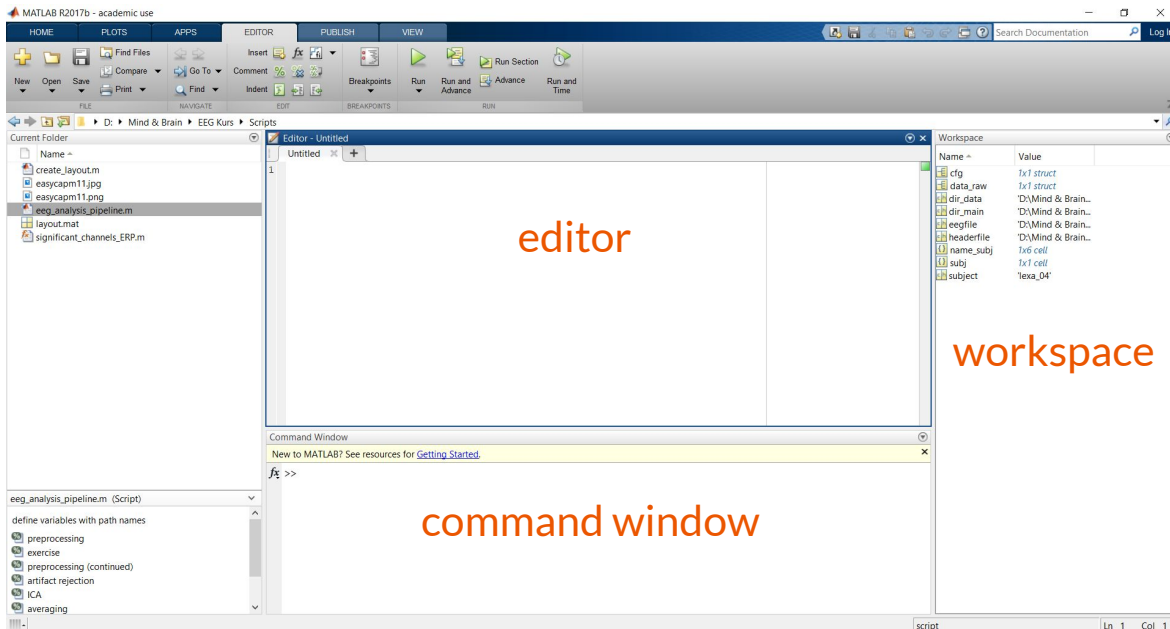# Matlab Programming Principles

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Editor, workspace, and command window

Variables

```
a = 1
b = a
c = a + b
d = 'hello';

% starts a comment (ignored by compiler)
% ; suppresses output
```

Vectors and matrices

```
vec = [3 8 2 6]
e = vec(1)

vec2 = [0 1 0 1]
sum = vec + vec2
```

```
mat = [2 3 9; 1 4 8]
f = mat(1,2)
g = mat(2,1)

% here ; starts a new column
```

Cell arrays

```
name_subj =  {'01', '02', '03', '04', '05', '06'};

a = name_subj(1)

b = name_subj{1}
```

```
a =                    b =
  1×1 cell                 '01'
array
    {'01'}
```

Structures

```
subject.name = 'mariella';

subject.age = 26;

subject.cell = {1 2 3 4};
```


1x1 struct with 3 fields

Field	Value
name	'mariella'
age	26
cell	*1x4 cell*

Using Matlab's help function

help disp

```
 disp Display array.

    disp(X) displays array X
without printing the array
name or additional description
information such as the size
and class name.
```

help length

```
length   Length of vector.

    length(X) returns the
length of vector X.
```
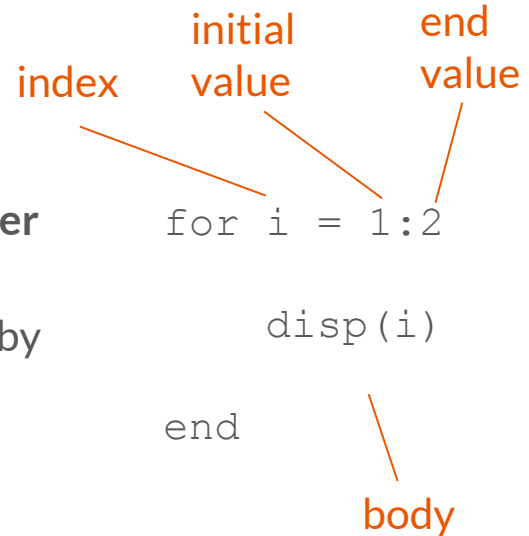
function name   input arguments

for loops

- `for` loops repeat commands a **pre-specified number of times**
- a `for` loop has an **index,** a variable that increases by one each time the loop runs
- it has an initial value and an end value that tell the index which values it can take
- it has a body, which contains the commands that should be repeated; the end of the body is marked by the keyword `end`

index   initial value   end value

```
for i = 1:2
    disp(i)
end
```

body

for loops

syntax:

```
for index = intial value:end value

    do something

end
```

in pseudocode:

```
repeat X number of times

        do something

end
```

for loops

```
for i = 1:2

    disp(i)

end
```

```
for i = 1:length(vec)

    disp(vec(i))

end
```

Plotting

```
x = -pi:0.01:pi;

plot(x, sin(x))
figure;
plot(x, cos(x))
```

Error messages

```
displ
```
Undefined function or variable 'displ'.

```
disp
```
Error using disp
Not enough input arguments.

Error messages

```
vec(5)
```
Index exceeds matrix dimensions.

```
h{(a+3)*(4+g}
```
Error: Unbalanced or unexpected parenthesis or bracket.