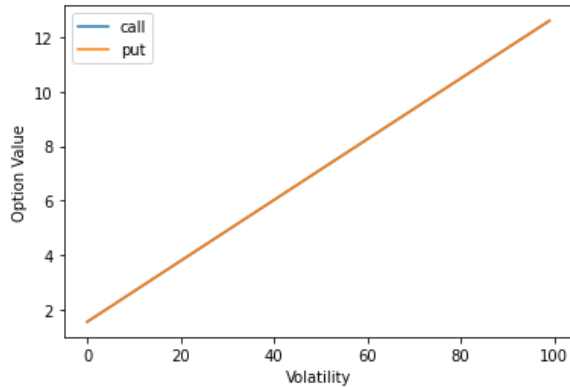


Week 6 Project

Question 1

Given the range of the implied volatility, the value of call and put is almost the same.

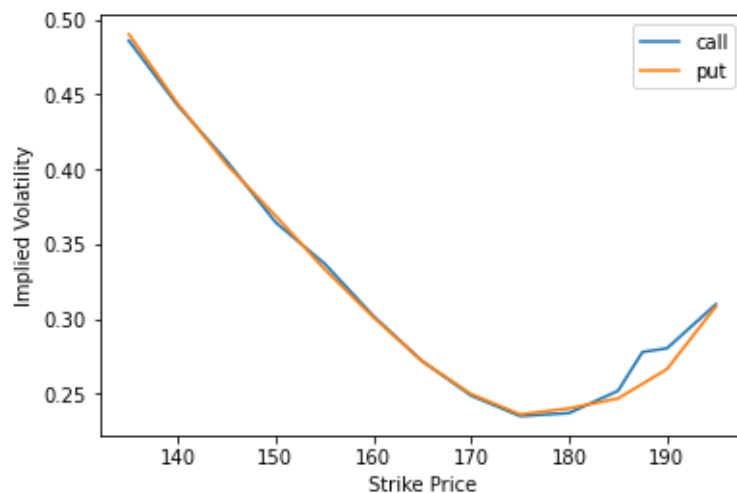


The graph above shows that the higher the volatility, the higher value the portfolio will be.

Given everything else to be the same, increasing in supply or decreasing in demand will cause the price to drop, therefore the volatility will decrease, and vice versa.

Question 2

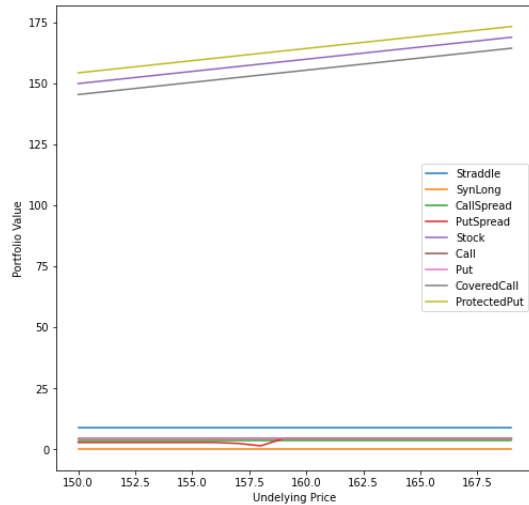
The implied volatility of AAPL is shown in the graph:



This is the typical graph between strike price and implied volatility, Implied volatility rises when the underlying asset of an option is further out of the money (OTM), or in the money (ITM), compared to at the money (ATM). However, not all options will have this kind of graph, near-term equity options and currency-related options are more likely to have a volatility smile.

Question 3

This first part of the problem is to divide the csv file and calculate the value and P&L for each portfolio.



For the portfolios that have options, the values are gathered around 0, because the goal of the option is to earn the premium.

The second part is to simulate AAPL's return in ten days and calculate the VaR and ES.

```
VaR = calc_VaR(sim_rets.mean(), std)
CVaR = calc_CVaR(sim_rets.mean(), std)
```

```
print(VaR)
print(CVaR)
```

```
0.026459130203977405
0.03316386963071315
```