

Chapter 2

MATLAB Essentials

ABSTRACT

The desktop of the Help, Editor, and Live Editor software windows are introduced in this chapter. Interactive calculations with MATLAB® language are studied. Elementary and special mathematical functions, input and output commands, numbers and strings, vectors, matrices, and arrays as well as flow control commands, relational and logical operators, user-defined and anonymous function are discussed. Each command is presented in its most applicable form and with practical examples. At the end of the chapter, the commands studied are applied to elementary engineering calculations, specifically to processing data on aerodynamic roughness length, detecting displacements of a string during wave propagation, calculating voltage and current in a circuit and determining currents in an electric network.

2.1. INTRODUCTION

Here the author describe the basic tools that are used when working in the MATLAB® environment. For this purpose, the chapter presents the graphical user interface of the software, i.e., the desktop, its toolbar and default windows; introduces the launch procedure, interactive work, work with files via regular and live editors; explains many commands for simple arithmetic, algebraic, matrix and array operations; and describes loop, logical and relational operators. It also describes the user-defined and anonymous functions. For a better understanding by novice starting non-programmers, the material contains explanatory and fairly simple engineering examples.

2.2. STARTING WORK WITH THE MATLAB® SOFTWARE

It is assumed that the user has obtained and installed MATLAB® in Windows. To open MATLAB®, click the  or  icon stationed on the task bar or computer Desktop, respectively. If you do not find the icons, you can start MATLAB® by typing the word MATLAB in the Windows Search box or by clicking the matlab.exe file. The path to this file looks like this C:\Program Files\MATLAB\R2022a\bin\matlab.exe. Upon opening a startup pane, you see a logo image and information about the MATLAB®,

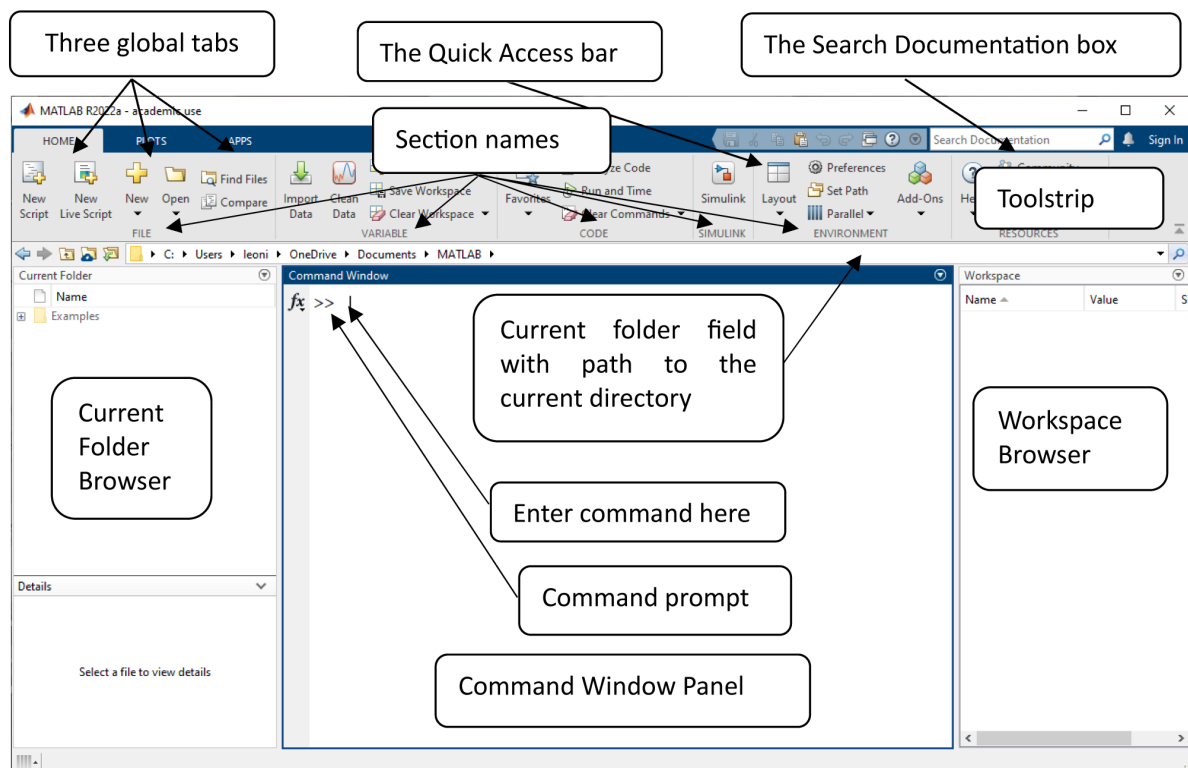
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including its version, license number and owner company name. This pane shortly disappears followed by the opening of the MATLAB® Desktop.

2.2.1. Desktop, Its Toolstrip, and Panels

The desktop is a main MATLAB window and includes a menu bar with controls, termed toolstrip and three panels, which can be undocked from the desktop and used as separate windows, specifically Command, Current Folder Browser and Workspace Browser – see Figure 1.

Figure 1. MATLAB® R2022a desktop, default view



Toolstrip

The toolstrip located on the top of the desktop and has a Quick Access bar, Search Document box, Current Folder bar and three global tabs labeled HOME, PLOTS and APPS. Each tab is divided into sections, each containing thematically combined buttons - drop-down and other controls (including “New Script”, “New Live Script”, “Open”, “New”, “Find Files”, and “Compare” buttons of the FILE section).

- The Quick Access bar is located in the upper right corner of the toolstrip and has some commonly used options, including Cut, Copy and Paste; this bar has a pull-down button to allow customizing.

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