plt.__version__
```

Activate matplotlib inline

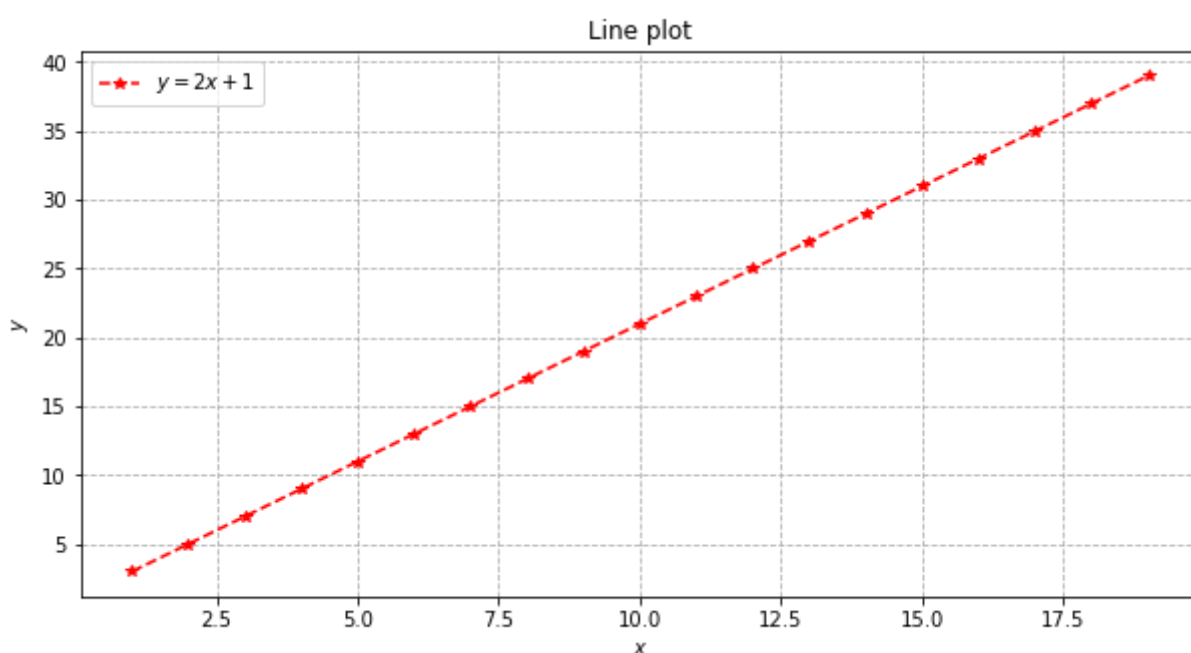
```
hint: ... inline
```

Base

Plot a line with formula $y = 2x + 1$

```
hint: np.arange, plt.figure, plt.plot, plt.title, plt.xlabel, plt.ylabel,
plt.grid, plt.legend, plt.show
```

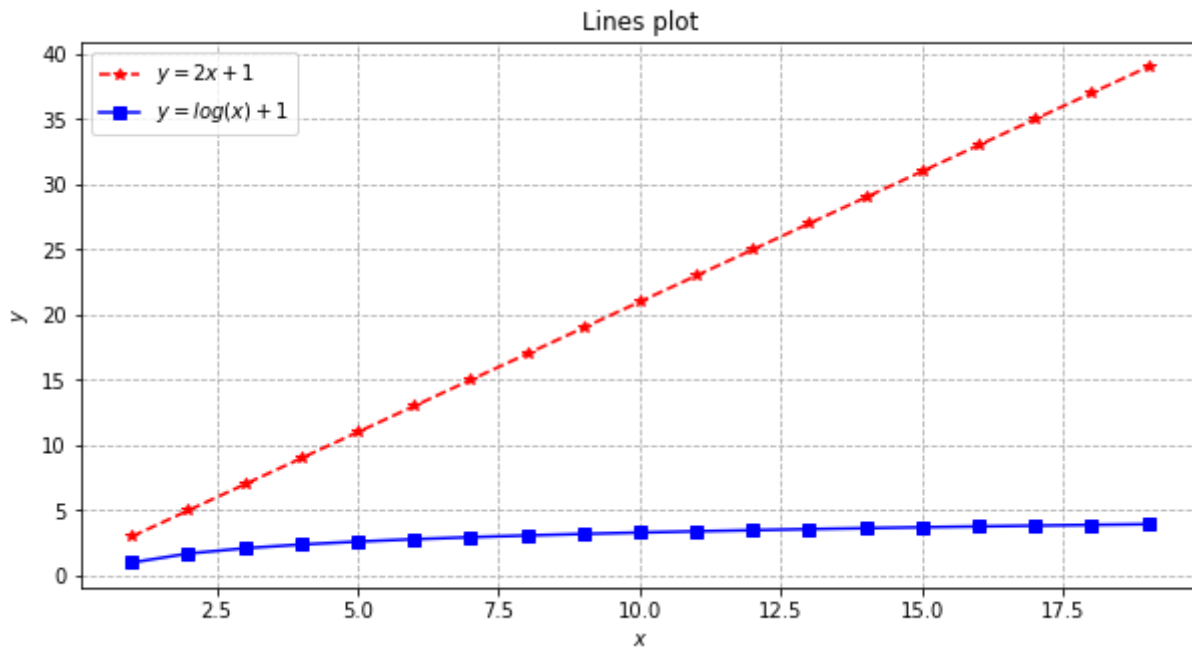
- Use points in range [1, 20]
- Figure size of (10,5)
- Set axis labels
- Set plot title
- Set line color as red
- Discontinued line (--) with star (*) on point
- Plot the legend with the formula in latex version (`r"$... $"`)
- Set a dashed grid



Add to the previous plot the line with formula $y = \log(x) + 1$ in the same range

hint: `np.log`, `plt.plot`

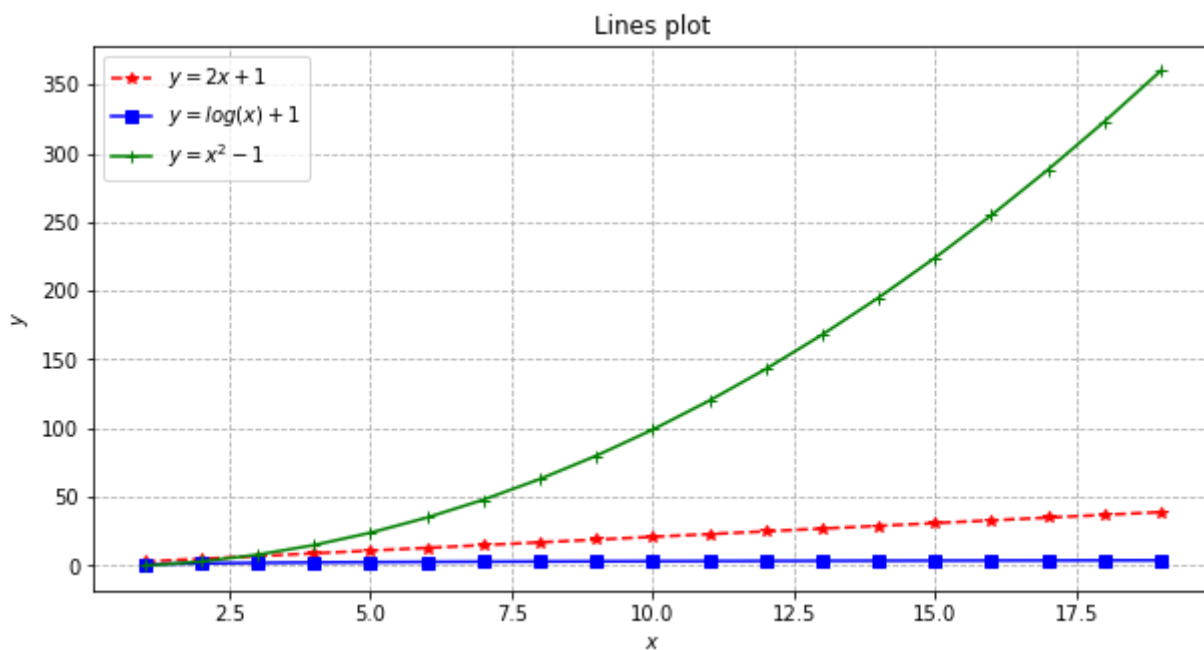
- Set line color as blue
- Normal line (-) with square (s) char on point



Add to the previous plot the line with formula $y = x^2 - 1$ in the same range

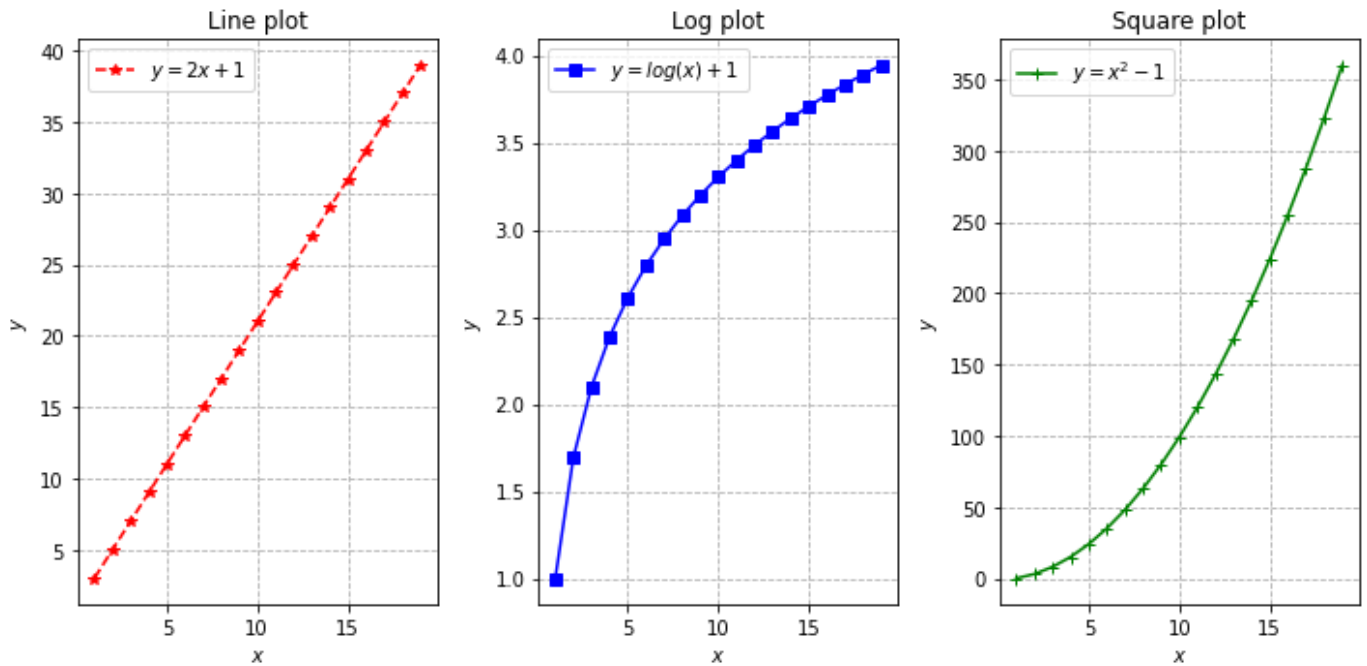
hint: `x**2`, `plt.plot`

- Set line color as green
- Normal line (-) with + (plus) char on point



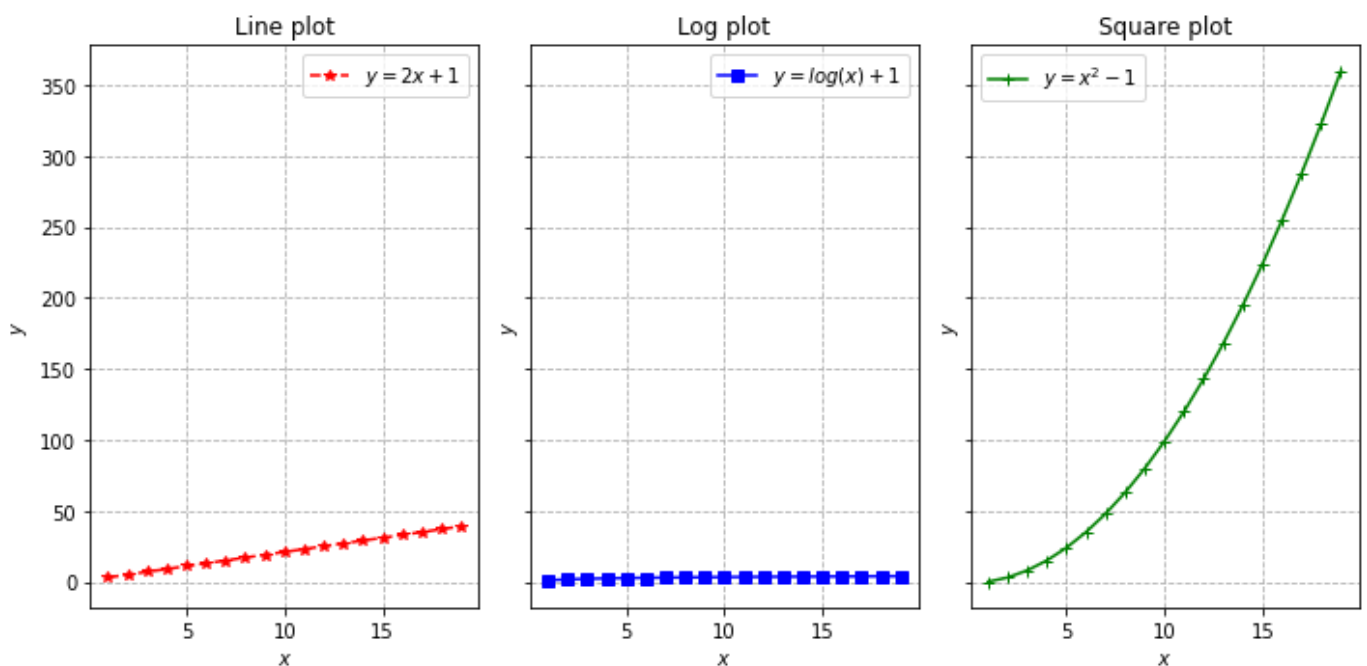
Replot the previous plot in different subplots in the same line without sharing axes

hint: `plt.subplots`, `axes[].plot`, `axes[].set_title`, `axes[].set_xlabel`, `axes[].set_ylabel`, `axes[].grid`, `axes[].legend`, `fig.tight_layout`



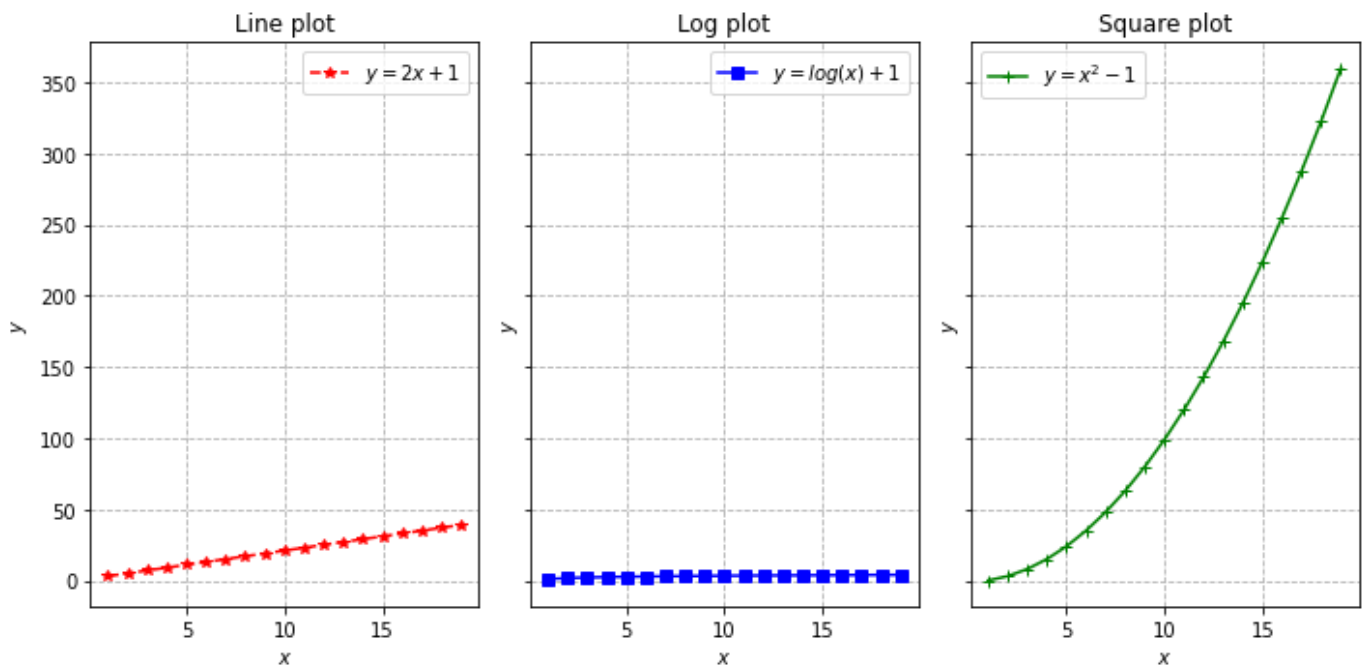
Replot the previous plot sharing y between suplots

hint: `sharey=True`

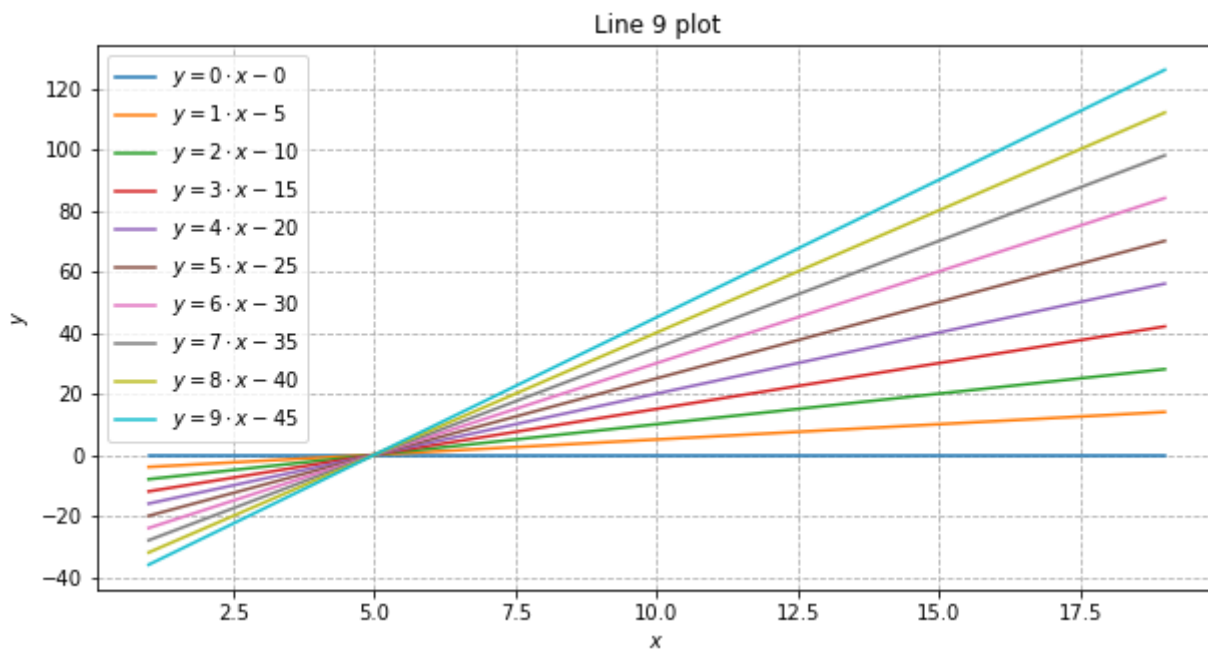


Replot the previous plot using the for loop, lists and dictionaries

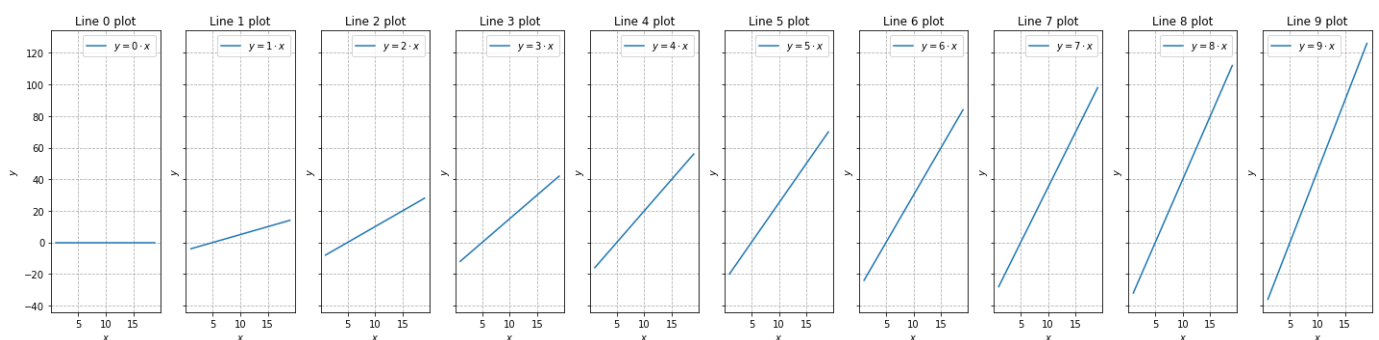
hint: `functions = [...]`, `{"title": ..., "y": ..., "label": ..., "linestyle": ...}`, `zip(functions, axes)`



Plot functions $y_i = i \cdot x - 5i$ with i in range (0, 10) in the same plot with size (10,5) and a different color for each function



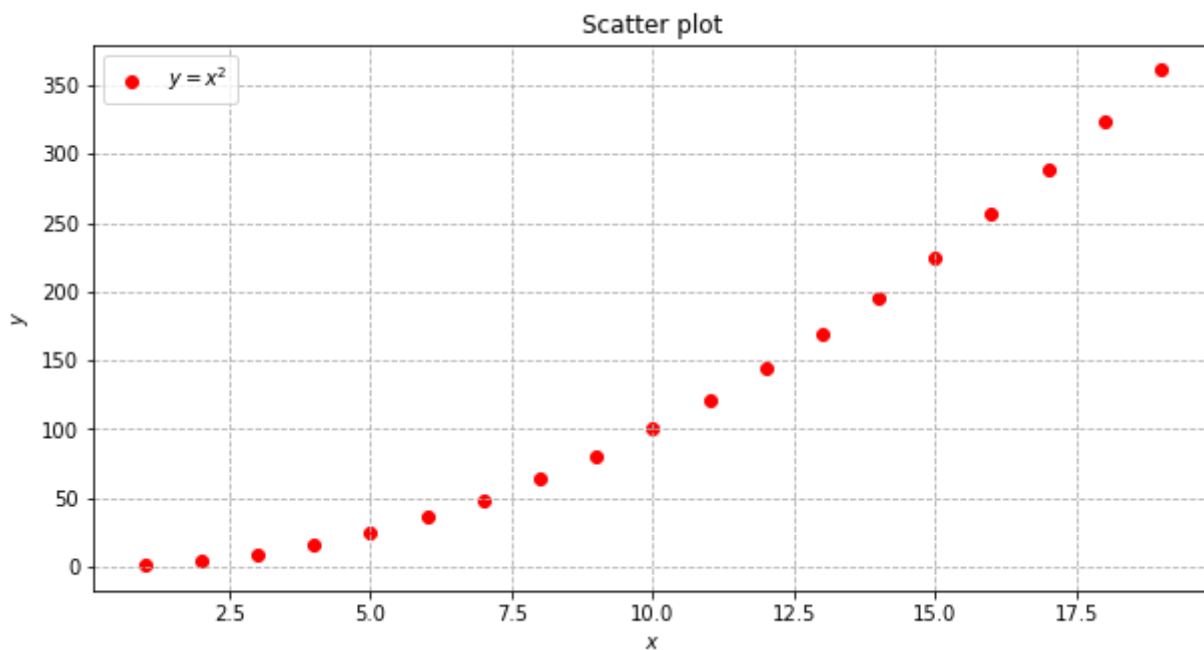
Plot functions $y_i = i \cdot x - 5i$ with i in range (0, 10) in different subplots with shared y and figure size (20,5)



Intermediate

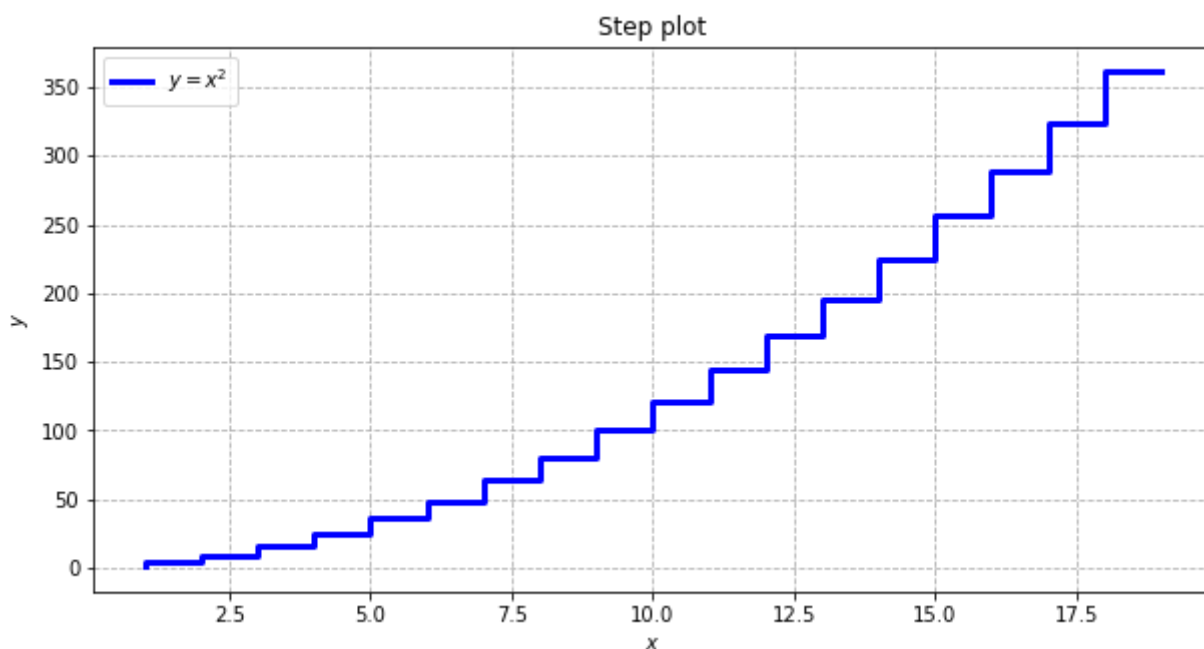
Plot a red scatterplot of x squared

hint: `plt.scatter`



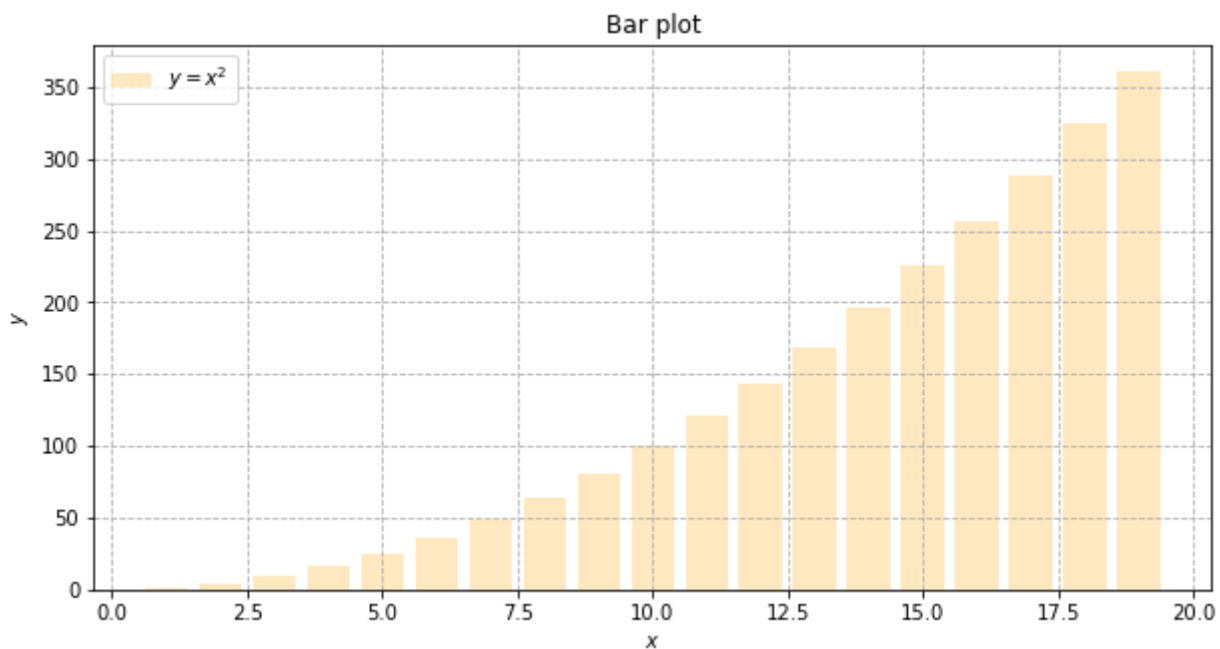
Plot a blue step plot of x squared with linewidth of 3

hint: `plt.step`



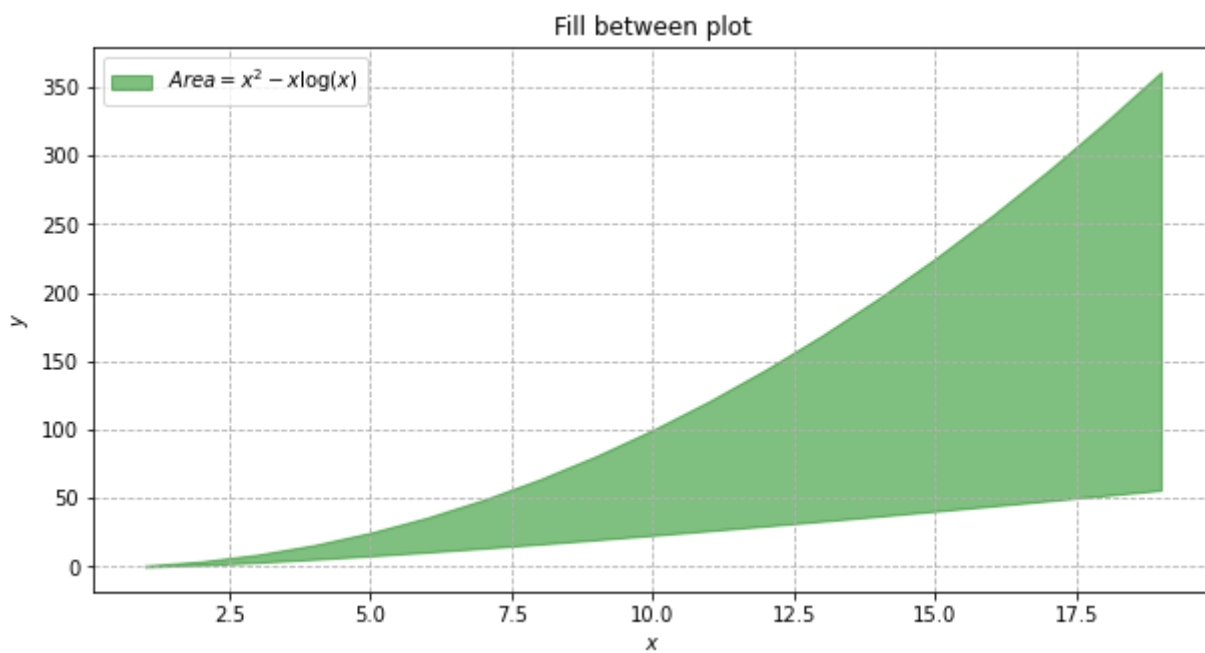
Plot an orange barplot plot of x squared with alpha of 0.25

hint: `plt.bar`



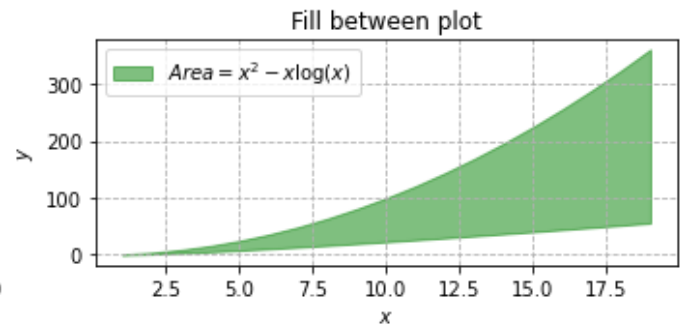
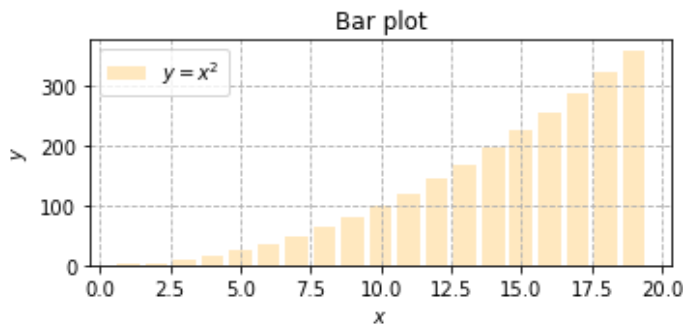
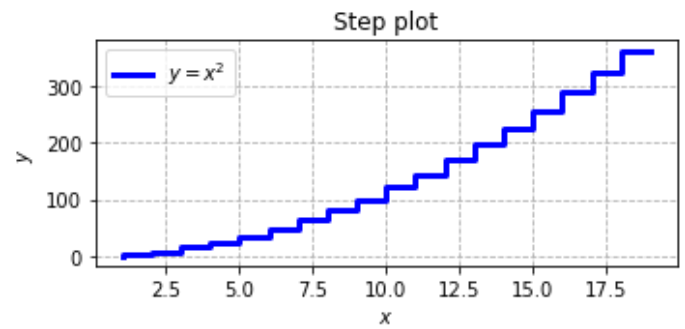
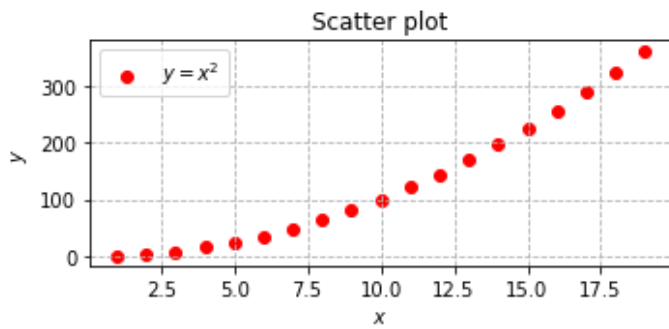
Plot the area between x squared and the $x \cdot \log(x)$ function in green and alpha 0.5

hint: `plt.fill_between`



Replot previous plots in square grid (2,2)

hint: `axes[0][0]`



Plot purple histogram of 50 bins and pink cumulative instogram of 100K random samples in subplots

hint: `np.random.randn, axes[].hist(), cumulative=True, bins=50`

