MATLAB for Financial Applications

Prerequisites

Undergraduate-level mathematics and experience with basic computer operations

This program has been approved by GARP and qualifies for 21 GARP CPD credit hours. If you are a Certified FRM or ERP, please record this activity in your credit tracker at http://www.garp.org/cpd

Day 1 of 3	
Working with the MATLAB User Interface	**Objective:** Become familiar with the main features of the MATLAB integrated design environment and its user interfaces. Interactively create customized visualizations that can be used for financial reporting. Importing data from files Saving and loading variables Visualizing data interactively Exploring and customizing graphics Sharing graphical results
Variables and Commands	**Objective:** Enter MATLAB commands, with an emphasis on creating and accessing numeric and text data. Collect MATLAB commands into code files for reproduction and automation. Learn how to perform tasks such as data import, analysis, and report generation. Entering commands Creating numeric and text variables Finding help and documentation Importing data programmatically Accessing and modifying values in variables Creating and running scripts
Visualizing Results	**Objective:** Create informative visualizations of numeric and time-based data. Enhance the appearance of charts by customizing graphics and annotations. Visualizing data Customizing graphics options Working with individual graphics components Annotation Converting between numbers and text
Data Analysis	**Objective:** Perform mathematical and statistical calculations on numerical data. Use MATLAB syntax to perform preprocessing and analysis tasks on multiple price series with single commands. Performing calculations on data Interpreting matrix data Using matrices for analysis

Day 2 of 3	
Dates and Times	**Objective:** Use variables to represent and manipulate dates and time durations. Extract components of dates and durations as numeric variables. Representing dates and durations Performing calculations with dates and durations Extracting numeric components of dates and durations Plotting with dates
Working with Tabular Data	**Objective:** Import data as a MATLAB table. Work with tabular financial datasets that include mixed data types. Storing data in tables Extracting data from tables Modifying tables Table operations Exporting data from tables
Conditional Data Selection	**Objective:** Analyze subsets of data that satisfy given criteria. Perform fast data extraction and manipulation using logical variables. Defining logical conditions using logical operators Extracting and filtering data by indexing with a logical variable Identifying and counting subsets of data Managing discrete variables using categorical arrays
Programming Flow Control	**Objective:** Create flexible code that can interact with the user, make decisions, and adapt to different situations. Automate tasks using programming constructs. Managing command-driven and graphical interaction with a user Controlling program flow using conditional programming constructs Performing iterative tasks using loops

Day 3 of 3	
Working with Missing Data	**Objective:** Perform statistical calculations on data with missing values. Identify, remove, and replace missing values in a data set. Locating missing values Ignoring, removing, and replacing missing values
Customizing Graphics	**Objective:** Create charts comprising multiple graphics components. Use color, text, and data manipulation techniques to produce eye-catching visualizations. Working with the MATLAB graphics hierarchy Accessing and modifying individual graphics components Managing graphical tables

Day 3 of 3	
Fitting Models to Empirical Data	**Objective:** Preprocess data prior to model fitting. Fit probability distributions and linear models to data. Generate random numbers from a theoretical or fitted distribution. Fitting linear regression models Fitting probability distributions Simulating from distribution fits
Increasing Automation with Functions	**Objective:** Increase automation by encapsulating modular tasks as user-defined functions. Understand how MATLAB resolves references to files and variables. Explore MATLAB tools for debugging code. Creating and calling functions Managing data in workspaces Writing plain text code files Managing the MATLAB path Debugging code files Simplifying interfaces using structures