Series 9

Introduction to Computational Finance

return no later than May 14th 2019 at 10:15

Binomial Tree vs Black-Scholes

Let an asset S be valuated at $t = 0$ at $S_0 = 100$. Let be a call option having maturity $T = 1$ and strike price $K = 120$. The volatility is assumed to be constant ($\sigma = 20\%$) over the lifespan of the call; the risk-free rate is $r = 5\%$.

- Implement the Black-Scholes forumla and determine the value of this call at $t = 0$.
- Implement a binomial tree to determine the call option value. The implementation should take the depth of the tree as an argument.
- Plot the evolution of the estimated value of the call option as a function of the binomial tree depth.
- How deep should be the tree in order to get a reasonable approximation?

Report

Each student is expected to give back a personal work consisting of a report in PDF format presenting his/her results and answering the questions of the exercise, as well as the script used to generate the presented results. Both report and script have to be uploaded on Moodle (IFC/Series9).