

# Beyond the Mouse – A Short Course on Programming

LAB 04. More Flow Control  
repeat;

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YOU'LL NEVER FIND A  
PROGRAMMING LANGUAGE  
THAT FREES YOU FROM  
THE BURDEN OF  
CLARIFYING  
YOUR IDEAS.



"The Uncomfortable Truths Well",  
<http://xkcd.com/568> (April 13, 2009)

# Control flow (1) – if – then – else

## Matlab Formal

```
if ( EXPRESSION )  
    STATEMENT  
    ...  
    STATEMENT  
[ elseif  
    STATEMENT  
    ...  
    STATEMENT  
]  
[ else  
    STATEMENT  
    ...  
]  
end
```

# Control flow (1) – if – then – else

## Matlab Formal

```
if ( EXPRESSION )  
    STATEMENT  
    ...  
    STATEMENT  
[ elseif  
    STATEMENT  
    ...  
    STATEMENT  
]  
[ else  
    STATEMENT  
    ...  
]  
end
```

## Matlab: Example 1

```
clc;  
%get a random number  
x = rand  
  
if (x > 0.5 )  
    disp('x > 0.5')  
else  
    disp('x <= 0.5')  
end
```

# Control flow (1) – if – then – else

## Matlab Formal

```
if ( EXPRESSION )  
    STATEMENT  
    ...  
    STATEMENT  
[ elseif  
    STATEMENT  
    ...  
    STATEMENT  
]  
[ else  
    STATEMENT  
    ...  
]  
end
```

## Matlab: Example 2

```
clc;  
%get a random number  
x = rand  
  
if (x > 0.5 )  
    if(x > 0.75)  
        disp('x > 0.75')  
    else  
        disp('0.5 < x <= 0.75')  
    end  
else  
    disp('x <= 0.5')  
end
```

# Control flow (1) – if – then – else

## Matlab Formal

```
if ( EXPRESSION )  
    STATEMENT  
    ...  
    STATEMENT  
[ elseif  
    STATEMENT  
    ...  
    STATEMENT  
]  
[ else  
    STATEMENT  
    ...  
]  
end
```

## Matlab: Example 3

```
clc;  
%get a random number  
x = rand  
  
if (x > 0.5 )  
    if (x > 0.75)  
        disp('x > 0.75')  
    else  
        disp('0.5 < x <= 0.75')  
    end  
elseif (x>0.25)  
    disp('0.25 < x <= 0.5')  
elseif (x>0.1)  
    disp('0.1 < x <= 0.25')  
else  
    disp('0 <= x <= 0.1')  
end
```

### Matlab Formal

```
while ( EXPRESSION )  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

## Control flow (2) – condition controlled loop: `while`

### Matlab Formal

```
while ( EXPRESSION )  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

### Matlab Example 1

```
clc ;  
%get a random number  
while ( 1 )  
    x = rand  
    if ( x > 0.5 )  
        disp( 'x_>_0.5' )  
    else  
        disp( 'x_<=_0.5' )  
    end  
end
```

## Control flow (2) – condition controlled loop: `while`

### Matlab Formal

```
while ( EXPRESSION )  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

### Matlab Example 2

```
clc;  
%get a random number  
while ( 1 )  
    x = rand  
    if ( x > 0.5 )  
        disp( 'x_>_0.5' )  
        break;  
    else  
        disp( 'x_<=_0.5' )  
    end  
end
```



## Control flow (2) – condition controlled loop: `while`

### Matlab Formal

```
while ( EXPRESSION )  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

### Matlab Example 3

```
clc ;  
%get a random number  
while ( 1 )  
    x = rand  
    while ( x < 0.5 )  
        disp( 'x < 0.5' )  
        x = x+0.1;  
    end  
end
```

### Matlab Formal

```
for var=start[:step]:end  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

## Control flow (3) – count controlled loop: `for`

### Matlab Formal

```
for var=start[:step]:end  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

### Matlab Example 1

```
clc ;           %clear screen  
for n=1:10  
    disp(sprintf('n=%d', n));  
end
```

## Control flow (3) – count controlled loop: `for`

### Matlab Formal

```
for var=start[:step]:end  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

### Matlab Example 2

```
clc;                %clear screen  
for n=1:10  
    if (mod(n,2) == 0)  
        disp(sprintf('%d_is_even', n));  
    else  
        disp(sprintf('%d_is_odd', n));  
    end  
end
```

## Control flow (3) – count controlled loop: `for`

### Matlab Formal

```
for var=start[:step]:end  
    STATEMENT  
    . . .  
    STATEMENT  
end
```

### Matlab Example 3

```
clc;                %clear screen  
for n=1:2:10  
    if (mod(n,2) == 0)  
        disp(sprintf('%d_is_even', n));  
    else  
        disp(sprintf('%d_is_odd', n));  
    end  
end
```

Implementation of a script and a very simple function:

**calling\_script.m**

```
x = 100  
y = function_name(x)
```

**function\_name.m**

```
function a = function_name (b)  
    a = b/2  
end
```

# Function stuff

Implementation of a script and a very simple function:

calling\_script.m

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```

function\_name.m

```
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Same colors are the same thing!

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