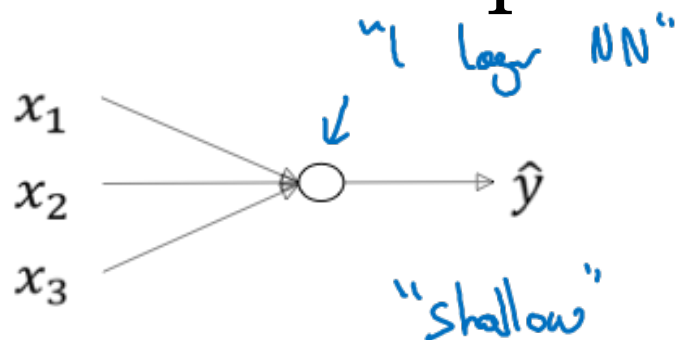deeplearning.ai
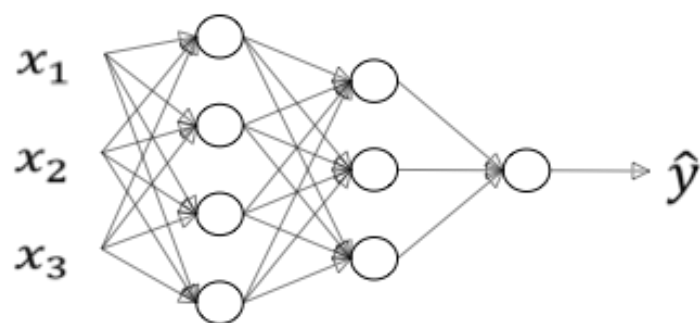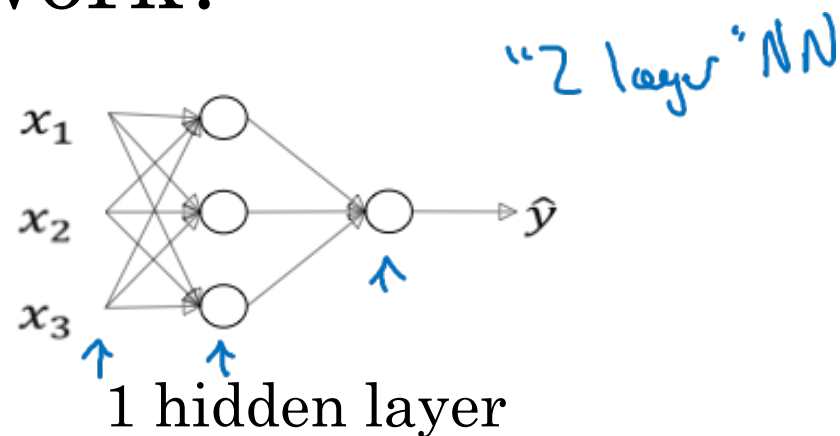
Deep Neural Networks

Deep L-layer Neural network

Over the last several years the AI or the machine learning community has realized that there are functions that very deep neural network can learn that shallower models are often unable to
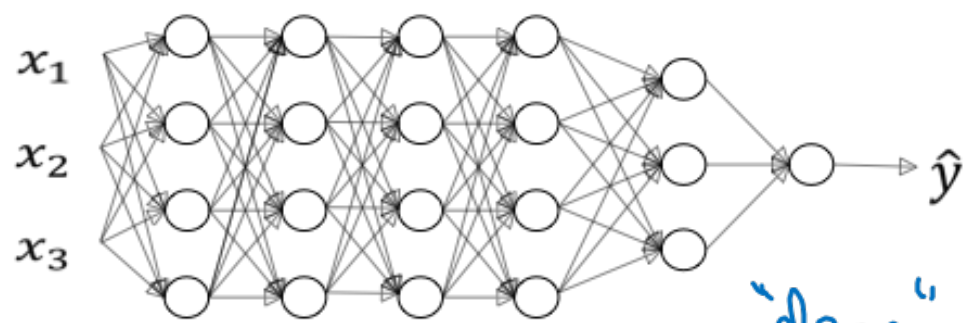
What is a deep neural network?

"1 layer NN"

x_1
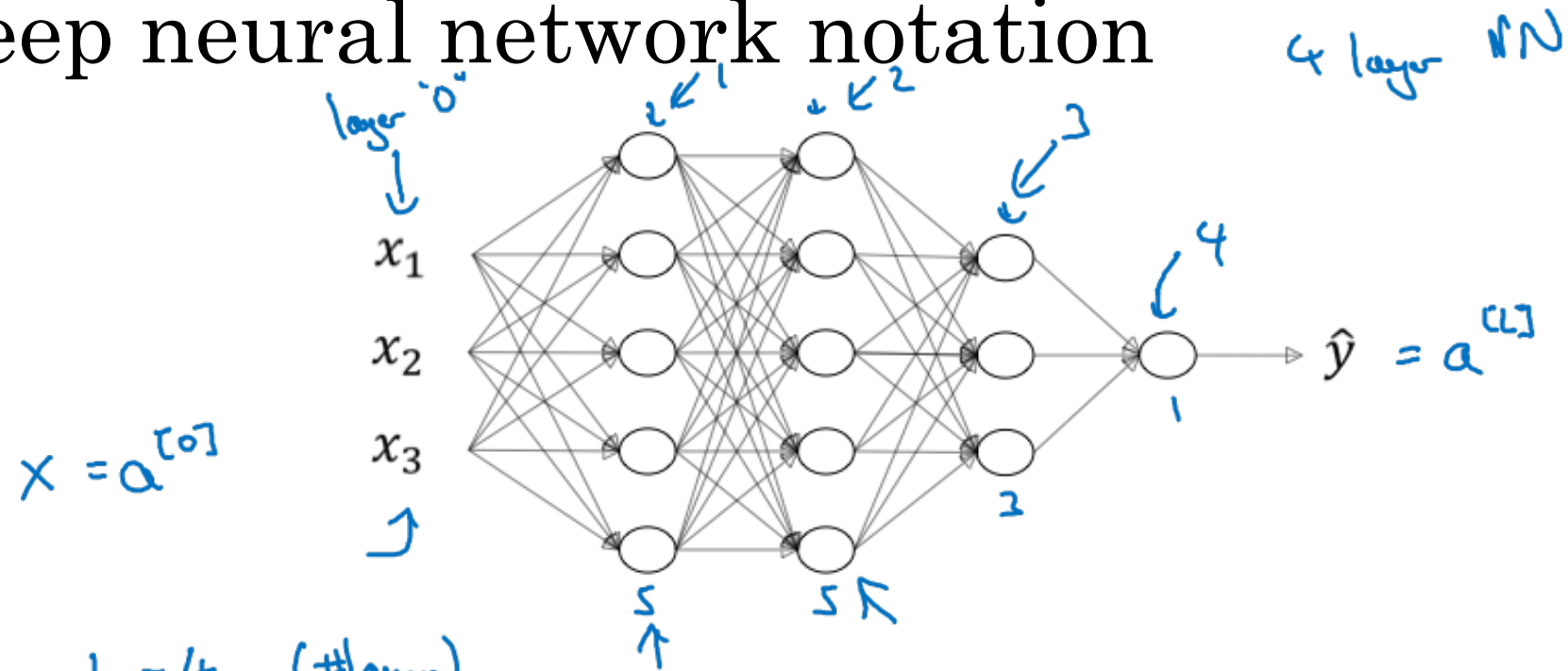
x_2 ⟶ ◯ ⟶ $\hat{y}$

x_3

"shallow"

logistic regression

"2 layer" NN

x_1

x_2 ⟶ $\hat{y}$

x_3

1 hidden layer

x_1

x_2 ⟶ $\hat{y}$

x_3

2 hidden layers

x_1

x_2 ⟶ $\hat{y}$

x_3

5 hidden layers

"deep"

Andrew

Deep neural network notation

4 layer NN

layer "0"

$\downarrow$

ℓ^1 ℓ^2 3 4

x_1

x_2

$\hat{y} = a^{[L]}$

x_3

$X = a^{[0]}$

1

3

5 $5\nwarrow$

$L = 4$ (#layers)

$n^{[\ell]} = $ #units in layer ℓ

$n^{[1]} = 5$, $n^{[2]} = 5$, $n^{[3]} = 3$, $n^{[4]} = n^{[L]} = 1$

$n^{[0]} = n_x = 3$

$a^{[\ell]} = $ activations in layer ℓ

$a^{[\ell]} = g^{[\ell]}(z^{[\ell]})$, $W^{[\ell]} = $ weights for $z^{[\ell]}$

$b^{[\ell]}$

Andrew
N