



Chapter 9: Handle Graphics

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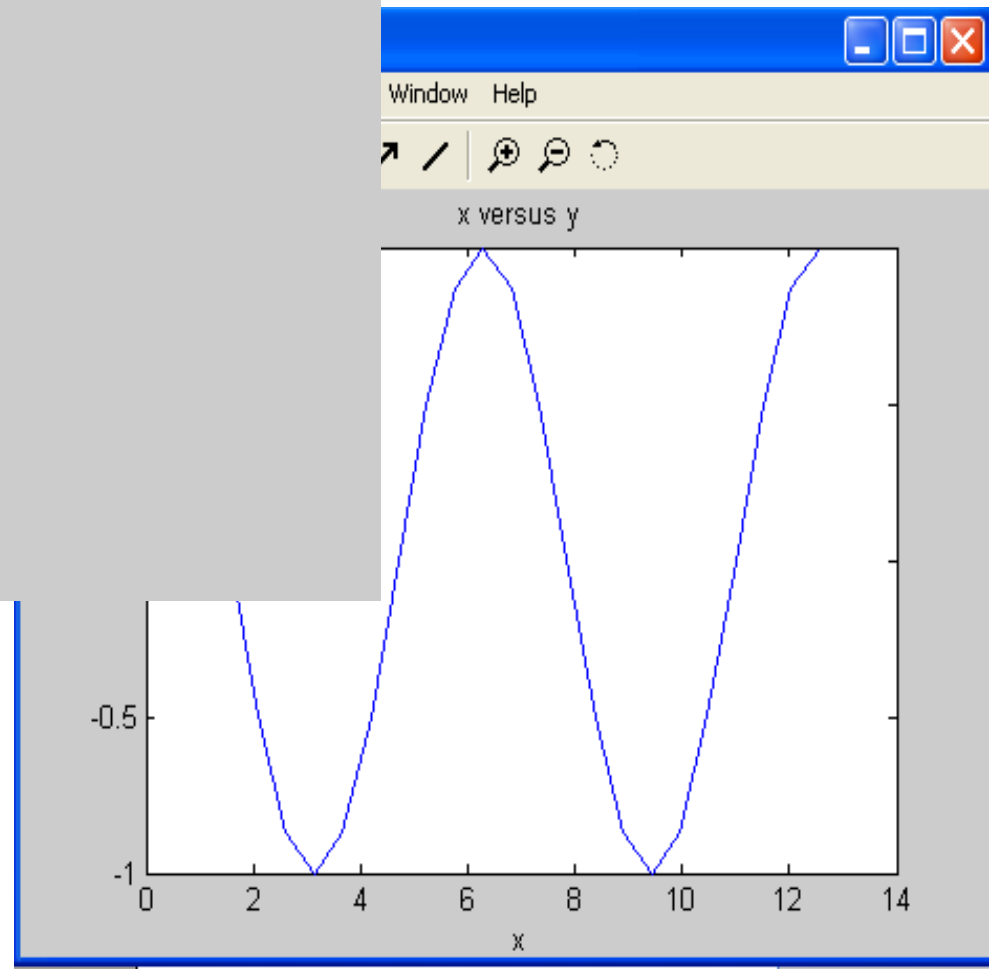
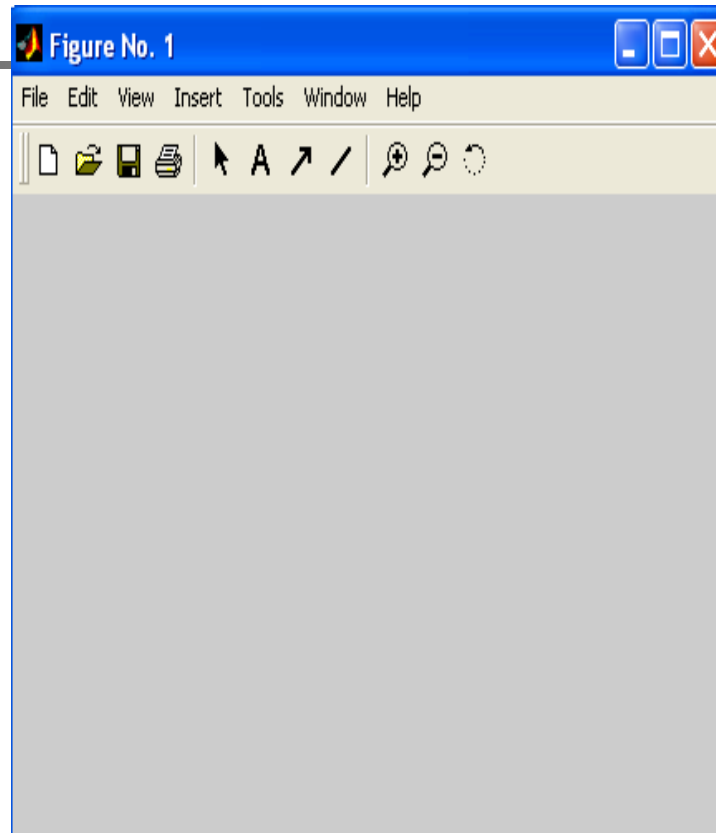
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Matlab Graphic System

```
x=0:pi/6:4*pi;  
y=cos(x);
```

```
figure(1);
```

```
plot(x,y);  
xlabel('x');  
ylabel('y');  
title('x versus y');
```





Matlab Graphic System (Cont.)

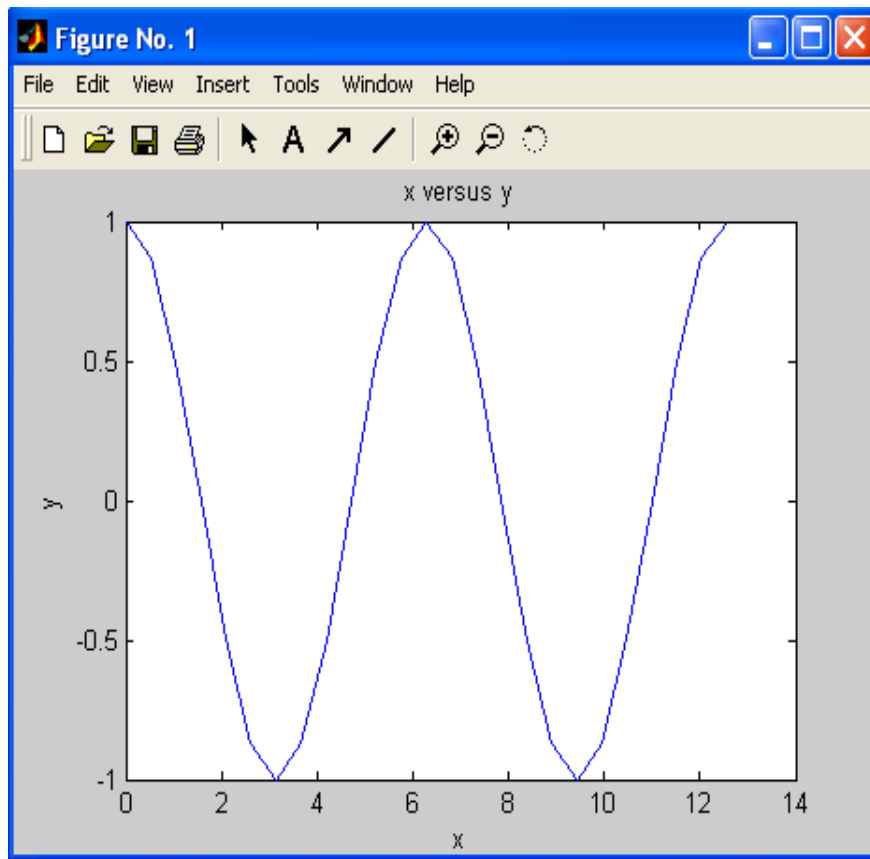
- Objects: figure, axes, line, text...
- Objects' ID: the object's **handle**/identifier

`hand1=figure(1);`

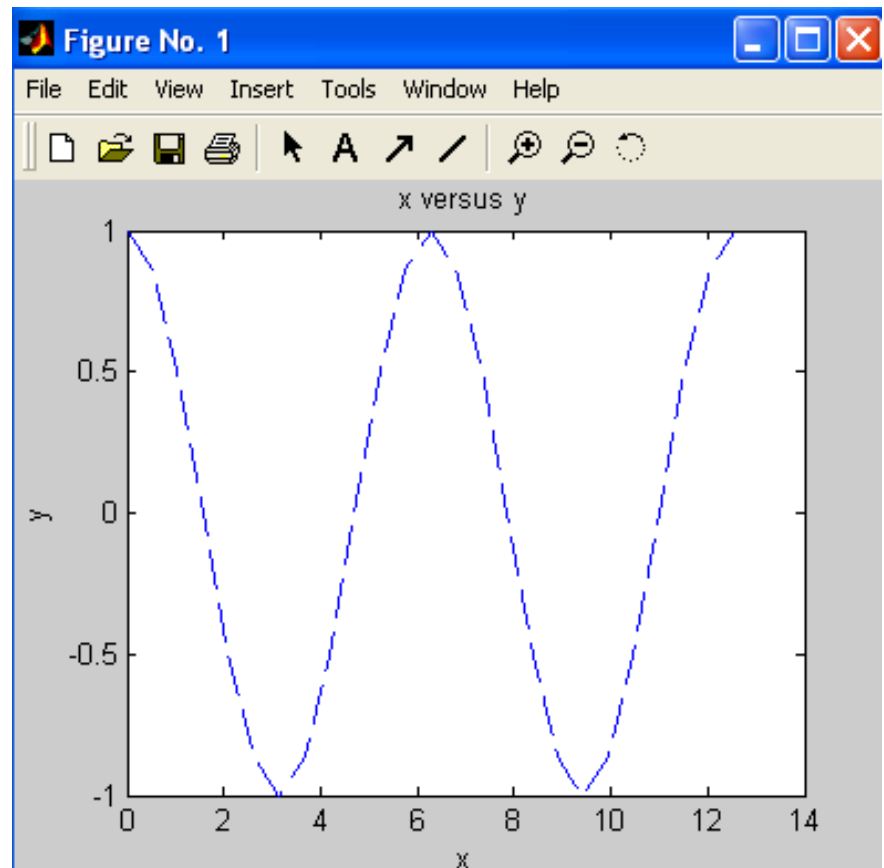
`hand2=plot(x,y);`

Matlab Graphic System (Cont.)

`plot(x,y);`



`plot(x,y,'--');`



Matlab Graphic System (Cont.)

```
x=0:pi/6:4*pi;
```

```
y=cos(x);
```

```
figure(1);
```

```
hand2=plot(x,y);
```

```
set(hand2,'LineStyle','--');
```

```
xlabel('x');
```

```
ylabel('y');
```

```
title('x versus y');
```

Command Window

```
>> x=0:pi/6:4*pi;
```

```
y=cos(x);
```

```
figure(1);
```

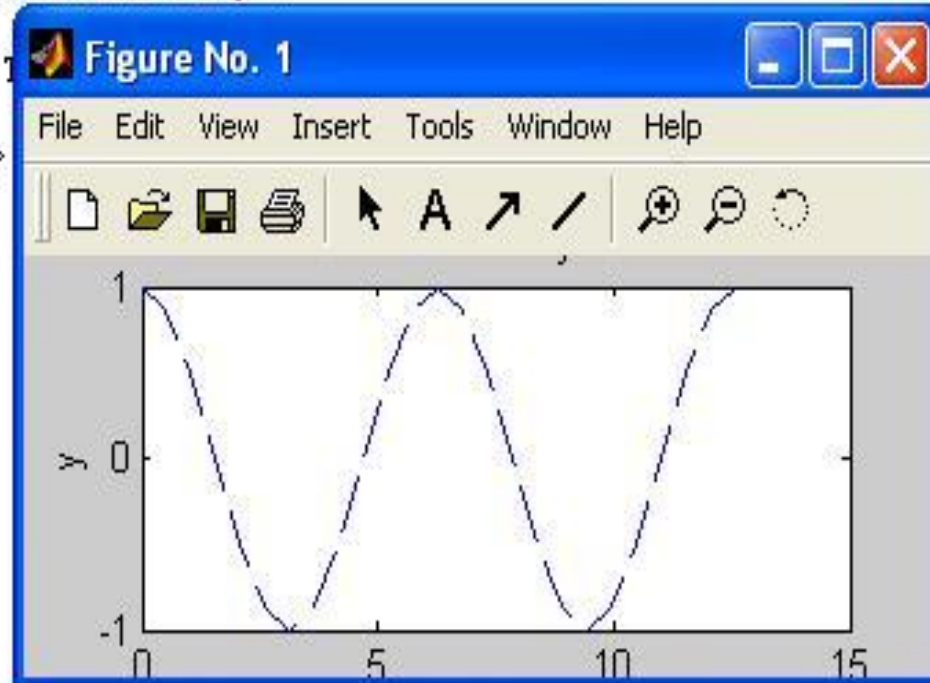
```
hand2=plot(x,y);
```

```
set(hand2,'LineStyle','--');
```

```
xlabel('x');
```

```
ylabel('y');
```

```
title('x versus y');
```





Changing Object Properties

- **set** function: modify the properties of an object

```
set(handle,'PropertyName1',val1, 'PropertyName2',val2,...);
```

- **get** function: Get the property values

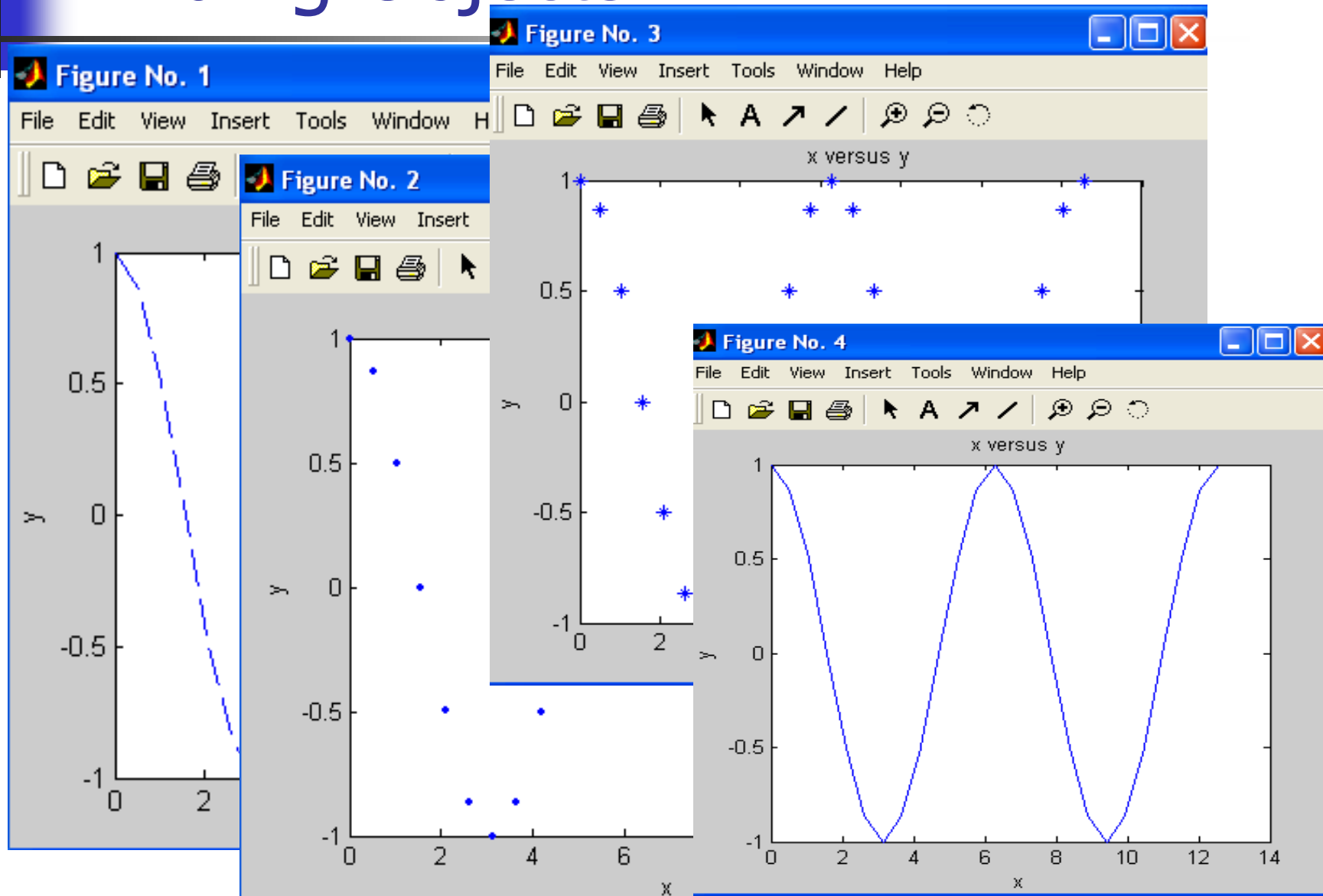
```
value=get(handle,'PropertyName');
```

```
result=get(hand2,'LineWidth')
```

```
ans =
```

```
0.5
```

Finding Objects





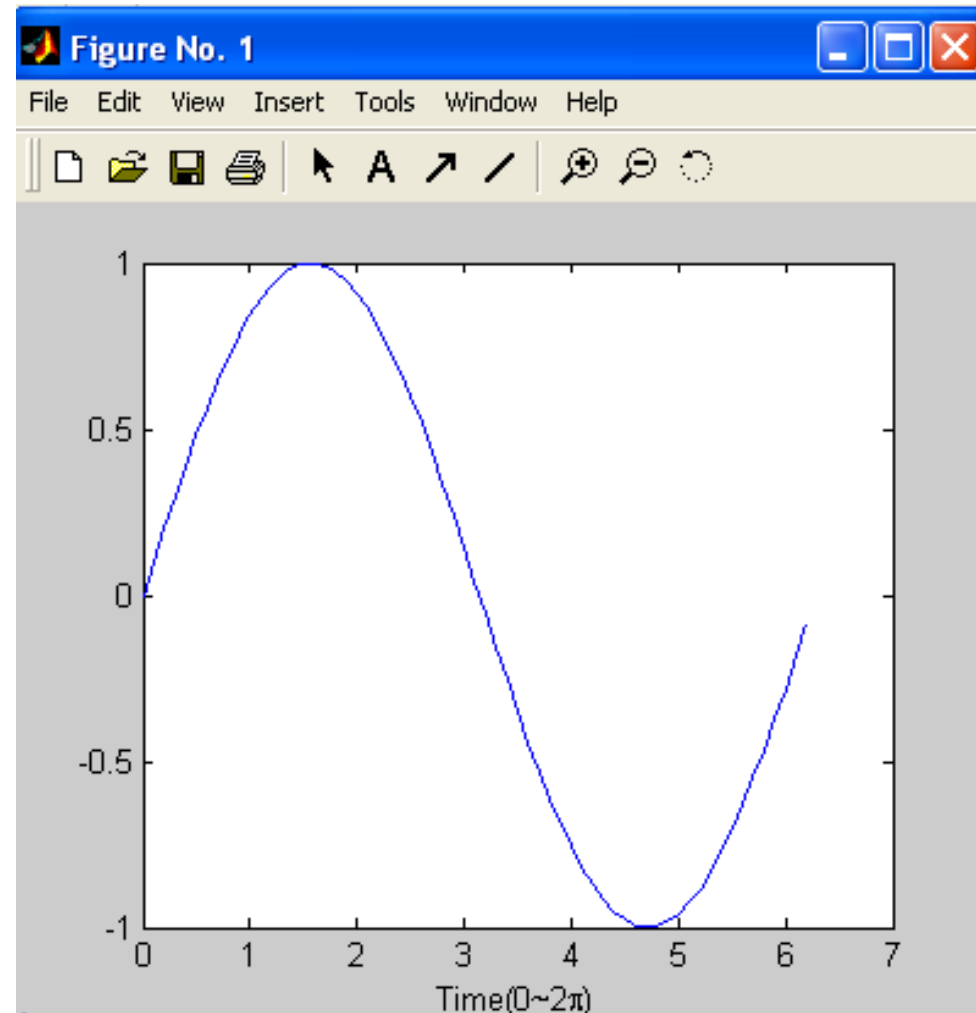
Finding Objects (Cont.)

- `findobj`: Finds a graphic object (with specified property values);
- `gcf`: Return the handle of the **current** **f**igure;
- `gca`: Return (**g**et) the handle of the current **a**xes in the **current** figure;
- `gco`: Return the handle of the **current** **o**bject.

Finding Objects (Cont.)

```
t=0:0.1:2*pi;  
y=sin(t);  
hand1=figure(1);  
plot(t,y);  
xlabel('Time(0~2\pi)');  
result=findobj(hand1);
```

returns the handles listed in
ObjectHandles, and the
handles of all their descendents.



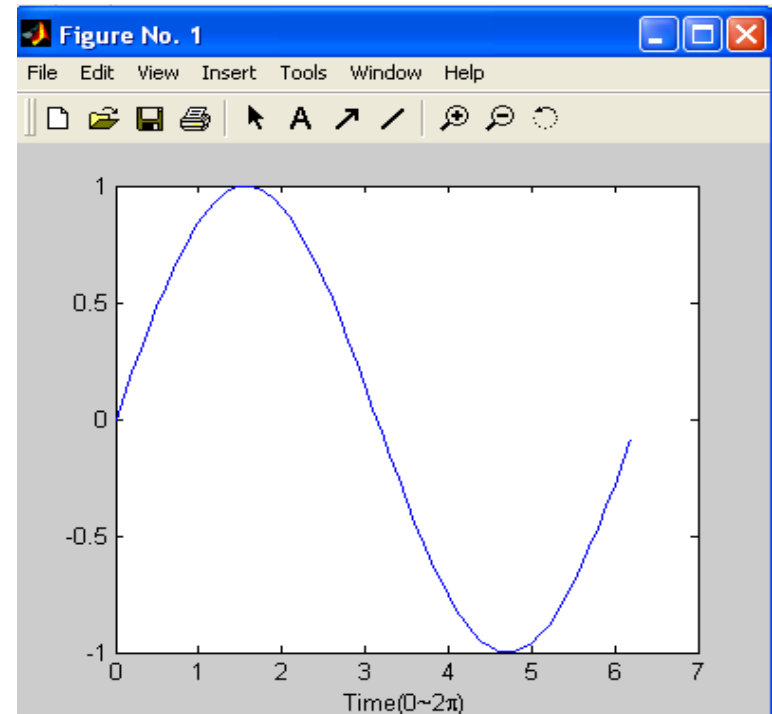
Finding Objects (Cont.)

result =

1

203.000244140625

202.000366210938



result(1): handle of the current figure;
result(2): handle of the axes of this figure;
result(3): handle of the line.

```

>> t=0:0.1:2*pi;
y=sin(t);
hand1=figure(1);
plot(t,y);
xlabel('Time (0~2\pi)');
result=findobj(hand1);
>> result

result =

    1.0000
  100.0004
    99.0010

>> format long; t=0:0.1:2*pi;
y=sin(t);
hand1=figure(1)
plot(t,y);
xlabel('Time (0~2\pi)');
result=findobj(hand1)

hand1 =

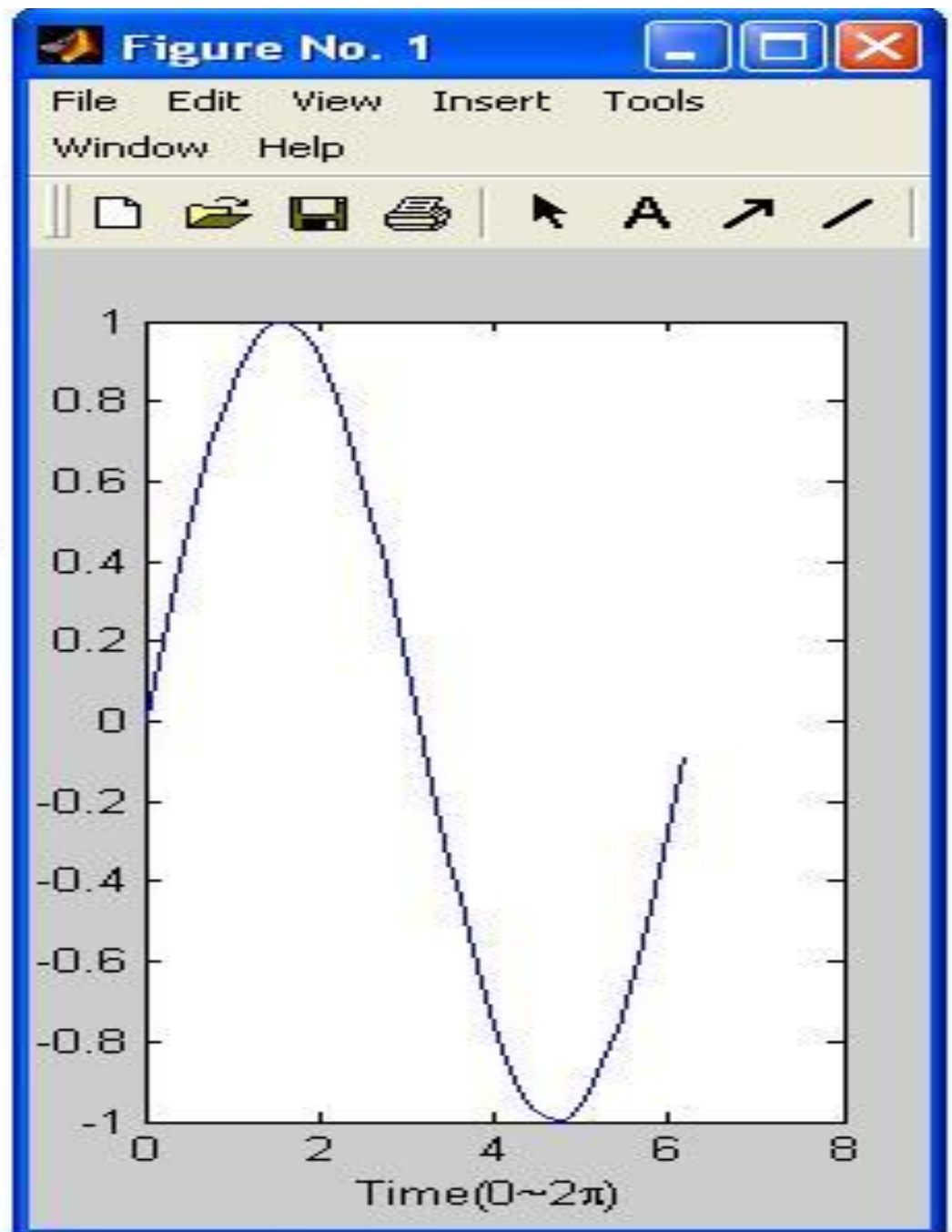
     1

result =

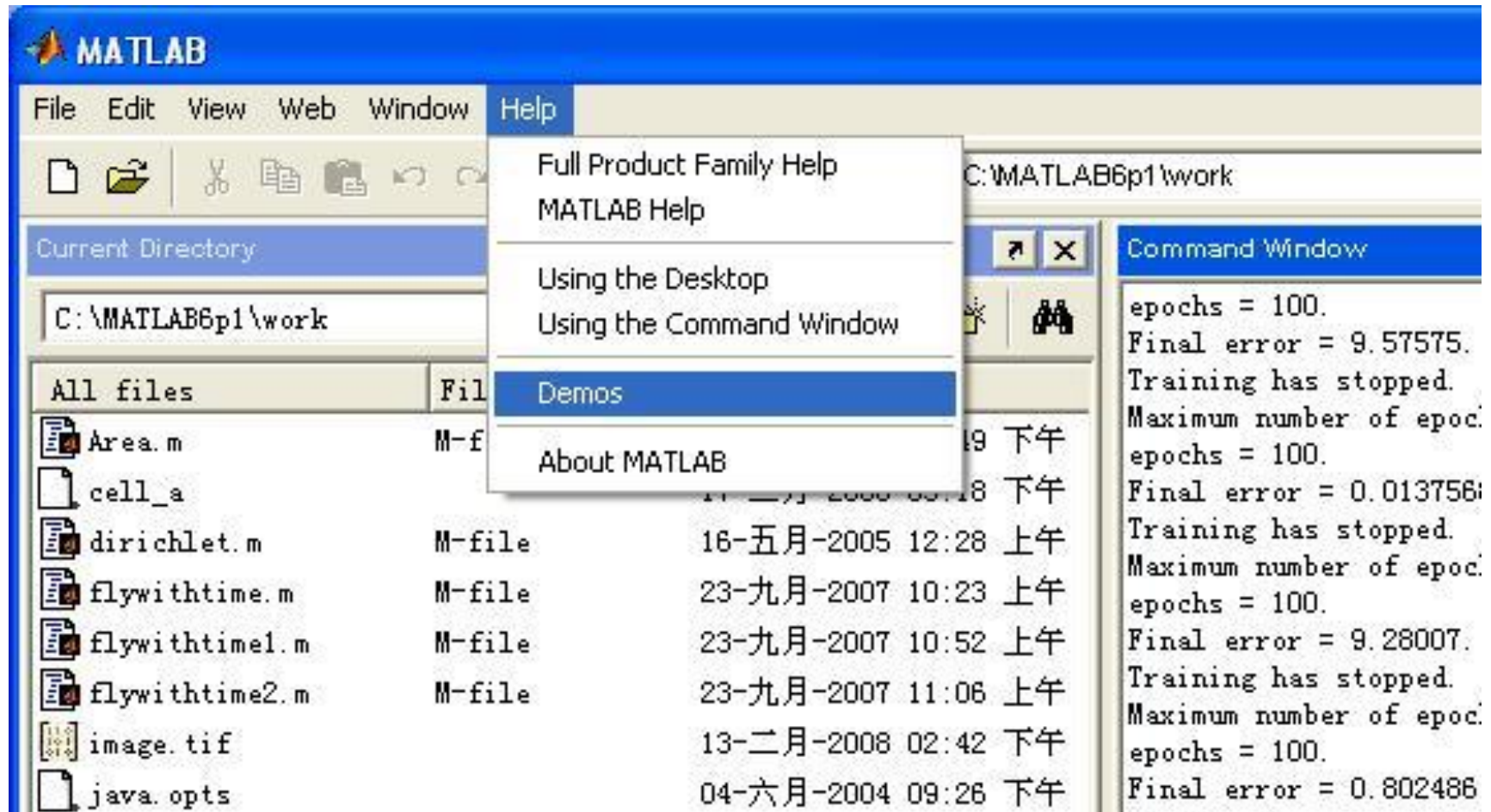
 1.0e+002 *

    0.0100000000000000
    1.00000366210938
    1.02000610351562
>>

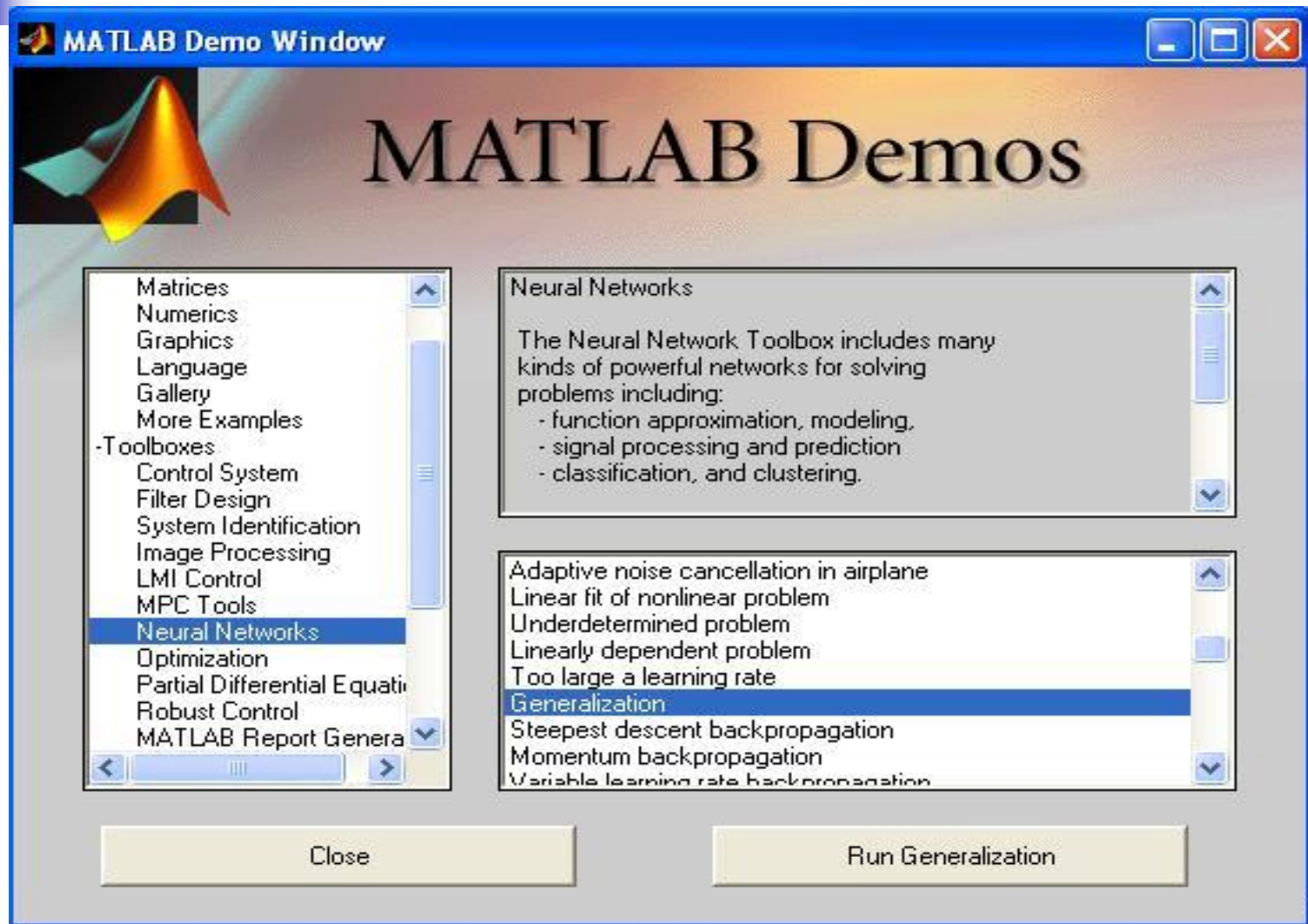
```



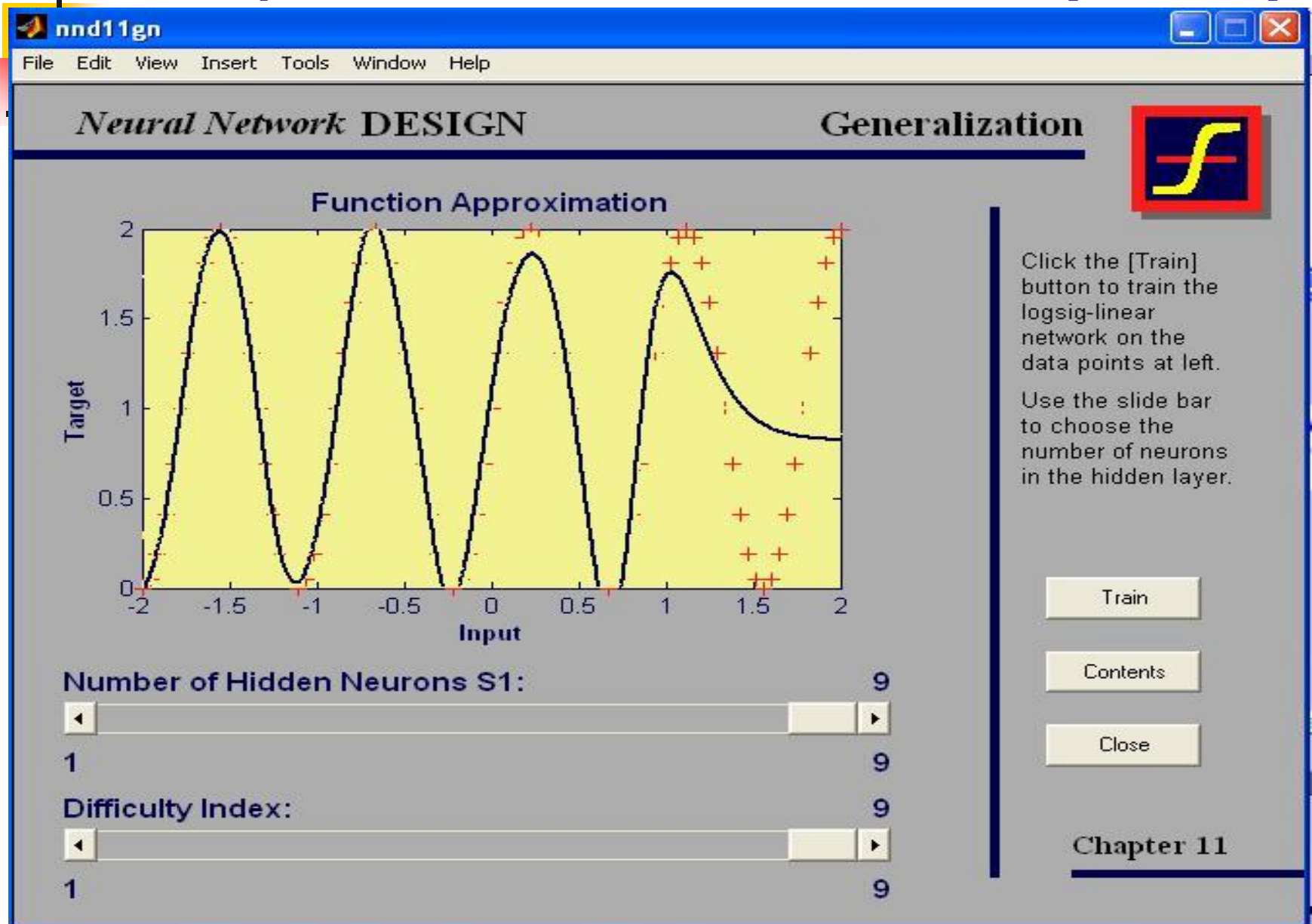
Graphical User Interfaces



Graphical User Interfaces (Cont.)



Graphical User Interfaces (Cont.)





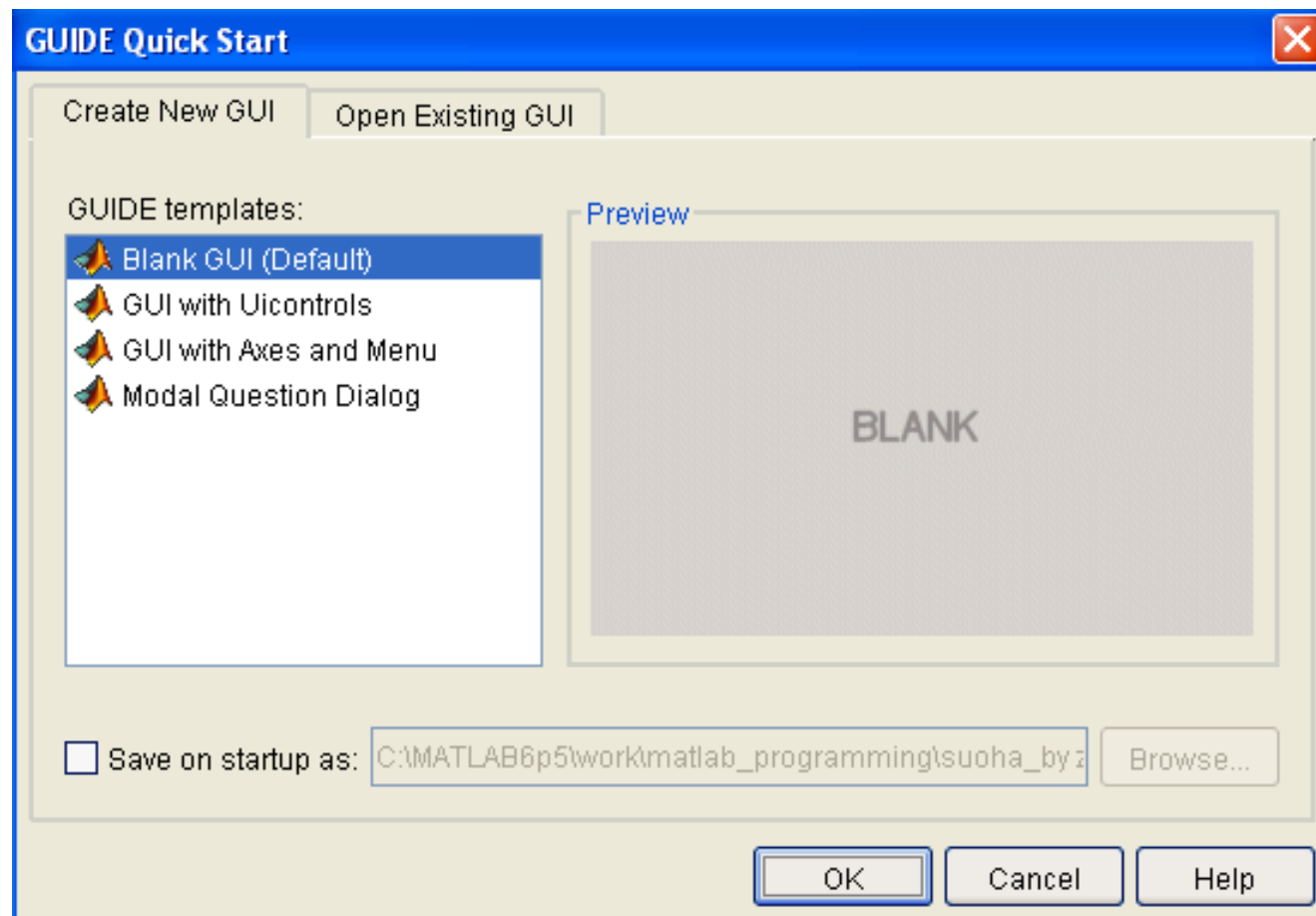
Graphical User Interfaces (Cont.)

- Text fields
- Pushbuttons
- Edit boxes
- ...

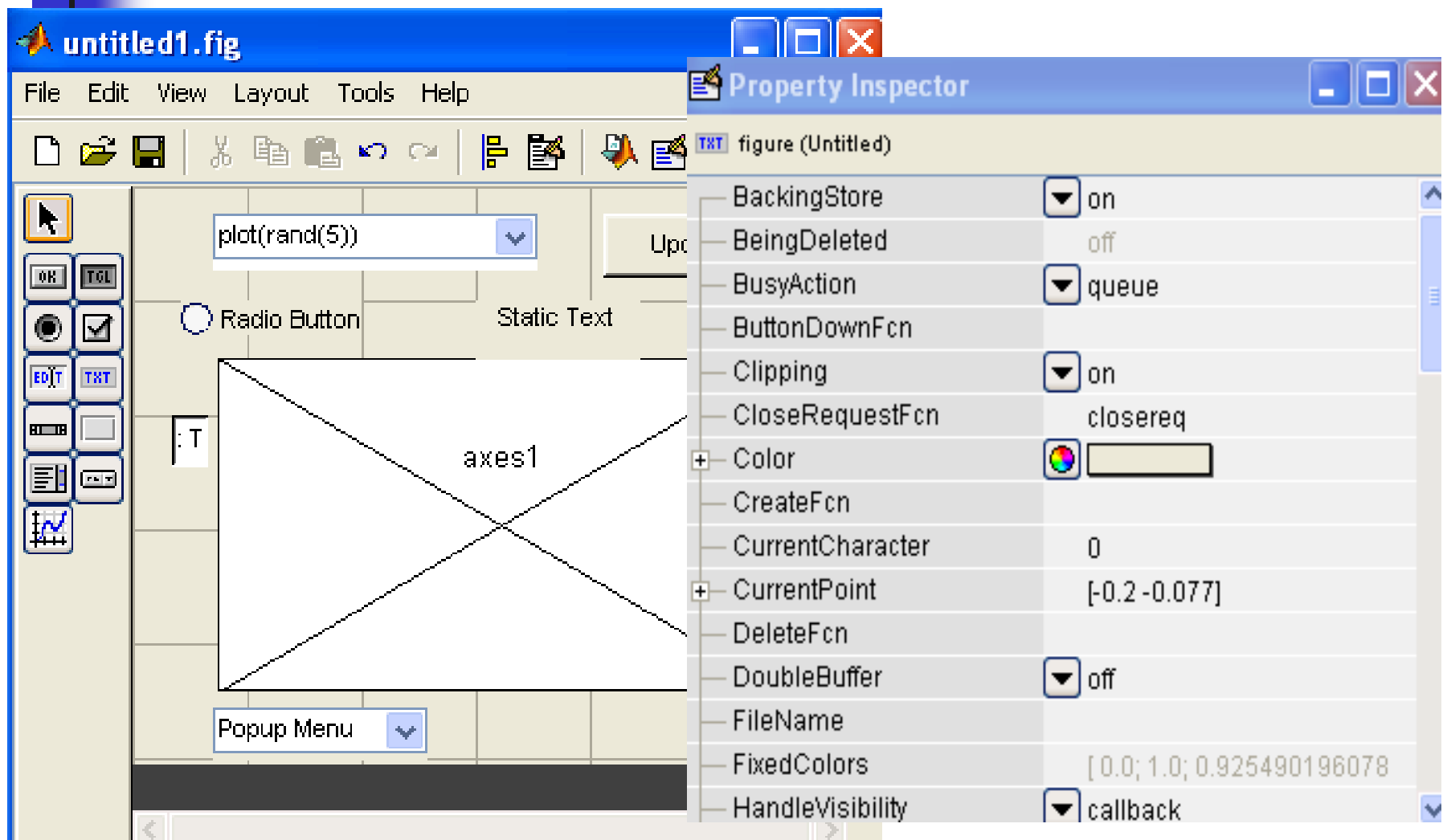
- event driven

Graphical User Interfaces (Cont.)

- >> guide



Graphical User Interfaces (Cont.)





Graphics and GUI: Videos

- <https://www.mathworks.com/videos/creating-a-gui-with-guide-101439.html>
- <https://www.mathworks.com/videos/new-graphics-and-gui-building-features-in-matlab-75-101536.html>
- <https://www.mathworks.com/videos/new-graphics-and-gui-building-features-in-r2008a-101539.html>
- <https://www.mathworks.com/videos.html>



Sincere Thanks!

- Using this group of PPTs, please read
- [1] Yunong Zhang, Weimu Ma, Xiao-Dong Li, Hong-Zhou Tan, Ke Chen, MATLAB Simulink modeling and simulation of LVI-based primal-dual neural network for solving linear and quadratic programs, Neurocomputing 72 (2009) 1679-1687
- [2] Yunong Zhang, Chenfu Yi, Weimu Ma, Simulation and verification of Zhang neural network for online time-varying matrix inversion, Simulation Modelling Practice and Theory 17 (2009) 1603-1617