Hello Earth!

A *grounded* introduction to Matlab

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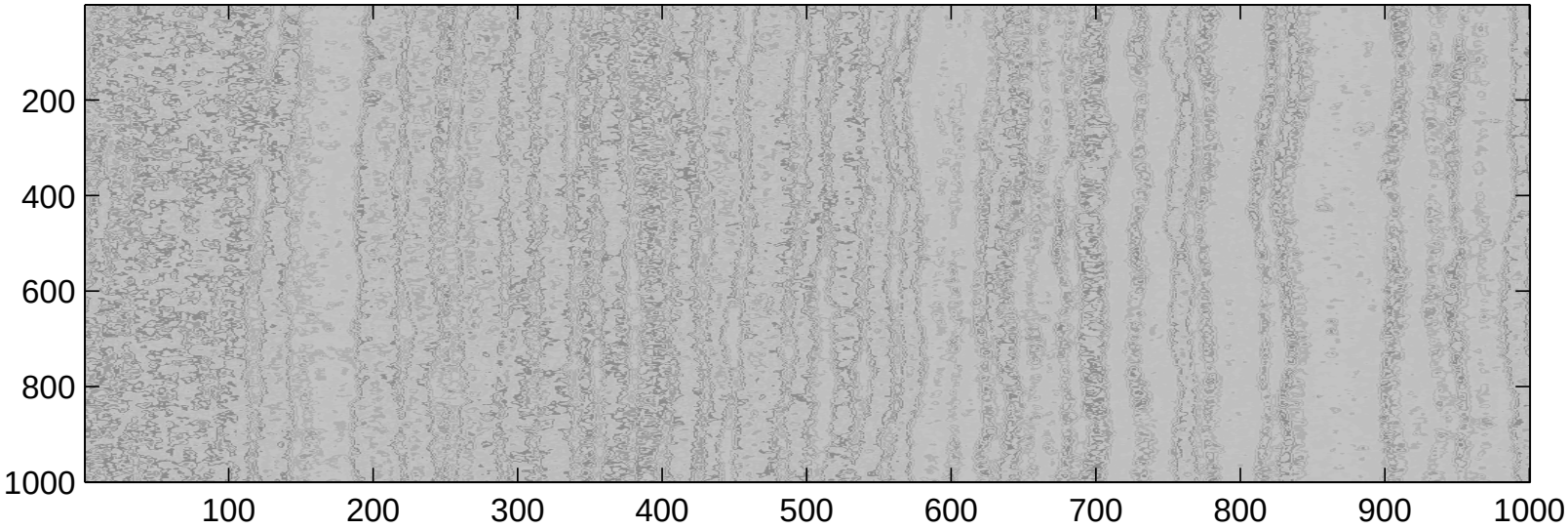
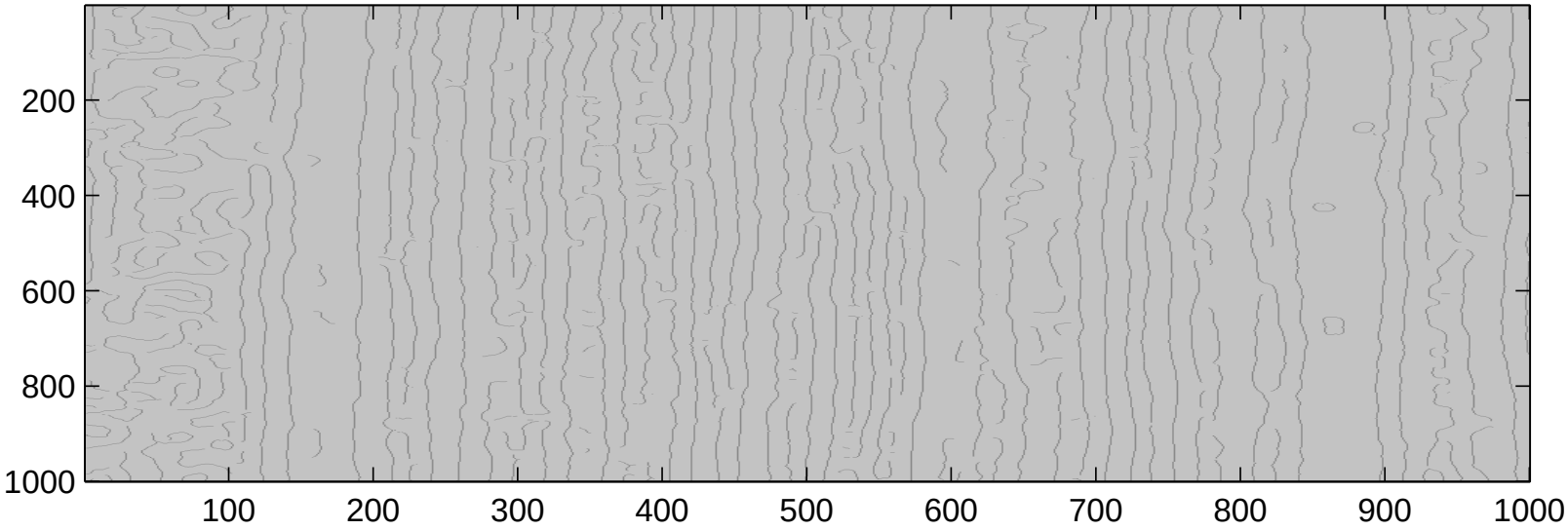
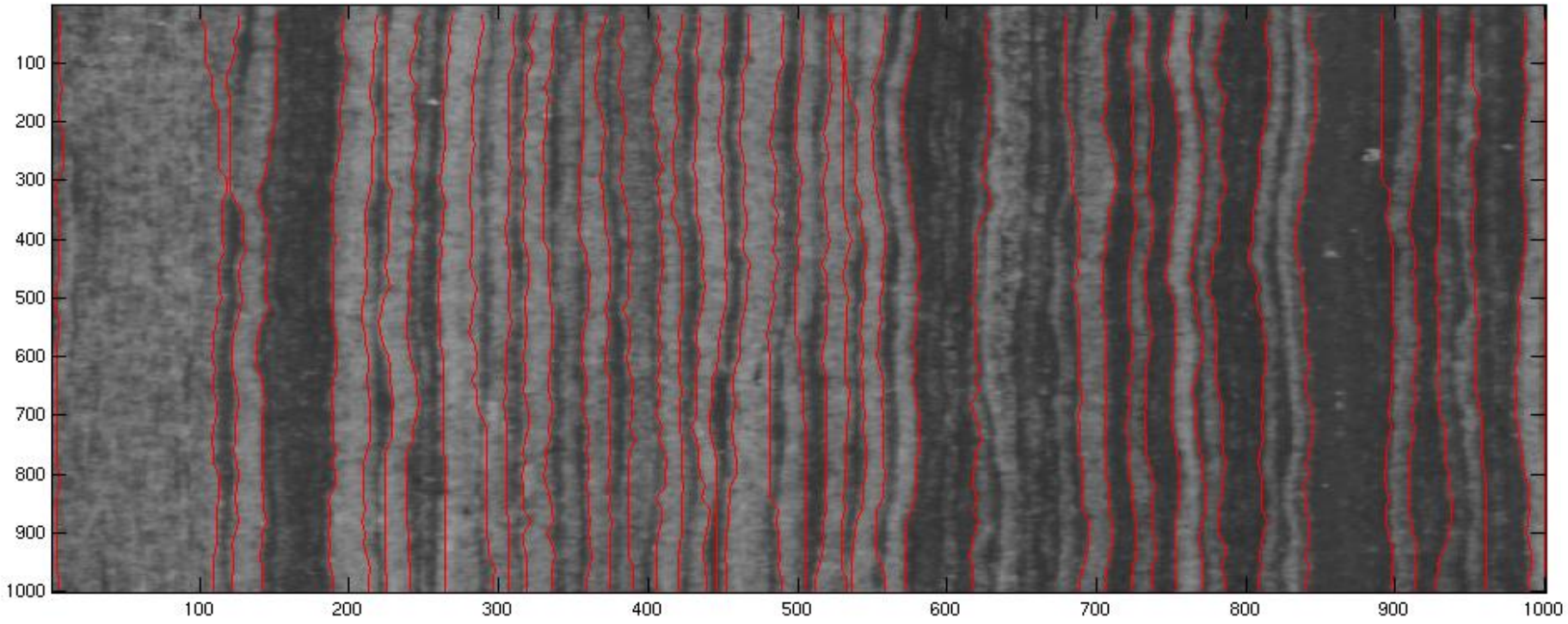
(Enter teacher)

Something canny *Matlab* can do





Something cunning *you* can do



The extreme basics — I

1. `help`

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2. `lookfor`

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3. `type`

The extreme basics — I

1. `help`
2. `lookfor`
3. `type`
4. `who, whos`

The extreme basics — I

1. `help`
2. `lookfor`
3. `type`
4. `who, whos`
6. `diary`

The extreme basics — II

7. `plot`

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8. `xlabel,ylabel,title`

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11. `hold on, hold off`

The extreme basics — II

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13. `sprintf`

The extreme basics — II

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14. `print`

The extreme basics — II

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11. `hold on, hold off`

13. `sprintf`

14. `print`

15. `load, imread`

Props

Name	Function	Example
`imread`	Reads an image file	`ix=imread('filename');`
`fullfile`	Constructs a valid path name	`ff=fullfile('dirn','fname');`
`size`	Queries the size of a variable	`s=size(ix);`
`plot`	Plots (x, y) values on a graph	`x=[1 2 3]; y=[10 20 30];` `plot(x,y,'o')`
`xlabel`	Uses a quoted string for an x-axis label	`xlabel('elevation [m]')`
`ylabel`	Uses a quoted string for a y-axis label	`xlabel('roughness')`

`hold on`	Keeps current axes for next time you plot anything	`x=[1 2 pi]; y=[10 20 30];`
		`plot(x,y,'bo'); hold on;`
		`plot(10*x,3*y,'rs')`

`linspace`	Makes an array of N evenly spaced values between a and b	`x=linspace(-3,3,100)`
`reshape`	Changes the dimensions of an array x to a rows and b columns	`x=linspace(-3,3,100);` `xr=reshape(x,20,5)`
`hist`	Makes a histogram (and plots it)	`x=linspace(-3,3,10);` `hist(x)`
`bar`		
`axis xy`		
`axis ij`		

The extreme basics — III

Addressing:

rows, columns, dimensions, range

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Addressing:

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19. `colon`

The extreme basics — III

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Logic:

logical, character, string, double

The extreme basics — III

Addressing:

rows, columns, dimensions, range

17. `size`
18. `transpose`
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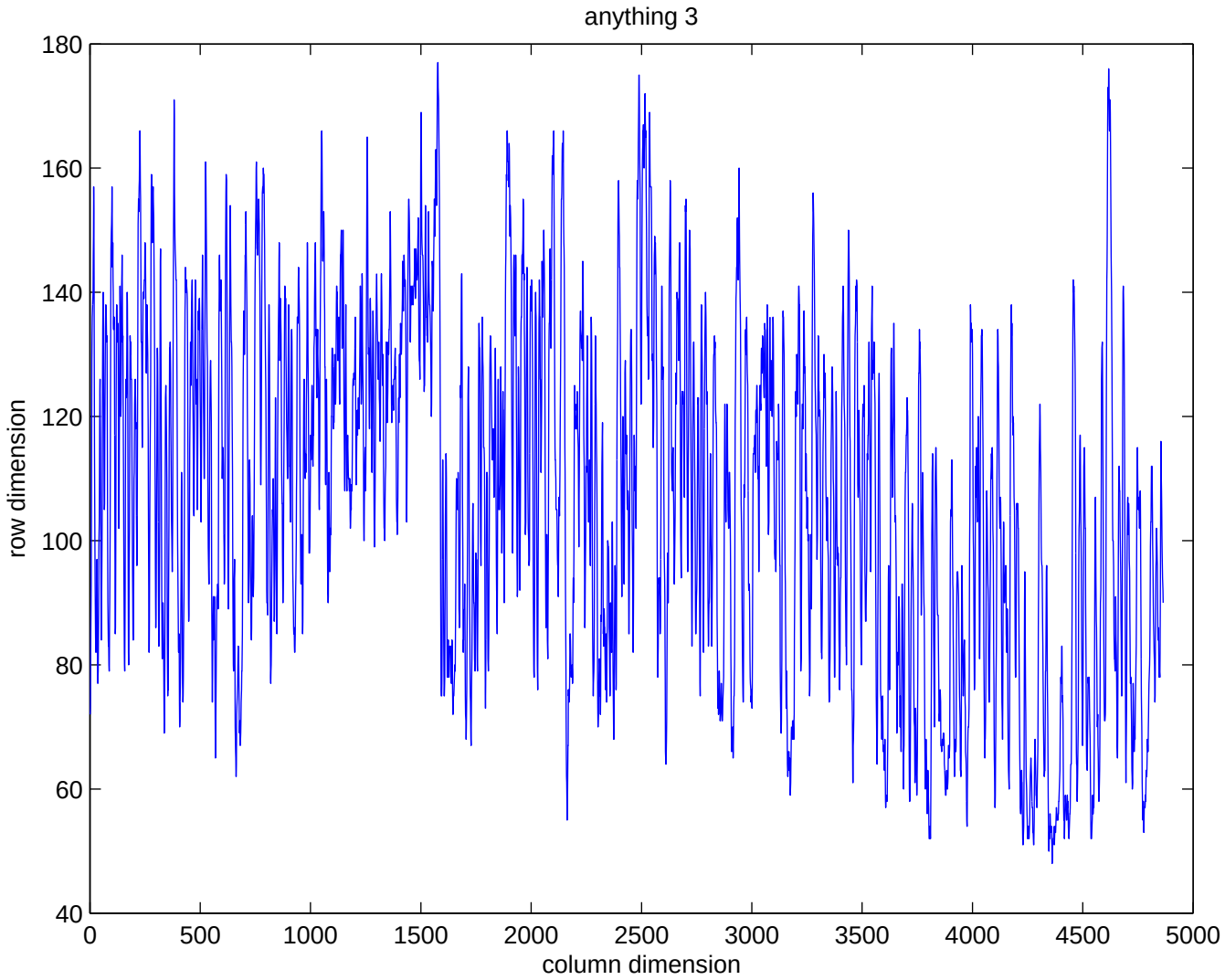
Logic:

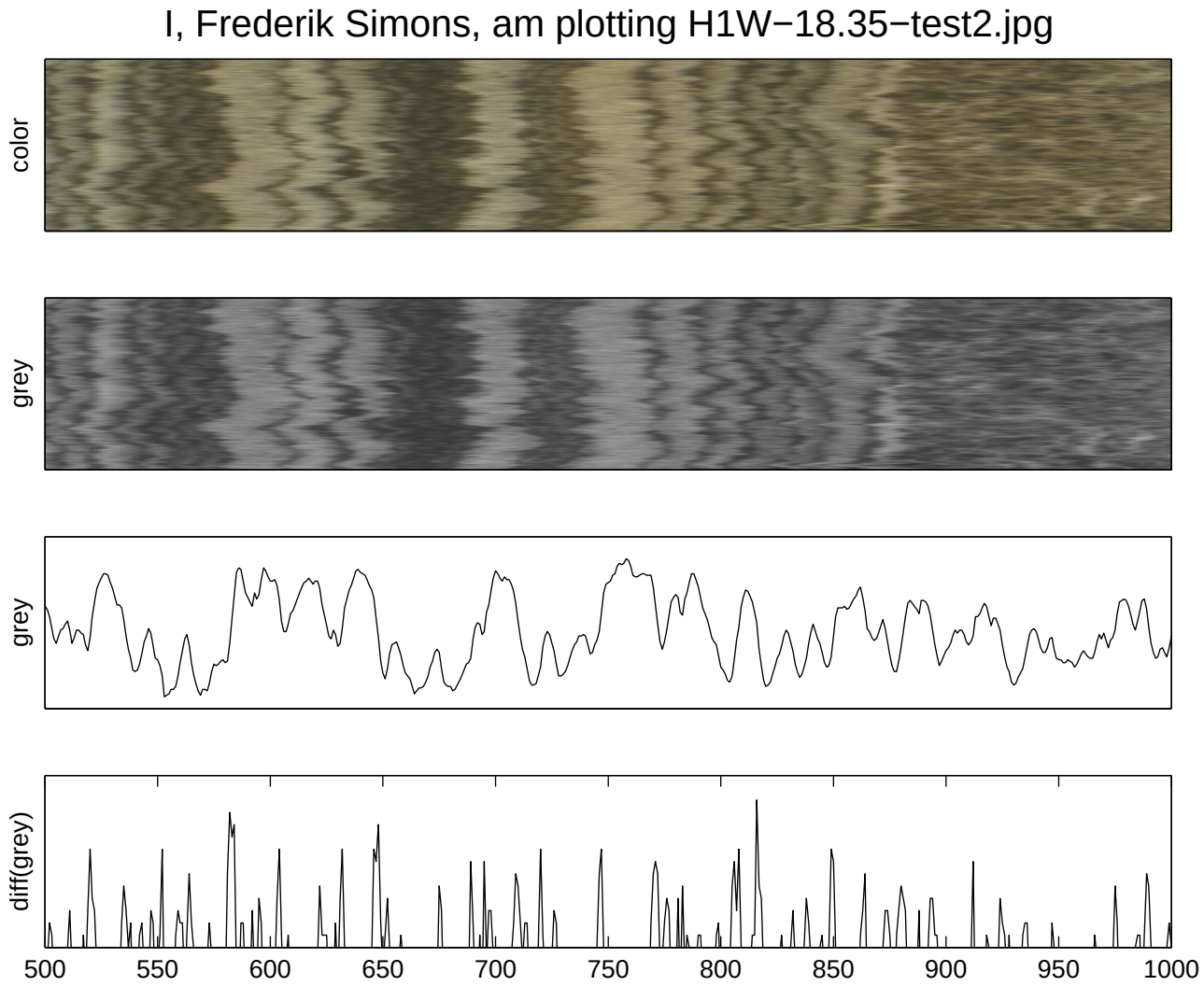
logical, character, string, double

21. `<, >, ==, ~, &, |`

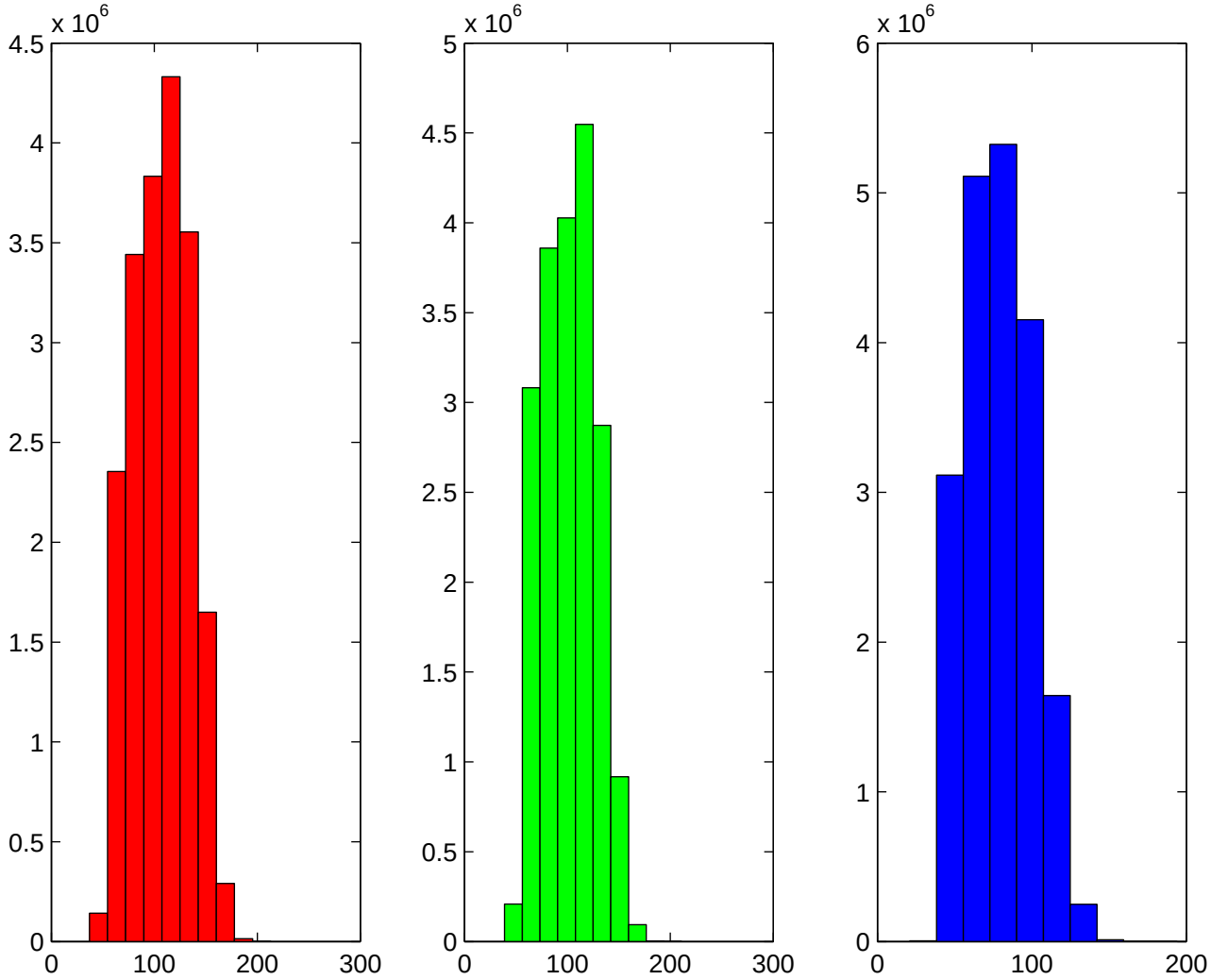
Going commando



Walkthrough



Script!


x 10^6
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
100
200
300
x 10^6
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
100
200
300
x 10^6
6
5
4
3
2
1
0
0
100
200

Homework 1

Navigate to Course Materials, Software Installation and Templates.

1. Install Matlab as per the instructions.
2. Start Matlab: you will be making a Very Simple Plot.
3. Create ("edit") a new code (*.m) file called "lab01b.m" and in it,
   type the following few instructions, or some slight variations
   thereof, according to your taste (i.e. vary the numbers):

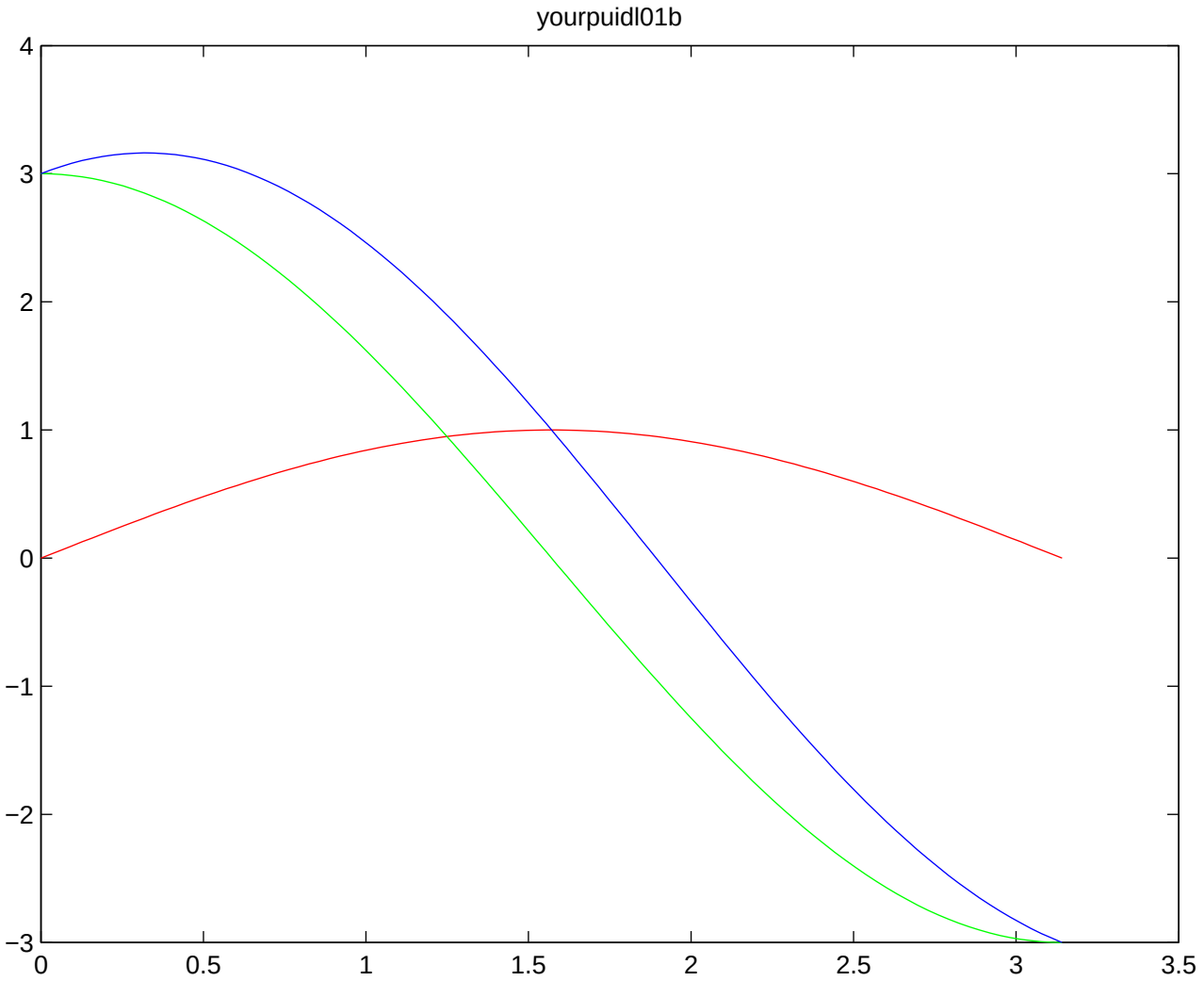
```
x=linspace(0,pi,100);
A=1; B=3; f1=0; f2=0;
y1=A*sin(x+f1); y2=B*cos(x+f2); y3=y1+y2;
figure (1)
plot(x,y1,'r'); hold on; plot(x,y2,'g'); plot(x,y3,'b')
title('yournetidl01b')
hold off; axis tight
print('-dpdf','yournetidl01b')
```

4. Save this file, see that you can find it again.

5. In step 3, "yournetid" is once again your Princeton netid of course.

6. Now "run" or "execute" this "script" and make sure that something
   pops up on your screen - and that a PDF gets made!

7. Find the PDF that you just made ('yournetidl01b.pdf').
   That is your second Assignment! Upload it to Blackboard by the deadline.


yourpuidl01b
4
3
2
1
0
−1
−2
−3
0
0.5
1
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2.5
3
3.5

Code hygiene

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Figures/Embellishment

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Variable Output