Module 1 (of 6)

Week 1 : What is Function

- What are functions and where do we use it?
- It's a relationship between some inputs and an output.

Eg I have function for distributing the temperature in the room.

- I may input x, y, z coordinate of a specific location of room as well as time t
- and function will output or return the TEMPERATURE at that specific point in space at that moment in time.

x, y, z → [Function] → Temperature

Here so many area of maths, the idea is very straightforward, But the notation can make things very confusing

Here is where a lot of the problems seem to arise!

In order to use and play with the interesting applications of maths, it requires you to do a lot of large and sometimes boring groundwork

∴ mathematical language.

But mathematical language is just like other learning other language in that respect., ie. can't enjoy French poetry, unless you have done a lot of learnt alot of french vocabulary. and grammer, quite

Understandable some people find this off putting. 

But here is maths poetry waiting for those who persevere at end of the tunnel.

Machine learning is a whole new genre of this "poetry"

So we need to hang in here! →

Let go:

we have expression:

$$f(x) = x^2 + 3$$

From the above, one just have to know the $f(x)$, means f is a function of x, and not f multiplied by x .....

This can get confusing, when:

$$f(x) = g(x) + h(x+a)$$

we can assume that f, g, h are NOT variables.

otherwise $f(x, g, h, a)$

we need more explanation and more context.

i.e is g a function applied to x?
is h something similar?

Now: we will be shown some data, and will need to select a function to represent the data

- not intended to be difficult
- But selecting a function is the Creative essence of Science

∴ Process of selecting a candidate Function or hypothesis to model world is what great genius of Science are remembered for.

Then there's a long process of testing this hypothesis
— But there will be nothing to test without that first creative step.

Calculus is simply the study of how these functions change w.r.t. to their input variables and allows you to investigate and manipulate them.

⇒ But ultimately it's just a set of tools

End of Case, use it myself to Model real world data.