Before we begin

**QZ1**  Online Quiz

**HW2**  Due June 9th, 10am

**FL**  Prelim + Group Project

**PL**  4th Week, Date: TBA

**GP**  Start thinking about the project
Arrays

Array
A variable to hold multiple values of the same type.

Example

```javascript
x = [1, 2, 3, 4, 5, 6, 7];
y = ['a', 'b', 'c'];
z = 'abc';
```
Arrays - Indexing

Indexing
Specifying an element of an array by providing its location.

Example

```plaintext
a = [2, 3, 5, 7, 11, 13];
a(1) % 2
a(2) % 3
a(3) % 5
a(6) % 13

s = 'Cornell'
s(1) % 'C'
s(4) % 'n'
```
Array operators

.\^ \hspace{1em} \text{elementwise power raising}
.* \hspace{1em} \text{elementwise multiplication}
./ \hspace{1em} \text{elementwise division}

Example

\begin{verbatim}
a = [2 3 4 5];
b = [1 2 4 3];
c = a.*b; \hspace{1em} \% c is [2 6 16 15]
d = a.^b; \hspace{1em} \% d is [2 9 256 125]
e = a./b; \hspace{1em} \% e is [2 1.5 1 1.6667]
f = a + b; \hspace{1em} \% f is [3 5 8 8]
\end{verbatim}
Colon (:) Notation

Colon (:) creates a sequence of numbers with constants steps

Example

```
1:6
% [1 2 3 4 5 6]
1:2:6
% [1 3 5]
6:-2:1
% [6 4 2]
'a':'e'
% 'abcde'
'e':2:'k'
% 'egik'
```
Indexing with Colon

Parts of an array can be extracted by indexing with colon notation.

Example

\[
\begin{align*}
\text{a} & = [2, 3, 5, 7, 11, 13]; \\
a(1:2) & \% [2, 3] \\
a(1:2:5) & \% [2, 5, 11] \\
a(6:-3:1) & \% [13, 5] \\
a(1:3:\text{end}) & \% [2, 7] \\
a(2:\text{end}-1) & \% [3, 5, 7, 11]
\end{align*}
\]
New Loop

for

iterates over a range of values

Usage

for \%<variable> = <range>
  \%<loop body>
end
Example

% This will display values of x
% at every iteration from 1 to 5
for x = 1:5
    x
end
for - Examples

Example

% Sum integers from 1 to 100
s = 0;
for j = 1:100
    s = s + j;
end
fprintf('1+...+100=%d\n',s);
Nested Loops

Nested loops are loops within loops

Example

```plaintext
for %<var1> = <range1>
    for %<var2> = <range2>
        % ....
    end
end
```
Example

```plaintext
while %<condition1>
  while %<condition2>
    end
  end
end
```