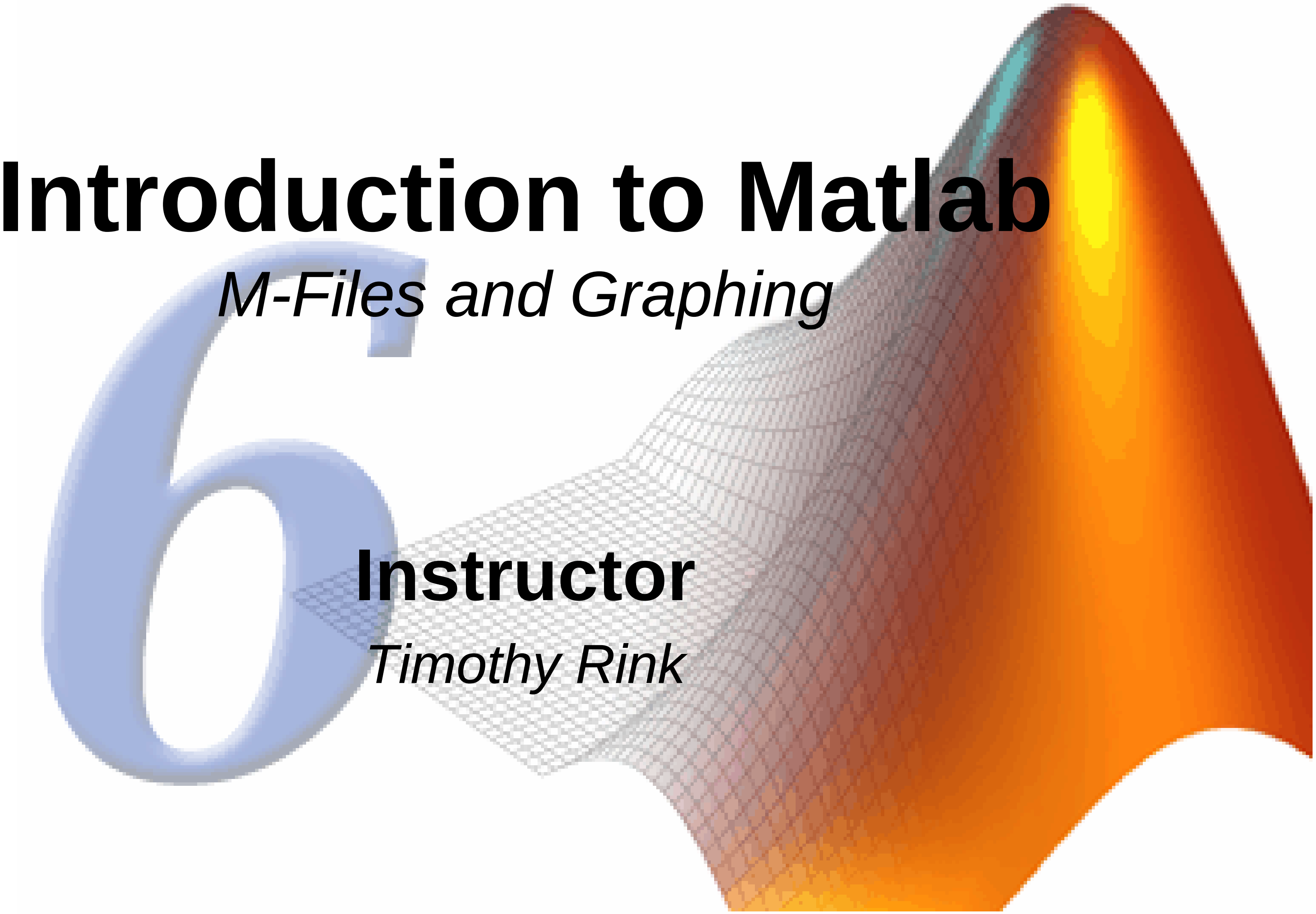

Introduction to Matlab

M-Files and Graphing

Instructor

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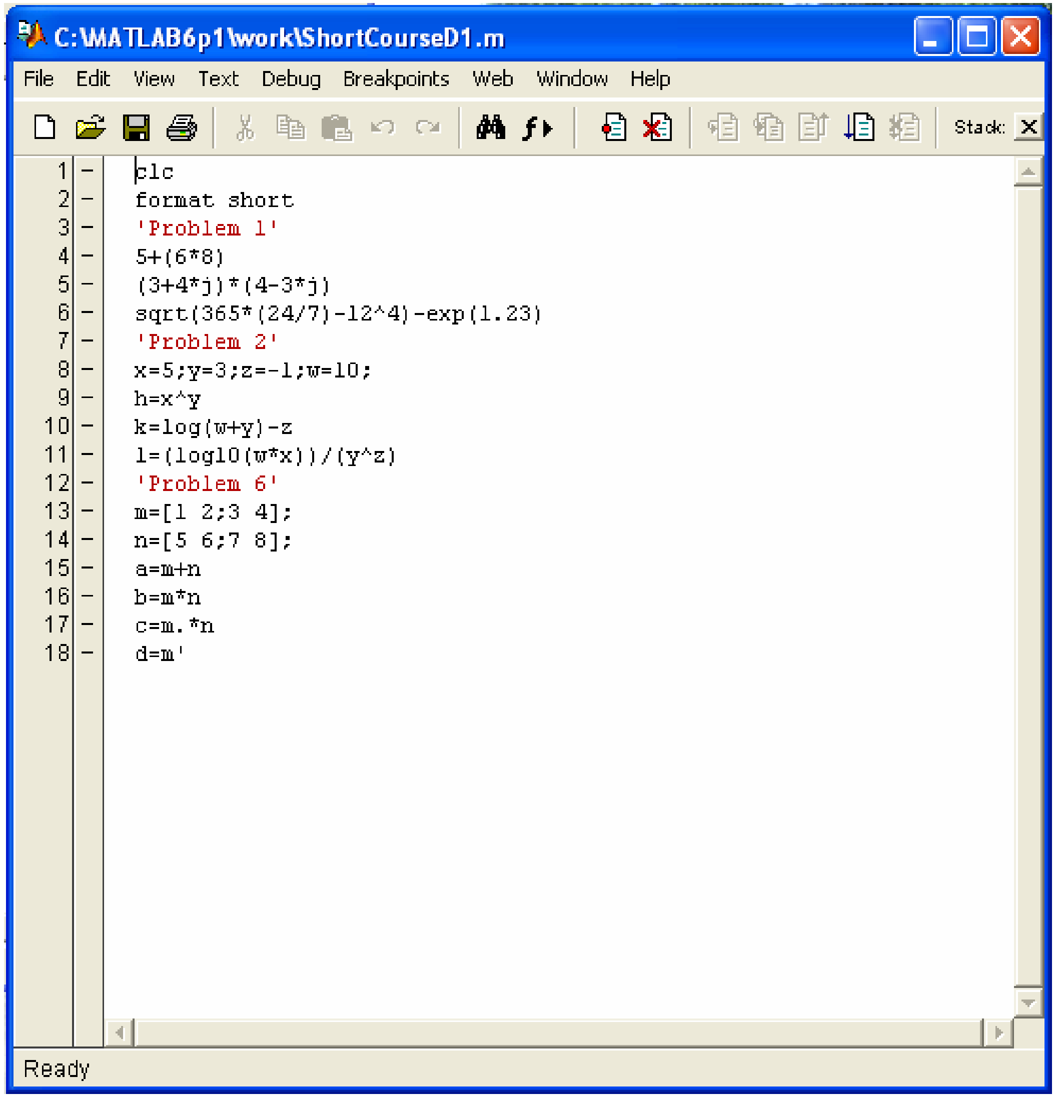
M-Files

- M-files
  - Simple batch files for line-by-line execution
  - Functions
- Anything than can be done in the command window can be done in an m-file
- Most work is done with in m-files

M-Files


C:\MATLAB6p1\work\ShortCourseD1.m
File Edit View Text Debug Breakpoints Web Window Help
Stack:
Ready

```
clc
format short
'Problem 1'
5+(6*8)
(3+4*j)*(4-3*j)
sqrt(365*(24/7)-12^4)-exp(1.23)
'Problem 2'
x=5;y=3;z=-1;w=10;
h=x^y
k=log(w+y)-z
l=(log10(w*x))/(y^z)
'Problem 6'
m=[1 2;3 4];
n=[5 6;7 8];
a=m+n
b=m*n
c=m.*n
d=m'
```

M-Files

- Creating an m-file
  - Use the edit command to open a new file
  - Enter commands line-by-line
  - Run m-file by pressing F5
  - An m-file can also be run by typing the name of the file from the command window
- Better understanding of m-files from experience

Vectors

- Creating a vector / array of numbers
  - There are a few different ways to create a vector of numbers with a chosen start and end point
    - **`x = [`***p1:spacing:p2***`]`**
    - **`linspace(`***p1,p2,# points between***`)`**

Graphing

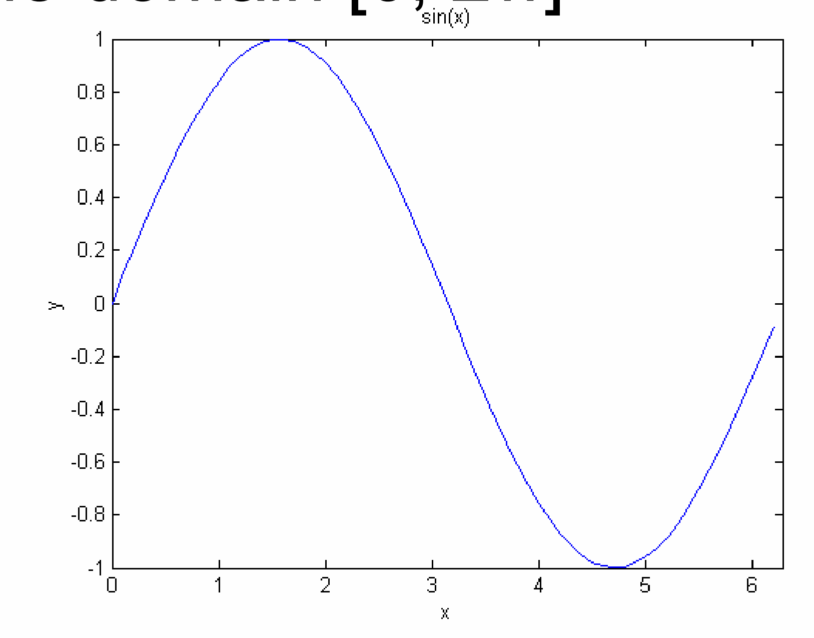
- Remember Matlab is numerically based
  - A function must be evaluated point-by-point
  - A vector must be created for the abscissa
- Common plotting commands

```
–plot                       hold on
–stem                       hold off
–subplot                    grid on
–axis                       grid off
–xlabel ylabel zlabel       figure
–title
–legend
–polar
–surf
```

Graphing

- Example
  - Plot sin(x) over the domain [0, 2π]
  - Code:

```
x = [0:.1:2*pi];
y = sin(x);
plot(x,y)
title(‘sin(x)’)
xlabel(‘x’)
ylabel(‘y’)
```

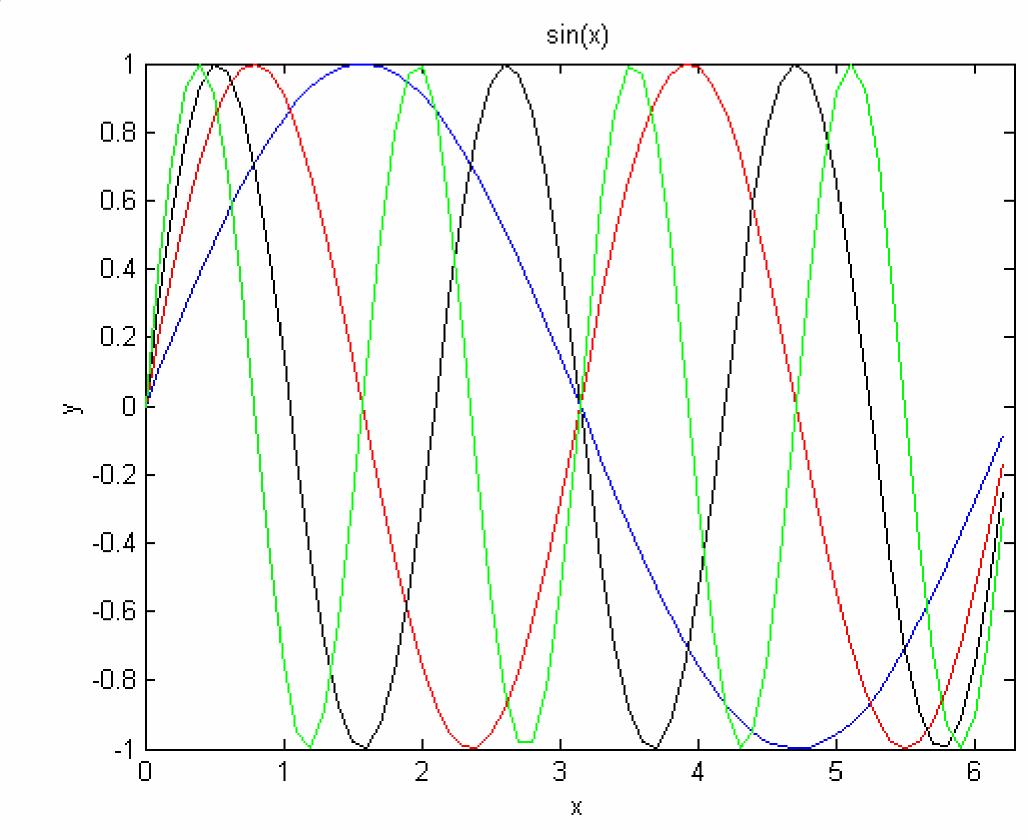


- Remember
  - Function variable must be initialized before defining function

Graphing

- Plots can be overlapped
- Example code

```
x = linspace(0,2*pi,100)
y = sin(x);
plot(x,y)
hold on
y = sin(2*x)
plot(x,y,’r’)
y = sin(3*x)
plot(x,y,’k’)
y = sin(4*x)
plot(x,y,’g’)
title(‘sin(x)’)
xlabel(‘x’)
ylabel(‘y’)
```


sin(x)
y
x