

Matlab Programming Programming^{1 2}

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October 1, 2009

¹*Matlab, An Introduction with Applications, 2nd ed.* by Amos Gilat

²*Matlab Guide, 2nd ed.* by D. J. Higham and N. J. Higham

Relational and Logical Operators

- Relational operator compares two numbers and states either true (1) or false (0)

<	Less than
>	Greater than
<=	Less than or equal
>=	Greater than or equal
==	Equal to
~=	Not Equal to

- Logical operator examines true/false statements and produces true (1) or false (0)

&	AND	Both true result is true (1) otherwise (0)
	OR	Either or both are true then true (1). If both false then false (0)
~	NOT	Gives the opposite of the operand. If operation false then true (1) otherwise false (0)

Conditional Statements

- A conditional statement is a command that allows Matlab to make a decision of whether to execute a groups or commands

```
if (cond state)
    _____Group 1 Commands
elseif (cond state)
    _____Group 2 Commands
else
    _____Group 3 Commands
end
```

Conditional Statements

Example: A worker is paid according to his hourly wage up to 40 hours and 50% more for overtime. In addition, if the worker works more than 60 hours then the worker gets a \$100 bonus.

```
t = input('Enter the number of hours worked ');
h = input('Enter the hourly wage ');
if t>60
    Pay = t*h;
    Pay = Pay + (t-40)*.5*h + 100;
elseif t>40
    Pay = t*h;
    Pay = Pay + (t-40)*.5*h;
else
    Pay = t*h;
end
fprintf('Your pay is $%5.2f\n',Pay);
```

For-end Loops

In for-end loops the execution is repeated a number of times

```
for k = f:s:t  
....  
end
```

- f: first number
- s: increment by
- t = end number

```
>>for k = 1:3:7  
k^2  
end  
ans =  
1  
ans =  
16  
ans =  
49
```

While-end Loops

In `while`-end loops the execution is repeated until a condition is satisfied

```
while (conditional statement)
```

```
....
```

```
end
```

```
>>k=1;
```

```
>>while k<7
```

```
k^2
```

```
k = k+2;
```

```
end
```

```
ans =
```

```
1
```

```
ans =
```

```
9
```

```
ans =
```

```
25
```

Notes on Nesting

- Loops and conditional statements can be nested within themselves
- Keep organized by having nice spacing (USE TABS)

```
nest1
  ____nest2
    _____nest3
      _____end
    ____end
  end
```