# Matplotlib Quick Reference

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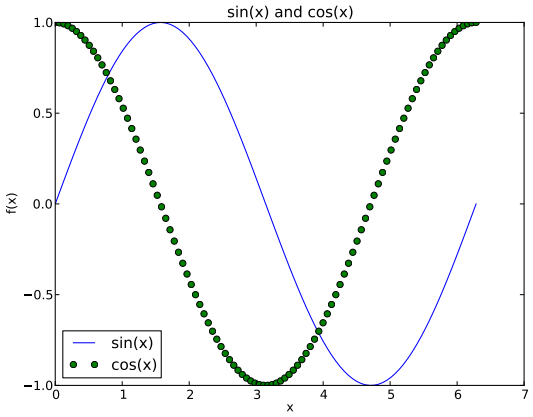
### Import pylab

```
from pylab import *
```

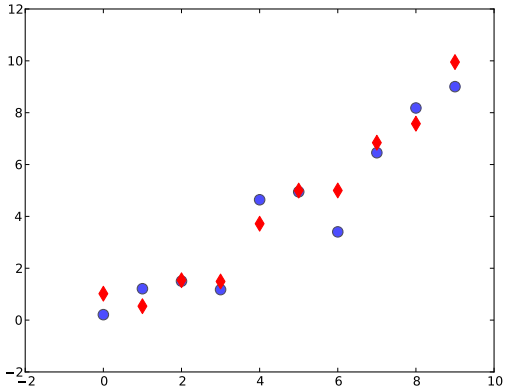
### Line plots

```
x = linspace(0, 2*pi, 100)
y = sin(x)
y2 = cos(x)
plot(x, y)
plot(x, y2, 'og')
title('sin(x) and cos(x)')
xlabel('x')
ylabel('f(x)')
legend(['sin(x)', 'cos(x)'], loc = 3)
```



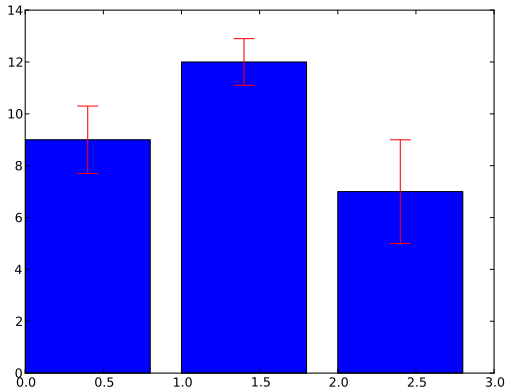

### Scatter plot

```
x = arange(10)
y = x + randn(len(x))
y2 = x + randn(len(x))
scatter(x, y, s=100, alpha=0.7)
scatter(x, y2, s=100, marker="d", color="red")
```



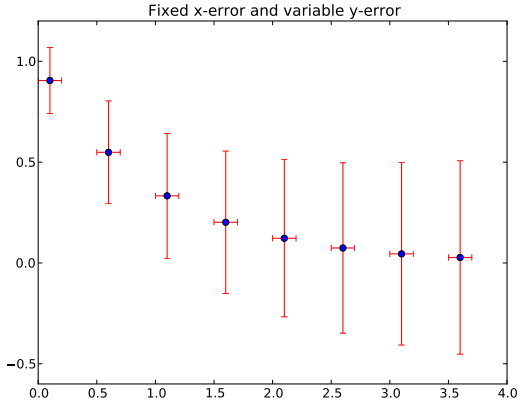
### Bar plot

```
y = [9, 12, 7]
errors = [1.3, 0.9, 2]
x = arange(len(y))
bar(x, y, yerr=errors, ecolor="red",
    capsize=10)
```



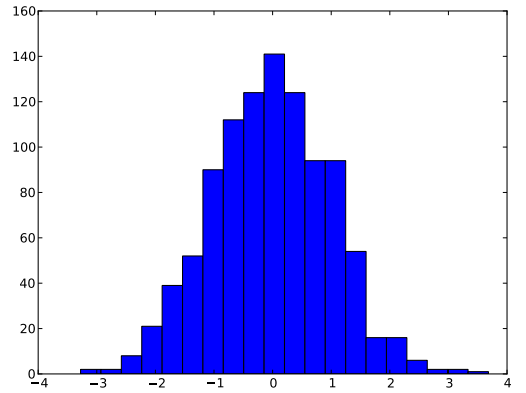
### Errorbars

```
x = arange(0.1, 4, 0.5)
y = exp(-x)
y_error = 0.1 + 0.2*np.sqrt(x)
x_error = 0.1
errorbar(x, y, xerr = x_error,
         yerr = y_error, fmt='o', ecolor="red")
title('Fixed x-error and variable y-error')
```



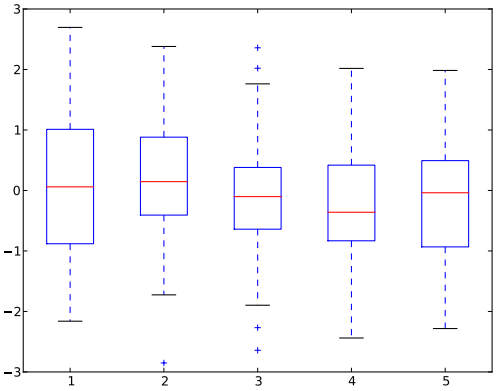

### Histogram

```
x = randn(1000)
hist(x, bins=20)
```



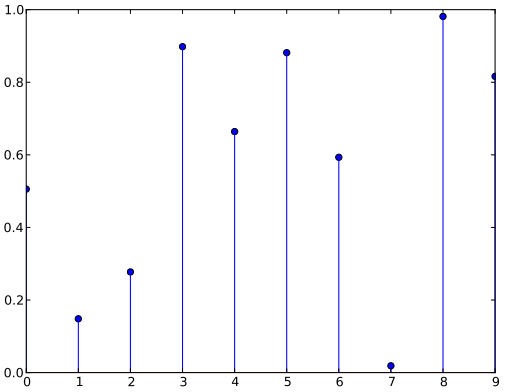
### Boxplot

```
x = randn(100, 5)
boxplot(x)
```



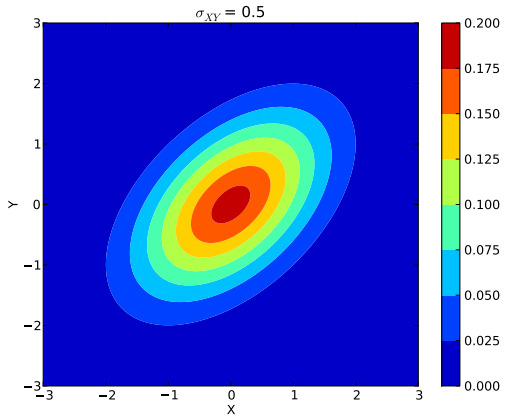
### Stem plot

```
x = range(10)
y = rand(10)
stem(x, y)
```



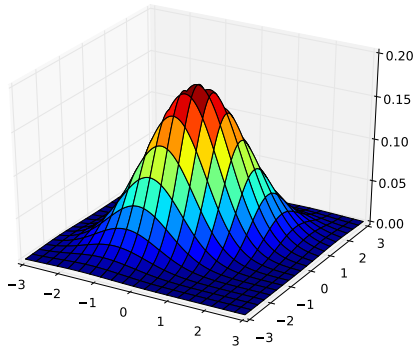
### Contour

```
x = linspace(-3, 3, 200)
y = x
X,Y = meshgrid(x, y)
Z = bivariate_normal(X, Y, sigmaxy=0.5)
contourf(X, Y, Z)
colorbar()
xlabel('X')
ylabel('Y')
title(r"$\sigma_{XY}$ = 0.5")
```



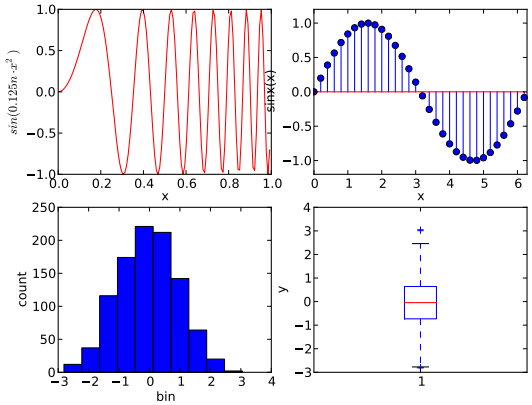

### Surface plot

```
from mpl_toolkits.mplot3d import Axes3D
fig = figure()
ax = fig.add_subplot(111, projection='3d')
ax.plot_surface(X, Y, Z, cmap="jet")
```



### Subplots

```
n = 128.
x = arange(n)/n
y = sin(0.125*pi*n*x**2)
subplot(221)
plot(x,y,'r')
xlabel('x')
ylabel(r'$sin(0.125n \cdot x^2)$')
subplot(222)
x = arange(0, 2*pi, 0.2)
y = sin(x)
stem(x,y)
axis([0, 2*pi, -1.2, 1.2])
xlabel('x')
ylabel('sinx(x)')
subplot(223)
y = randn(1000)
hist(y)
xlabel('bin')
ylabel('count')
subplot(224)
boxplot(y)
ylabel('y')
```




### Links

- Matplotlib tutorial: http://www.loria.fr/~rougier/teaching/matplotlib/
- Examples gallery: http://matplotlib.org/gallery.html
- Matplotlib colormaps http://mpastell.com/2013/05/02/matplotlib_colormaps/