

## BA & BE - Discussion #9, 2020-10-30

### Announcements

- Schedule: next week we start C!!! Must use GCC compiler in labs next week.  
→ also, Friday 11-6-20 is last day to drop
- HW #4 released!
- Exam II today from 4<sup>30</sup> - 6<sup>15</sup> pm EDT  
→ meant to be 1.5 hr, 15 min to upload  
→ upload .pdf of 9 pages (more is OK)  
→ you can use MATLAB but we don't recommend it  
→ be careful! READ DIRECTIONS! GOOD PROGRAMMING STYLE!  
→ if method to solve isn't specified, do easiest possible!

GOOD LUCK ON  
THE EXAM!!!  
YOU'RE GOING TO  
CRUSH THIS!

### Quiz #5 Review Questions?

### Review of Material

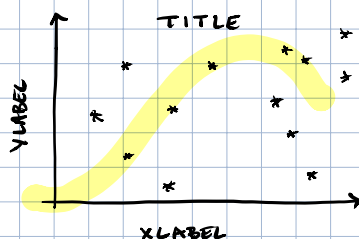
#### Polyval() and Polyfit()

Ex.  $p1 = [3 \ 0 \ -1];$   
 $\text{polyval}(p1, 1:2) \longrightarrow 3x^2 + 0x - 1$   
 $\text{polyval} =$   
 $\underline{\hspace{1cm} 2 \quad 11 \hspace{1cm}}$   
 $3(2)^2 + 0(2) - 1$

Ex. (More practical) Have a data file where first column is x-values, second column is y-values. This data file is called raw-data.dat

```
load raw-data.dat
plot(raw-data(:,1), raw-data(:,2), 'k*')
xl = sprintf('%s LABEL', 'x');
yl = sprintf('%s LABEL', 'y');
title('TITLE')
xlabel(xl)
ylabel(yl)
```

just showing  
examples of  
sprintf(), not  
really necessary  
in this example



now using this  
plot, we want  
to fit

$p2 = \text{polyfit}(\text{raw-data}(:,1), \text{raw-data}(:,2), 3)$   
 $p2 =$   
 $\quad -3 \quad 2 \quad -1 \quad 4$

$\text{trend} = \text{polyval}(p2, \text{linspace}(0, 100, 1000))$

## Quick subplot() example!

function plotanyrin % notice it's a plotting function so no output argument!  
for i = 1:3

```
npts = randi([5, 50]);  
x = linspace(0, 2 * pi, npts);  
y = sin(x);  
subplot(1, 3, i) ← subplot(arg1, arg2, arg3)  
plot(x, y, 'ko')  
title(sprintf('%d points', npts))
```

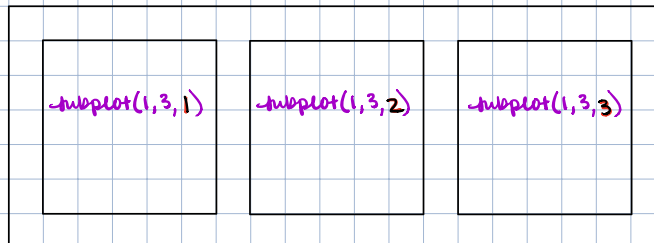
end  
end

m-dimension of an m x n subplot

which plot to fill in (goes row-wise, NOT column-wise)

n-dimension of an m x n subplot

1 Figure Window



← 3 plots in the single figure window (a 1 x 3 subplot)

subplots are numbered row-wise!!!

## Ch. 14A Examples

Ex. set1 = 2:5;  
set2 = [4 0 -3 2];  
intersect(set1, abs(set2))  
ans =

2 3 4

← since no 'stable' passed to intersect, automatically sorts!

set1: 2 3 4 5  
abs(set2): 4 0 3 2

Ex. ismember(set1, set2)

ans =

1 0 1 0

← logical array

Ex. vec1(3:6);  
median(vec1)

ans =

4.5

3 4 5 6  
↑  
4.5

Ex. mode([vec1] 2:4)

ans =

3

← there's two modes (aka bimodal), but MATLAB will always return the smallest value!

3 4 5 6 2 3 4

## Anonymous Functions

FORMAT:

functionhandle = @(x) x.^2 + 5.\*x + 5;  
examplecall = functionhandle(1)  
examplecall = 11 (answer)

What about multiple inputs? Vectors?

anony = @(x, a) 4 \* x - a;  
anony(5, 2) 18  
anony(1:4, 3) 1 5 9 13