Harman Outline 1 CENG 4331 PDF

August 29, 2015

I. Review of Chapter 1 for MATLAB basic operation.

Read Chapters 1 and 2 in the text.

A. Introduction to the Course

Why the Math and Applications - DSP, Control, Communications, etc.

Syllabus handout and homework rules and HONESTY- Go over in Detail

Get the book and the m-files from the WEB site of the publisher.
A BRIEF DISCUSSION OF MATLAB AND ITS CAPABILITIES

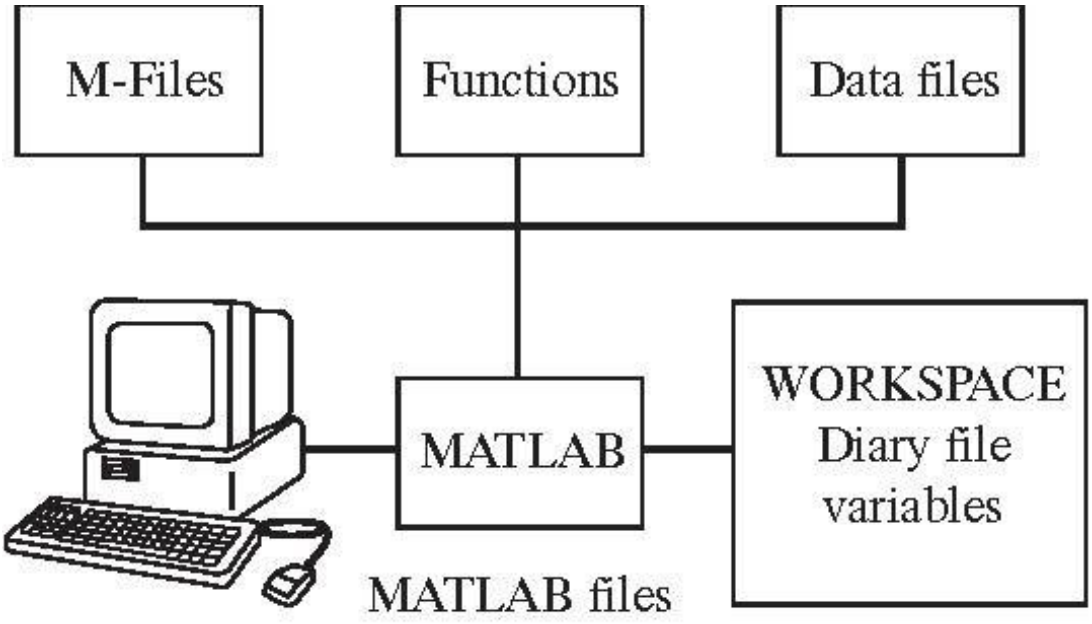


Figure 1: MATLAB Structure

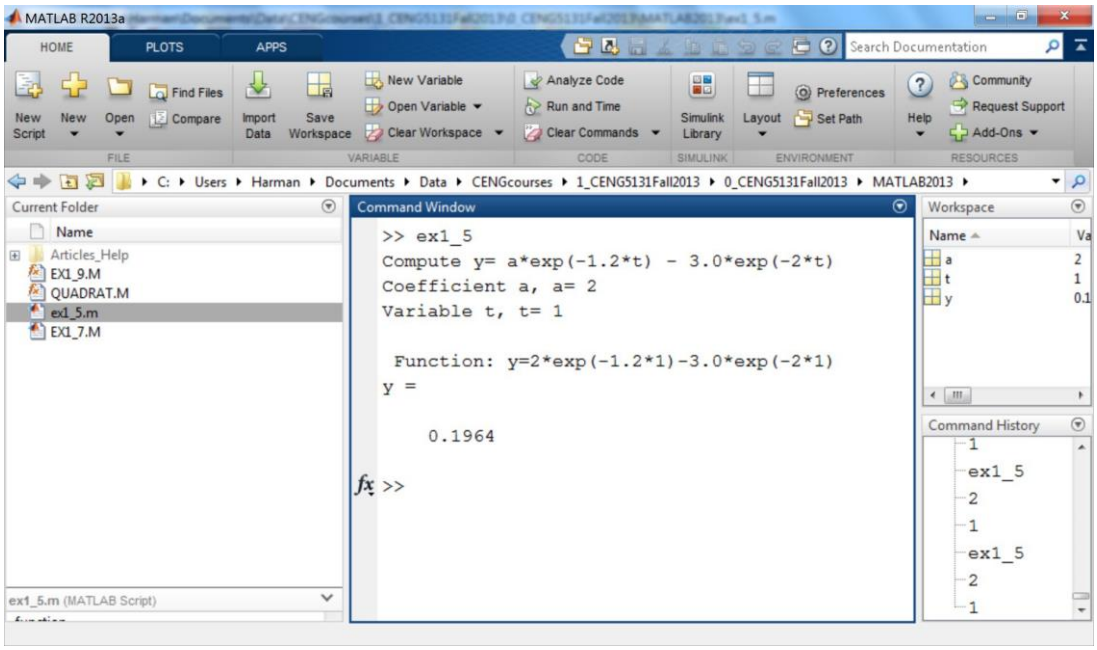


Figure 2: MATLAB Screen

Notice on the MATLAB screen, the Ribbon, Current Directory, Command Window and Workspace.

B. Show some of the MATLAB stuff on computer - HELP, some of MY examples

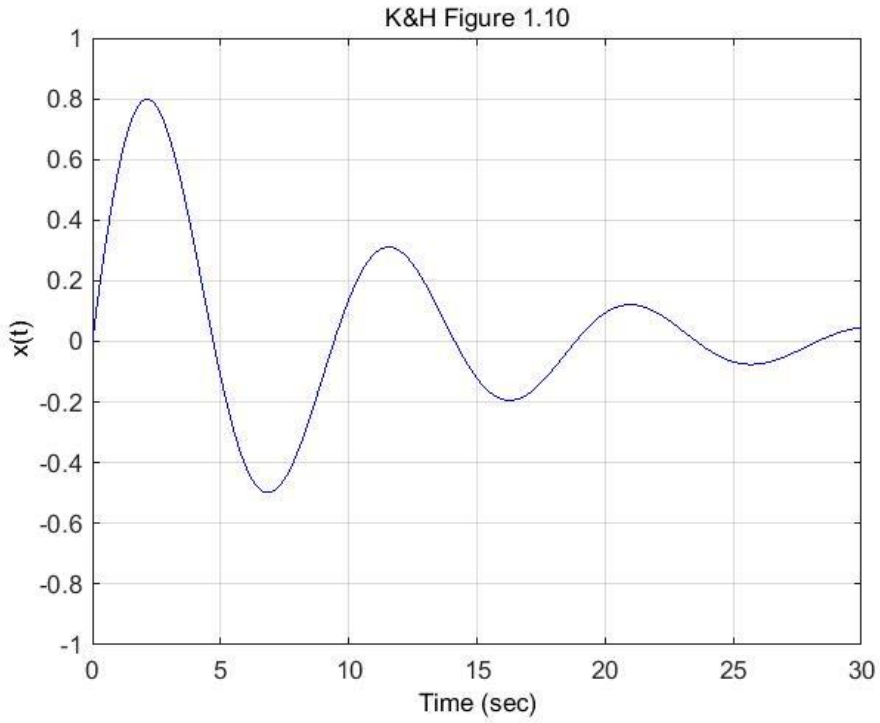
HANDOUTS ABOUT MATLAB AND BOOK - WEB SITES
Go over START > MATLAB > HELP > DEMOS
Go over Desktop with Commands of Example Directory, Workspace, History

Classification	*Examples*
Data types	Scalars, vectors, matrices, strings, and special values
Operators:	
Arithmetic	+ − * / \ ^ =
Logical	& | ~ **all**, **any**, **find**
Relational	< <= > >= ~= ==
Special	% ‘ . : ;
Functions	Mathematics, signal processing, and symbolic math
Program statements:	
Control flow	**if**, **for**, **while**, **break**
Debugging	**echo on**, **pause**, **keyboard**, **dbtype**
Evaluation	Timing commands such as **clock**, **etime**, and **profile**
I/O	Commands to input data, create graphics, and print

Table 1: MATLAB program characteristics

```
%  afirstmfile.m   Simple M-file to start off
%    Description Use of MATLAB
%  1. Create a new m-file and execute it and debug
%  2. Create a diary file if data results are to be
handed-in
%  3. Run the m-file and save the figure(s) if any
and >>diary off
%  4. Clean up and compress the diary file and turn
in the printouts
%       of the m-file, diary file, and figure.
% Example - Just plot x vs y
%
fprintf('Start a diary file - afirstmfile- Strike a
key'), pause
x1=1:1:10     % x=1,2, ... 10 The values will be
printed (no ; after)
y1=x1.^2      % y = 1,4,9,...     (Note the x. -
element by element)
plot(x1,y1)  % Plot and save the figure
xlabel('x values')
ylabel('x Squared')
title('afirst mfile')
% After this executes, save the figure and turn
diary off.
```

```
% K&H Figure 1.10 Page 11 decaying sinusoid
%  This will plot but not output data t and x
%  After it runs, save the figure as .jpg or .png to
print.
t = 0:0.1:30;          % Time Scale from 0 to 30 seconds
x = exp(-0.1*t).*sin((2/3)*t);  % Function to plot
%
figure(1)              % Optional - use if multiple
figures
plot(t,x)              % Create a figure
axis([0 30 -1 1 ])  % Set appropriate axis limits
grid                           % Overlay a grid
title('K&H Figure 1.10')    % Annotate the figure
xlabel('Time (sec)')
ylabel('x(t)')
```



```
% Figure 1.12 KL&H 3rd Page 13
%
n = -2:6;         % Set up x-axis index
x = [0 0 1 2 1 0 -1 0 0]; % Data Points
stem(n,x,'filled');       % Fill the circles
xlabel('n')               % Label the x-axis
ylabel('x[n]')            % Label the y-axis
title('Figure 1.12 Kamen&Heck') % Title of figure
```