Seaborn Workshop

Controlling figure aesthetics

- Drawing attractive figures is important. When making figures for yourself, as you explore a dataset, its nice to have plots that are pleasant to look at.
- Visualizations are also central to communicating quantitative insights to an audience, and in that setting its even more necessary to have figures that catch the attention and draw a viewer in.

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Matplotlib is highly customizable, but it can be hard to know what settings to tweak to achieve an attractive plot. Seaborn comes with a number of customized themes and a high-level interface for controlling the look of matplotlib figures.

```
%matplotlib inline
import numpy as np
import matplotlib as mpl
import matplotlib.pyplot as plt
np.random.seed(sum(map(ord, "aesthetics")))
```

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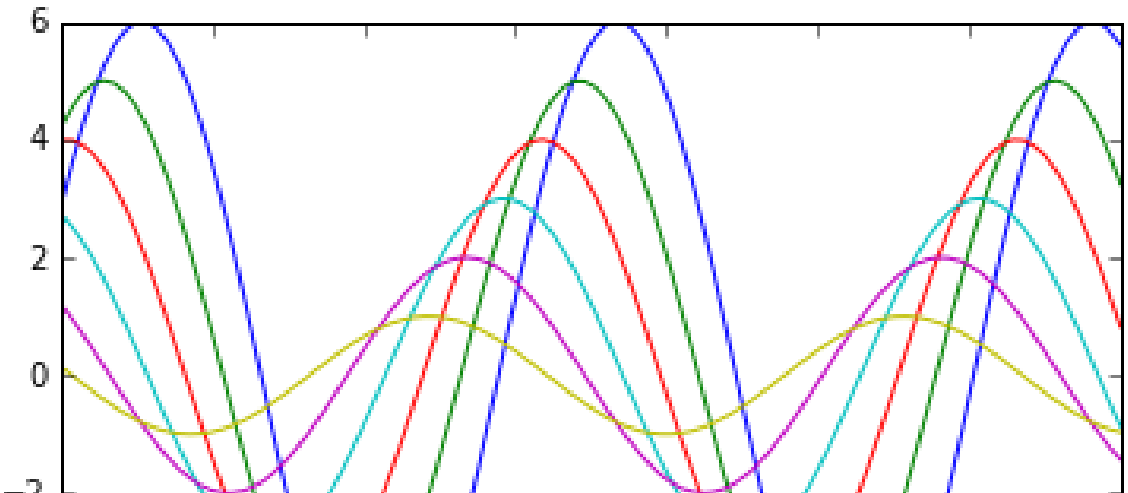
Lets define a simple function to plot some offset sine waves, which will help us see the different stylistic parameters we can tweak.

```
def sinplot(flip=1):
    x = np.linspace(0, 14, 100)
    for i in range(1, 7):
        plt.plot(x, np.sin(x + i * .5) * (7 - i) * flip
```

This is what the plot looks like with matplotlib defaults:
sinplot()



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To switch to seaborn defaults, simply import the package.

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```
import seaborn as sns
sinplot()
```

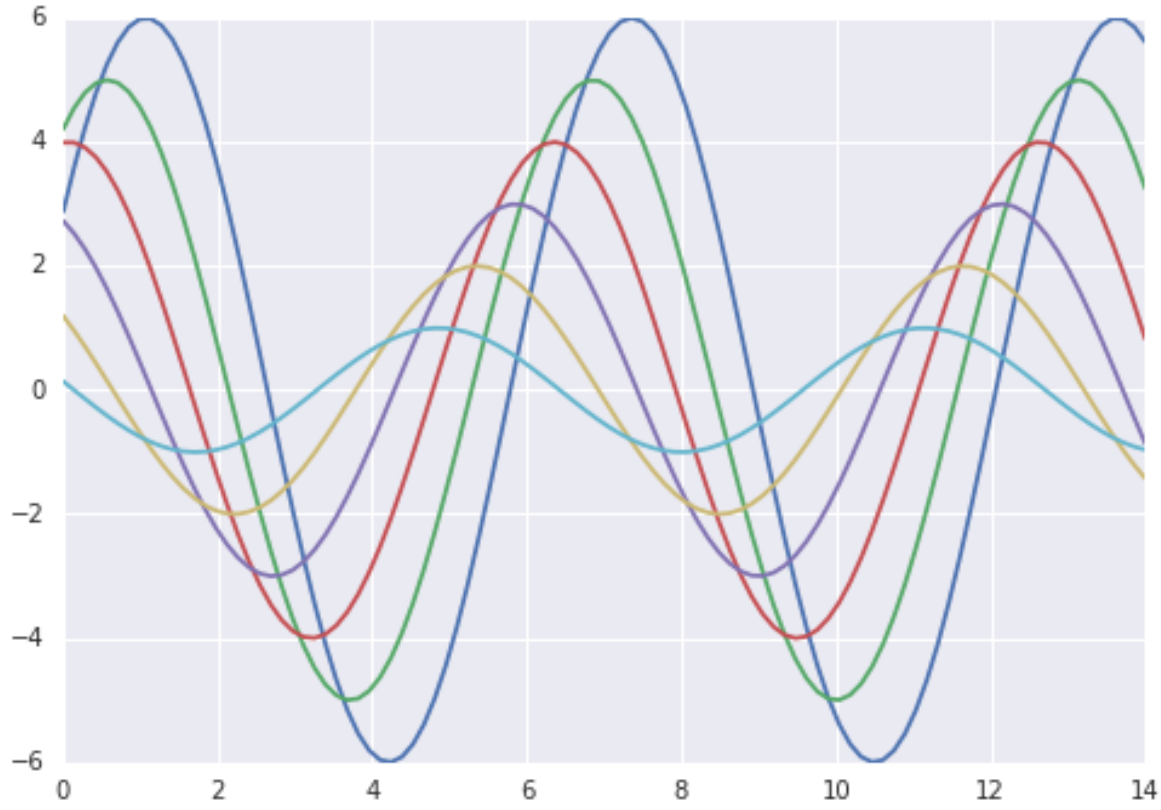

Figure:

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- The seaborn defaults break from the MATLAB inspired aesthetic of matplotlib to plot in more muted colors over a light gray background with white grid lines.
- We find that the grid aids in the use of figures for conveying quantitative information in almost all cases, figures should be preferred to tables.
- The white-on-gray grid that is used by default avoids being obtrusive.
- The grid is particularly useful in giving structure to figures with multiple facets, which is central to some of the more complex tools in the library.

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- Seaborn splits matplotlib parameters into two independent groups.
- The first group sets the aesthetic style of the plot, and the second scales various elements of the figure so that it can be easily incorporated into different contexts.

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- The interface for manipulating these parameters are two pairs of functions.
- To control the style, use the `axes_style()` and `set_style()` functions.
- To scale the plot, use the `plotting_context()` and `set_context()` functions.
- In both cases, the first function returns a dictionary of parameters and the second sets the matplotlib defaults.

Styling figures with `axes_style()` and `set_style()`

- There are five preset seaborn themes: darkgrid, whitegrid, dark, white, and ticks. They are each suited to different applications and personal preferences. The default theme is darkgrid.
- As mentioned above, the grid helps the plot serve as a lookup table for quantitative information, and the white-on grey helps to keep the grid from competing with lines that represent data.
- The whitegrid theme is similar, but it is better suited to plots with heavy data elements:

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```
sns.set_style("whitegrid")
data = np.random.normal(size=(20, 6)) + np.arange(6) /
sns.boxplot(data=data);
```

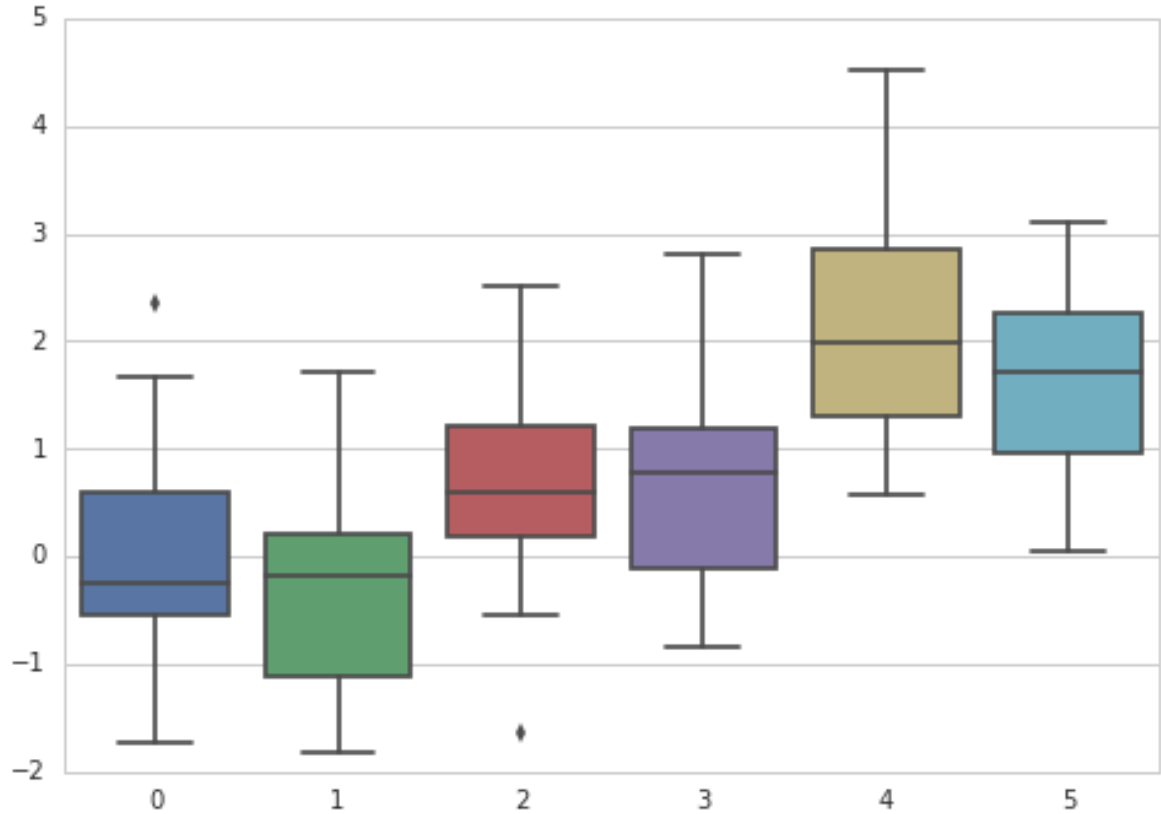

Figure:

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For many plots, (especially for settings like talks, where you primarily want to use figures to provide impressions of patterns in the data), the grid is less necessary.

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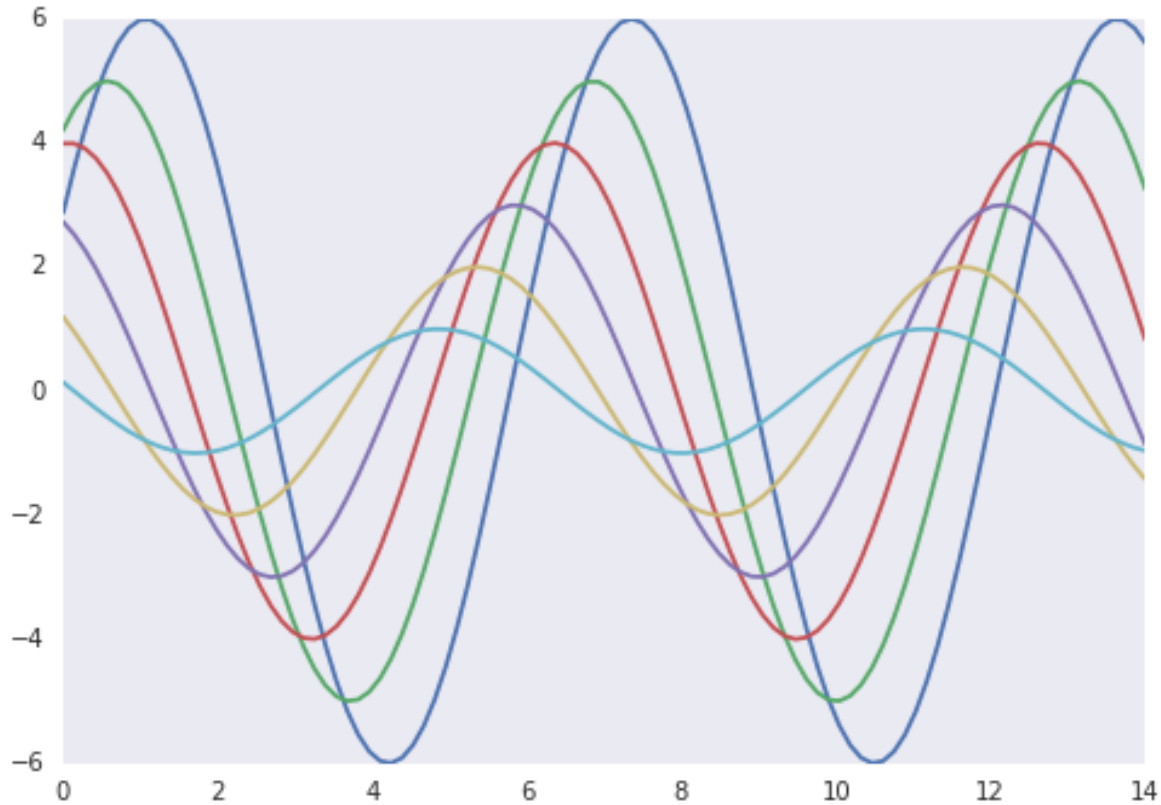
```
sns.set_style("dark")
sinplot()
```



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```
sns.set_style("white")
sinplot()
```

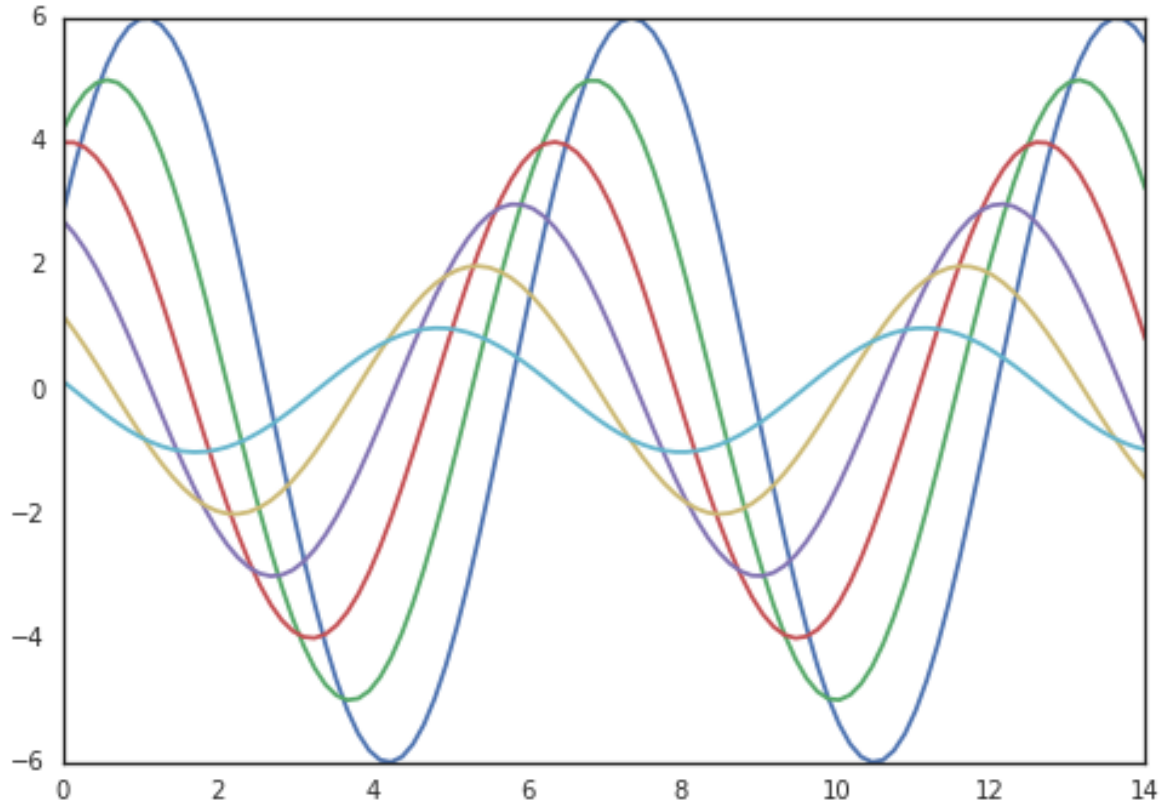

Figure:

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Sometimes you might want to give a little extra structure to the plots, which is where ticks come in handy:

```
sns.set_style("ticks")
sinplot()
```

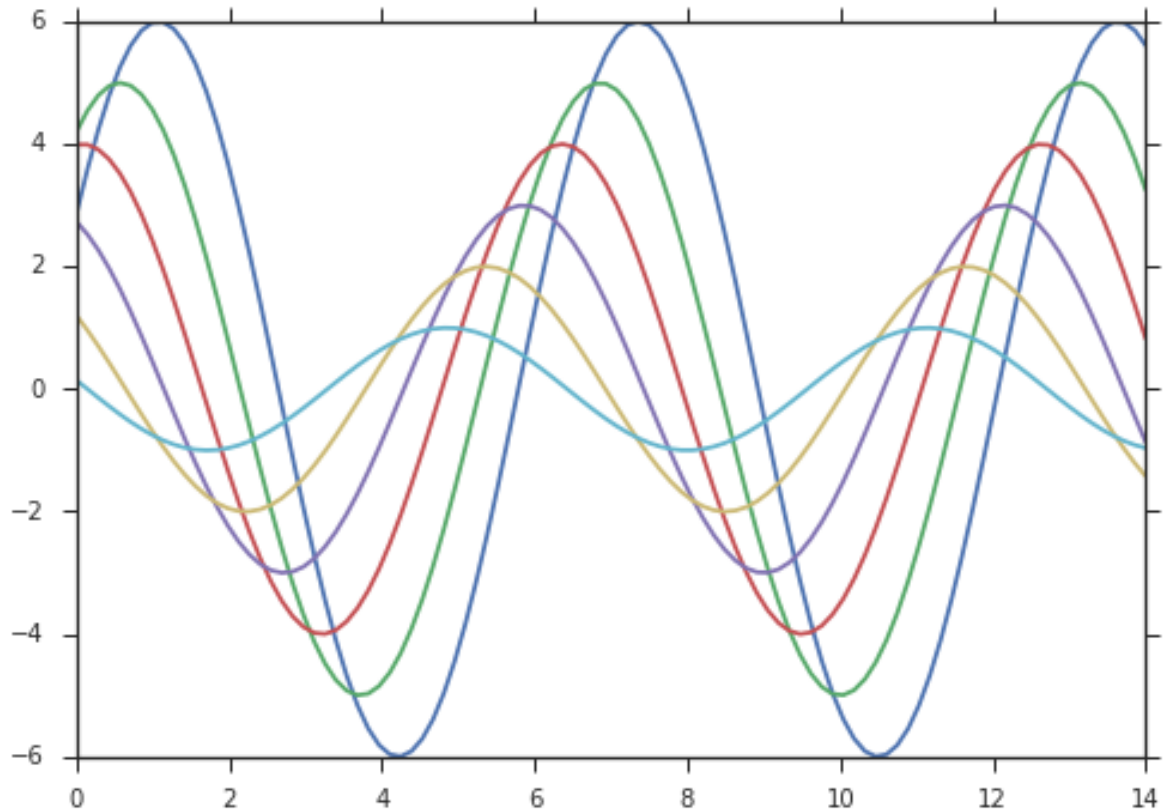

Figure:

Removing spines with despine()

- Both the white and ticks styles can benefit from removing the top and right axes spines, which are not needed.
- Its impossible to do this through the matplotlib parameters, but you can call the seaborn function `despine()` to remove them:

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```
sinplot()
sns.despine()
```

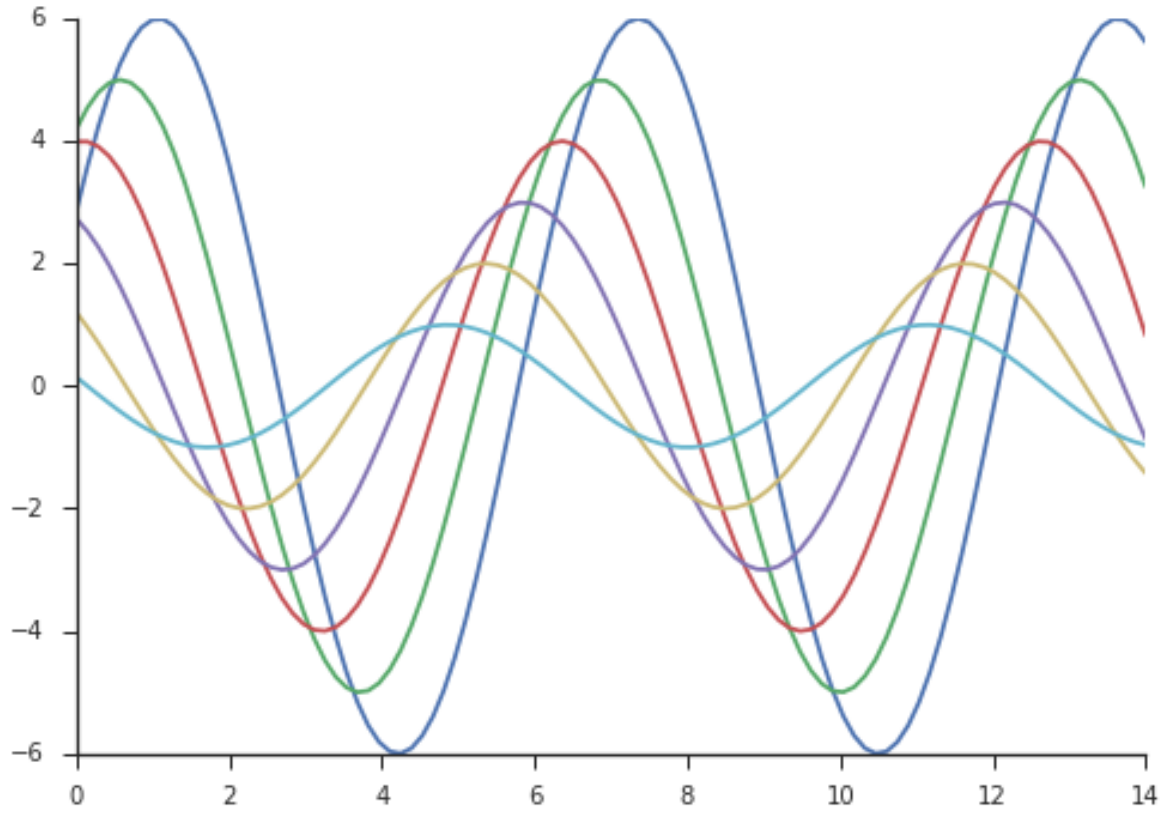

Figure: