Chapter 5 - Basic Math and Statistics

Segment 5 - Starting with parametric methods in pandas and scipy

```
import pandas as pd
import numpy as np

import matplotlib.pyplot as plt
import seaborn as sb
from pylab import rcParams

import scipy
from scipy.stats.stats import pearsonr


%matplotlib inline
rcParams['figure.figsize'] = 8,4
plt.style.use('seaborn-whitegrid')
```

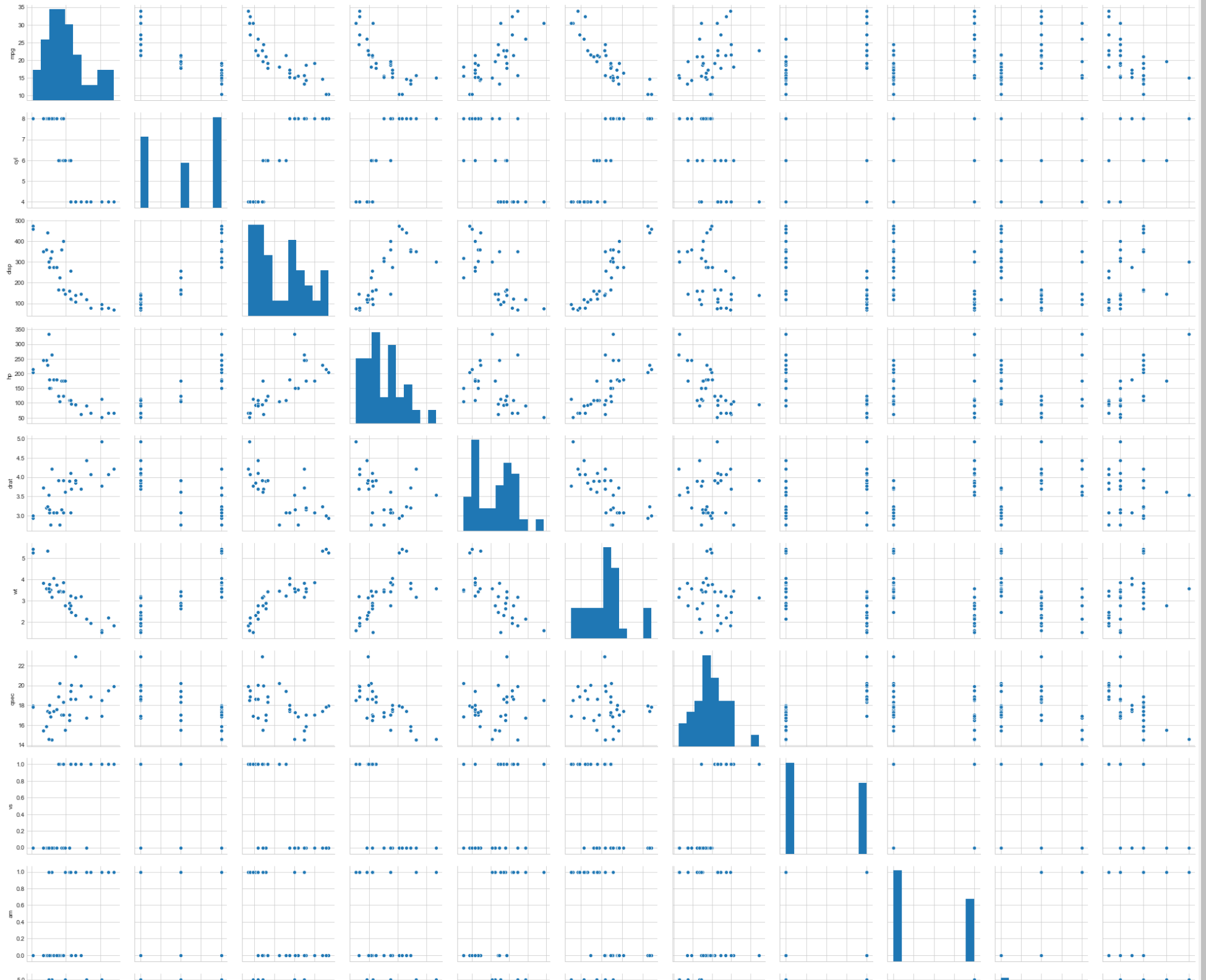
The Pearson Correlation

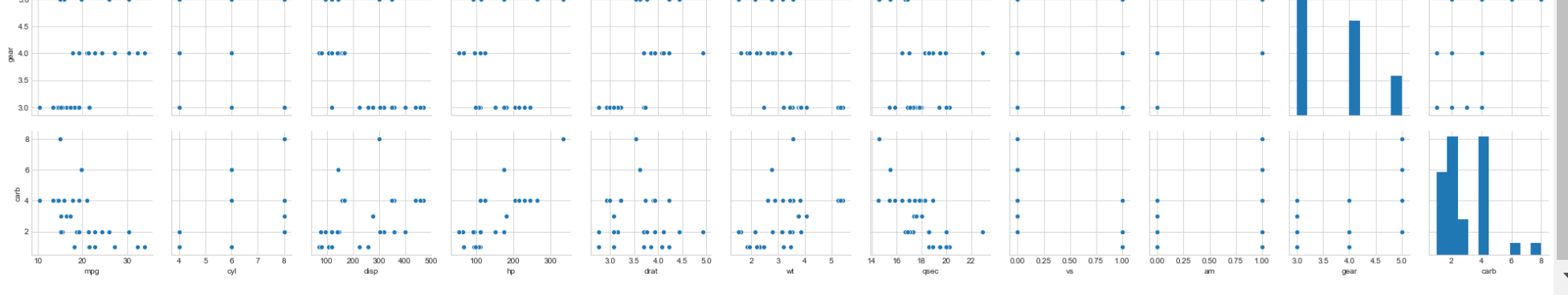
```
address = 'C:/Users/Lillian/Desktop/ExerciseFiles/Data/mtcars.csv'

cars = pd.read_csv(address)
cars.columns = ['car_names','mpg','cyl','disp','hp','drat','wt','qsec','vs','am','gear','carb']


sb.pairplot(cars)
```

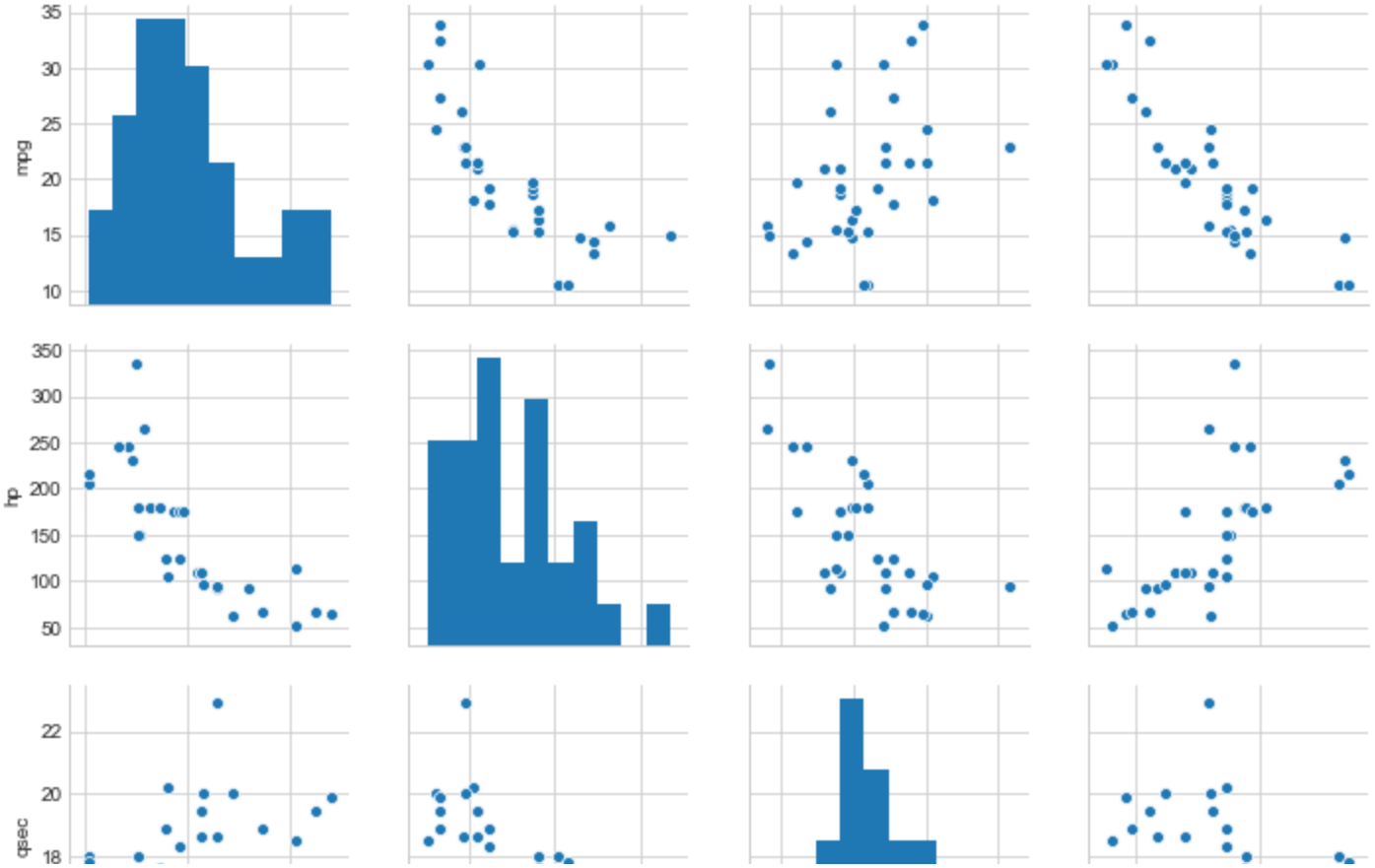
<seaborn.axisgrid.PairGrid at 0x27f96e200b8>






```
X = cars[['mpg', 'hp', 'qsec', 'wt']]
sb.pairplot(X)
```

```
<seaborn.axisgrid.PairGrid at 0x27f9ca9b550>
```



Using scipy to calculate the Pearson correlation coefficient

```
mpg = cars['mpg']
hp = cars['hp']
qsec = cars['qsec']
wt = cars['wt']

pearsonr_coefficient, p_value = pearsonr(mpg, hp)
print('PeasonR Correlation Coefficient %0.3f'% (pearsonr_coefficient))
```

```
PeasonR Correlation Coefficient -0.776
```

```
pearsonr_coefficient, p_value = pearsonr(mpg, qsec)
print('PeasonR Correlation Coefficient %0.3f'% (pearsonr_coefficient))
```

```
PeasonR Correlation Coefficient 0.419
```

```
pearsonr_coefficient, p_value = pearsonr(mpg, wt)
print('PeasonR Correlation Coefficient %0.3f'% (pearsonr_coefficient))
```

```
PeasonR Correlation Coefficient -0.868
```

Using pandas to calculate the Pearson correlation coefficient

```
corr = X.corr()
corr
```

	mpg	hp	qsec	wt
mpg	1.000000	-0.776168	0.418684	-0.867659
hp	-0.776168	1.000000	-0.708223	0.658748
qsec	0.418684	-0.708223	1.000000	-0.174716
wt	-0.867659	0.658748	-0.174716	1.000000

Using Seaborn to visualize the Pearson correlation coefficient

```
sb.heatmap(corr, xticklabels=corr.columns.values, yticklabels= corr.columns.values)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x27f9e6c5c88>
```