

# MATLAB Week 1 Notes

## Introduction to MATLAB

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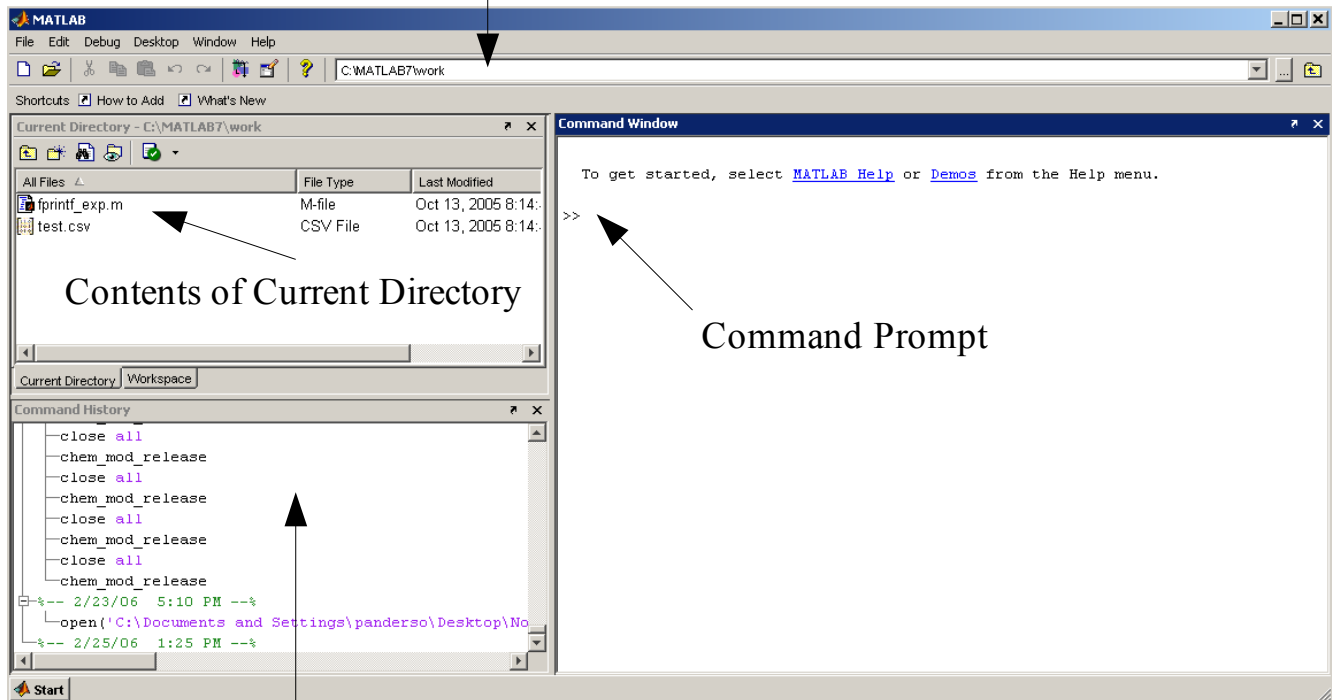
*Notes: MATLAB commands and output are shown in a bold red font*

### Overview

- What is MATLAB?
  - Powerful language for technical computing
    - Mathematical computations
    - Modeling and simulations
    - Data analysis and processing
    - Visualization and graphics
    - Algorithm development
  - MATrix LABoratory –MATLAB
    - key data structure is matrix (array)
- Why do engineers like MATLAB?
  - Scientific language
    - Specializing in scientific computing
  - Specialized toolboxes for engineering applications
  - Syntax is simpler than other languages
    - Leads to decreased development time

### MATLAB

Current Directory



Contents of Current Directory

Command Prompt

Command History

## MATLAB as a Calculator

Sample commands:

1. Type command in the command window at the command prompt
2. Hit enter to execute the command

```
>> 3*2
```

```
ans =
```

```
6
```

```
>> 4/3
```

```
ans =
```

```
1.3333
```

```
>> 4-2
```

```
ans =
```

```
2
```

```
>> 10^(-6)
```

```
ans =
```

```
1.0000e-006
```

```
>> 10^(-3/2)
```

```
ans =
```

```
0.0316
```

## Built-in Functions

What is a function?

- Similar to mathematical function
- Examples: sqrt, exp, log, log10, sin, cos, tan, sind, cosd, tand
- To access MATLAB help for a function type **help <function name>** (e.g. help log10).
- Standard syntax
  - <function name>(<arg1>,<arg2>,<arg3>,...)
  - Example: **sqrt(16)**

## Extras

- Pressing up arrow key at command prompt cycles through previous commands
- **%** - signifies a comment and anything following a percent sign will not be evaluated
- **;** - semicolon suppresses the output of the command:

**>> 3\*5 % 15 is the output**

**ans =**

**15**

**>> 3\*5; % no output because of the semicolon**

**>>**

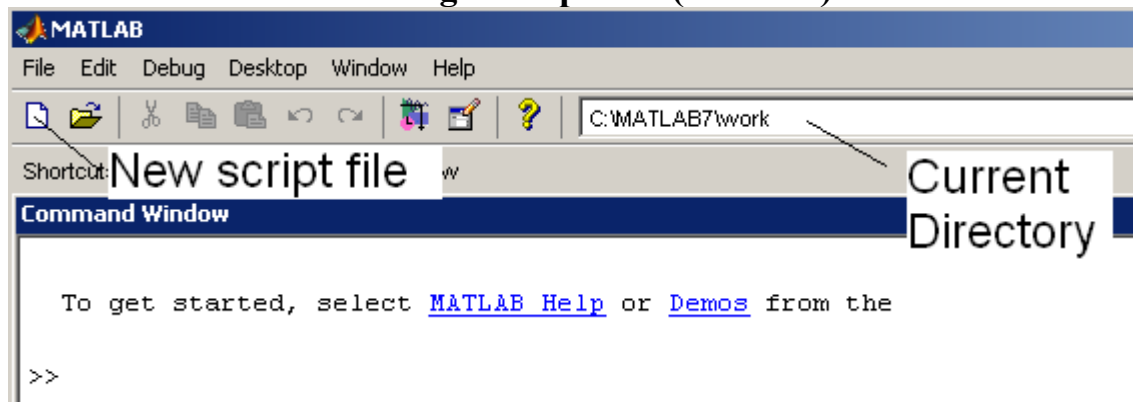
## Common Mistakes

- MATLAB has strict syntactical requirements
  - There are no implied operators
    - Valid:  $3*(5+2)$ ,  $10*\log(10)$
    - Invalid:  $3(5+2)$ ,  $10\log(10)$
  - Parenthesis must be balanced
    - Valid:  $(3+5*(3/(2+5)))$
    - Invalid:  $(3+5*(3/(2+5))$

## Script Files (Gilat 1.8)

- A script file is a text file that contains a sequence of MATLAB commands
- Convenient for larger projects and saving work

## Creating a Script File (Gilat 1.8)



## Running a Script File (Gilat 1.8)

There are two ways to run a script file

- 1.) Type the name of script file in the command window and hit enter
- 2.) Directly from the editor window by clicking the run icon.

Note: The script file must be located in the current directory or in the search path.