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| MT-525 | Computation and Simulation in Finance |
| | <p><u>Basic Numerical Methods:</u> Errors and conditioning, Solution of nonlinear algebraic equations, Interpolation, differentiation and quadrature, Solution of ordinary differential equations.</p> <p><u>Numerical Solution of Parabolic Partial Differential Equations:</u> Finite difference methods, Stability, Convergence, Error, Black-Scholes equation, European options.</p> <p><u>Binomial Trees:</u> Introduction to binomial trees, Transform methods, Numerical solution of partial differential equations, Derivative security pricing.</p> <p><u>Monte Carlo Simulation:</u> Generating random numbers, Creating normal variates, Box-Muller, Inverse cumulative normal, Generating random numbers, Path generation using the incremental method, Multivariate products and correlation, Generating multivariate paths with cholesky decomposition, Continuous features and Monte Carlo, Barriers and lookback.</p> <p><u>Reference Books:</u></p> <ol style="list-style-type: none"> 1. Glasserman, <i>Monte Carlo Methods in Financial Engineering</i>, Springer Verlag, 2003. 2. Hull, <i>Options, Futures and other Derivatives</i>, 5th Edition. Prentice Hall, 2003. 3. Huynh H.T and Lai V.S, <i>Stochastic Simulation and Applications in Finance with Matlab Programs</i>, 1st Edition, Wiley Finance Series,2008. |