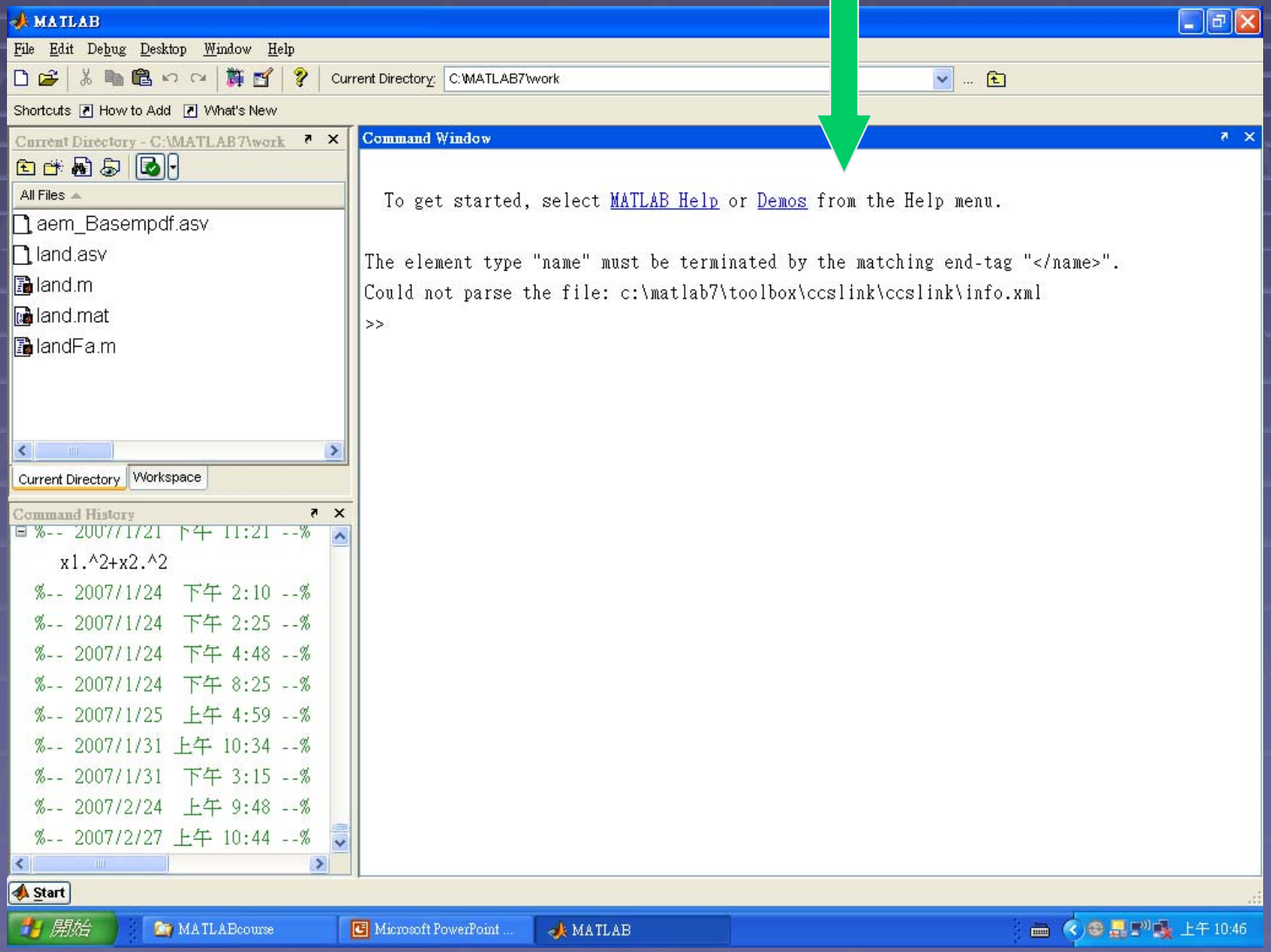
MATLAB Starting

- Interactive computing environment
  - Command window
  - Workspace window
  - MAT file

Command window



Interactive computing environment

- Give instructions directly in command window for evaluation of mathematic expressions
- Ex.
  - sin(2*pi)+cos(3*pi)
  - 1.01^3 +1.01^2+1.01

Math expression

```
>> sin(2*pi)+cos(3*pi)

ans =

  -1.000000000000000
```

Expression

```
>> 1.01^3+1.01^2+1.01

ans =

    3.06040100000000
```

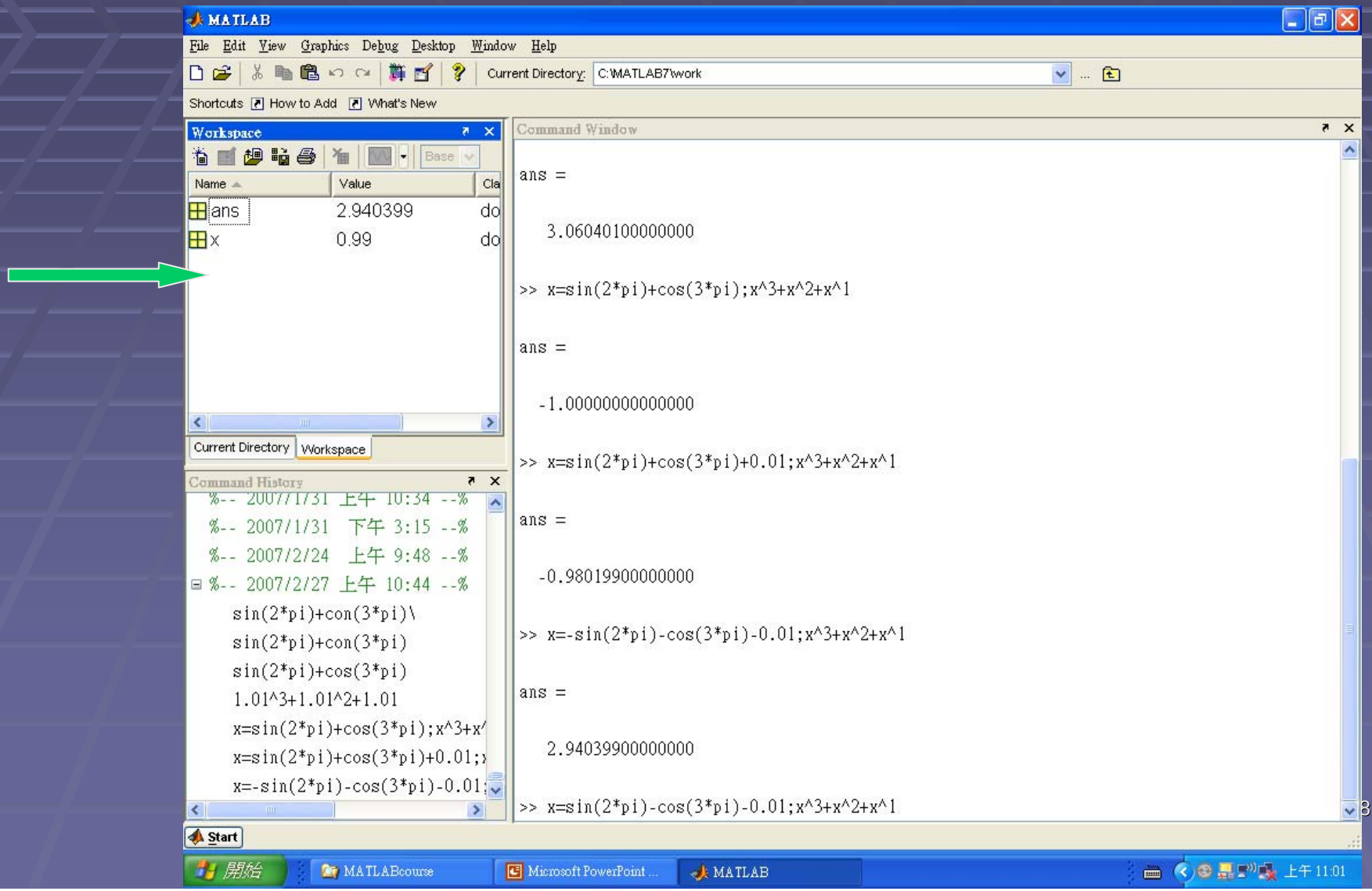
A set of instructions

```
x=sin(2*pi)+cos(3*pi)+0.01;x^3+x^2+x^1

ans =

  -0.98019900000000
```

Instruction

- Validity
  - Infix expression: 2+3*5
  - Not prefix expression: +(*(3 5) 2)
- Operator
  - +, -, *, /, ^
- Operand
  - Variables and constants
  - Outputs of built-in functions
  - Outputs of User created functions

Work space


MATLAB
File Edit View Graphics Debug Desktop Window Help
Current Directory: C:\MATLAB7\work
Shortcuts How to Add What's New
Workspace
Name Value Cla
ans 2.940399 do
x 0.99 do
Current Directory Workspace
Command History
%-- 2007/1/31 下午 3:15 --%
%-- 2007/2/24 上午 9:48 --%
%-- 2007/2/27 上午 10:44 --%
sin(2*pi)+con(3*pi)\
sin(2*pi)+con(3*pi)
sin(2*pi)+cos(3*pi)
1.01^3+1.01^2+1.01
x=sin(2*pi)+cos(3*pi);x^3+x^2+x^1
x=sin(2*pi)+cos(3*pi)+0.01;x^3+x^2+x^1
x=-sin(2*pi)-cos(3*pi)-0.01;x^3+x^2+x^1
Command Window
ans =
3.06040100000000
>> x=sin(2*pi)+cos(3*pi);x^3+x^2+x^1
ans =
-1.00000000000000
>> x=sin(2*pi)+cos(3*pi)+0.01;x^3+x^2+x^1
ans =
-0.98019900000000
>> x=-sin(2*pi)-cos(3*pi)-0.01;x^3+x^2+x^1
ans =
2.94039900000000
>> x=sin(2*pi)-cos(3*pi)-0.01;x^3+x^2+x^1
Start
開始 MATLABcourse Microsoft PowerPoint ... MATLAB 上午 11:01

Work space

- Visible variables in workspace window
- A matrix is typically represented as a variable
- A variable has its size, which can be retrieved by the built-in function
  - size( )

Matrix size

size(x)

ans =

1 1

Matrix size

```
>> x=[1 2;3 4;5 6]

x =

     1     2
     3     4
     5     6
```

Row number

```
>> size(x,1)

ans =

     3
```

Column number

```
>> size(x,2)

ans =

     2
```

3D matrix

- X=ones(2,3,4);

```
>> size(X)

ans =

     2     3     4
```

Sub-matrices of a 3D matrix

- A sub-matrix

```
>> X(:,:,1)

ans =

     1     1     1
     1     1     1
```

MAT file

- Users can save current variables in work space to an intermediate file
- Ex

  >> save mywork x

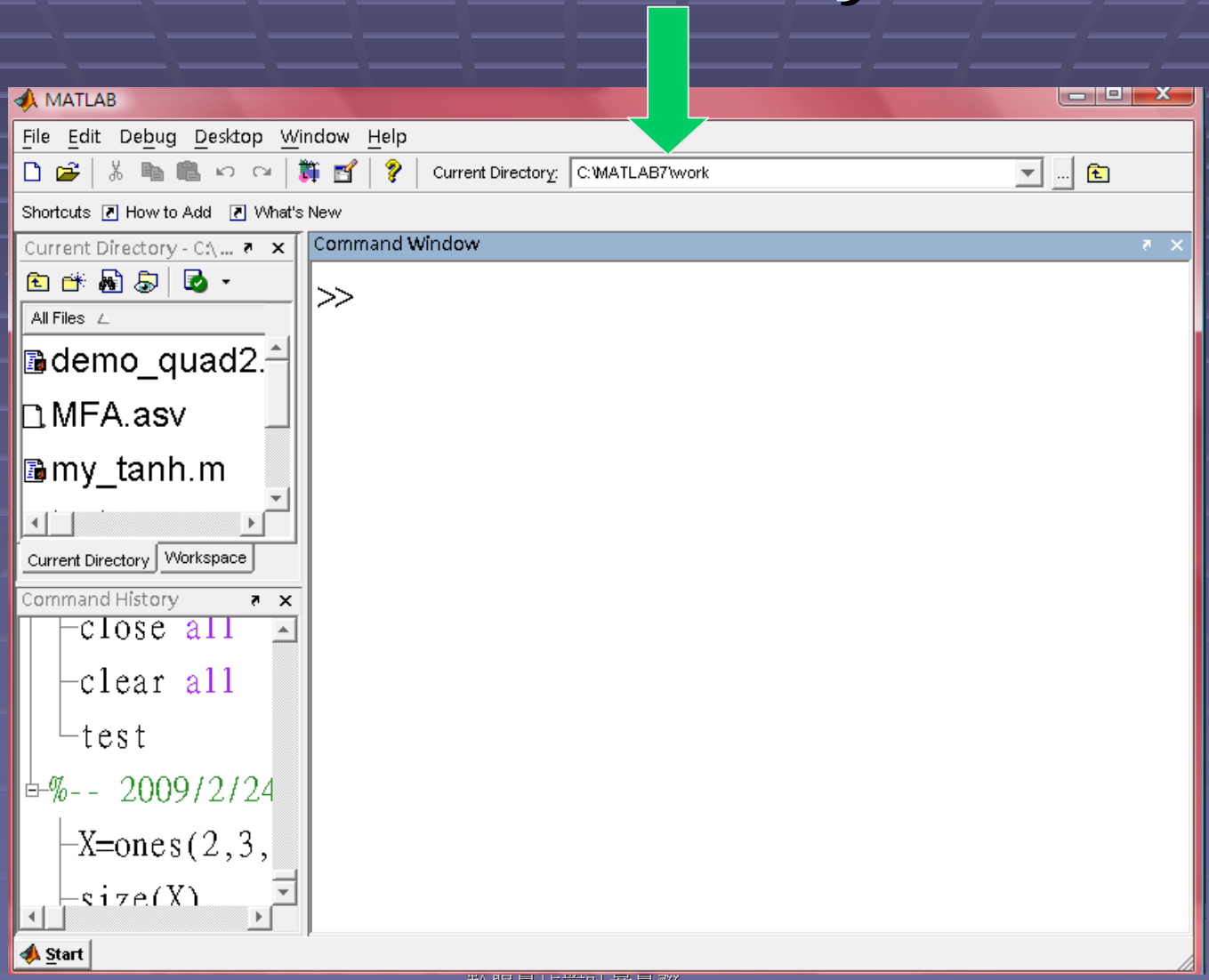
Variable in work space

filename

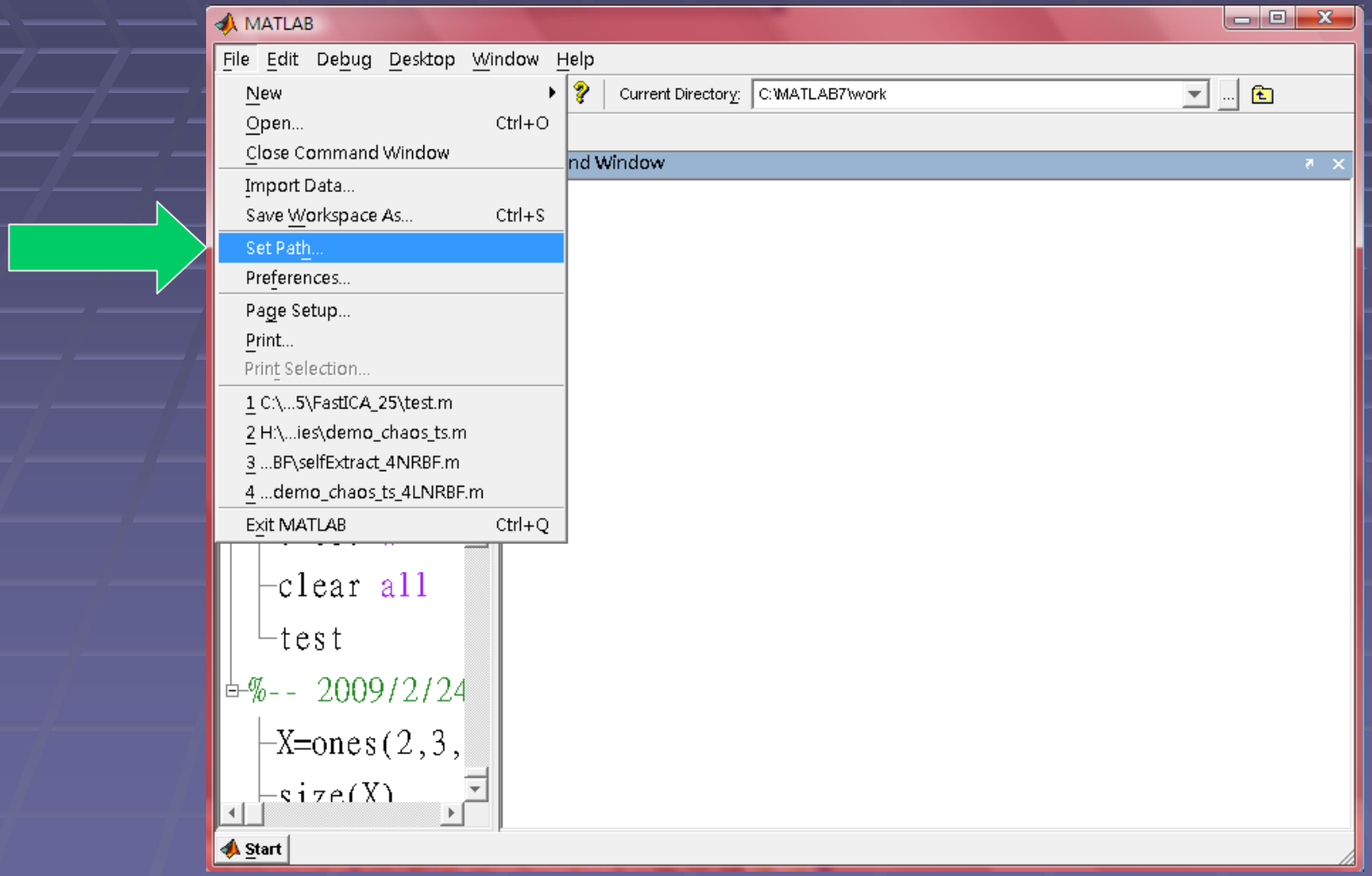
Load MAT files

- The ‘save’ instruction creates mywork.mat in the current directory
- Load MAT files
  - Restore previously saved variables

Current Directory



SET Path


MATLAB
File Edit Debug Desktop Window Help
New
Open... Ctrl+O
Close Command Window
Import Data...
Save Workspace As... Ctrl+S
Set Path...
Preferences...
Page Setup...
Print...
Print Selection...
1 C:\...5\FastICA_25\test.m
2 H:\...ies\demo_chaos_ts.m
3 ...BF\selfExtract_4NRBF.m
4 ...demo_chaos_ts_4LNRBF.m
Exit MATLAB Ctrl+Q
Current Directory: C:\MATLAB7\work
nd Window
clear all
test
%-- 2009/2/24
X=ones(2,3,
size(X)
Start

SET PATH

- MATLAB engine seeks executable functions
  - Current path
  - Directories listed at PATH