
Referring to Lab Assignment Number 07, take the values of $S(0)$, μ and σ, to be ones that you obtained using the daily adjusted closing stock prices of State Bank of India.

Problem Statement:

(1) Use the Monte Carlo technique to determine the price $\widehat{\mu}$, of an **average price** Asian put option (in the BSM framework) with $K = 1.1S(0)$ and $T = 30$ days. Make use of $N = 300$ equally spaced time intervals, and $M = 1000$ number of simulations. Tabulate, $\widehat{\mu}$, $\widehat{\sigma}$ (the sampling variance) and the 95% confidence interval of $\left[\widehat{\mu} - \dfrac{1.96\widehat{\sigma}}{\sqrt{M}}, \widehat{\mu} + \dfrac{1.96\widehat{\sigma}}{\sqrt{M}}\right]$.

(2) Repeat part (1) making use of control variates. Take the control variate to be the price of a standard European put option, with the payoff of $\max\left[\left(K - S(T)\right), 0\right]$.

Note: The payoff of an **average price** Asian put option is given by, $\max\left[\left(K - \dfrac{1}{N+1}\sum_{i=1}^{N+1} S(t_i)\right), 0\right]$.

Submission Deadline: 11th November 2020, 11:59 PM