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info to start HW 4

`% simple examples`

save and load from disk file & plot with axis()

```
clear all; clc;
rng('default')
a = rand([10 3])
save mydata.txt a -ascii % command form
% function form: save('mydata.txt','a','-ascii')
% type mydata.txt % just to see it's there
b = load('mydata.txt')
```

e.g., data we collect in an experiment one day, save it to disk file for analysis another day or to email to someone else
see ASCII at https://en.wikipedia.org/wiki/Character_encoding

```
% plot(b)
% axis([1 10 0.2 0.8]) % xmin, xmax, ymin, ymax
% ylabel('values 0.2 to 0.8')
% xlabel('x')
% title('some random numbers')
```

now we come back the next day to load the data from the disk file and analyze it

```
% notice numeric constants 0.2 & 0.8
% in more than one place
% assign to variables
plot(b)
mn = 0.3;
mx = 0.7;
axis([1 10 mn mx]) % xmin, xmax, ymin, ymax
tt = sprintf('NEW values %g to %g',mn,mx);
ylabel(tt)
xlabel('x')
title('some random numbers')
```

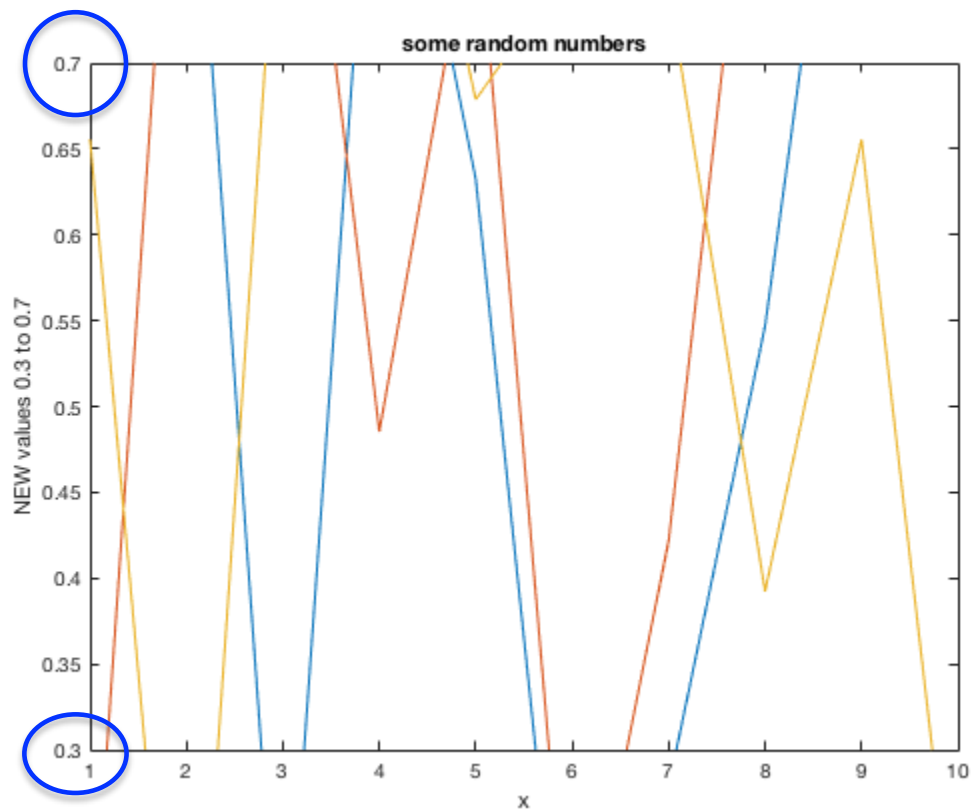
`a =`

```
0.8147    0.1576    0.6557
0.9058    0.9706    0.0357
0.1270    0.9572    0.8491
0.9134    0.4854    0.9340
0.6324    0.8003    0.6787
```

0.0975	0.1419	0.7577
0.2785	0.4218	0.7431
0.5469	0.9157	0.3922
0.9575	0.7922	0.6555
0.9649	0.9595	0.1712

b =

0.8147	0.1576	0.6557
0.9058	0.9706	0.0357
0.1270	0.9572	0.8491
0.9134	0.4854	0.9340
0.6324	0.8003	0.6787
0.0975	0.1419	0.7577
0.2785	0.4218	0.7431
0.5469	0.9157	0.3922
0.9575	0.7922	0.6555
0.9649	0.9595	0.1712



now plot data with SUBPLOTS

```
clear all; clc;  
rng('default')  
a = rand([10 3]);
```

```

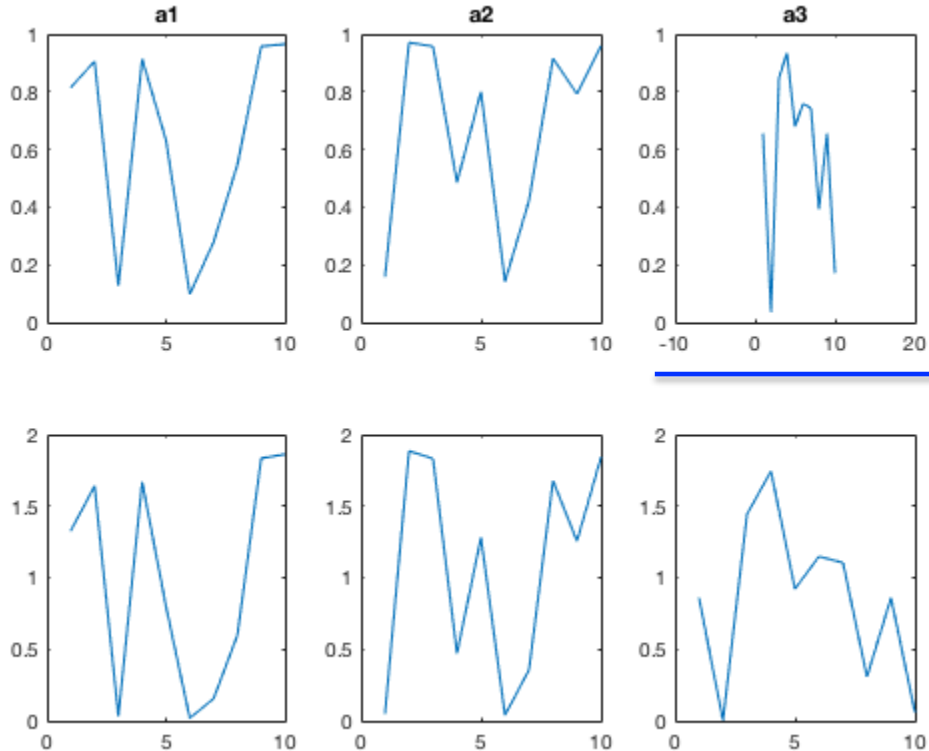
save mydata.txt a -ascii % command form
% function form: save('mydata.txt','a','-ascii')
% type mydata.txt % just to see it's there
b = load('mydata.txt');

% something arbitrary to make b different from a
b = 2*b.^2;

% subplot(#rows,#cols,#numThisOneCountAcrossRows)
subplot(2,3,1), plot(a(:,1)), title('a1')
subplot(2,3,2), plot(a(:,2)), title('a2')
subplot(2,3,3), plot(a(:,3))
title('a3'), axis([-10 20 0 1])

subplot(2,3,4), plot(b(:,1))
subplot(2,3,5), plot(b(:,2))
subplot(2,3,6), plot(b(:,3))

```



notice we can use repeats here

```

clear all; clc;
rng('default')
a = rand([10 3]);
save mydata.txt a -ascii % command form
% function form: save('mydata.txt','a','-ascii')
% type mydata.txt % just to see it's there

```

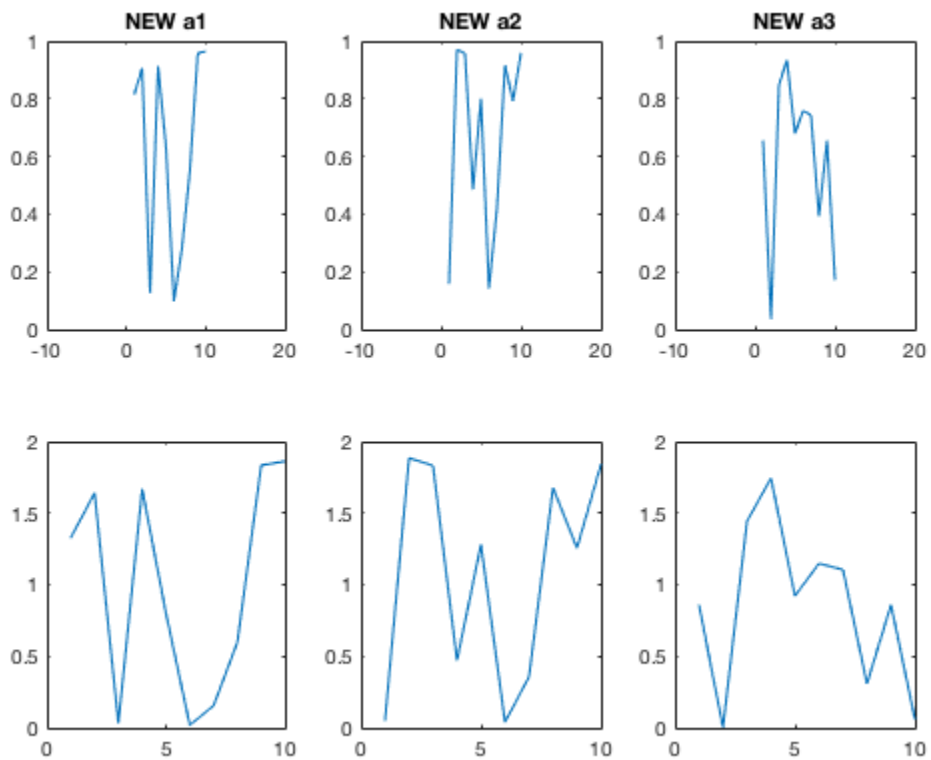
```

b = load('mydata.txt');
b = 2*b.^2;

for j = 1:3
    subplot(2,3,j), plot(a(:,j))
    tt = sprintf('NEW a%i',j);
    title(tt)
    axis([-10 20 0 1])
end

subplot(2,3,4), plot(b(:,1))
subplot(2,3,5), plot(b(:,2))
subplot(2,3,6), plot(b(:,3))

```



call function with no input or output

```

myFunc01

type myFunc01

hello from myFunc01

function myFunc01
    % example function with no input or output

    disp('hello from myFunc01')

```

call function which has subfunction

```
a = myFuncWithSub(1)

type myFuncWithSub

in mySubF
in myFuncWithSub, a = 2
in myFuncWithSub, b = 4

a =

4
```

this is one m-file named myFuncWithSub.m

```
function result = myFuncWithSub(x)

    a = x+1;

    b = mySubF(a);

    fprintf('in myFuncWithSub, a = %g \n',a)
    fprintf('in myFuncWithSub, b = %g \n',b)

    result = b;

    % need end on main & all sub funcs
    % when sub funcs are present in a file
    % end is optional for a single func with no subs
end

function result = mySubF(x)
    % subfunctions can only be called
    % by main function in file
    % use when a function is ONLY called
    % by functions in the same m-file

    result = x.^2;
    fprintf('in mySubF \n')

end

% can have multiple subfunctions
```

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