MAT 1206 – Introduction to MATLAB

CHAPTER 01: Introduction

Lesson 1

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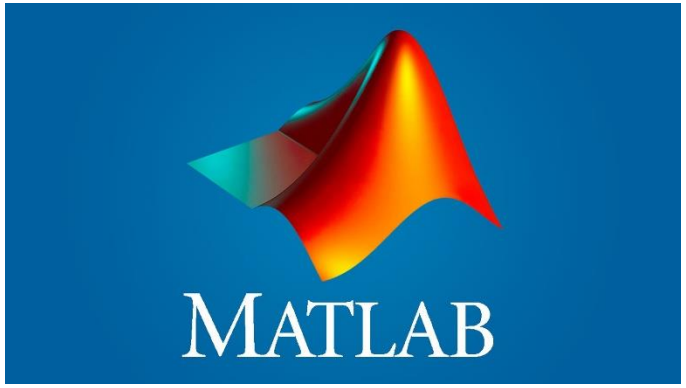

What is MATLAB

- MATLAB (**mat**rix **lab**oratory) is a high-level programming language and interactive environment for numerical computation, visualization and programming.

- MATLAB is developed by MathWorks.

  MathWorks is an American privately held corporation that specializes in mathematical computing software.

Cont.

- MATLAB allows:
  - matrix manipulations
  - plotting of functions and data
  - interfacing with programs written in other languages including C, C++, and Java
  - creation of user interfaces
  - analyze data
  - implementation of algorithms
  - create models and applications
- It has numerous built-in commands and math functions that help you in mathematical calculations, generating plots, and performing numerical methods.

MATLAB ‘s Power of Computational Mathematics

- MATLAB is used in every aspect of computational mathematics. Following are some commonly used mathematical calculations:

  - Dealing with Matrices and Arrays
  - 2-D and 3-D Plotting and graphics
  - Linear Algebra
  - Algebraic Equations
  - Non-linear Functions
  - Statistics
  - Data Analysis
  - Calculus and Differential Equations
  - Numerical Calculations
  - Integration
  - Transforms
  - Curve Fitting

Uses of MATLAB

- MATLAB is widely used as a computational tool in science and engineering encompassing the fields of physics, chemistry, mathematics and all engineering streams.
- It is used in a range of applications including:
  - signal processing and Communications
  - image and video Processing
  - control systems
  - test and measurement
  - computational finance
  - computational biology

MATLAB Environment Setup

- Setting up MATLAB environment is a matter of few clicks.

- MathWorks provides the licensed product, a trial version and a student version as well.

Understanding the MATLAB Environment

- MATLAB development (Integrated Development Environment) IDE can be launched from the icon created on the desktop.

  An IDE is a software application that provides comprehensive facilities to computer programmers for software development.

- The main working window in MATLAB is called the desktop. When MATLAB is started, the desktop appears in its default layout.

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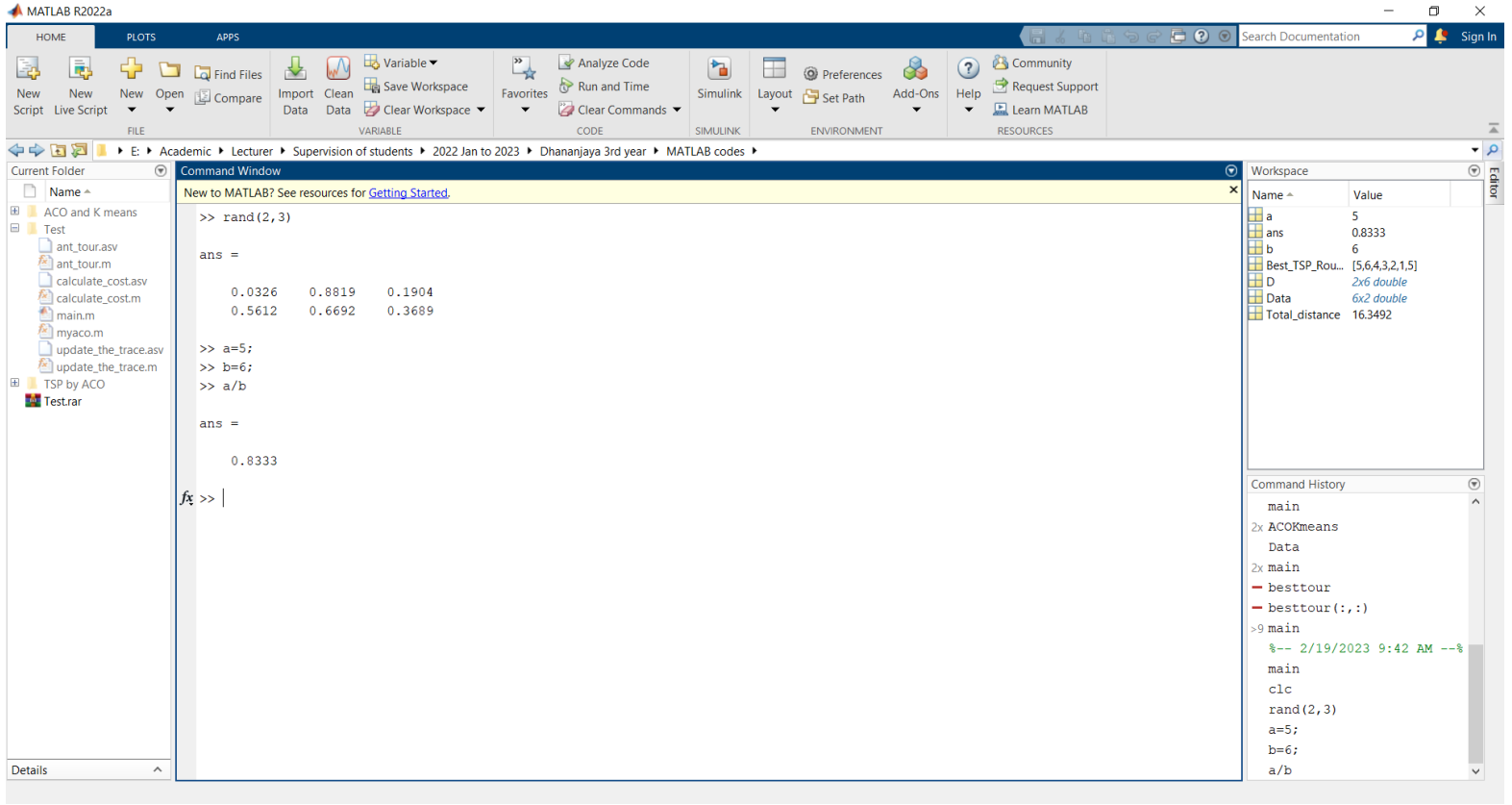
- MATLAB desktop window:



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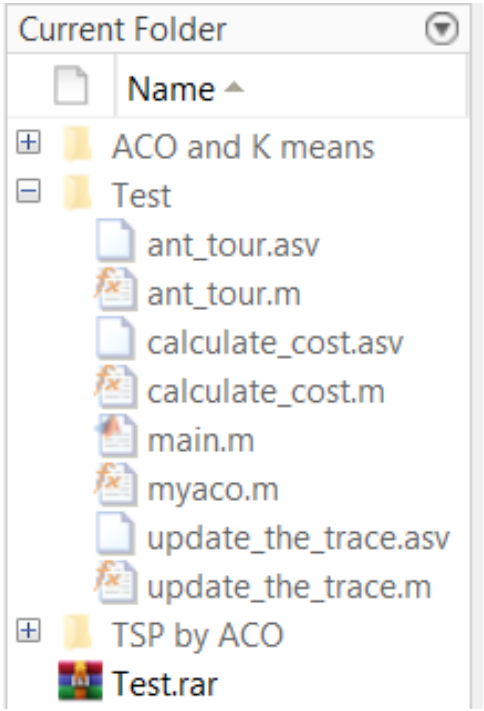
- The desktop has the following panels:

Current Folder - This panel allows you to access the project folders and files.



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Command Window - This is the main area where commands can be entered at the command line. It is indicated by the command prompt (>>).

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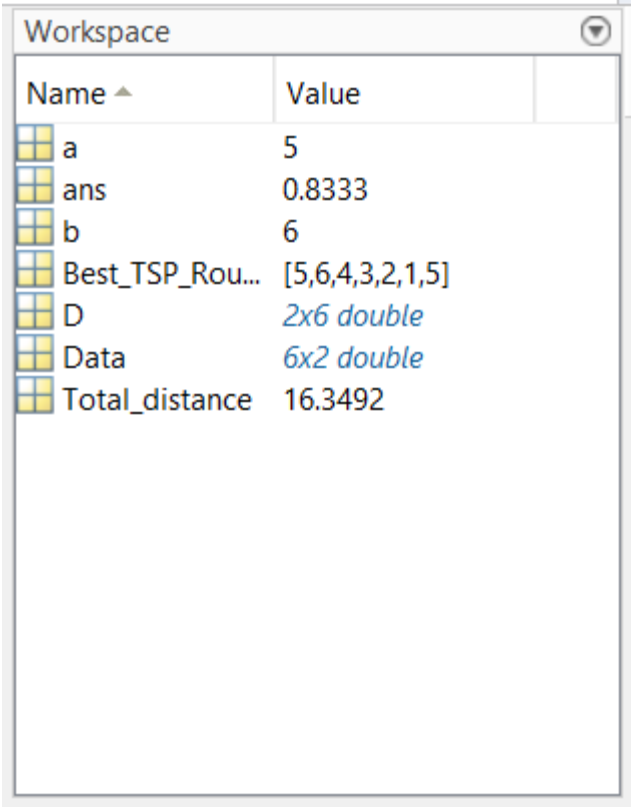
Workspace - The workspace shows all the variables created and/or imported from files.



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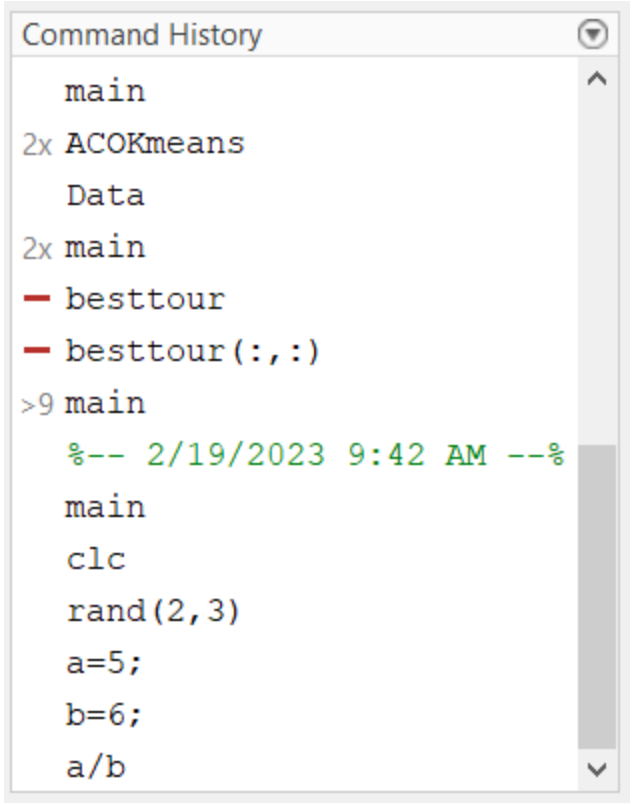
Command History - This panel shows or rerun commands that are entered at the command line.



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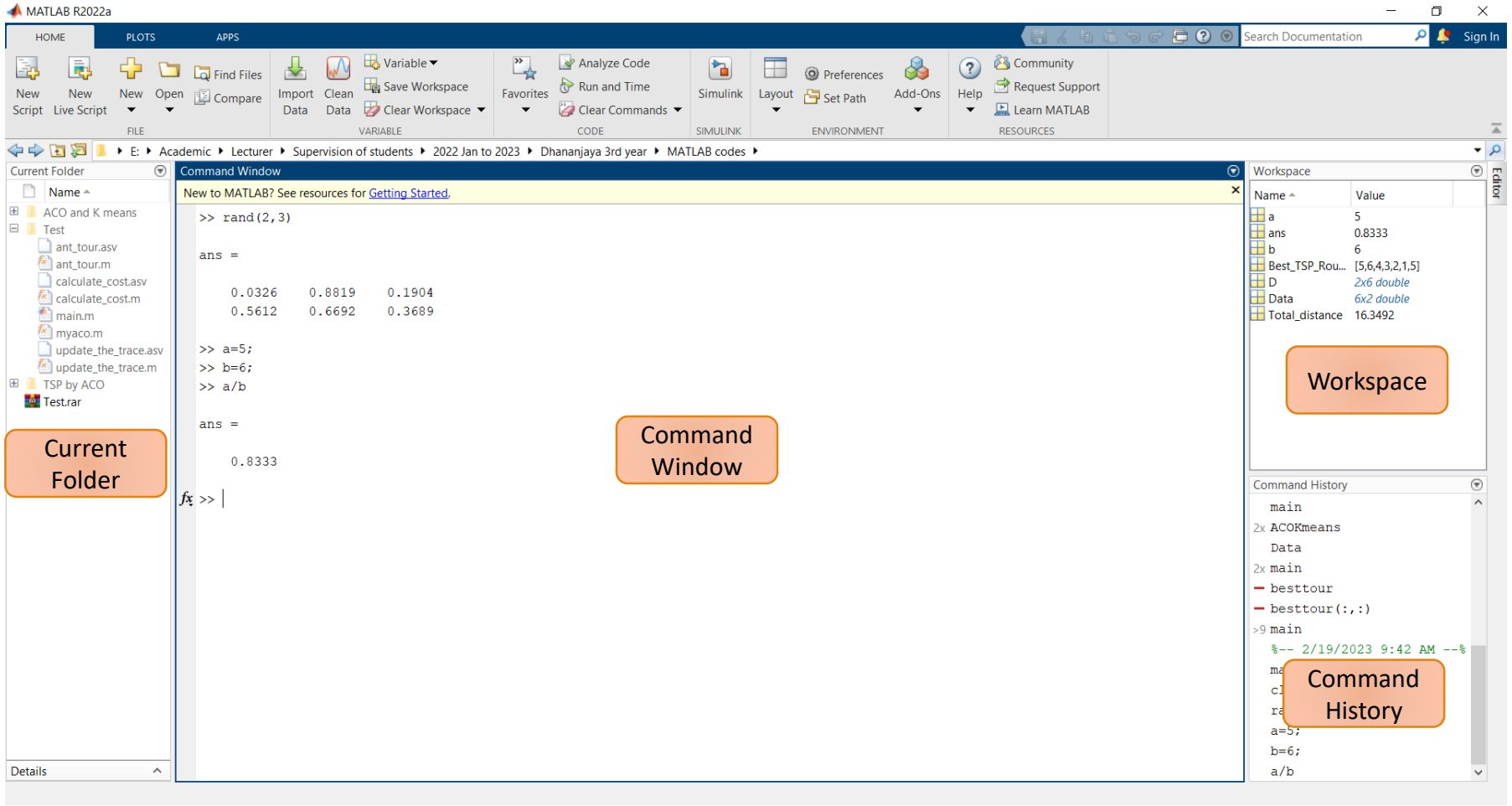
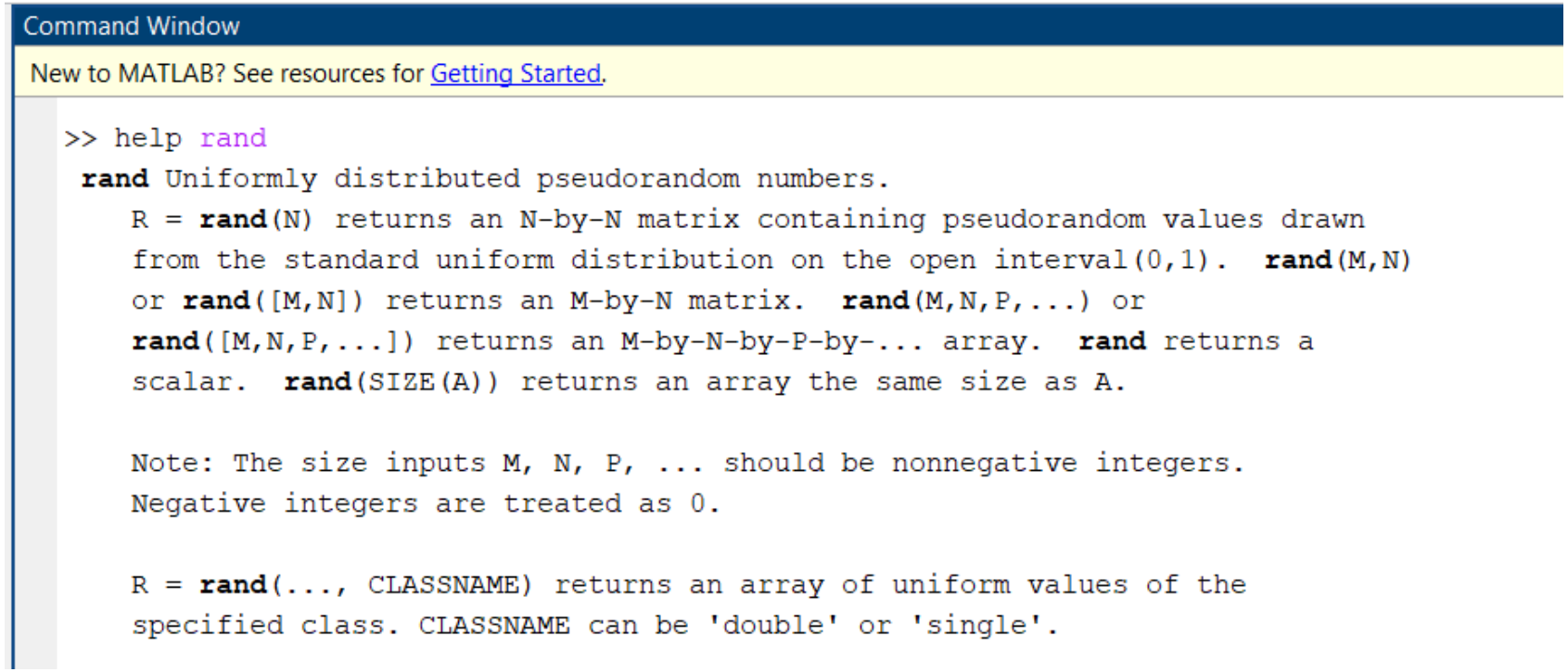

MATLAB R2022a
HOME
PLOTS
APPS
Search Documentation
Sign In
New Script
New Live Script
New
Open
Find Files
Compare
Import Data
Clean Data
Variable
Save Workspace
Clear Workspace
Favorites
Analyze Code
Run and Time
Clear Commands
Simulink
Layout
Preferences
Set Path
Add-Ons
Help
Community
Request Support
Learn MATLAB
FILE
VARIABLE
CODE
SIMULINK
ENVIRONMENT
RESOURCES
E: ▸ Academic ▸ Lecturer ▸ Supervision of students ▸ 2022 Jan to 2023 ▸ Dhananjaya 3rd year ▸ MATLAB codes ▸
Current Folder
Name
ACO and K means
Test
ant_tour.asv
ant_tour.m
calculate_cost.asv
calculate_cost.m
main.m
myaco.m
update_the_trace.asv
update_the_trace.m
TSP by ACO
Test.rar
Details
Command Window
New to MATLAB? See resources for Getting Started.
>> rand(2,3)
ans =
0.0326 0.8819 0.1904
0.5612 0.6692 0.3689
>> a=5;
>> b=6;
>> a/b
ans =
0.8333
>>
Workspace
Name
Value
a 5
ans 0.8333
b 6
Best_TSP_Rou... [5,6,4,3,2,1,5]
D 2x6 double
Data 6x2 double
Total_distance 16.3492
Editor
Command History
main
ACOKmeans
Data
main
besttour
besttour(:,:)
main
%-- 2/19/2023 9:42 AM --%
a=5;
b=6;
a/b
Current Folder
Command Window
Workspace
Command History

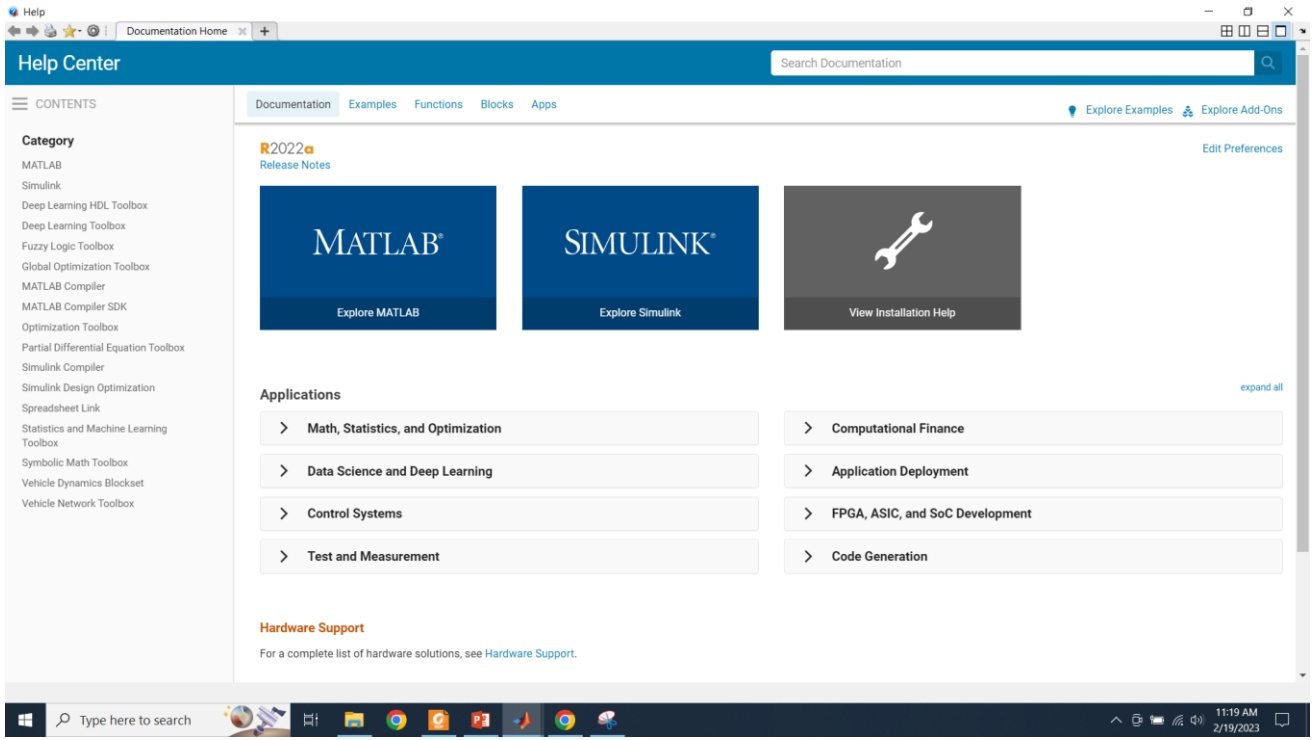
MATLAB Help

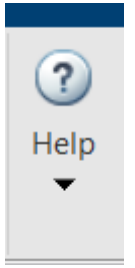
- MATLAB offers several options for getting help on MathWorks products.
- Access abbreviated function ***help*** text in the Command Window:



Cont.

- Search the documentation (Help Center) for in-depth, comprehensive help topics and examples.





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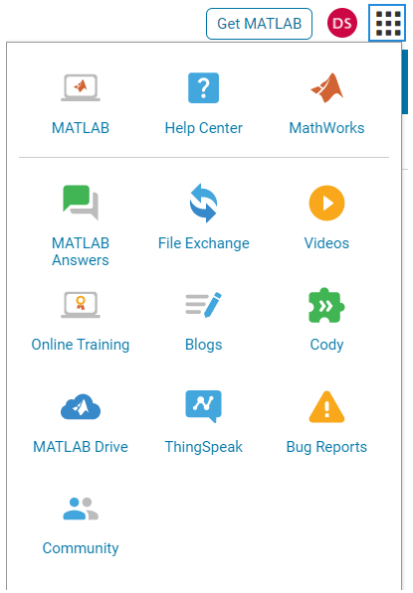
- MathWorks Account: Learn how MATLAB Answers™, File Exchange, Cody™, and Blogs help MATLAB Central™ community members find answers to their technical questions, get code, practice their programming skills, and stay up to date on ways engineers and scientists around the world use MATLAB® to do their work.



Create MathWorks Account

1. Go to the MathWorks Account Creation page: https://www.mathworks.com/mwaccount/register
2. Provide the required information
3. Click 'Create'
4. Click link in email from MathWorks to verify your email address
5. Provide the required information to finish creating your profile, and accept Online Services Agreement
6. Click 'Create'

Questions/queries?