

Confidence Intervals

Not only do you want to DESCRIBE the general

tendency of your data but also the SPREAD...

$$CI = X \pm z * \frac{sd}{\sqrt{n}}$$









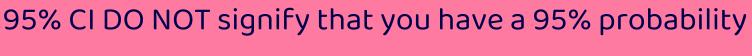




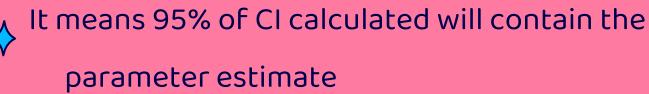
Confidence Intervals



$$CI = X \pm z * \frac{sd}{\sqrt{n}}$$



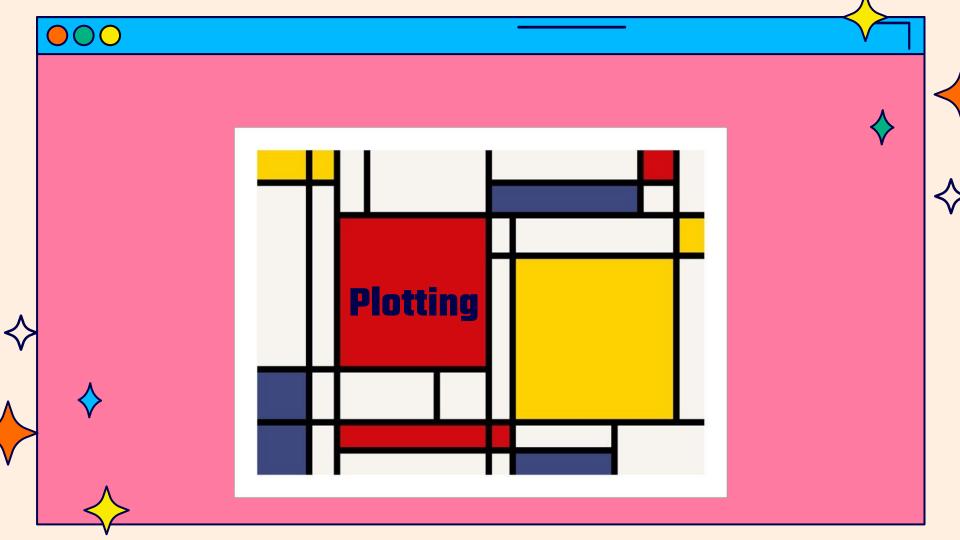














Plotting Tips

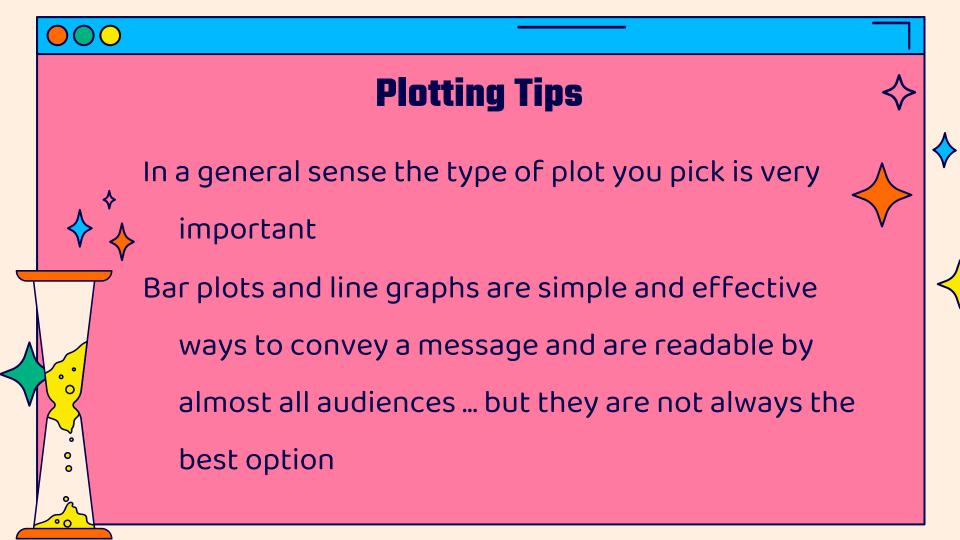


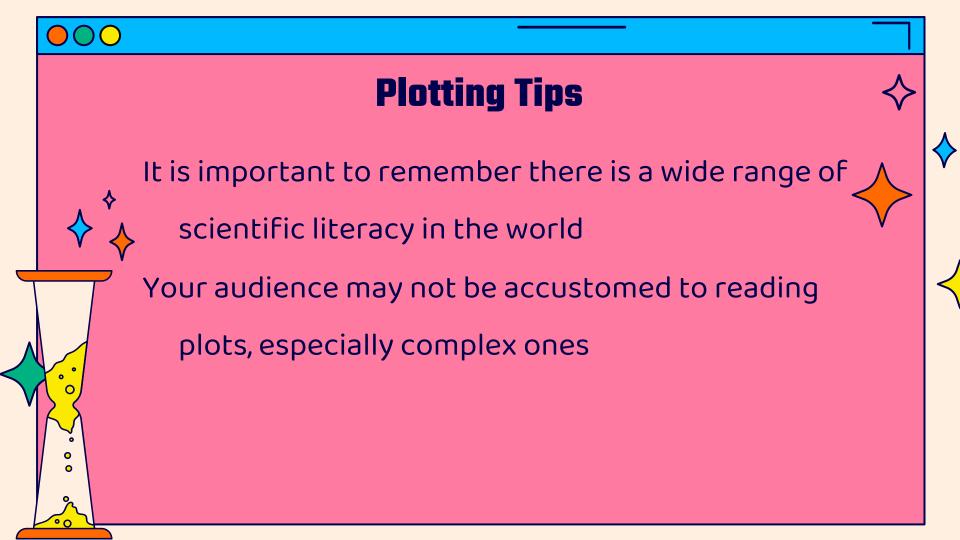
The first thing you need to consider when plotting is your **message**, the **audience**, and type of **plot**

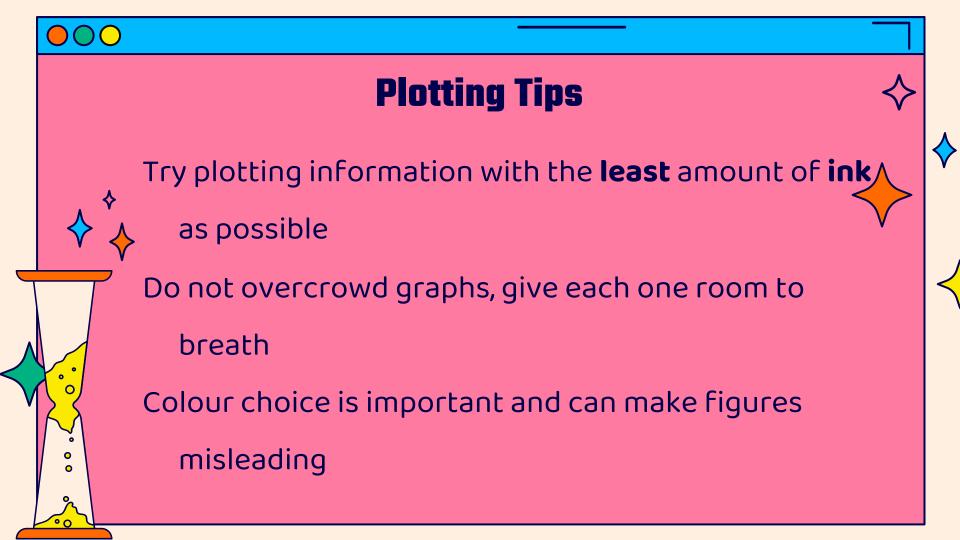


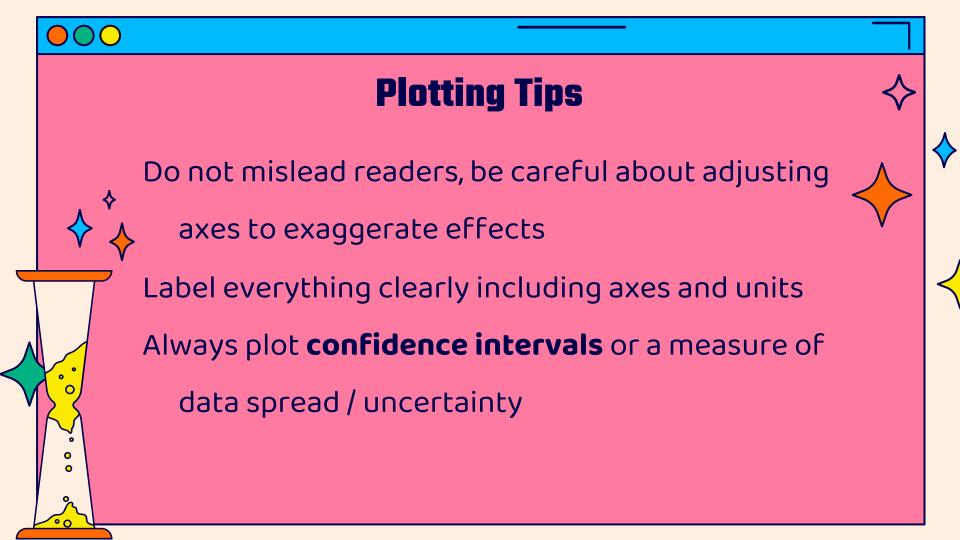
Making a graphic is always helpful for a reader but not always necessary. Can you say this image in words?

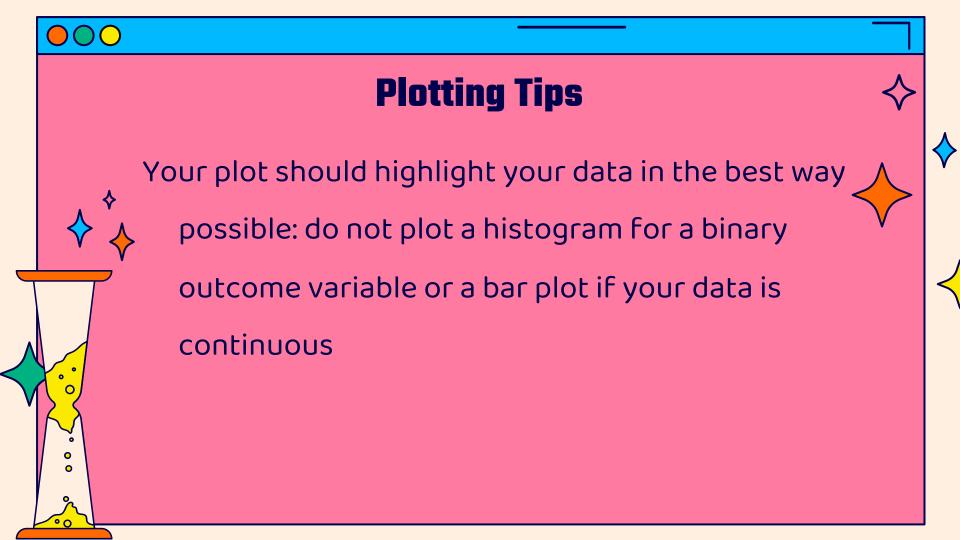








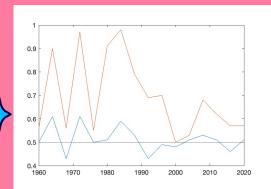


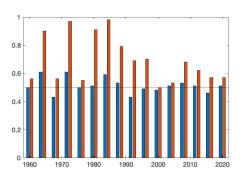


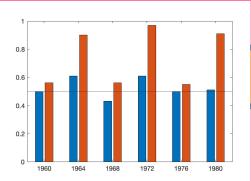


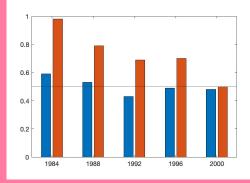
Plots tell a story

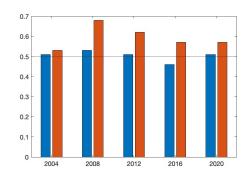


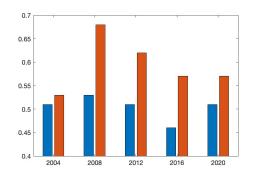














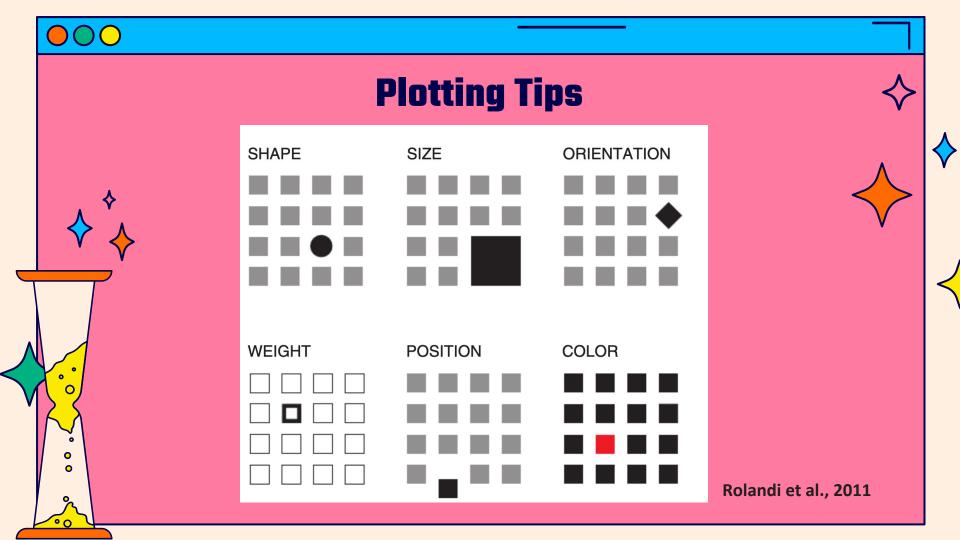


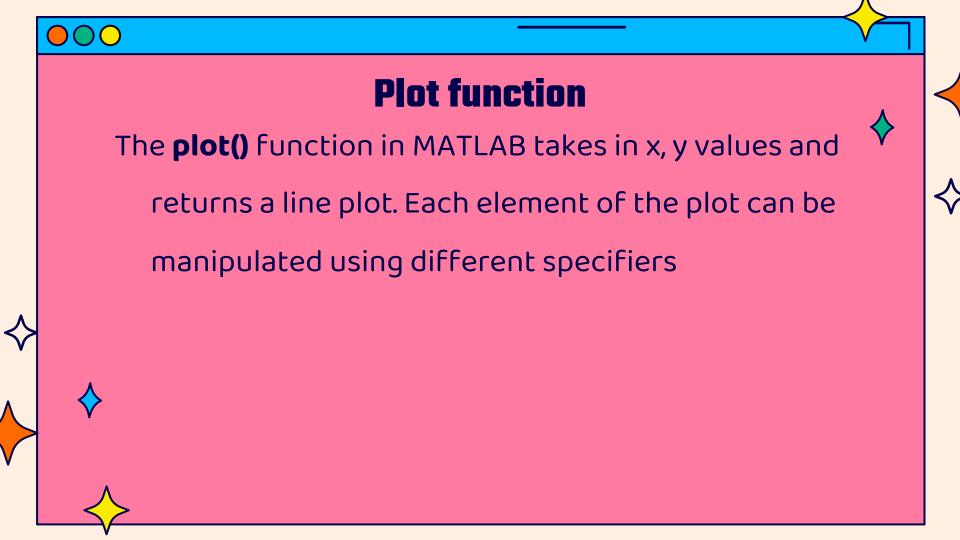


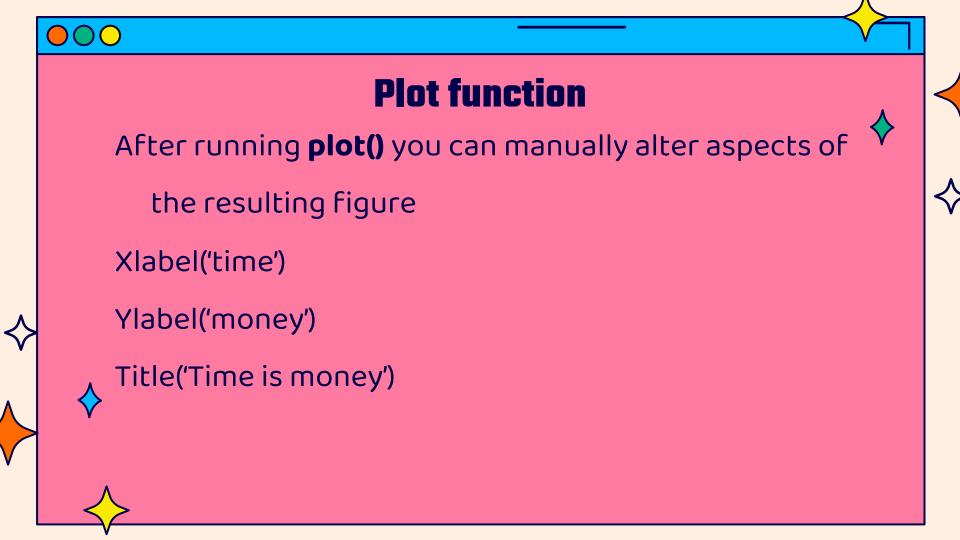


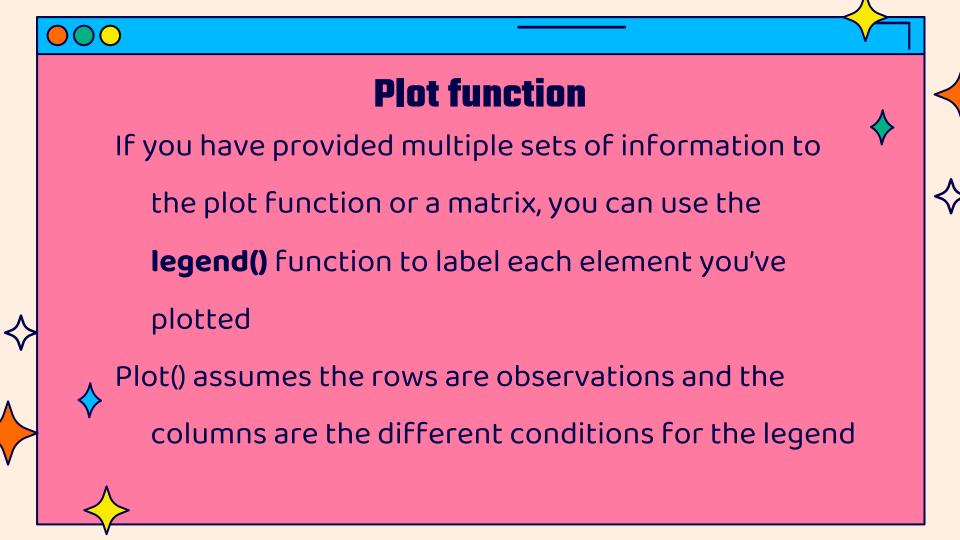














Plot Colours



You can change the colour of your lines by specifying one of the

following colours from the table

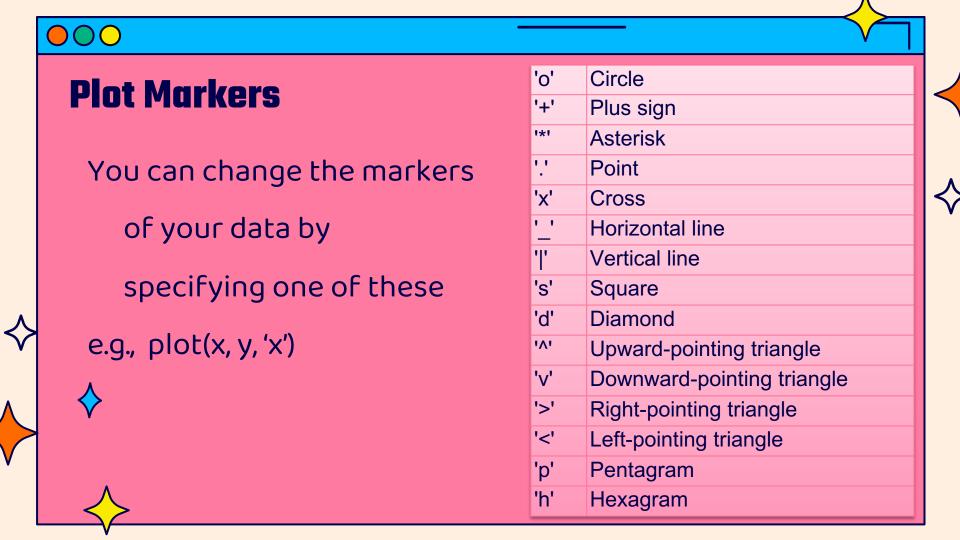
e.g., plot(x, y, 'r')



у	yellow
m	magenta
С	cyan
r	red
g	green
b	blue
W	white
k	black

you can also specify RGB values using a specifier, see below

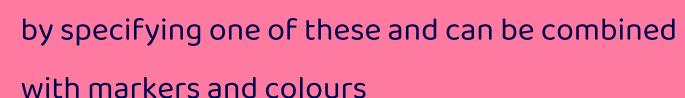






Plot Lines

You can change the appearance of the lines of a plot()



e.g., plot(x, y, '-.')

plot(x, y, 'xr')

-	Solid line
	Dashed line
:	Dotted line
_	Dash-dot line





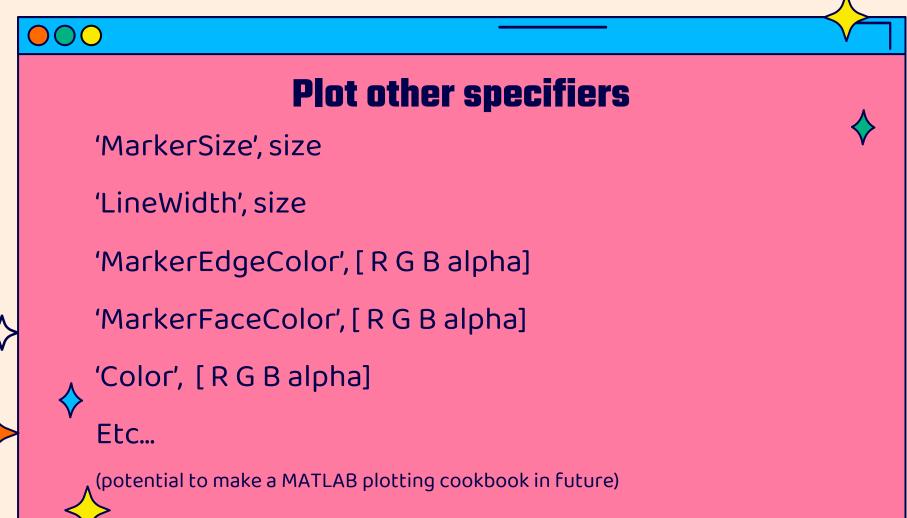






Figure and close all

I always recommend you begin a new graph with the **figure** command; this ensures that you are not overwriting any previous information you've plotted before

Reminder that **close()** can be used to close currently opened figures



Hold on / off

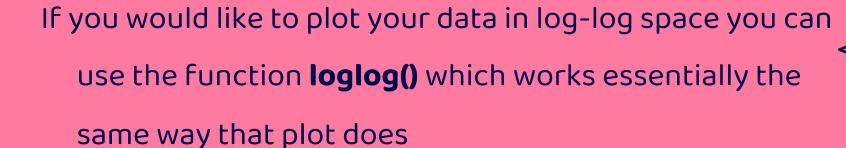
The command hold on allows one to **add to the existing axes** of a plot you just made. It is like adding another layer.

This does **not** need to be the **same type** of plot

Hold off removes this hold on the figure's axes and allows you to overwrite them

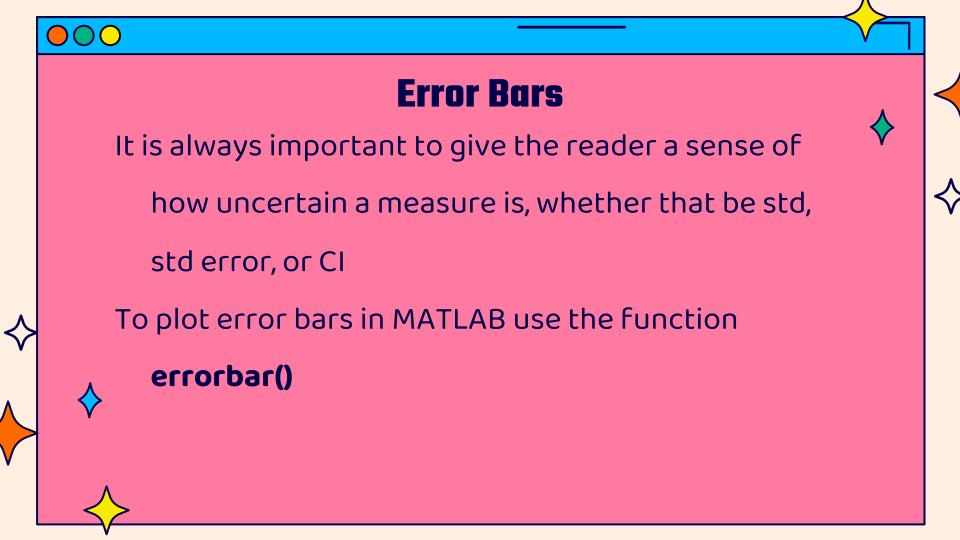


Other Line plots

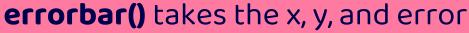


Useful when data is decaying or exponentially growing







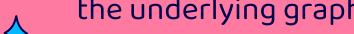




Use 'LineStyle' to remove line between x values this

allows you to plot the error bars separately from







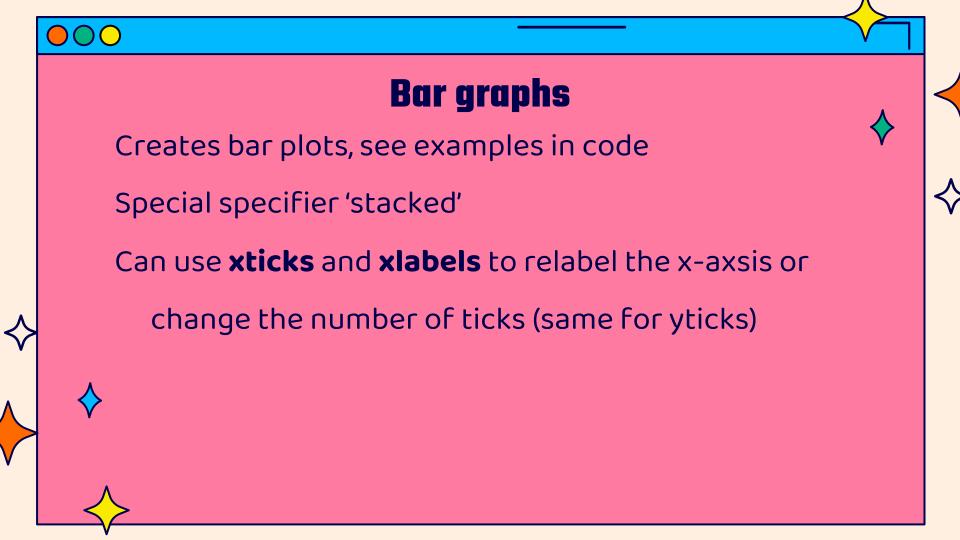


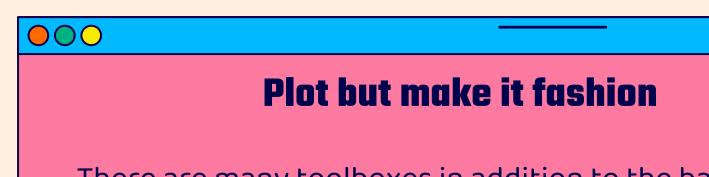






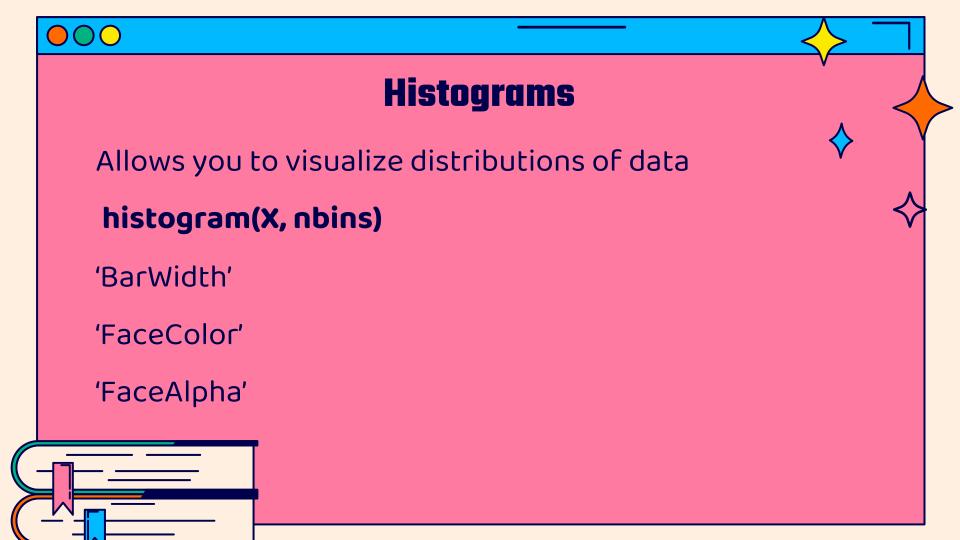


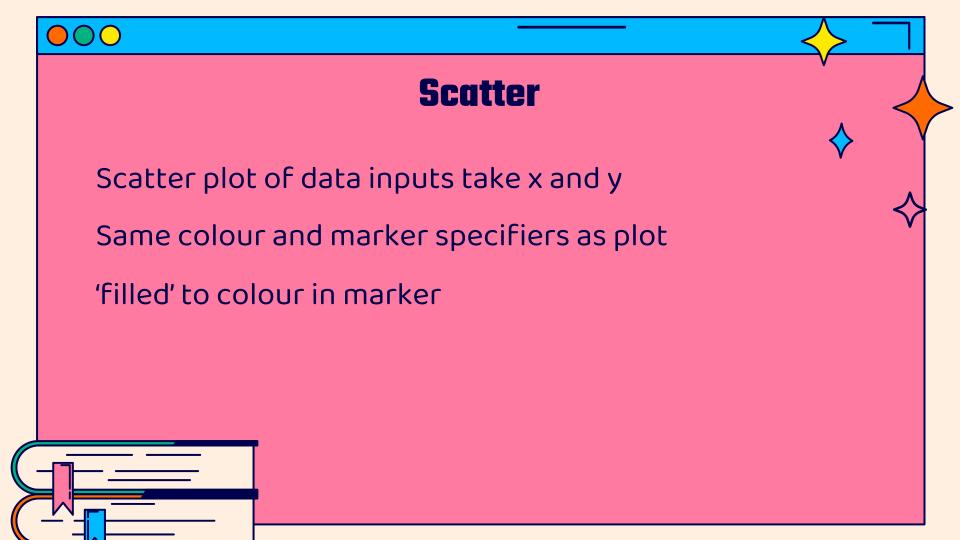


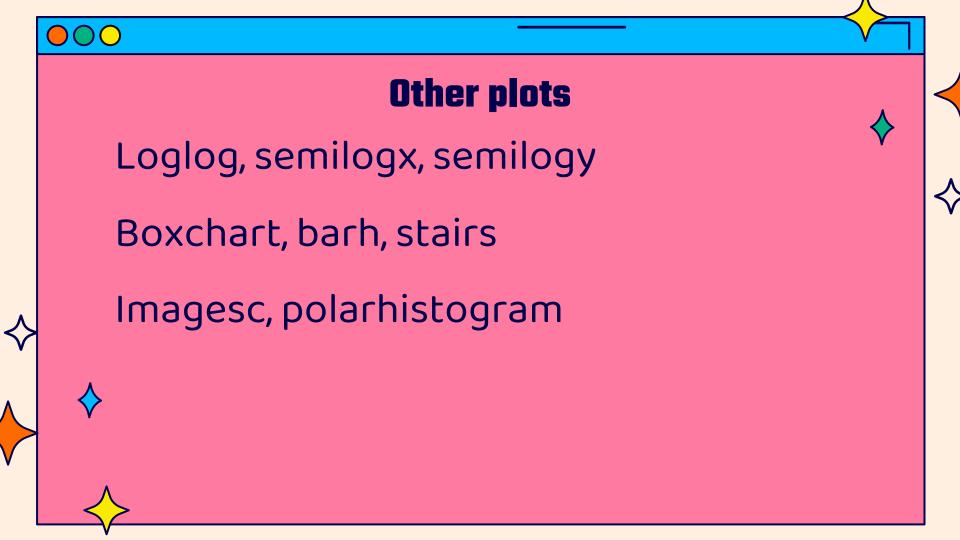


There are many toolboxes in addition to the basic functions of MATLAB, some are developed by MATLAB and others are **external** and need downloading











Gramm





whereby data is fed into the gramm function and

each layer of the graph is added on top



See below for a cheat sheet summarizing gramm's capacities

https://github.com/piermorel/gramm/raw/master/gramm%20cheat%20sheet.pdf







Gramm



g=gramm('x',cars.Model_Year,'y',cars.MPG,'color',cars.Cylinders,'subset',cars.Cylinders~=3 & cars.Cylinders~=5);

g.facet_grid([],cars.Origin_Region);

g.geom_point();

g.stat_glm();

g.set_names('column','Origin','x','Year of production','y','Fuel economy (MPG)','color','# Cylinders');

g.set_title('Fuel economy of new cars between 1970 and 1982');

Figure('Position',[100 100 800 400]);



g.draw();

See example on their website













References



- **Rolandi** et al 2011. A Brief Guide to Designing Effective Figures for the Scientific Paper. *Advanced Materials*
 - Rougier et al 2014. Ten Simple Rules for Better Figures. *Plos Computational Biology*



• **Nature** blog http://blogs.nature.com/methagora/2013/07/datavisualization-points-of-view.html

