← Go Back to Deep Learning

Course Content

Functions & Derivatives

Functions

Functions in mathematics help define a relationship between an independent variable (x) and a dependent variable (y).

Functions are represented as y=f(x), where the function f takes some value x and gives the output y.

For example, f(x)= x, or f(x) = x^2

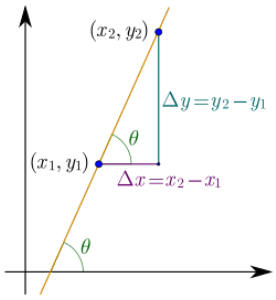
Derivatives

Derivatives are very important to understand the working of Neural Networks, which we will be studying this week.

A derivative is defined as the rate of change in y = f(x) with respect to a very small change in x.

To find the derivative of a function y = f(x) we use the slope formula:

Slope = **Change in y/Change in x = Δy/ Δx**



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From the above diagram, we see that:

x changes from x to x+Δx and y changes from f(x) to f(x+Δx)

Now follow these steps:

- Putting Δy and Δx in slope formula: Δy/Δx = (f(x+Δx) − f(x))/Δx
- Make **Δx** tend towards zero.

We write dx instead of **"Δx tends towards 0"** and "the derivative of" is commonly written as d/dx.

Let's say we are given a function y=f(x)=x^2 So, d(x^2)/dx = 2x
"The derivative of x^2 equals 2x"

This means that, for the function x^2, the slope or "rate of change" at any point is 2x.

To learn more about derivatives, check out the video given in the additional reference material.

Previous

Next