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| Nota di contenuto       | Front Cover; Essential MATLAB for Engineers and Scientists; Copyright; Contents; Preface; Acknowledgments; Part 1 Essentials; 1 Introduction; 1.1 Using MATLAB; 1.1.1 Arithmetic; 1.1.2 Variables; 1.1.3 Mathematical functions; 1.1.4 Functions and commands; 1.1.5 Vectors; 1.1.6 Linear equations; 1.1.7 Tutorials and demos; 1.2 The desktop; 1.2.1 Using the Editor and running a script; 1.2.2 Help, publish and view; 1.2.3 Symbolics and the MuPAD notebook APP; 1.2.4 Other APPS; 1.2.5 Additional features; 1.3 Sample program; 1.3.1 Cut and paste; 1.3.2 Saving a program: script les<br>1.3.3 A program in action Summary; Exercises; Appendix 1.A Supplementary material; 2 MATLAB Fundamentals; 2.1 Variables; 2.1.1 Case sensitivity; 2.2 The workspace; 2.2.1 Adding commonly used constants to the workspace; 2.3 Arrays: Vectors and matrices; 2.3.1 Initializing vectors: Explicit lists; 2.3.2 Initializing vectors: The colon operator; 2.3.3 The linspace and logspace functions; 2.3.4 Transposing vectors; 2.3.5 Subscripts; 2.3.6 Matrices; 2.3.7 Capturing output; 2.3.8 Structure plan; 2.4 Vertical motion under gravity; 2.5 Operators, expressions, and statements; 2.5.1 Numbers<br>2.5.2 Data types2.5.3 Arithmetic operators; 2.5.4 Operator precedence; 2.5.5 The colon operator; 2.5.6 The transpose operator; 2.5.7 Arithmetic operations on arrays; 2.5.8 Expressions; 2.5.9 Statements; 2.5.10 Statements, commands, and functions; 2.5.11 Formula vectorization; 2.6 Output; 2.6.1 The disp statement; 2.6.2 The format |

command; 2.6.3 Scale factors; 2.7 Repeating with for; 2.7.1 Square roots with Newton's method; 2.7.2 Factorials!; 2.7.3 Limit of a sequence; 2.7.4 The basic for construct; 2.7.5 for in a single line; 2.7.6 More general for; 2.7.7 Avoid for loops by vectorizing!

2.8 Decisions 2.8.1 The one-line if statement; 2.8.2 The if-else construct; 2.8.3 The one-line if-else statement; 2.8.4 elseif; 2.8.5 Logical operators; 2.8.6 Multiple ifs versus elseif; 2.8.7 Nested ifs; 2.8.8 Vectorizing ifs?; 2.8.9 The switch statement; 2.9 Complex numbers; Summary; Exercises; Appendix 2.A Supplementary material;

3 Program Design and Algorithm Development; 3.1 The program design process; 3.1.1 The projectile problem; 3.2 Programming MATLAB functions; 3.2.1 Inline objects: Harmonic oscillators; 3.2.2 MATLAB function:  $y = f(x)$ ; Summary; Exercise

4 MATLAB Functions and Data Import-Export Utilities 4.1 Common functions; 4.2 Importing and exporting data; 4.2.1 The load and save commands; 4.2.2 Exporting text (ASCII) data; 4.2.3 Importing text (ASCII) data; 4.2.4 Exporting binary data; 4.2.5 Importing binary data; Summary; Exercises; 5 Logical Vectors; 5.1 Examples; 5.1.1 Discontinuous graphs; 5.1.2 Avoiding division by zero; 5.1.3 Avoiding in nity; 5.1.4 Counting random numbers; 5.1.5 Rolling dice; 5.2 Logical operators; 5.2.1 Operator precedence; 5.2.2 Danger; 5.2.3 Logical operators and vectors; 5.3 Subscripting with logical vectors

5.4 Logical functions

## Sommario/riassunto

Essential MATLAB for Engineers and Scientists, Sixth Edition, provides a concise, balanced overview of MATLAB's functionality that facilitates independent learning, with coverage of both the fundamentals and applications. The essentials of MATLAB are illustrated throughout, featuring complete coverage of the software's windows and menus. Program design and algorithm development are presented clearly and intuitively, along with many examples from a wide range of familiar scientific and engineering areas. This updated edition includes the latest MATLAB versions through 2016a, and is an ideal book for a first course on MATLAB, or for an engineering problem-solving course using MATLAB, as well as a self-learning tutorial for professionals and students expected to learn and apply MATLAB. Updated to include all the newer features through MATLAB R2016a Includes new chapter on complex variables analysis Presents a comparison of execution time between compiled and un-compiled code that includes examples Describes the new H2 graphics features