

## Anonymous Functions:

If you want to create a function that is only one line long and you only need it until the workspace is cleared (using the **clear** command or exiting from Matlab/Octave), you can use an “anonymous function.” An anonymous function is declared within the program where it will be used.

```
anonymous_function_name = @(input variables) function expression
```

Example: Make an anonymous function that adds 2 to a variable or array.

In m-file:

```
add2 = @(x) x+2;  
y = 5;  
disp( add2(y) )  
y = [5, 2, 3];  
disp( add2(y) )
```

After execution:

```
7  
7 4 5
```

Example: Make an anonymous function that adds two variables or arrays together

In m-file:

```
addnums = @(x,y) x+y;  
a = 4; b = 6;  
disp( addnums(a,b) )  
a = [5, 99];  
b = [11, 100];  
disp( addnums(a,b) )
```

After execution:

```
10  
16 199
```

Example: Make a polynomial anonymous function

In m-file:

```
poly3 = @(x) x.^3 + 2*x.^2 - x + 2;  
x = (0:1:3);  
y = poly3(x);  
disp( y )
```

After execution:

```
2 4 16 44
```

## Midterm II review session:

(1) Nested loops:

```
for i=1:3
    j = 1;
    while(j<i)
        disp([i,j])
        j = j+1;
    end
end
```

Output:

```
2 1
3 1
3 2
```

(2) Formatting:

```
A = [3 4 5; 2 2 4; 8 9 8];
B = [7 8; 2 1; 9 9];
C = [3.4 5.6; 7.8 9.9];
D = 'hello'; F = 'bye';
fprintf('%3i %2i %1i\n', B)
fprintf('%3i %2i %1i\n', B')
fprintf('P %2i Q %2i\n',A,B)
fprintf('%5.1f %7.2e\n', C)
fprintf('%g\n %5.1f',C)
fprintf('%10s %4s',D,F)
```

Output:

```
7 2 9
8 1 9
7 8 2
1 9 9
P 3 Q 2
P 8 Q 4
P 2 Q 9
P 5 Q 4
P 8 Q 7
P 2 Q 9
P 8 Q 1
P 9 Q 3.4 7.80e+000
5.6 9.90e+000
3.4
7.85.6
9.9 hello bye
```

### (3) Functions

In main.m:

```
clear; clc;  
x = [2 5 7];  
y = [7 8 9];  
x = f1( x(1:2) ) + f1( x(2:3) );  
disp(x)  
w = f2( f3(y), y(2) );  
disp(w)
```

In f1.m:

```
function[w] = f1(w)  
disp( w(2) )  
w = w .* 1;  
endfunction
```

In f2.m:

```
function [ out ] = f2 (a,b)  
disp( a )  
disp( b )  
out = a .* b;  
endfunction
```

In f3.m:

```
function [out] = f3(a)  
disp(a)  
out = sum(a);  
endfunction
```

At command line:

```
> main  
5  
7  
5 10  
7 8 9  
24  
8  
32
```