

Financial Modeling with Python

Assignments

Last date of submission – 4th April 2021

Assignment 1:

The following website contains information companies listed in NIFTY 50.

<https://tradebrains.in/nifty-50-companies-list/>

Choose any 3 companies from the list.

What will be the prices for both Call Option and Put Option derived from each of three companies' stocks? Assume,

1. Risk free interest rate is 6% annually compounded.
2. You are computing the prices on 01-March-2021
3. The Stock price is the opening price on 01-March-2021
4. Expiration date is exactly 65 business day from 01-March-2021
5. The Strike price is last trading day's closing price. (WRT: when you are solving this problem. Please mention date)

Additionally: Compute the Delta, Gamma, Vega and Theta for each of the derivatives.

Also – Construct a portfolio of consists of These three stocks and their derivatives such that the portfolio is Delta, Gamma and Vega neutral.

Explain if such a portfolio cannot be constructed.

Assignment 2:

In the context of fixed income security such a fixed coupon bond, explain the following: -

Greater convexity translates into greater price gains as interest rates fall, lessened price declines as interest rates rise.

Assignment 3:

Suppose a student has taken an education load of size Rs 0.8 Million. The interest rate is 12%. Write a python program that generates the schedule of repayment of the loan in 5 years (or 'n' number of years). Assume the first payment date is 15 August 2021. Also show the breakup of each payment in principal and interest.