MONASH University

MONASH
ENGINEERING
ENG1060

PLOTTING DATA

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GROUP OF EIGHT AUSTRALIA

PLOTS

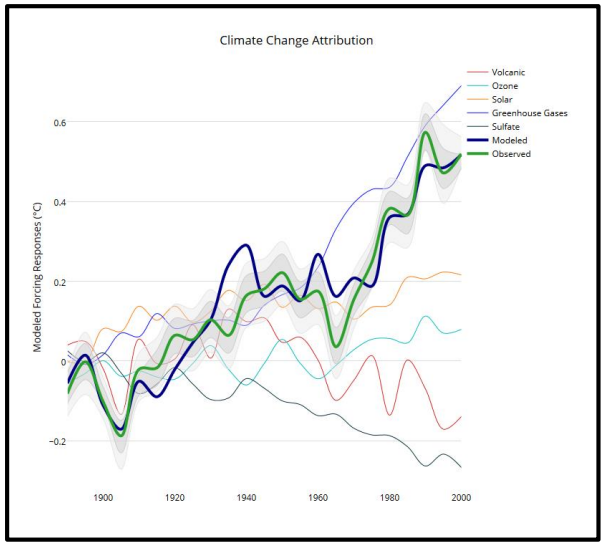
- Visualising the data allows you to interpret more information and more quickly

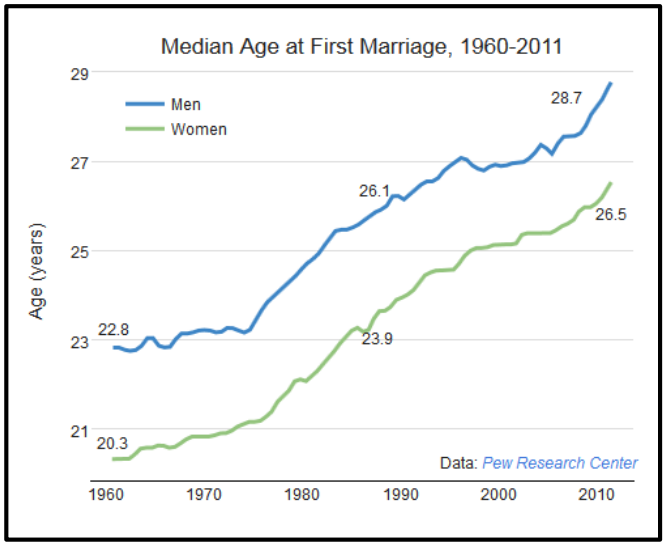
- Easier to characterise trends
  - I.e. Is it increasing or decreasing with increasing x?
  - How many maximum or minimums are there?

- Your bosses and clients want easy interpretation!

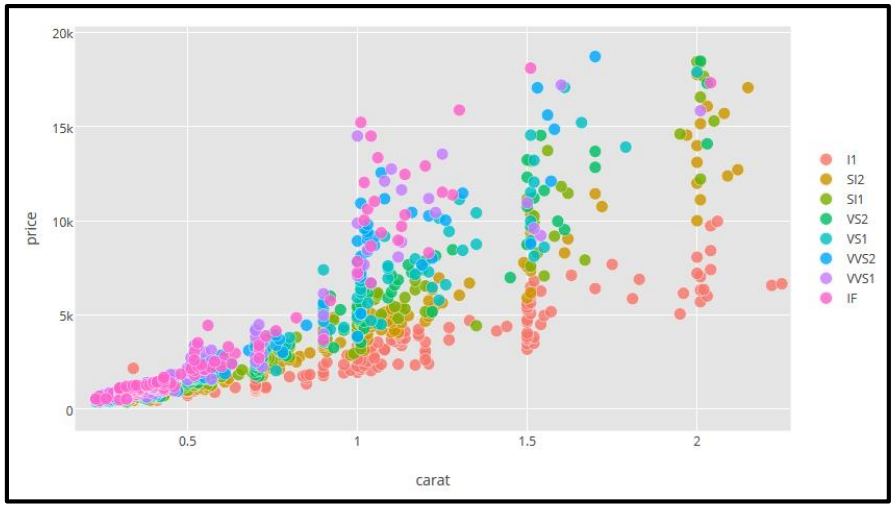
PLOTS CAN BE INFORMATIVE

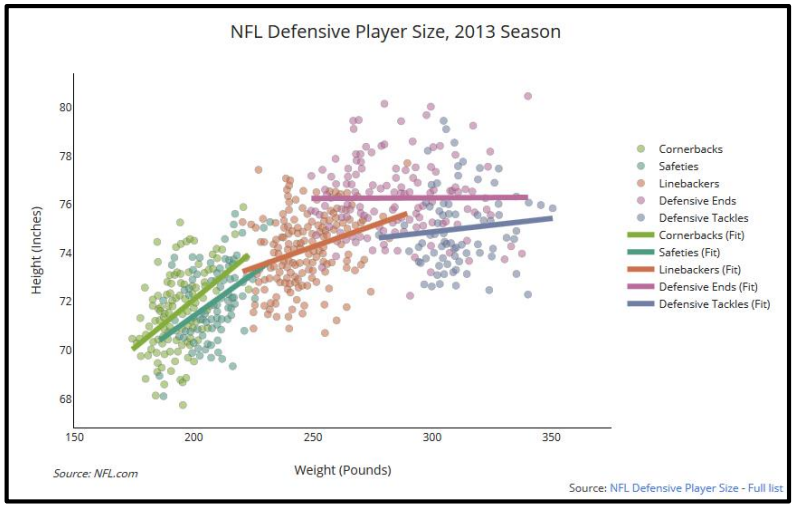
- Examples only! Not MATLAB generated





PLOTS CAN BE PRETTY

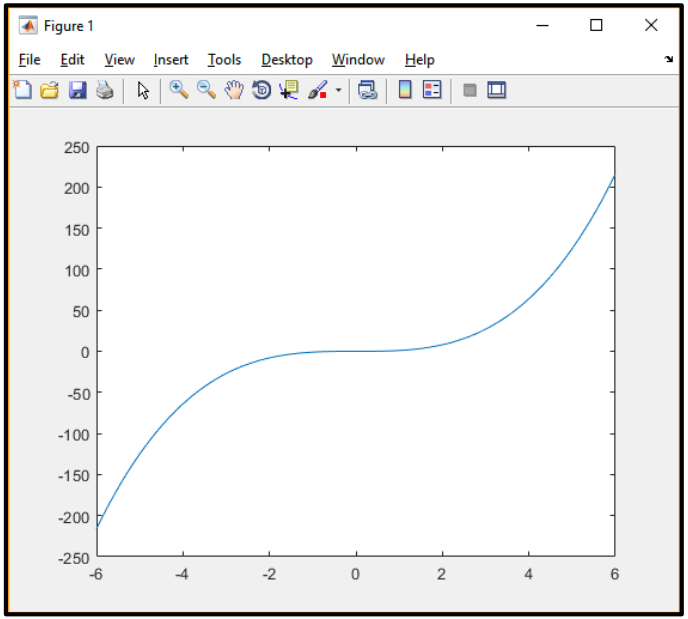




THE PLOT FUNCTION

- Syntax: plot(x, y)
  - x: independent variable
  - y: dependent variable

- E.g. x = -6:0.01:6
  y = x.^3
  plot(x, y)



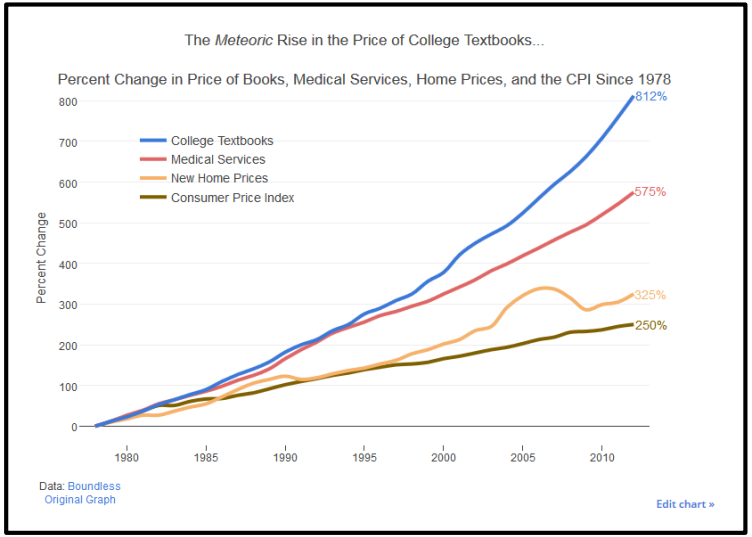
THE PLOT FUNCTION: OPTIONAL ARGUMENTS

- The plot function has many optional arguments

  plot(x, y, 'argument')

- Some examples include:
  - Line colour, type and width
  - Marker colour, symbol and size

- Line specifications available in plot documentation



THE PLOT FUNCTION: OPTIONAL ARGUMENTS

Specifier	Marker
o	Circle
+	Plus sign
*	Asterisk
.	Point
x	Cross
s	Square
d	Diamond
^	Upward-pointing triangle
v	Downward-pointing triangle
>	Right-pointing triangle
<	Left-pointing triangle
p	Pentagram
h	Hexagram

Specifier	Line Style
-	Solid line (default)
--	Dashed line
:	Dotted line
-.	Dash-dot line

Specifier	Color
y	yellow
m	magenta
c	cyan
r	red
g	green
b	blue
w	white
k	black

THE PLOT FUNCTION: OPTIONAL ARGUMENTS

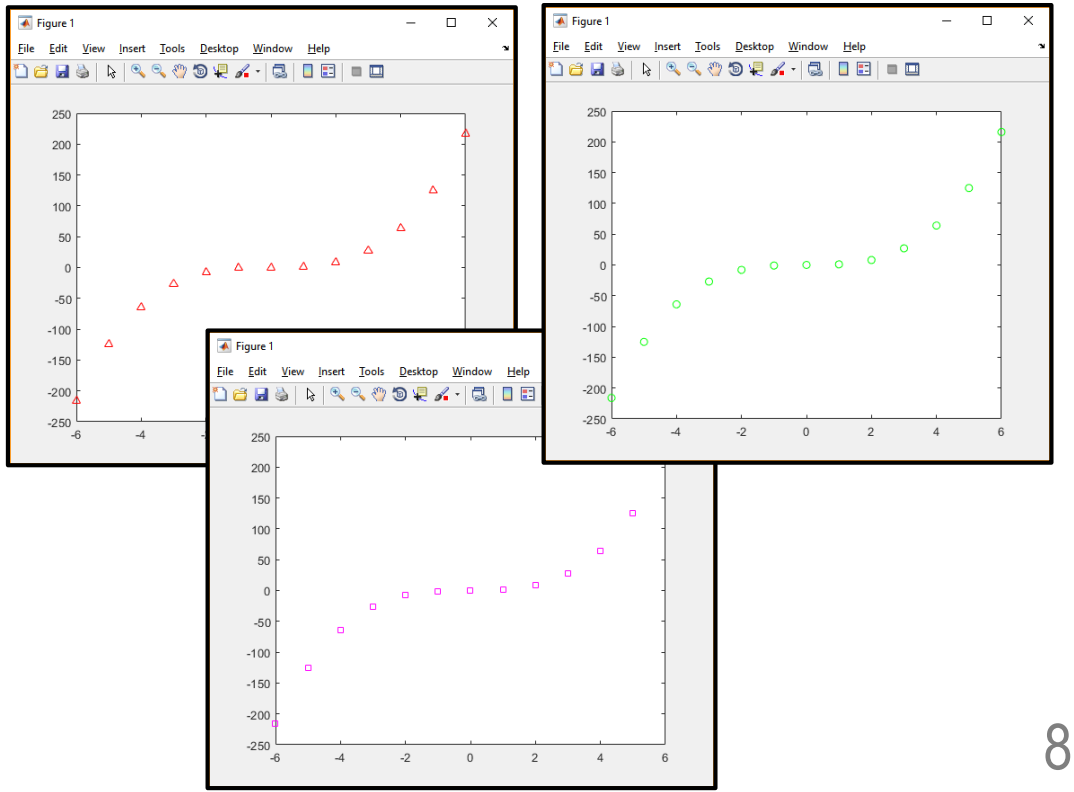
- Examples:

```
x = -6:6
y = x.^3

plot(x, y, 'r^')

plot(x, y, 'ms')

plot(x, y, 'go')
```



THE PLOT FUNCTION: COMPLEMENTARY FUNCTIONS

- There are some functions that should be used together with the plot function

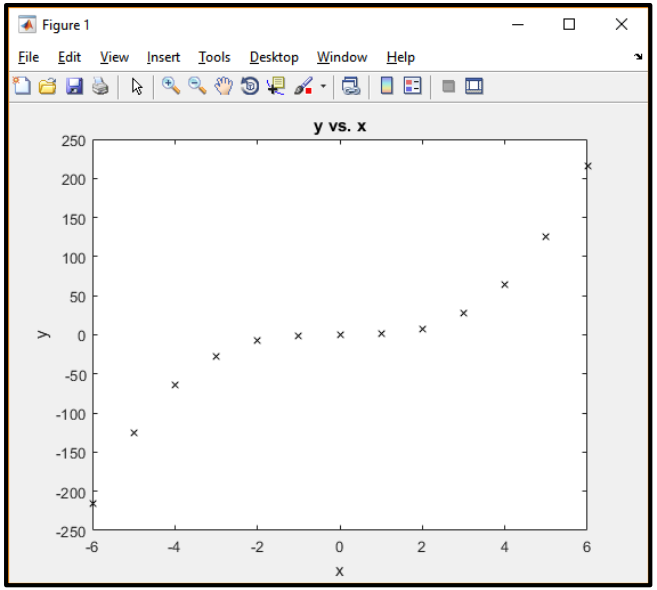
- Some examples include:

```
xlabel('string')
ylabel('string')
title('string')
```

LABELLING PLOTS

- It is very important to label plots
  - Otherwise how do we know what's being plotted?

```
plot(x,y,'kx')
xlabel('x')
ylabel('y')
title('y vs. x')
```



CONVEY THE INFORMATION APPROPRIATELY

- On the 23rd of September 1999, NASA lost its $US125 million Mars Orbiter climate satellite when it crashed into Mars
  - NASA uses metric units (metres, centimetres)
  - Lockheed Martin was working in Imperial units (feet, inches)
- Data labels and unit consistency are important, especially in group work

SUMMARY

- The significance of plots
- Create plots
- Label plots

- Is it possible to have two sets of data on the one figure?