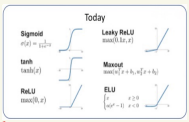
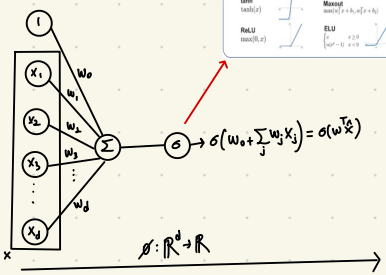
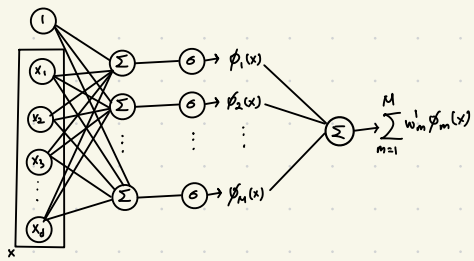
Neural Networks





Multi-Layer Perceptron (MLP) - One Hidden layer



$$f(x) = \sum_{m=1}^{M} w_m^1 \sigma\left(\sum_{j=1}^{d} W_{jm}^0 x_j\right)$$

- The problem with fully connected networks (MLP)
  - A 256x256 (RGB) image $\Rightarrow$ ~200k dimensional input x
  - A fully connected network would need a very large # of parameters, very likely to overfit.
  - Generic deep network also doesn't capture the 'natural' invariances we expect in images.

$\Rightarrow$