

50.021 -AI

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Week 03: Basics of neural networks

[The following notes are compiled from various sources such as textbooks, lecture materials, Web resources and are shared for academic purposes only, intended for use by students registered for a specific course. In the interest of brevity, every source is not cited. The compiler of these notes gratefully acknowledges all such sources.]

suppose we have a layer which computes $Y = f(X)$ for some function f .

The code uses DY in the backwardpass, this is $\frac{\partial E}{\partial Y}$ - where Y the outputs of the current layer. This is the gradient that comes from above

We need to do two things:

- if f has learnable parameters W , then: compute $\frac{dE}{dW} = DY * \frac{\partial f}{\partial W}$, store this as `self.DW` – this needs NOT to be done for the tanh layer, but for `self.DB`, `self.DW` in the linear layer
- always we have to compute

$$\frac{dE}{dX} = DY * \frac{\partial f}{\partial X}$$

and let the backward function return this term $\frac{dE}{dX}$