

Visualization in Python

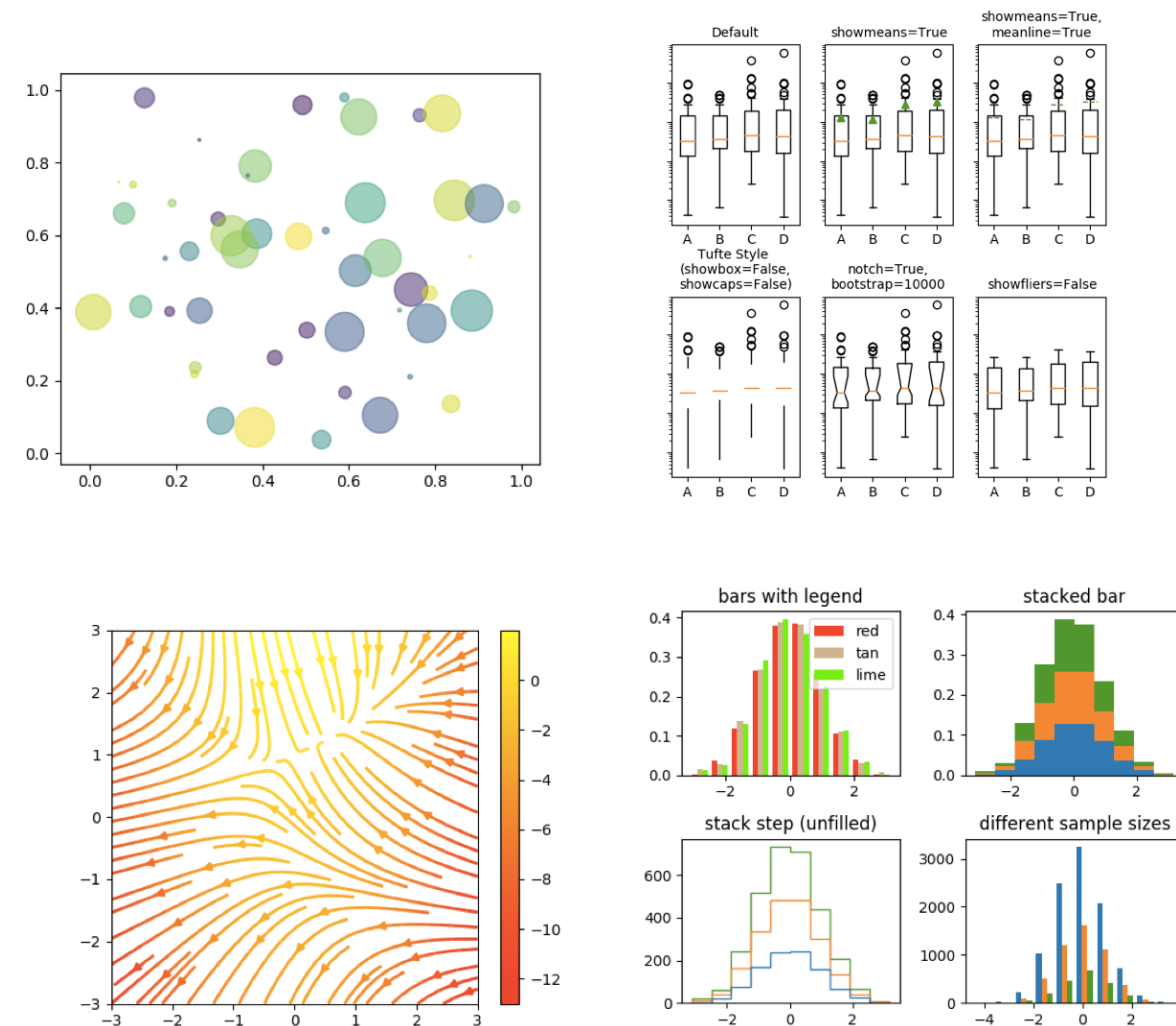
INTRODUCTION TO PYTHON FOR FINANCE



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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
```

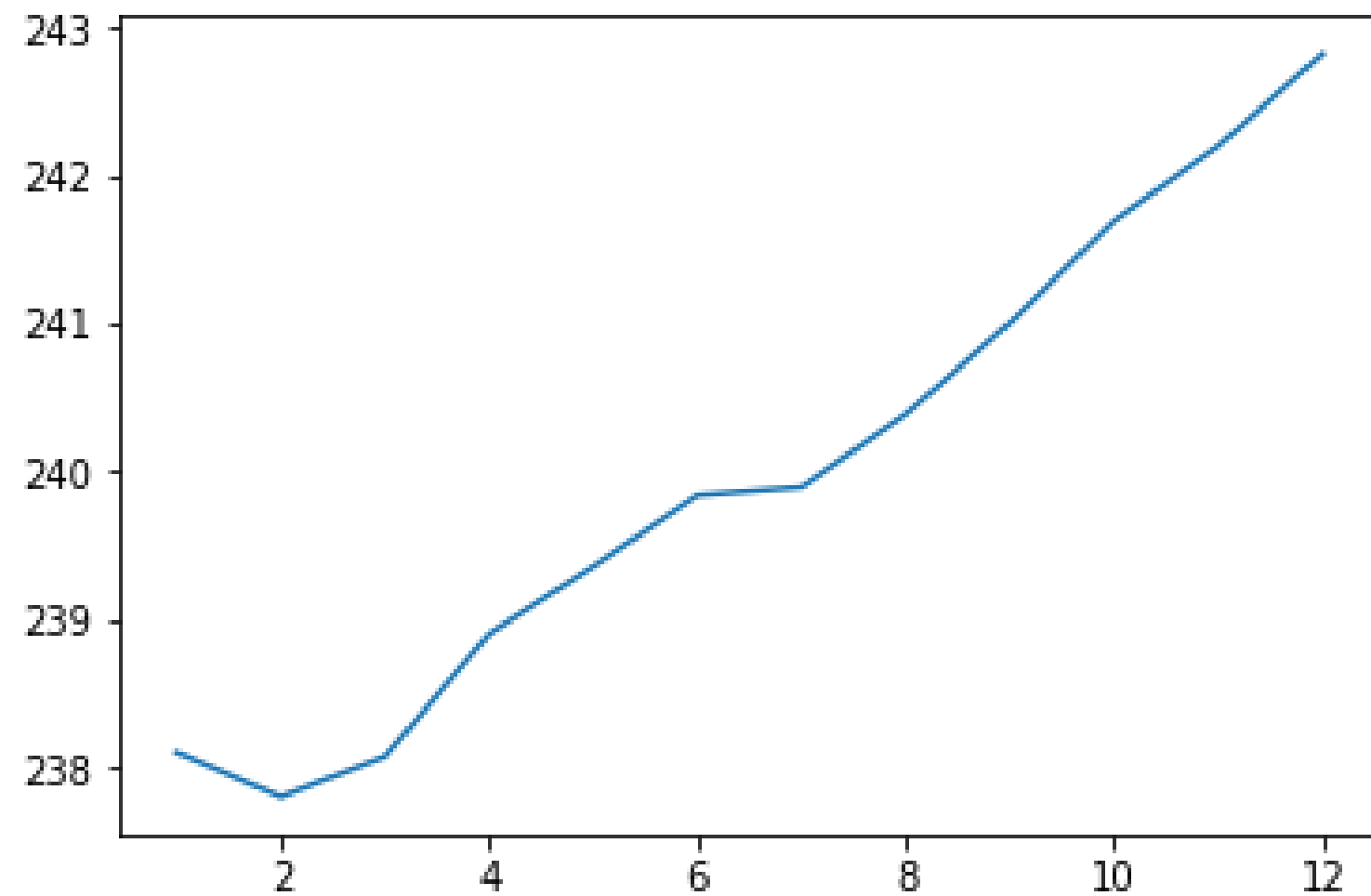
matplotlib.pyplot - diverse plotting functions

- `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()
```

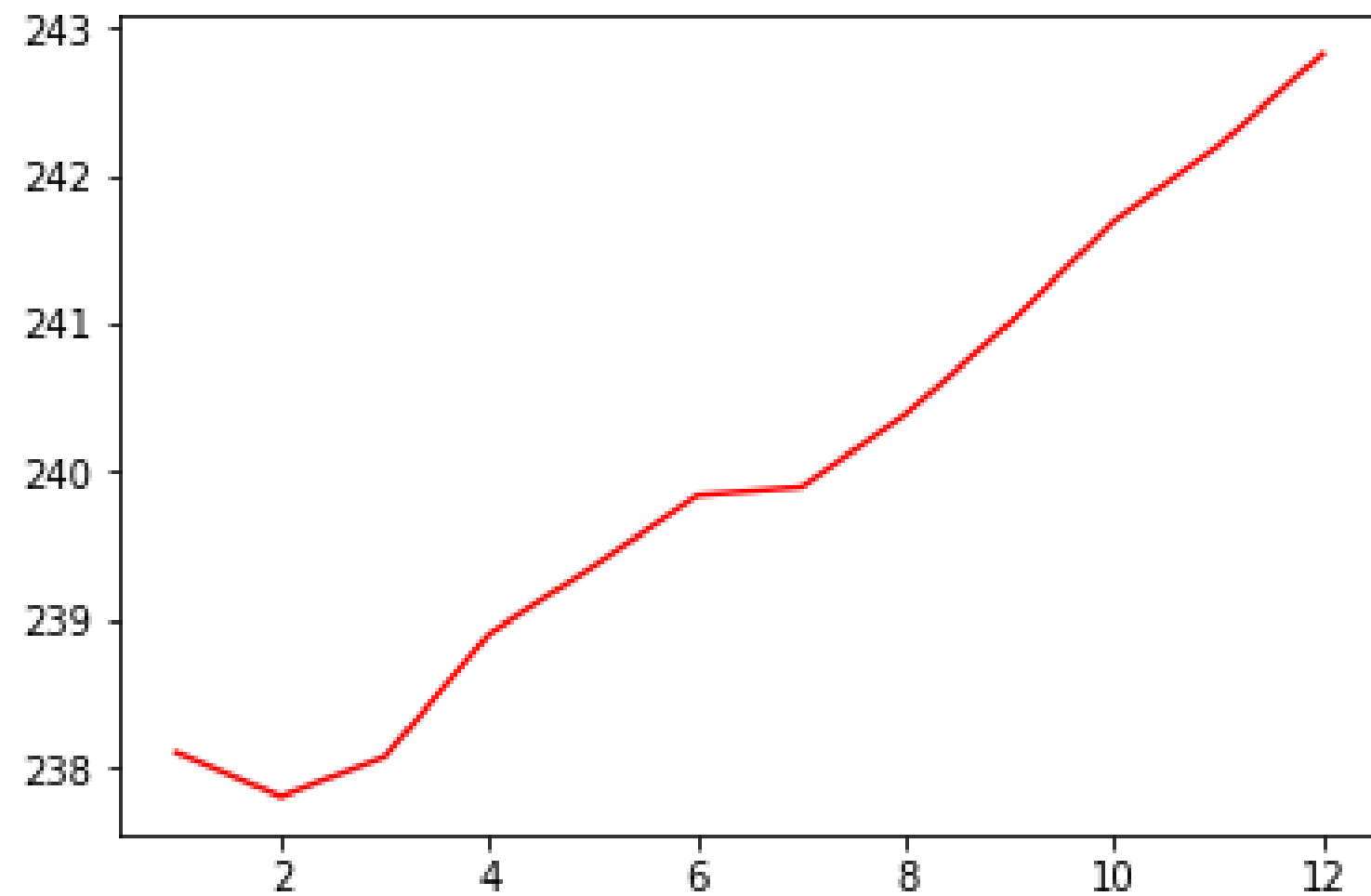
Plot result



Red solid line

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

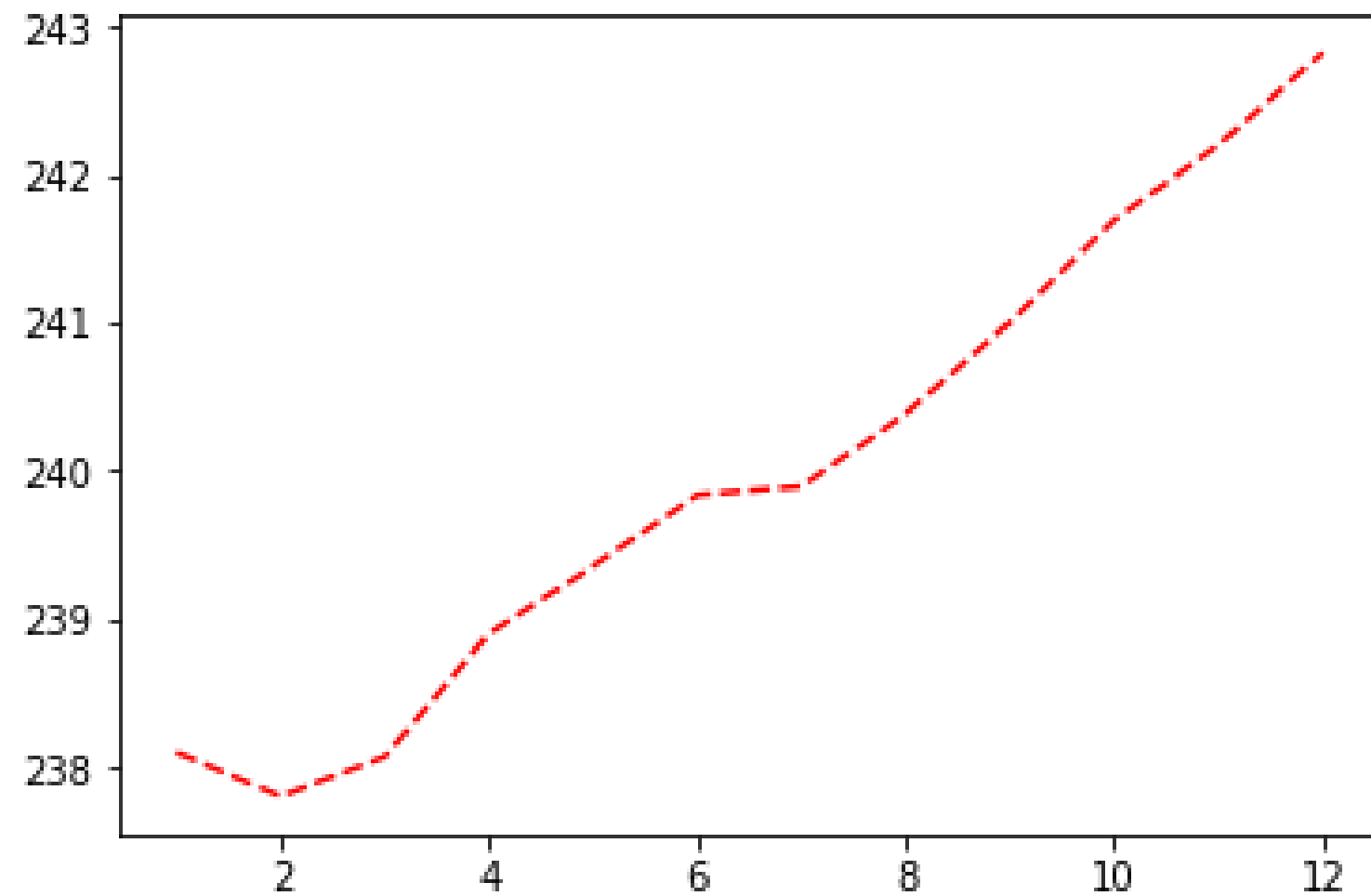
Plot result



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](#).

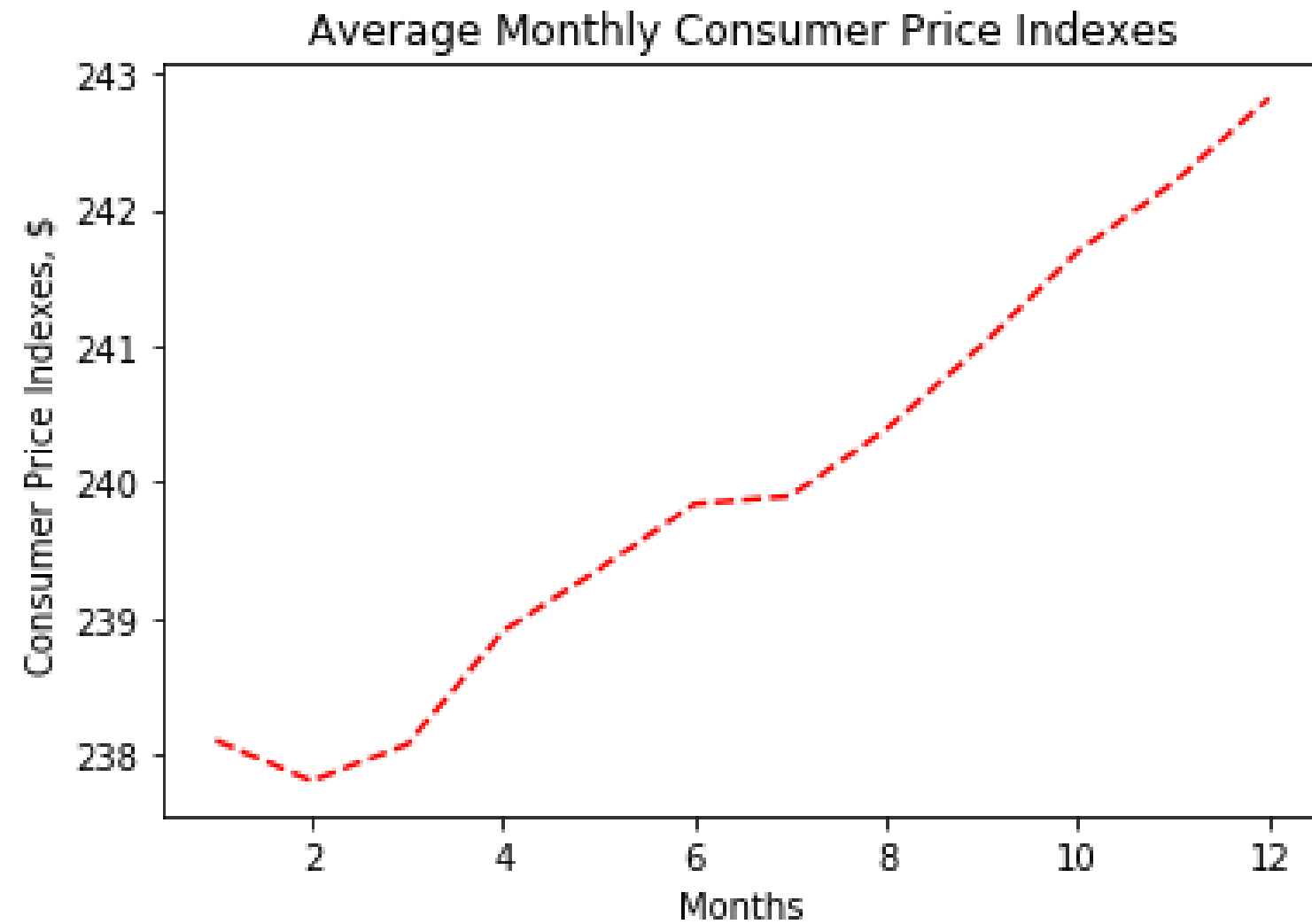
Adding Labels and Titles

```
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



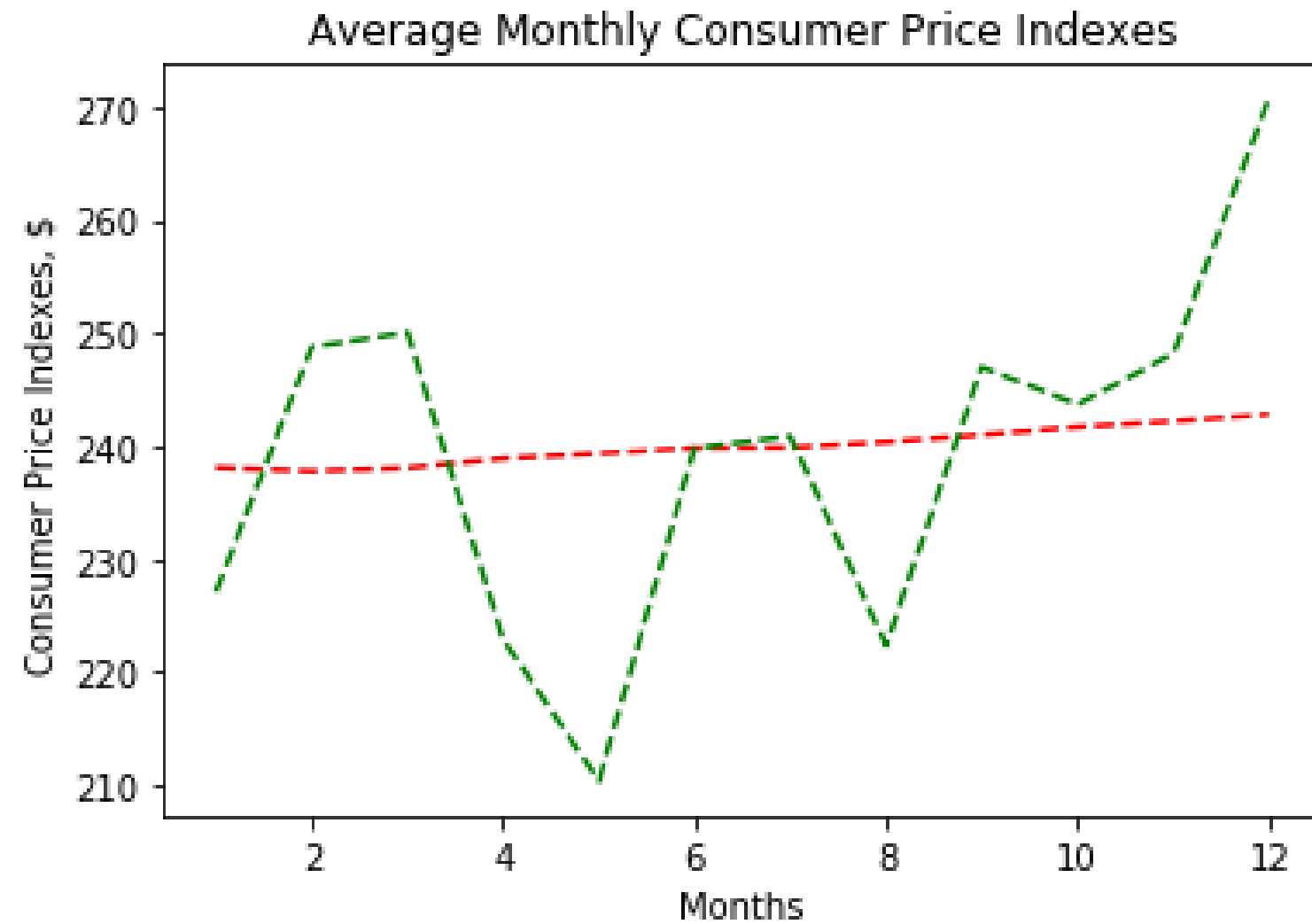
Adding additional lines

```
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()
```

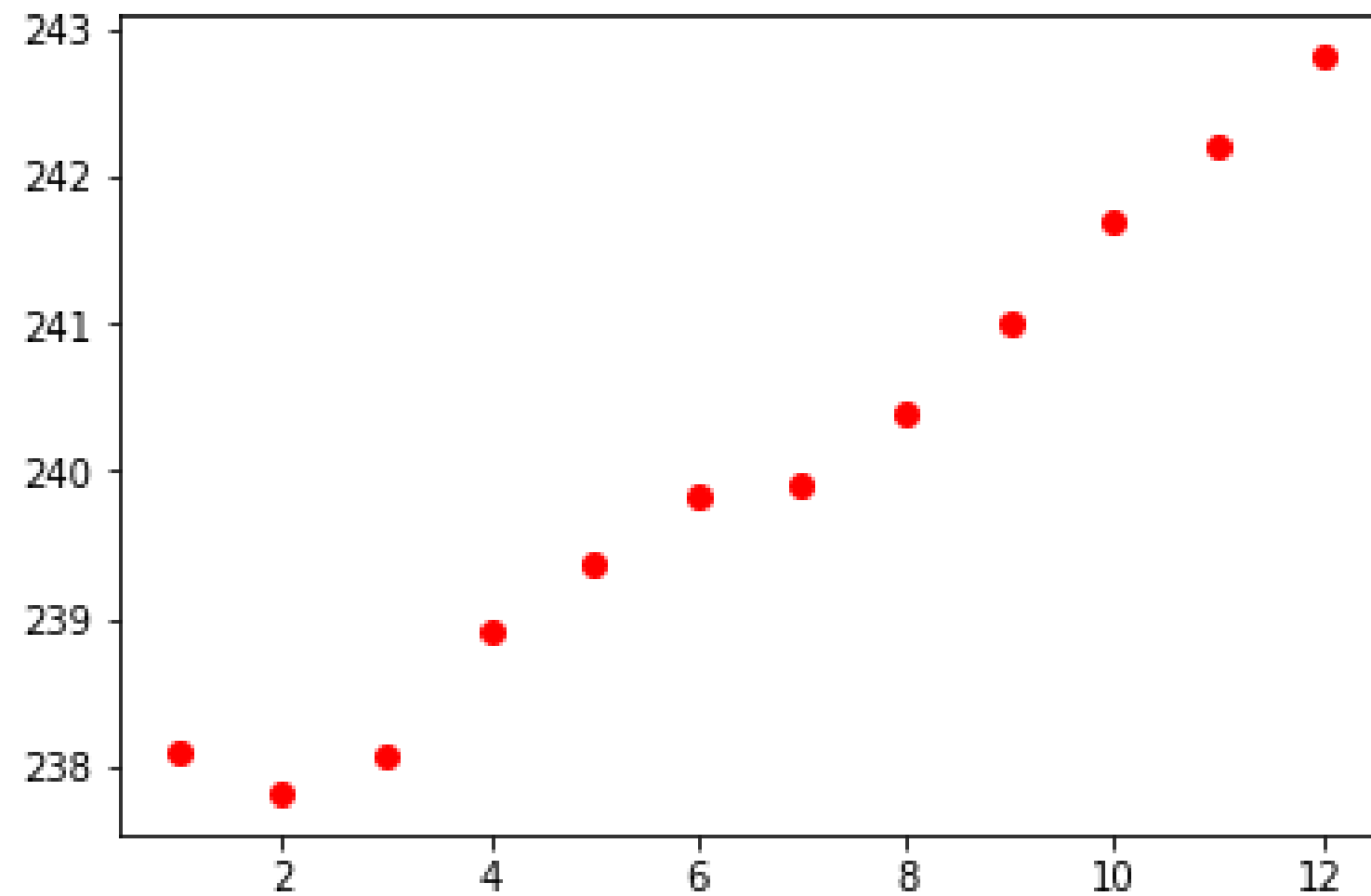
Plot result



Scatterplots

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


Scatterplot result



Let's practice!

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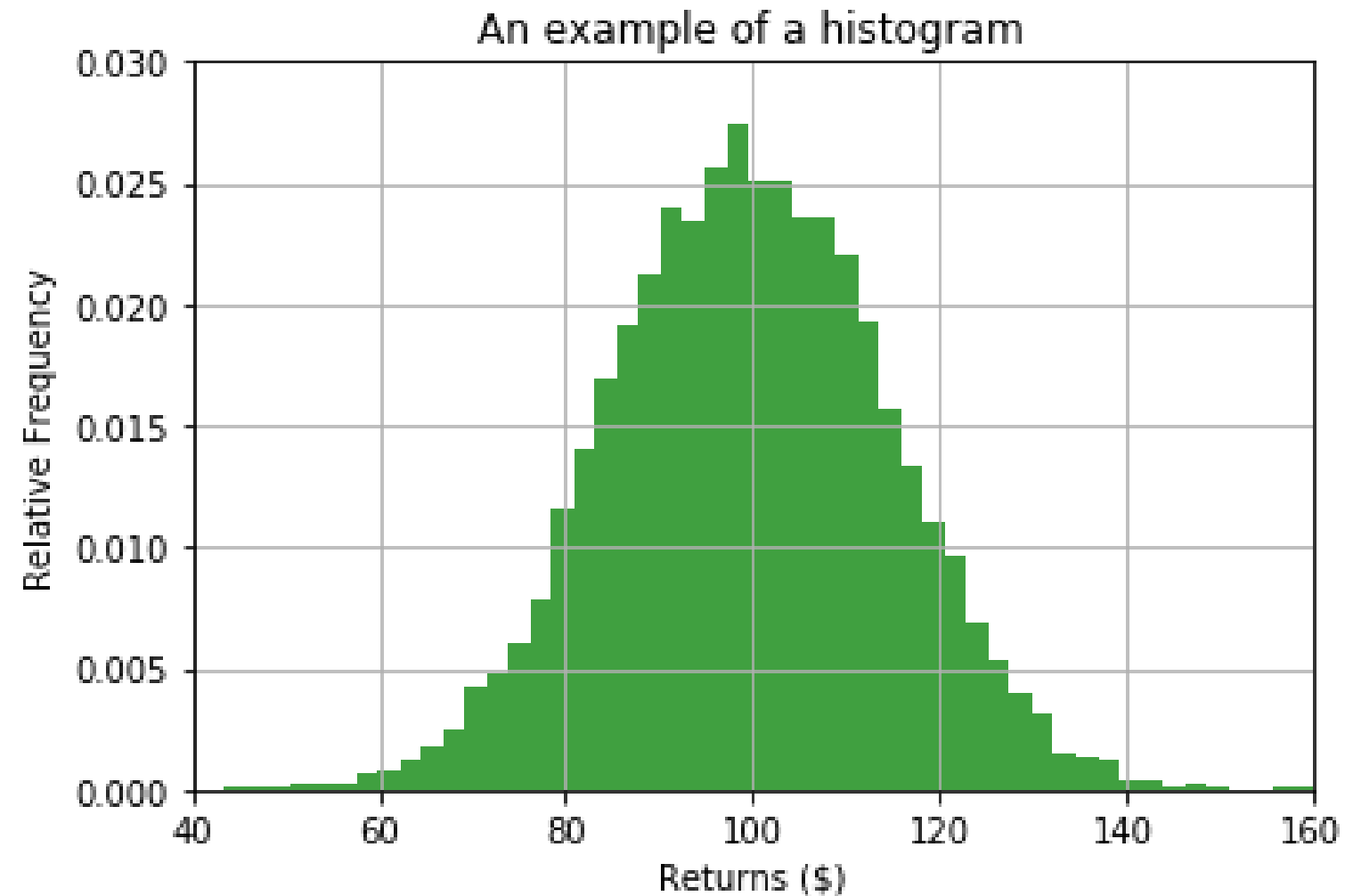
Histograms

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Why histograms for financial analysis?

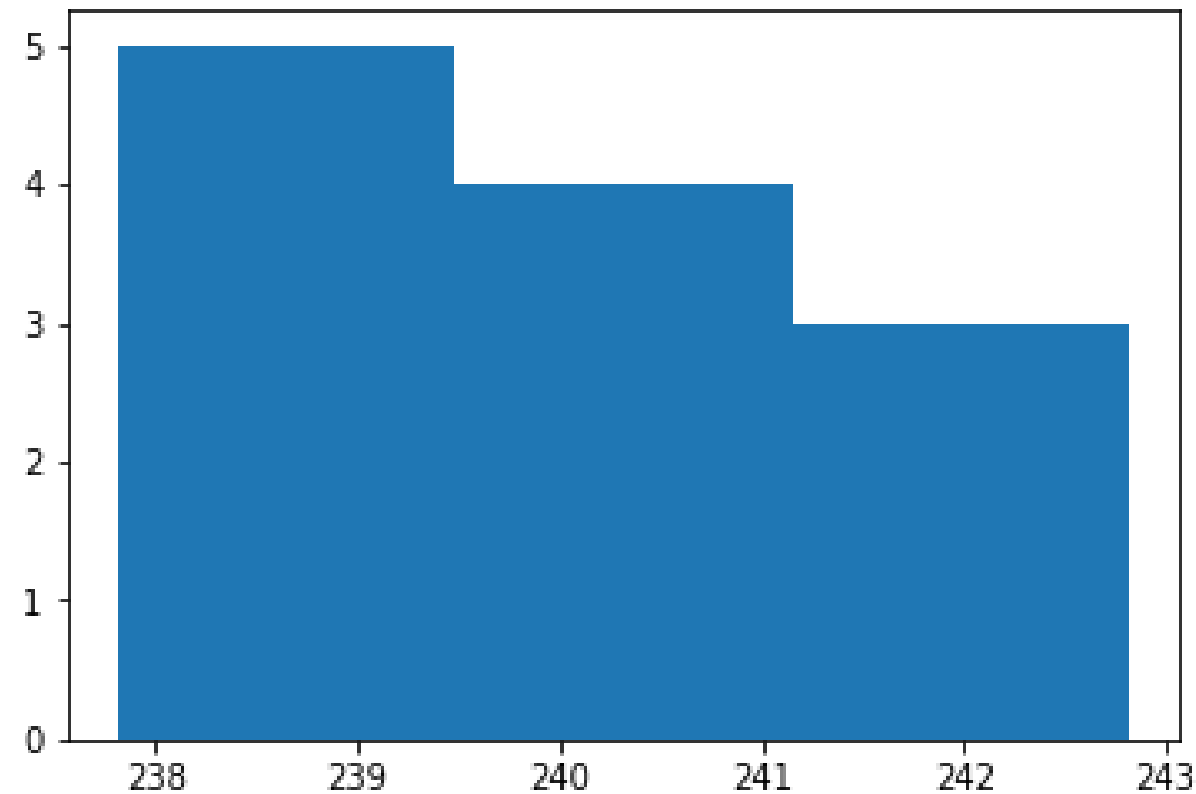


Histograms and Data

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

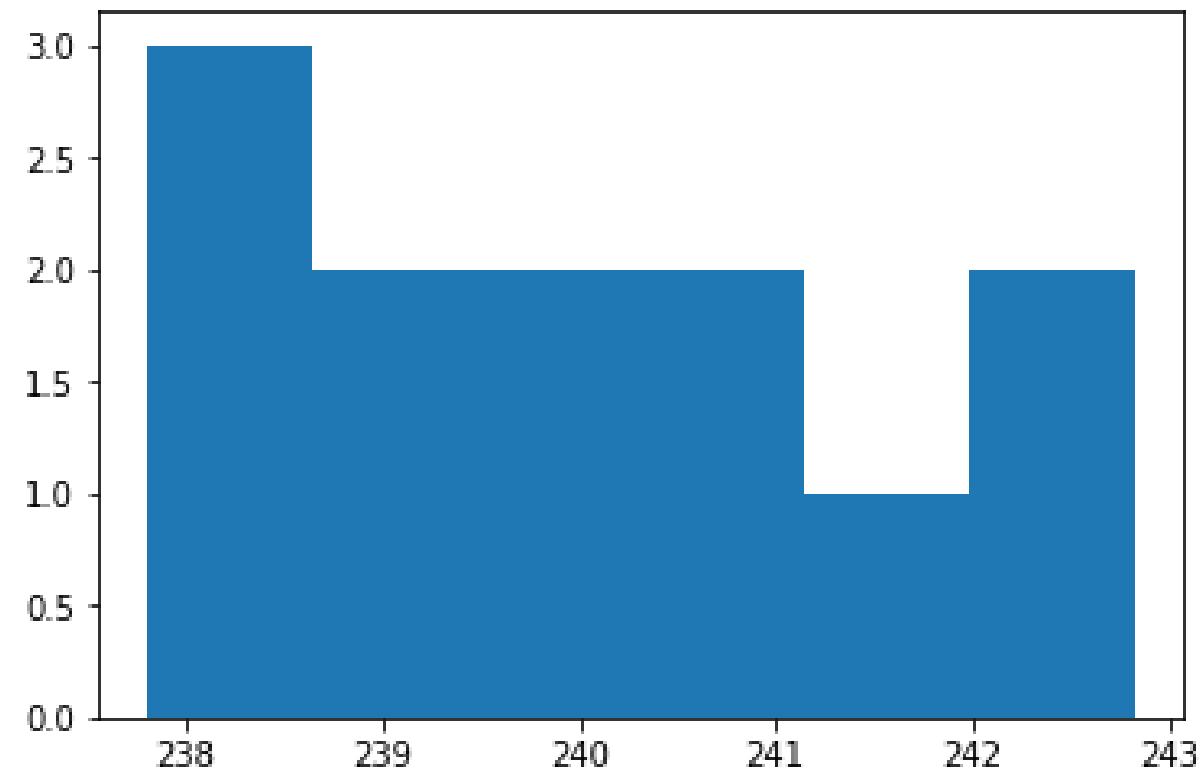
Histograms and matplotlib.pyplot

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



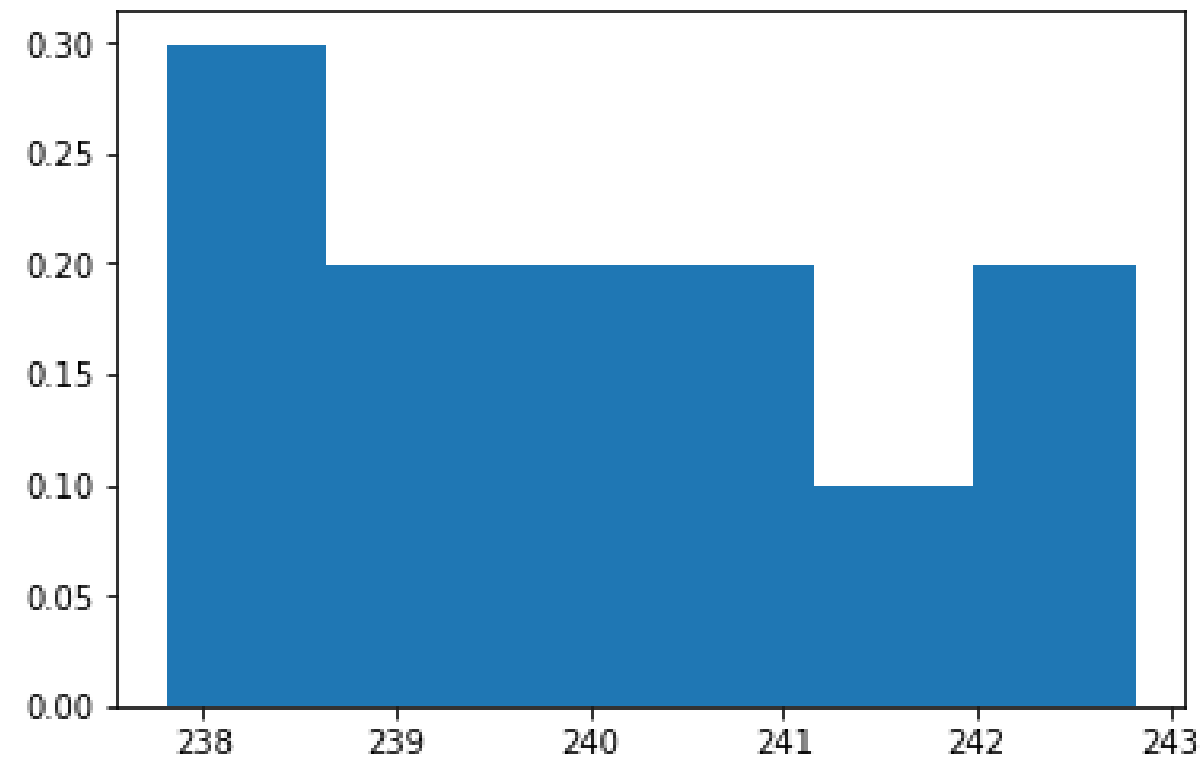
Changing the number of bins

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



Normalizing histogram data

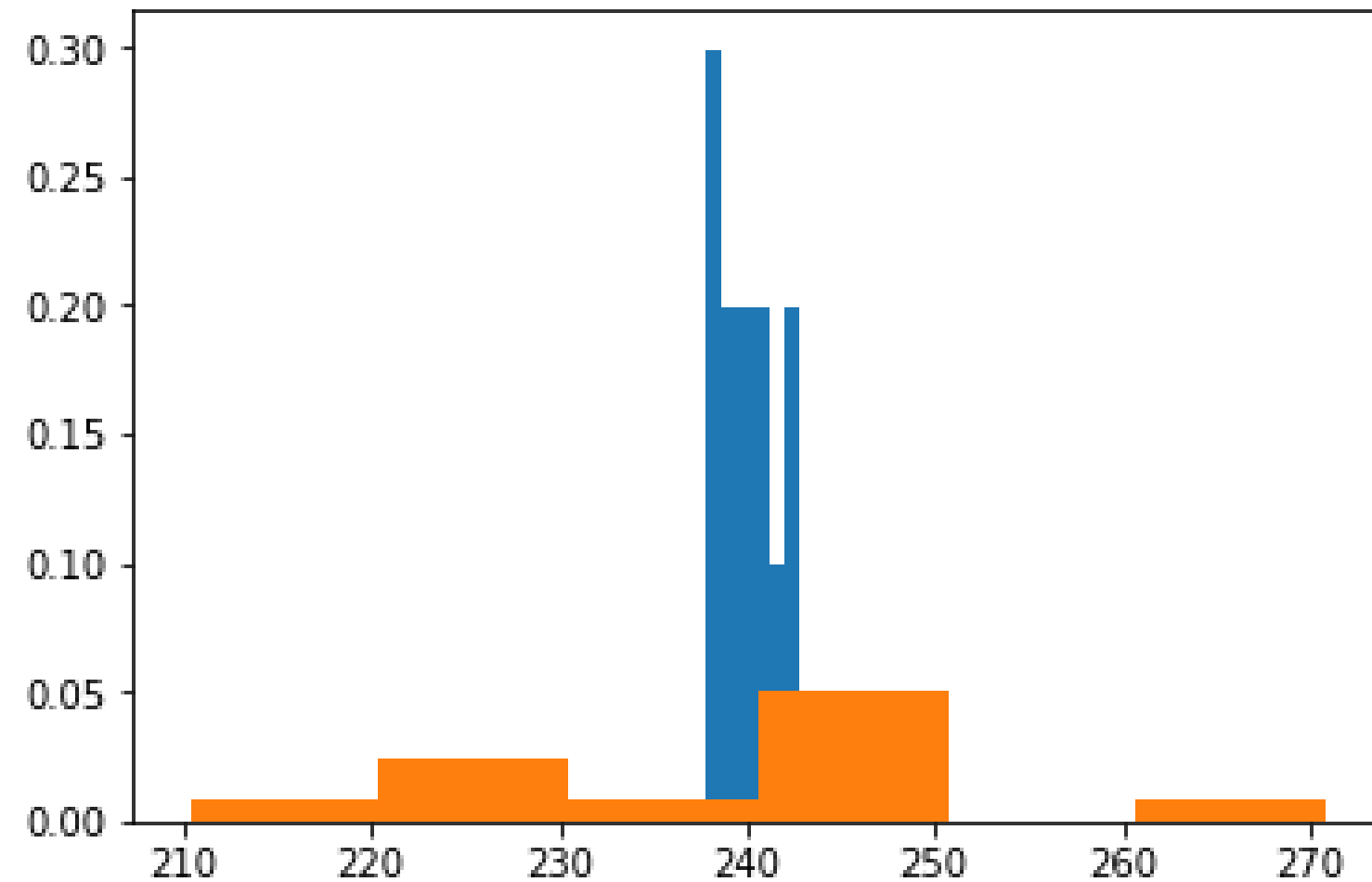
```
import matplotlib.pyplot as plt  
plt.hist(prices, bins=6, normed=1)  
plt.show()
```



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()
```

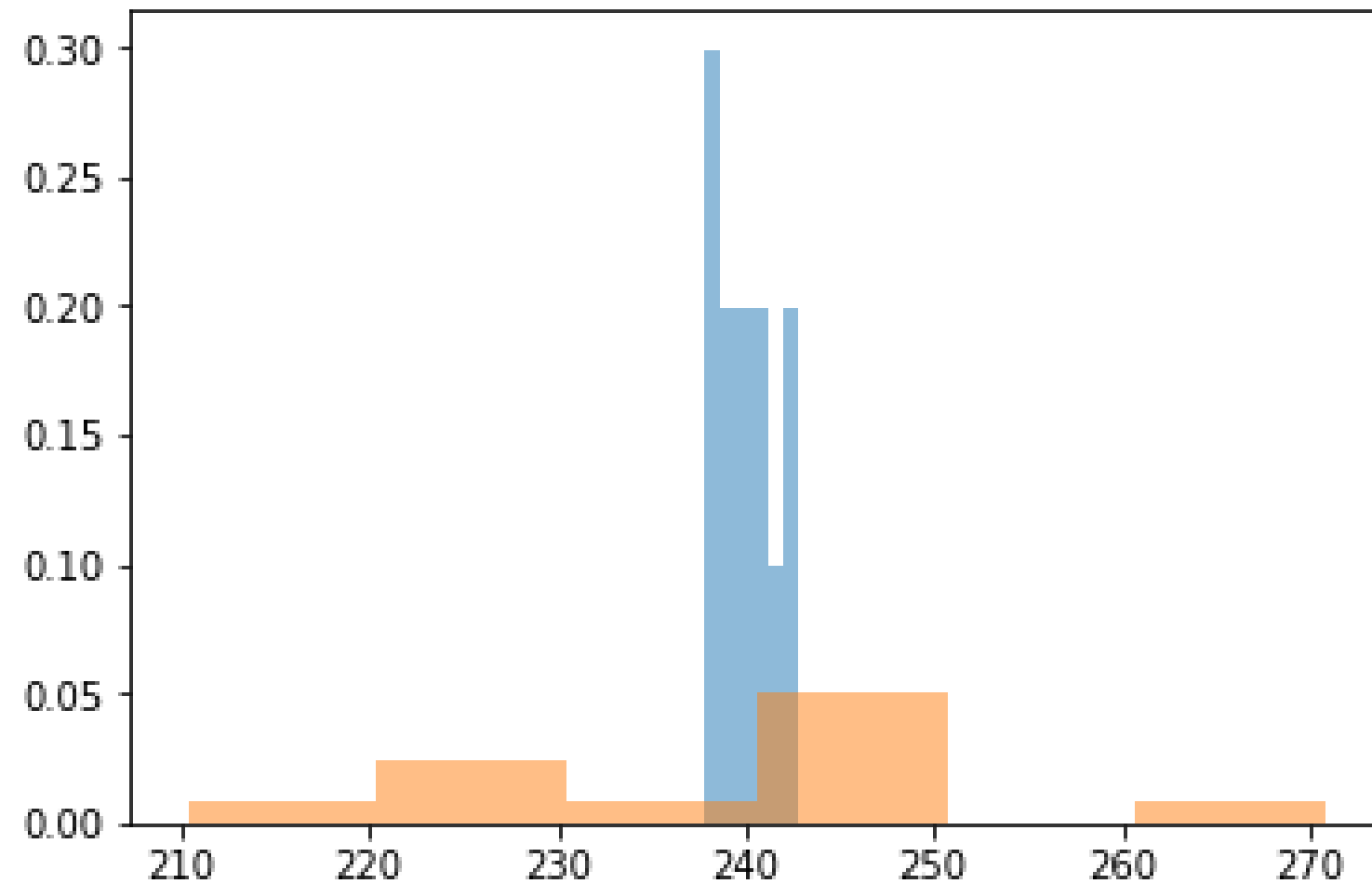
Histogram result



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()
```

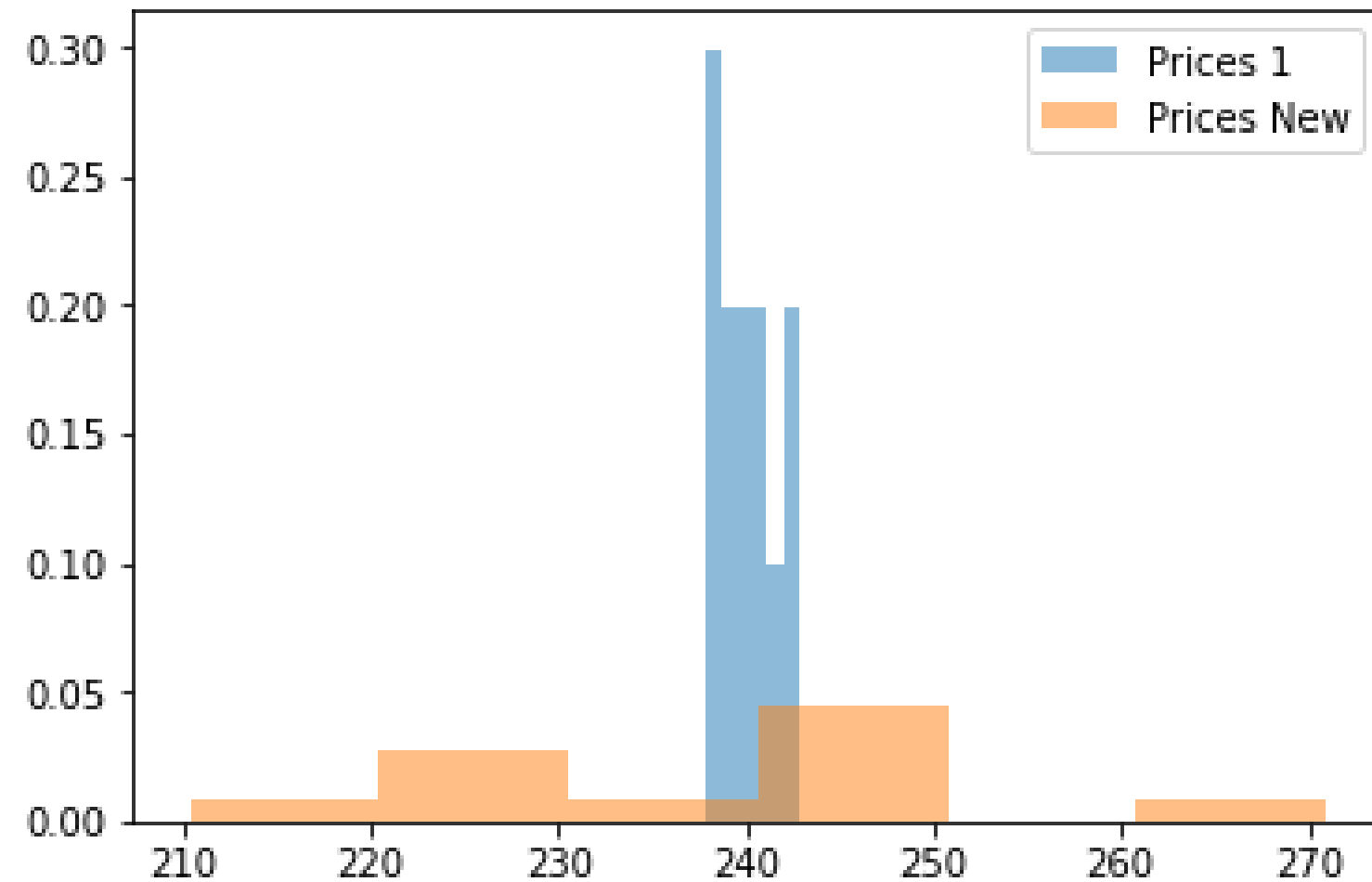
Histogram result



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



Let's practice!

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