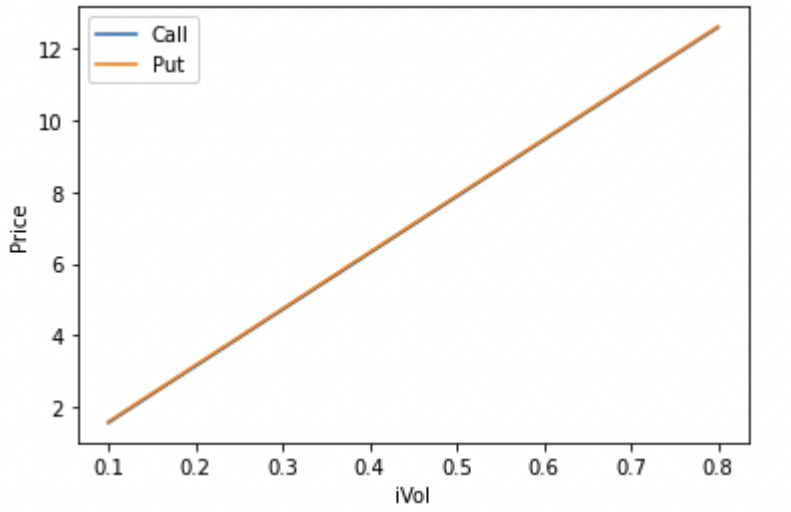
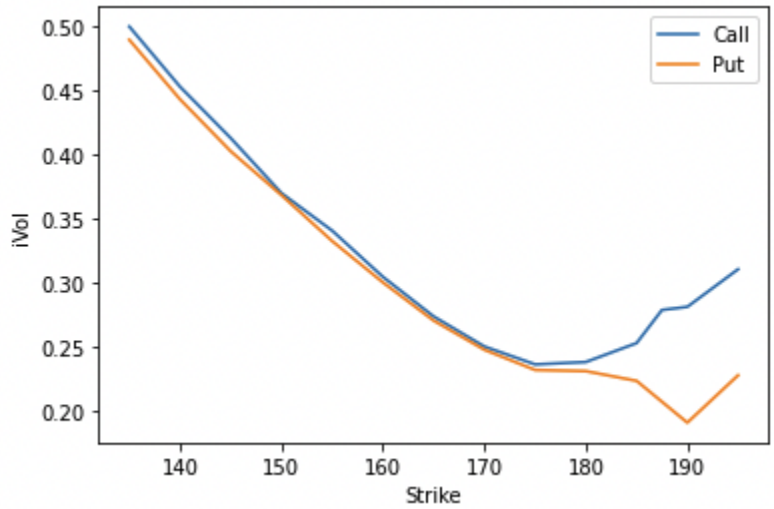
Problem 1



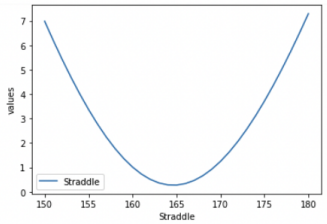
Observations:
When strike price = current price, the shape of implied volatilities for both call and put are linear and appear to be overlapping completely.

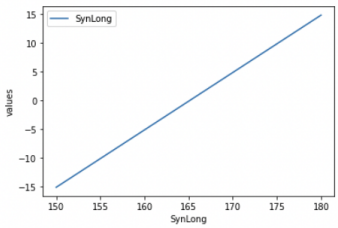
Problem 2

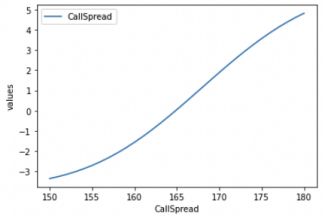


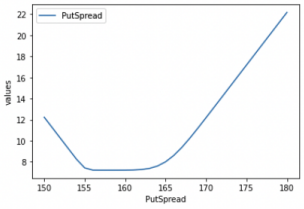
Observations:
The graph shows that when the options are in the money, it is more expensive than when the options are out of money.

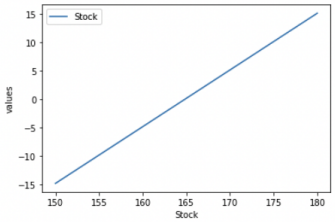
Problem 3

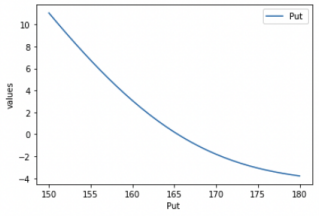


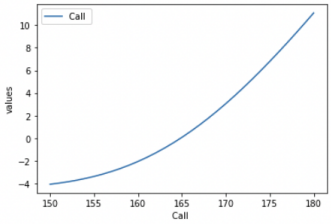


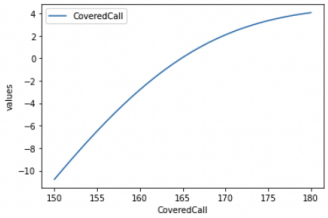


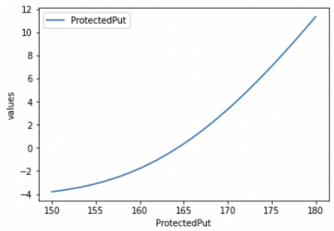












	Name	Mean	VaR	Es
0	Straddle	7.252757	3.405397	-2.428012
1	SynLong	-7.252757	-11.100118	12.077503
2	CallSpread	0.655643	0.568163	-0.545939
3	PutSpread	2.609842	0.322668	0.258366
4	Stock	-10.350000	-15.074482	16.274691
5	Call	-3.370616	-4.261056	4.487264
6	Put	7.252757	3.405397	-2.428012
7	CoveredCall	3.370616	2.480176	-2.253969
8	ProtectedPut	7.252757	3.405397	-2.428012

Observations:

- Straddle has the least ES because it lower the risk by hedging a call and a put

- SynLong and Stock has significantly small VaAr because SynLong simulates stock prices