

Spring 2008 Math 152

Gilat3: Chapters & Sections

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1 Starting with MATLAB

- 1.1 Starting MATLAB, MATLAB Windows
- 1.2 Working in the Command Window
- 1.3 Arithmetic Operations with Scalars
- 1.4 Display Formats
- 1.5 Elementary Math Built-In Functions
- 1.6 Defining Scalar Variables
- 1.7 Useful Commands for Managing Variables
- 1.8 Script Files
- 1.9 Examples of MATLAB Applications
- 1.10 Problems

2 Creating Arrays

- 2.1 Creating a One-Dimensional Array (Vector)
- 2.2 Creating a Two-Dimensional Array (Matrix)
- 2.3 Notes About Variables in MATLAB
- 2.4 The Transpose Operator
- 2.5 Array Addressing
- 2.6 Using a Colon : in Addressing Arrays
- 2.7 Adding Elements to Existing Variables
- 2.8 Deleting Elements
- 2.9 Built-In Functions for Handling Arrays
- 2.10 Strings and Strings as Variables
- 2.11 Problems

3 Mathematical Operations with Arrays

- 3.1 Addition and Subtraction
- 3.2 Array Multiplication
- 3.3 Array Division
- 3.4 Element-by-Element Operations
- 3.5 Using Arrays in MATLAB Built-In Math Functions
- 3.6 Built-In Functions for Analyzing Arrays
- 3.7 Generation of Random Numbers
- 3.8 Examples of MATLAB Applications
- 3.9 Problems

4 Using Script Files and Managing Data

- 4.1 The MATLAB Workspace and the Workspace Window
- 4.2 Input to a Script File
- 4.3 Output Commands
- 4.4 The **save** and **load** Commands
- 4.5 Importing and Exporting Data
- 4.6 Examples of MATLAB Applications
- 4.7 Problems

5 Two-Dimensional Plots

- 5.1 The **plot** Command
- 5.2 The **fplot** Command
- 5.3 Plotting Multiple Graphs in the Same Plot
- 5.4 Formatting a Plot
- 5.5 Plots with Logarithmic Axes
- 5.6 Plots with Error Bars
- 5.7 Plots with Special Graphics
- 5.8 Histograms
- 5.9 Polar Plots
- 5.10 Plotting Multiple Plots on the Same Page
- 5.11 Multiple Figure Windows
- 5.12 Examples of MATLAB Applications
- 5.13 Problems

6 User-Defined Functions and Function Files

- 6.1 Creating a Function File
- 6.2 Structure of a Function File
- 6.3 Local and Global Variables
- 6.4 Saving a Function File
- 6.5 Using a Function File
- 6.6 Examples of Simple User-Defined Functions
- 6.7 Comparison Between Script Files and Function Files
- 6.8 Anonymous and Inline Functions
- 6.9 Function Functions
- 6.10 Subfunctions
- 6.11 Nested Functions
- 6.12 Examples of MATLAB Applications
- 6.13 Problems

7 Programming in MATLAB

- 7.1 Relational and Logical Operators
- 7.2 Conditional Statements
- 7.3 The **switch-case** Statement
- 7.4 Loops
- 7.5 Nested Loops and Nested Conditional Statements
- 7.6 The **break** and **continue** Commands
- 7.7 Examples of MATLAB Applications
- 7.8 Problems

8 Polynomials, Curve Fitting, and Interpolation

- 8.1 Polynomials
- 8.2 Curve Fitting
- 8.3 Interpolation
- 8.4 The Basic Fitting Interface
- 8.5 Examples of MATLAB Applications
- 8.6 Problems

9 Three-Dimensional Plots

- 9.1 Line Plots
- 9.2 Mesh and Surface Plots
- 9.3 Plots with Special Graphics
- 9.4 The **view** Command
- 9.5 Examples of MATLAB Applications
- 9.6 Problems

10 Applications in Numerical Analysis

- 10.1 Solving an Equation with One Variable
- 10.2 Finding a Minimum or a Maximum of a Function
- 10.3 Numerical Integration
- 10.4 Ordinary Differential Equations
- 10.5 Examples of MATLAB Applications
- 10.6 Problems

11 Symbolic Math

- 11.1 Symbolic Objects and Symbolic Expressions
- 11.2 Changing the Form of an Existing Symbolic Expression
- 11.3 Solving Algebraic Equations
- 11.4 Differentiation
- 11.5 Integration

11.6 Solving an Ordinary Differential Equation

11.7 Plotting Symbolic Expressions

11.8 Numerical Calculations with Symbolic Expressions

11.9 Examples of MATLAB Applications

11.10 Problems