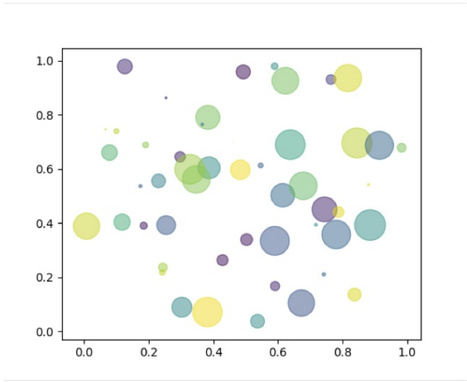
INTRO TO PYTHON FOR FINANCE

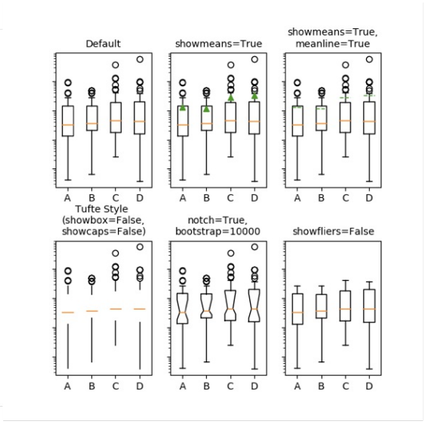
Visualization in Python

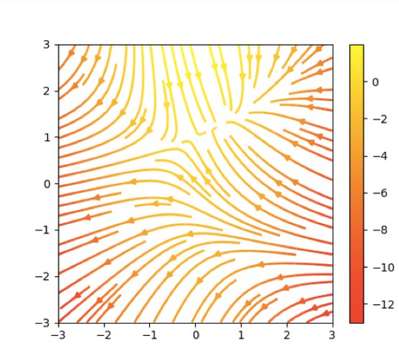
Adina Howe
Instructor

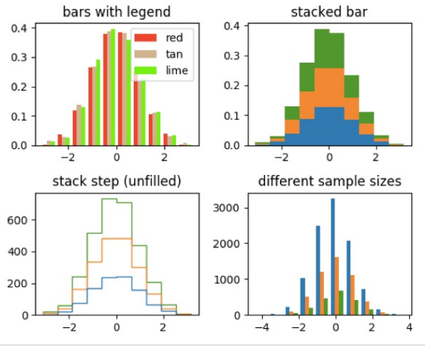
Matplotlib: A visualization package

See more of the Matplotlib gallery by clicking this link.









matplotlib.pyplot - diverse plotting functions

```
import matplotlib.pyplot as plt
```

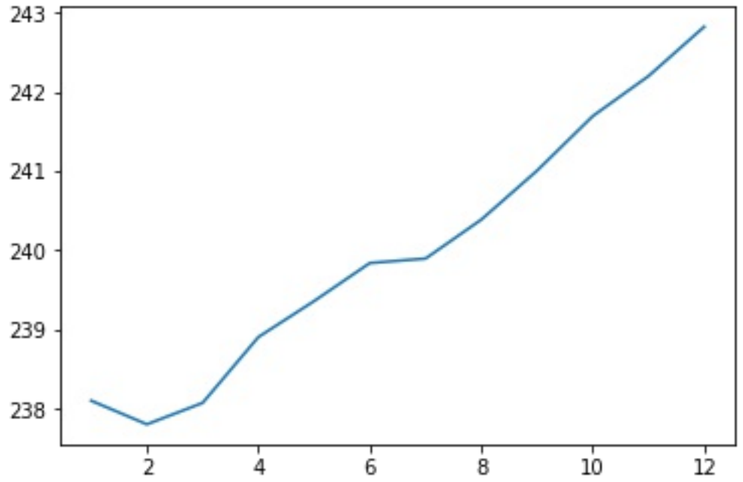
matplotlib.pyplot - diverse plotting functions

- **plt.plot()**
  - takes arguments that describe the data to be plotted
- **plt.show()**
  - displays plot to screen

Plotting with pyplot

```
import matplotlib.pyplot as plt
plt.plot(months, prices)
plt.show()
```

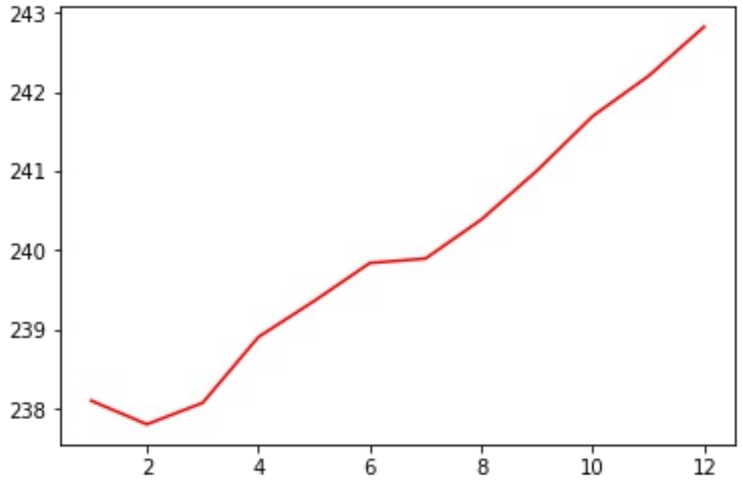
Plot result



Red solid line

```
import matplotlib.pyplot as plt
plt.plot(months, prices, color = 'red')
plt.show()
```

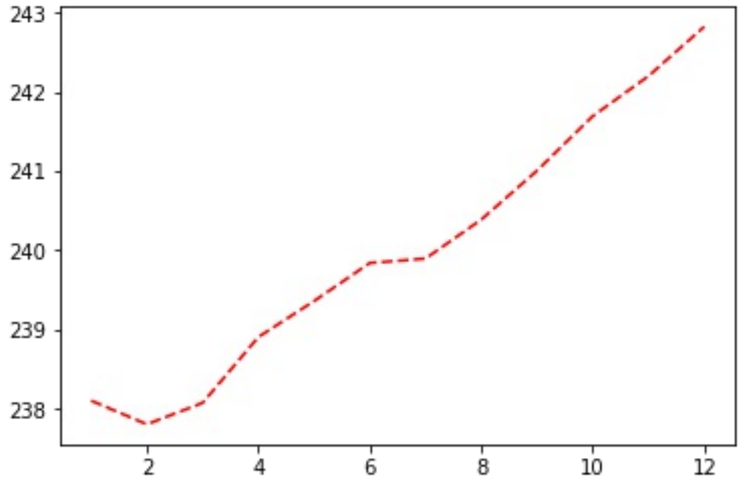
Plot result



Dashed line

```
import matplotlib.pyplot as plt
plt.plot(months, prices, color = 'red', linestyle = '--')
plt.show()
```

Plot result



Colors and linestyles

	color
'green'	green
'red'	red
'cyan'	cyan
'blue'	blue

	linestyle
'-'	solid line
'--'	dashed line
'-.'	dashed dot line
':'	dotted

More documentation on colors and lines can be found here.

Adding Labels and Titles

```
import matplotlib.pyplot as plt
plt.plot(months, prices, color = 'red', linestyle = '--')

# Add labels
plt.xlabel('Months')
plt.ylabel('Consumer Price Indexes, $')
plt.title('Average Monthly Consumer Price Indexes')

# Show plot
plt.show()
```

Plot result


Average Monthly Consumer Price Indexes
Consumer Price Indexes, $
243
242
241
240
239
238
2
4
6
8
10
12
Months

Adding additional lines

```
import matplotlib.pyplot as plt
plt.plot(months, prices, color = 'red', linestyle = '--')

# adding an additional line
plt.plot(months, prices_new, color = 'green', linestyle = '--')

plt.xlabel('Months')
plt.ylabel('Consumer Price Indexes, $')
plt.title('Average Monthly Consumer Price Indexes')
plt.show()
```

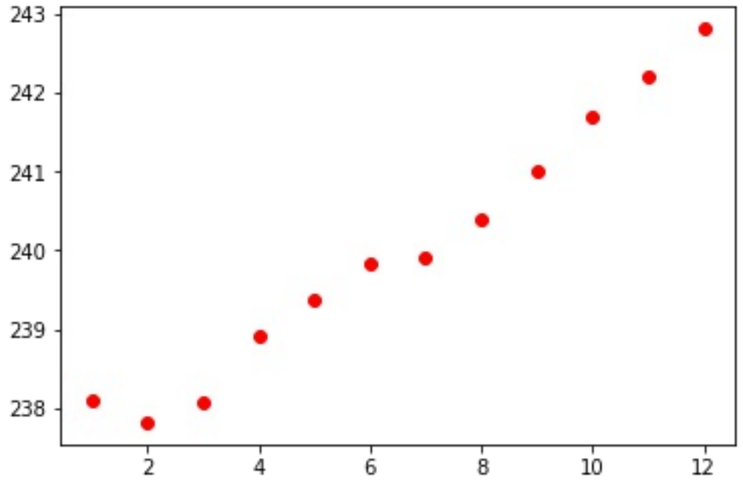
Plot result


Average Monthly Consumer Price Indexes
Consumer Price Indexes, $
270
260
250
240
230
220
210
2
4
6
8
10
12
Months

Scatterplots

```
import matplotlib.pyplot as plt
plt.scatter(x = months, y = prices, color = 'red')
plt.show()
```

Scatterplot result



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Let's practice!

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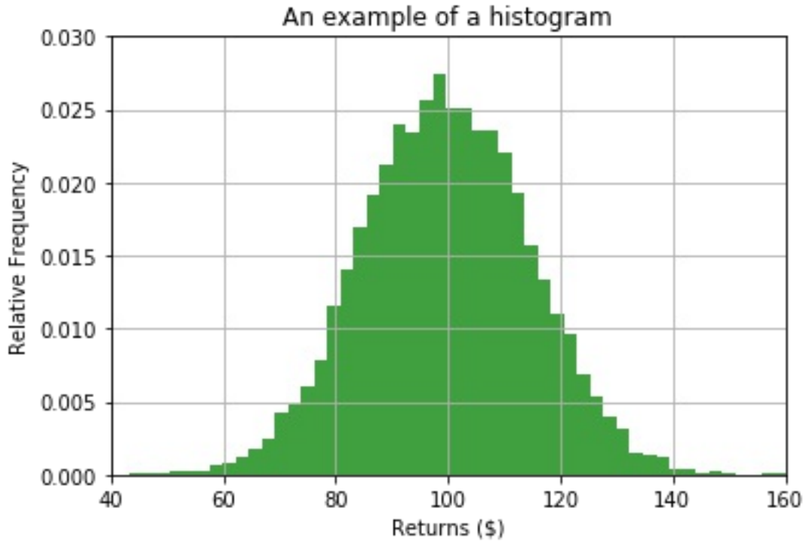
Histograms

Adina Howe
Instructor

Why histograms for financial analysis?

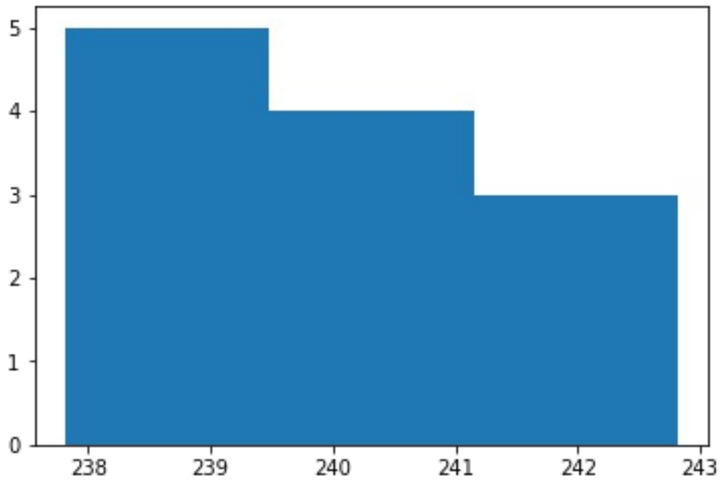


Histograms and Data

- Is your data skewed?
- Is your data centered around the average?
- Do you have any abnormal data points (outliers) in your data?

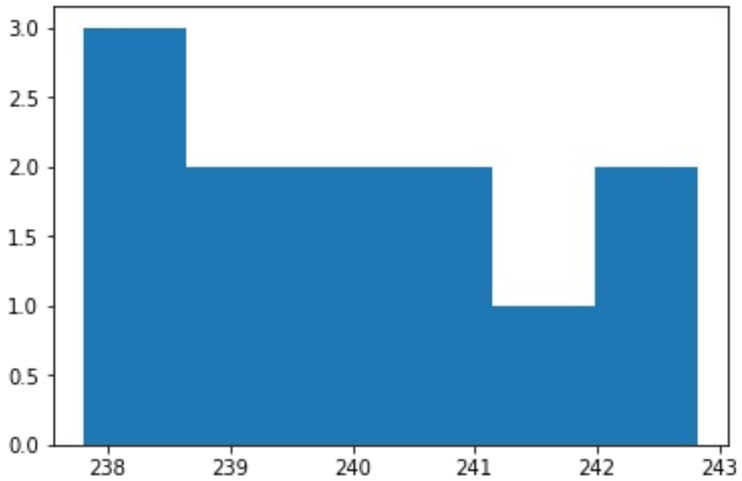
Histograms and matplotlib.pyplot

```
import matplotlib.pyplot as plt
plt.hist(x=prices, bins=3)
plt.show()
```



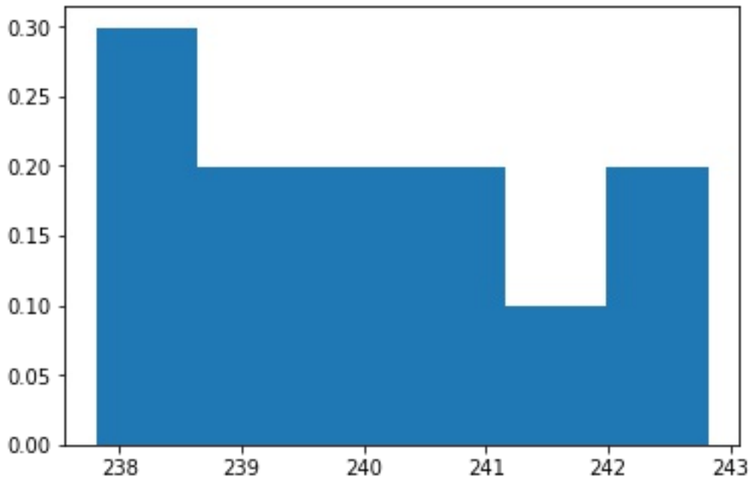
Changing the number of bins

```
import matplotlib.pyplot as plt
plt.hist(prices, bins=6)
plt.show()
```



Normalizing histogram data

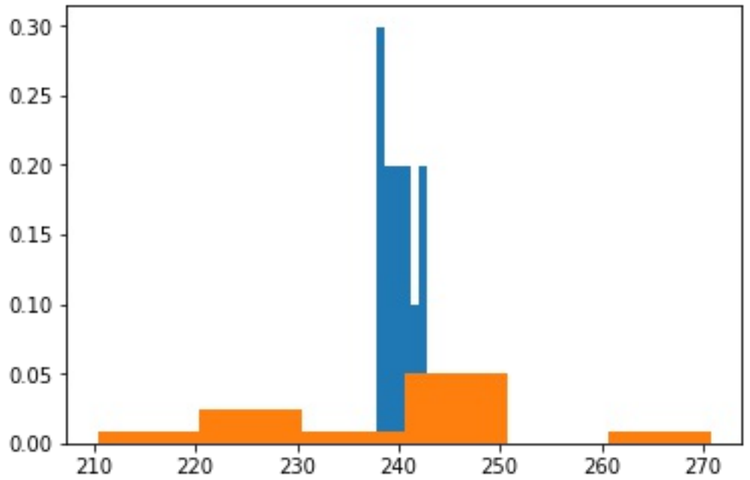
```
import matplotlib.pyplot as plt
plt.hist(prices, bins=6, normed=1)
plt.show()
```



Layering histograms on a plot

```
import matplotlib.pyplot as plt
plt.hist(x=prices, bins=6, normed=1)
plt.hist(x=prices_new, bins=6, normed=1)
plt.show()
```

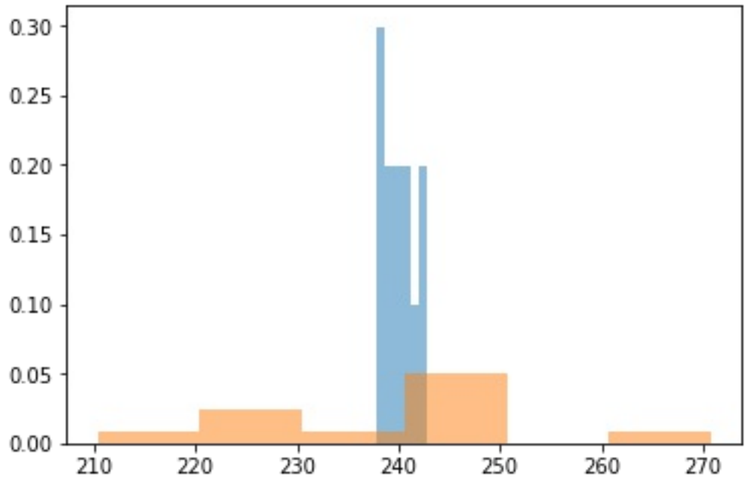
Histogram result



Alpha: Changing transparency of histograms

```
import matplotlib.pyplot as plt
plt.hist(x=prices, bins=6, normed=1, alpha=0.5)
plt.hist(x=prices_new, bins=6, normed=1, alpha=0.5)
plt.show()
```

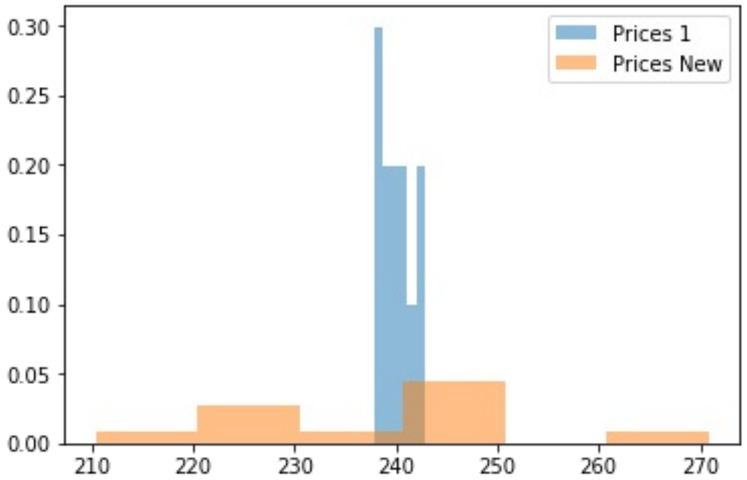
Histogram result



Adding a legend

```
import matplotlib.pyplot as plt
plt.hist(x=prices, bins=6, normed=1, alpha=0.5, label="Prices 1")
plt.hist(x=prices_new, bins=6, normed=1, alpha=0.5, label="Prices New")
plt.legend()
plt.show()
```

Histogram result



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