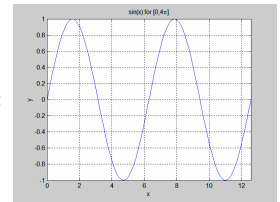


Plotting

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Plotting

```
x = linspace(0, 4*pi);  
y = sin(x);  
plot(x,y);  
title('sin(x) for [0,4*pi]');  
xlabel('x');  
ylabel('y');  
grid on;  
axis([0 4*pi -1 1]);
```



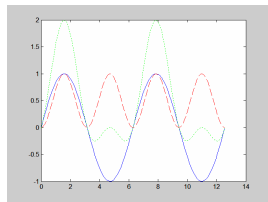
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Plotting: Multiple Graphs

```
x = linspace(0, 4*pi);  
y1 = sin(x);  
y2 = sin(x) .^ 2;  
y3 = y1 + y2;  
plot(x,y1,'b-');  
hold on;  
plot(x,y2,'r--');  
plot(x,y3,'g:');  
hold off;
```



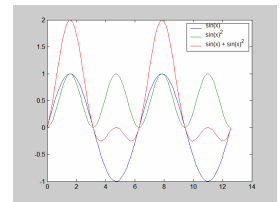
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Plotting: Multiple Graphs

```
x = linspace(0, 4*pi);  
y1 = sin(x);  
y2 = sin(x) .^ 2;  
y3 = y1 + y2;  
plot(x,y1,x,y2,x,y3);  
legend('sin(x)', ...  
       'sin(x)^2', ...  
       'sin(x) + sin(x)^2');
```



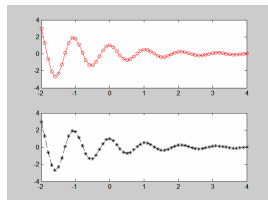
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Plotting: Subplots

```
x = -2:0.1:4;  
y = 3.5 .^ (-0.5*x) .* ...  
    cos(6*x);  
figure(1);  
subplot(2,1,1);  
plot(x,y,'r-o');  
subplot(2,1,2);  
plot(x,y,'k--*');  
print -f1 -dtiff myplot.tif
```



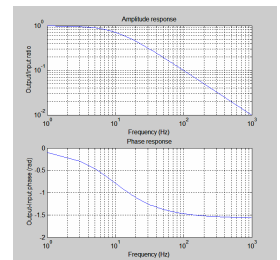
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Plotting: Logarithmic Plots

```
r = 16000; c = 1.0e-6;  
f = 1:2:1000;  
res = 1 ./ (1 + j*2*pi*f*r*c);  
amp = abs(res);  
phase = angle(res);  
subplot(2,1,1);  
loglog(f,amp);  
title('Amplitude response');  
xlabel('Frequency (Hz)');  
ylabel('Output/Input ratio');  
grid on;  
subplot(2,1,2);  
semilogx(f,phase);  
title('Phase response');  
xlabel('Frequency (Hz)');  
ylabel('Output-Input phase (rad)');  
grid on;
```



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Plotting Summary

- `plot(x,y)`
linear plot of vector y vs. vector x
- `title('text'), xlabel('text'), ylabel('text')`
labels the figure, x-axis and y-axis
- `grid on/off`
adds/removes grid lines
- `hold on/off`
allows/disallows adding subsequent graphs to the current graph

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Plotting Summary

- `legend('string1', 'string2', 'string3', ...)`
adds a legend using the specified strings
- `v = axis`
returns a row vector containing the scaling for the current plot
- `axis([xmin xmax ymin ymax])`
sets axes' limits

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Plotting Summary

	line color	line marker	line style
b	blue	.	solid
g	green	o	dotted
r	red	x	dashdot
c	cyan	+	dashed
m	magenta	*	
y	yellow	s	
k	black	d	
		v	
		^	
		<	
		>	
		p	
		h	

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Plotting Summary

- `semilogy(x,y), semilogx(x,y), loglog(x,y)`
logarithmic plots of vector y vs. vector x
- `figure(k)`
makes figure k the current figure
- `subplot(m,n,p)`
breaks the figure window into an m-by-n matrix of small axes and selects the pth axes for the current plot
- `clf`
clears current figure

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Plotting Summary

- `print -f<handle> -d<device> <filename>`
saves the figure with the given handle in the format specified by the device
 - `-deps` Encapsulated PostScript
 - `-depsc` Encapsulated Color PostScript
 - `-deps2` Encapsulated Level 2 PostScript
 - `-dep2c` Encapsulated Level 2 Color PostScript
 - `-djpeg<nn>` JPEG image with quality level of nn
 - `-dtiff` TIFF image
 - `-dpng` Portable Network Graphics image

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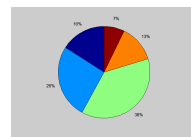
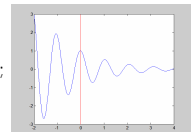
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Plotting Examples

- Line plot

```
x = -2:0.01:4;
y = 3.5.^(-0.5*x).*cos(6*x);
plot(x,y);
line([0 0],[ -3 3], 'color', 'r');
```
- Pie plot

```
grades = [ 11 18 26 9 5 ];
pie(grades);
```



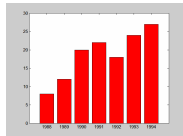
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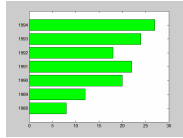
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Plotting Examples

- Vertical bar plot
`y = 1988:1994;`
`s = [8 12 20 22 18 24 27];`
`bar(y,s,'r');`



- Horizontal bar plot
`y = 1988:1994;`
`s = [8 12 20 22 18 24 27];`
`barh(y,s,'g');`



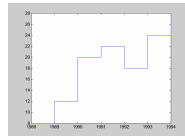
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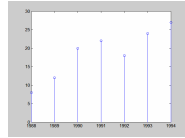
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Plotting Examples

- Stairs plot
`y = 1988:1994;`
`s = [8 12 20 22 18 24 27];`
`stairs(y,s);`



- Stem plot
`y = 1988:1994;`
`s = [8 12 20 22 18 24 27];`
`stem(y,s);`



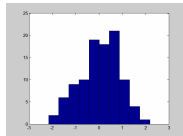
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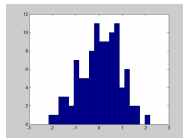
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Plotting Examples

- Histogram
`x = randn(1,100);`
`hist(x,10);`



`hist(x,20);`



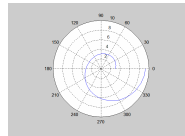
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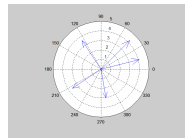
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Plotting Examples

- Polar plot
`t = linspace(0,2*pi,200);`
`r = 3 * cos(0.5*t).^2 + t;`
`polar(t,r);`



- Compass plot
`u = [3 4 -2 -3 0.5];`
`v = [3 1 3 -2 -3];`
`compass(u,v);`



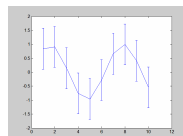
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Plotting Examples

- Error bar plot
`x = 1:10;`
`y = sin(x);`
`e = std(y) * ones(size(x));`
`errorbar(x,y,e);`



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