In-class Presentation Assignment

Group 14

MIE 1622H Due: March 27, 2023

The Black-Scholes equation is a partial differential equation (PDE) governing the price evolution of a European call or European put option under the Black-Scholes model. Write down Black-Scholes equation and provide its financial interpretation. Do not derive the equation as its derivation is provided in lecture slides, just describe and interpret it.

Provide an example in Python of solving the Black-Scholes PDE numerically using standard methods of numerical analysis, such as finite difference method. You do not need to write a program yourself. You may borrow a Python code from one of the course textbooks or Internet. Describe your Python code and show your pricing results.

Discuss forward contracts and futures contracts used in finance. Describe types of forward and futures contracts and how those derivatives are commonly used.

Provide an example in Python of pricing a currency future or a commodity forward/future using two pricing methods, one of those being Monte Carlo simulations. Describe your Python code and show your pricing results.

Prepare 10-12 minute presentation of your results. Before the presentation, upload your PowerPoint slides, PDF slides, IPython Notebook `ipynb` file(s) and all data files in `zip` archive via Quercus portal, such that those can be posted on the course web-page and re-used by your colleagues for assignments. Presentation materials should be uploaded to Quercus portal by 4:00pm on the due date. If you have any questions about your in-class presentation assignment, please contact course TA Shreya Patki `s.patki@mail.utoronto.ca` or course instructor Oleksandr Romanko `oleksandr.romanko@utoronto.ca`.