Read me

There are 6 python file in this assignment.

AmericanPricer.py

Using trinomial tree to simulate American option pricing model. Moreover, when volatility equals to zero, degrade to a single strand with drift.

BlackSholes.py

Defining the Black Scholes Merton price model

ImpliedVolatility.py

Using Classic Brent method or Newton method(see in annotation but not safe as Brent method) to solve the function of pricing model.

JimGatheralSVI.py

Using none-linear least squares to fit the volatility smile

volatilitySmile.py

Plot the volatility smile based on the data. See the picture: volatility smile

volatilitySurface.py

plot the 3d surface of implied volatility. One can find the term structure and smile in it. See pictures.