

Today's lecture we will see how to compare matrices, create cell arrays and extract information from it, and create calendar duration.

Compare matrices

Let's compare two matrices

```
A = [1 3 2; 8 7 4]
```

```
B = [6 6 6; 9 9 9]
```

```
% compare A to B
```

```
A < B
```

```
% we can compare one of the arrays to a scalar
```

```
A > 5
```

```
A =
```

```

1     3     2
8     7     4
```

```
B =
```

```

6     6     6
9     9     9
```

```
ans =
```

```

1     1     1
1     1     1
```

```
ans =
```

```

0     0     0
1     1     0
```

Create cell array

Create a 2-by3 cell array of text and numeric data

```
M = {'one', 'two', 'three'; 1, 2, 3}
```

```
% access data in cell array
```

```
M(1:2,1:2)
```

```
M =
```

```
    'one'    'two'    'three'
    [ 1]    [ 2]    [ 3]
```

```
ans =
```

```
    'one'    'two'
    [ 1]    [ 2]
```

Extract Information

Consider the following list

```
contacts = { ...
'Harris Bern, OH hparker@hmail.com'; ...
'Jane Paris, CA jane_borbon@horizon.net'; ...
'Mose Munich, VA mose_hillan@hmail.net'; ...
'Norah Paris, FL norah_kevin@horizon.net'; ...
'Jackson London, CO jackson_bel@mymail.com'};

% each individual's record occupies a row of the cell array

% We can extract row 2 the list
contacts{2}

% we identify a unique pattern in the text
email = '[a-z_]+@[a-z]+\.(com|net)';

% search for the email of all individuals in the list
regexp(contacts, email, 'match')
% search for the email of the fourth individual in the list
regexp(contacts{4}, email, 'match')

ans =

Jane Paris, CA jane_borbon@horizon.net

ans =

{1x1 cell}
{1x1 cell}
{1x1 cell}
{1x1 cell}
{1x1 cell}

ans =
```

```
'norah_kevin@horizon.net'
```

Plot

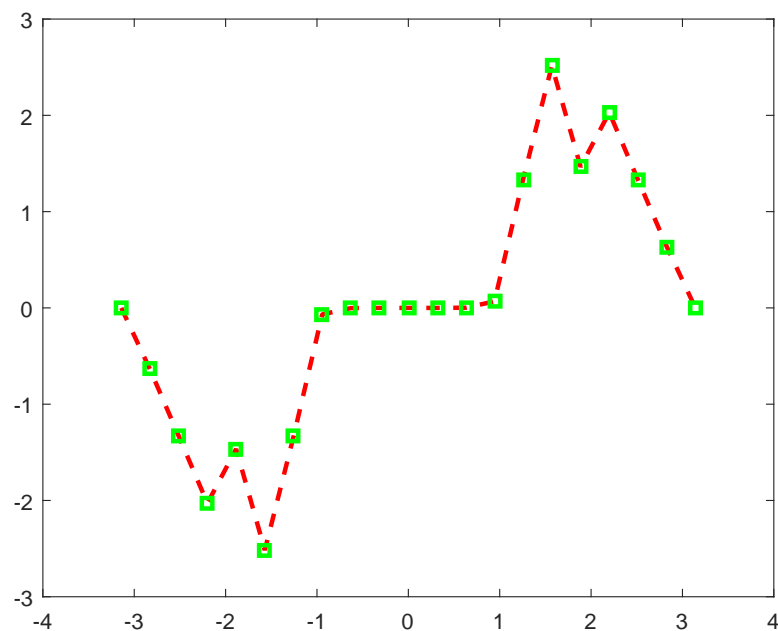
Use line styles from a 2-by-3 cell array R

```
x = -pi:pi/10:pi;  
y = tan(sin(x)) - sin(tan(x));
```

```
R(:,1) = {'Linewidth',2};  
R(:,2) = {'MarkerEdgeColor','k'};  
R(:,3) = {'MarkerEdgeColor','g'};
```

```
plot(x,y,'--rs',R{:})
```

```
Warning: MATLAB has disabled  
some advanced graphics  
rendering features by  
switching to software OpenGL.  
For more information, click  
<a  
href="matlab:opengl('problems')">here</a>.
```



Create a Calendar Duration

```
S = calmonths(3)  
S1 = caldays(3)  
S2 = calweeks(3)  
S3 = calquarters(3)
```

```
S4 = calyears(3)
% consider two dates  June 28, 2018 at 6 am and June 28, 2018 at 7 am
t = datetime(2018,6,28,6:7,0,0)
% add calendar durations to datetime to obtain a new date
t2 = t + S
t3 = t + S1
t4 = t + S2
t5 = t + S3
t6 = t + S4
```

S =

3mo

S1 =

3d

S2 =

3w

S3 =

3q

S4 =

3y

t =

28-Jun-2018 06:00:00 28-Jun-2018 07:00:00

t2 =

28-Sep-2018 06:00:00 28-Sep-2018 07:00:00

t3 =

01-Jul-2018 06:00:00 01-Jul-2018 07:00:00

t4 =

19-Jul-2018 06:00:00 19-Jul-2018 07:00:00

```
t5 =  
  
    28-Mar-2019 06:00:00    28-Mar-2019 07:00:00  
  
t6 =  
  
    28-Jun-2021 06:00:00    28-Jun-2021 07:00:00
```

Some Exercises

```
A = [ 1   5   8;  
      -3 NaN 14;  
      0   6 NaN ]  
  
% create a function called remove_nan_rows  
remove_nan_rows(A);  
  
x=5;  
  
disp(['the number is ',num2str(x)])  
  
% create a function called functionname  
functionname(1,6);  
  
% define function y  
y=@sin  
  
y(pi)  
y(0)  
y(pi/2)  
  
% define function with only one input  
y=@(x)sin(cos(x))  
  
y(3)  
  
% define function with multiple input  
y=@(x,z)sin(cos(x+z))  
  
y(3,6)
```

```
A =  
  
     1     5     8  
    -3    NaN    14  
     0     6    NaN
```

B =

1 5 8

the number is 5

y1 =

6

y2 =

6

y3 =

12

y =

@sin

ans =

1.2246e-16

ans =

0

ans =

1

y =

@(x)sin(cos(x))

ans =

-0.8360

y =

@(x,z)sin(cos(x+z))

ans =

-0.7902