Week 1

Neural Networks

Neural Networks intuition

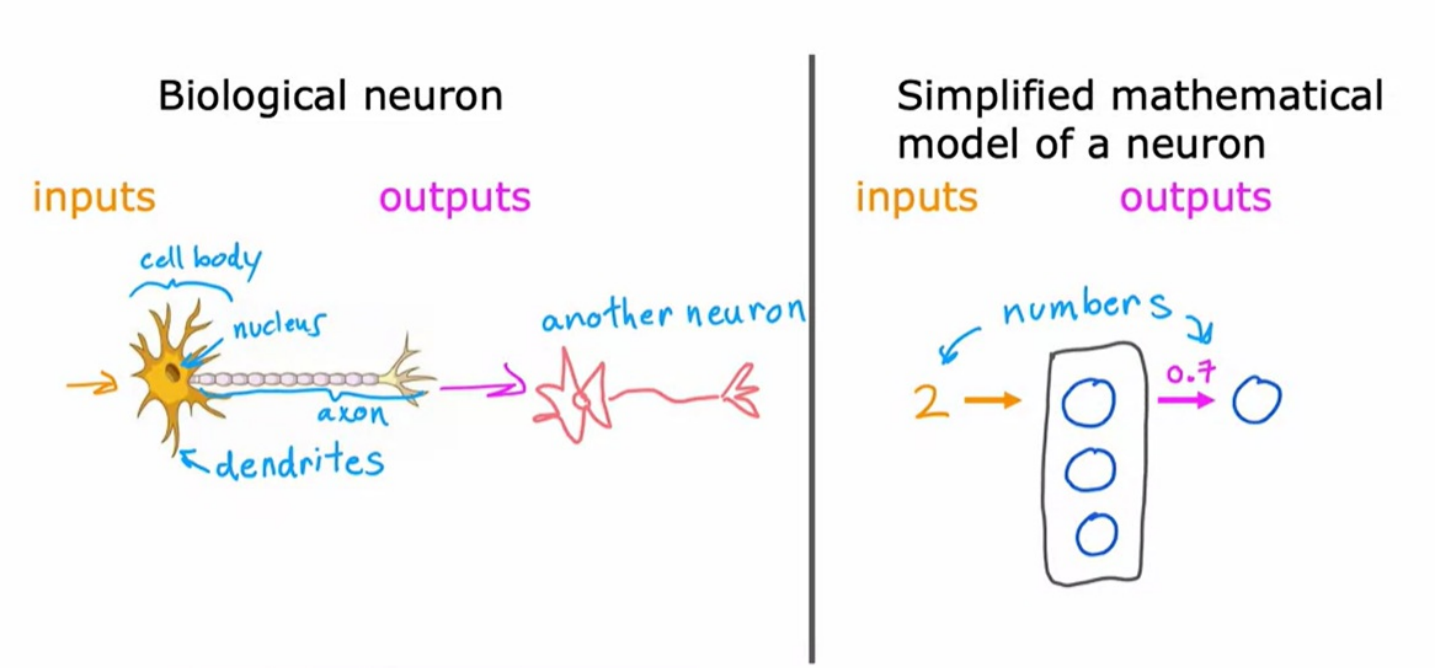
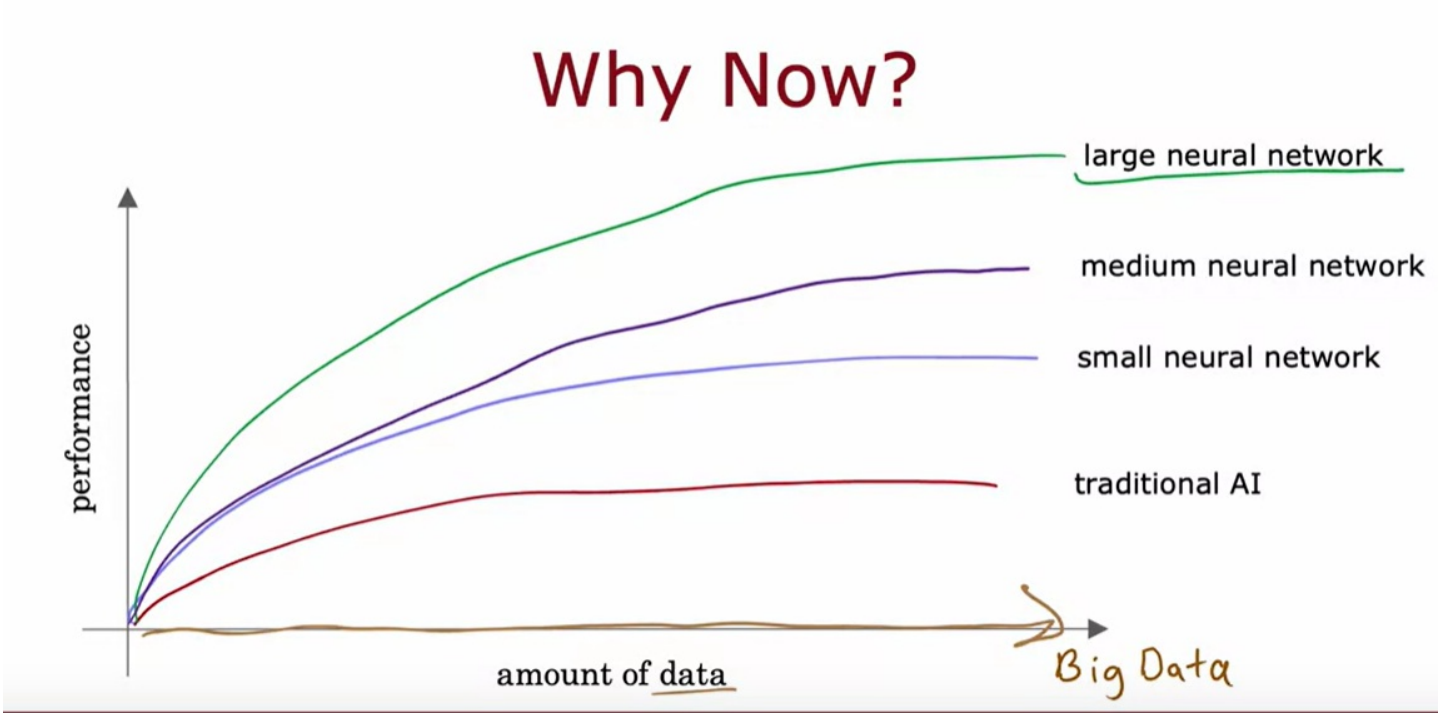


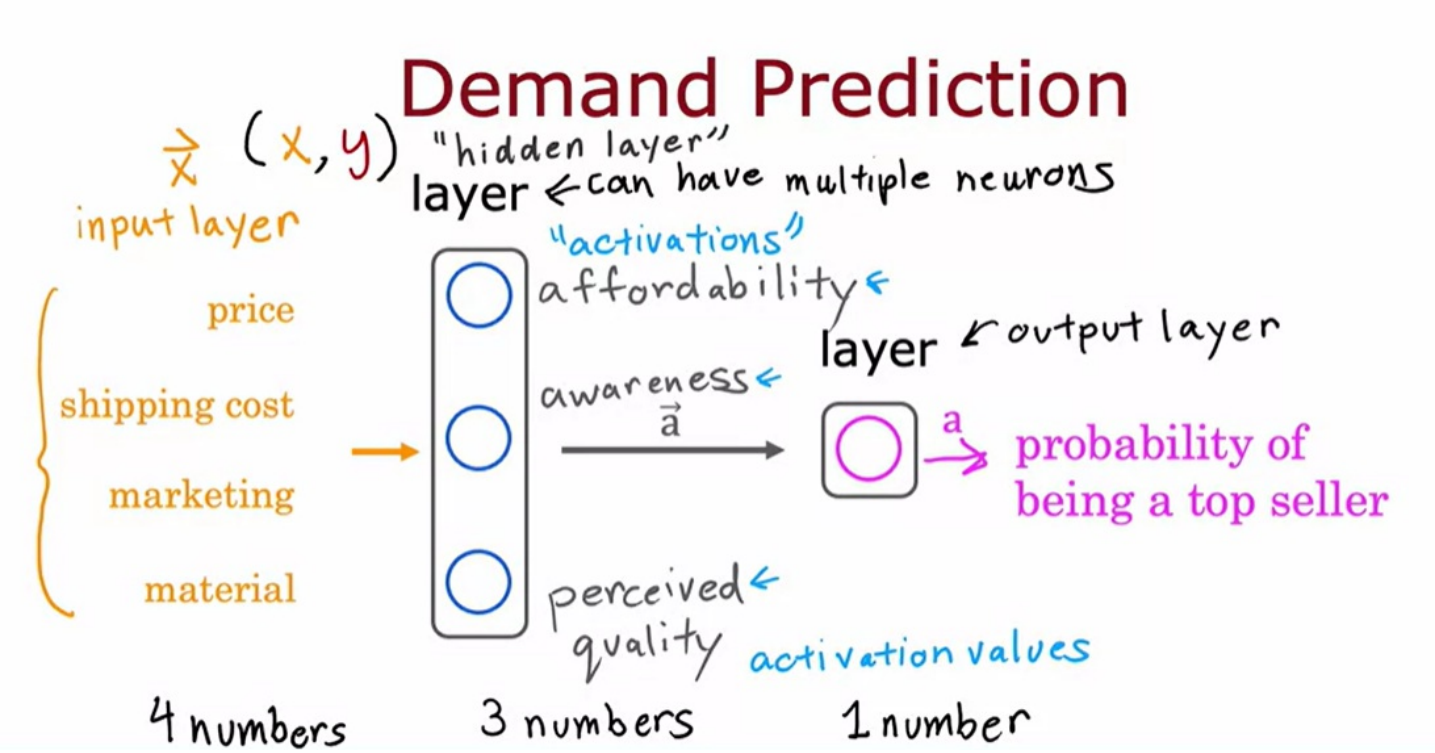
image source: https://biologydictionary.net/sensory-neuron/

- Traditional AI (Linear regression/Logistic regression) was unable to scale with large data



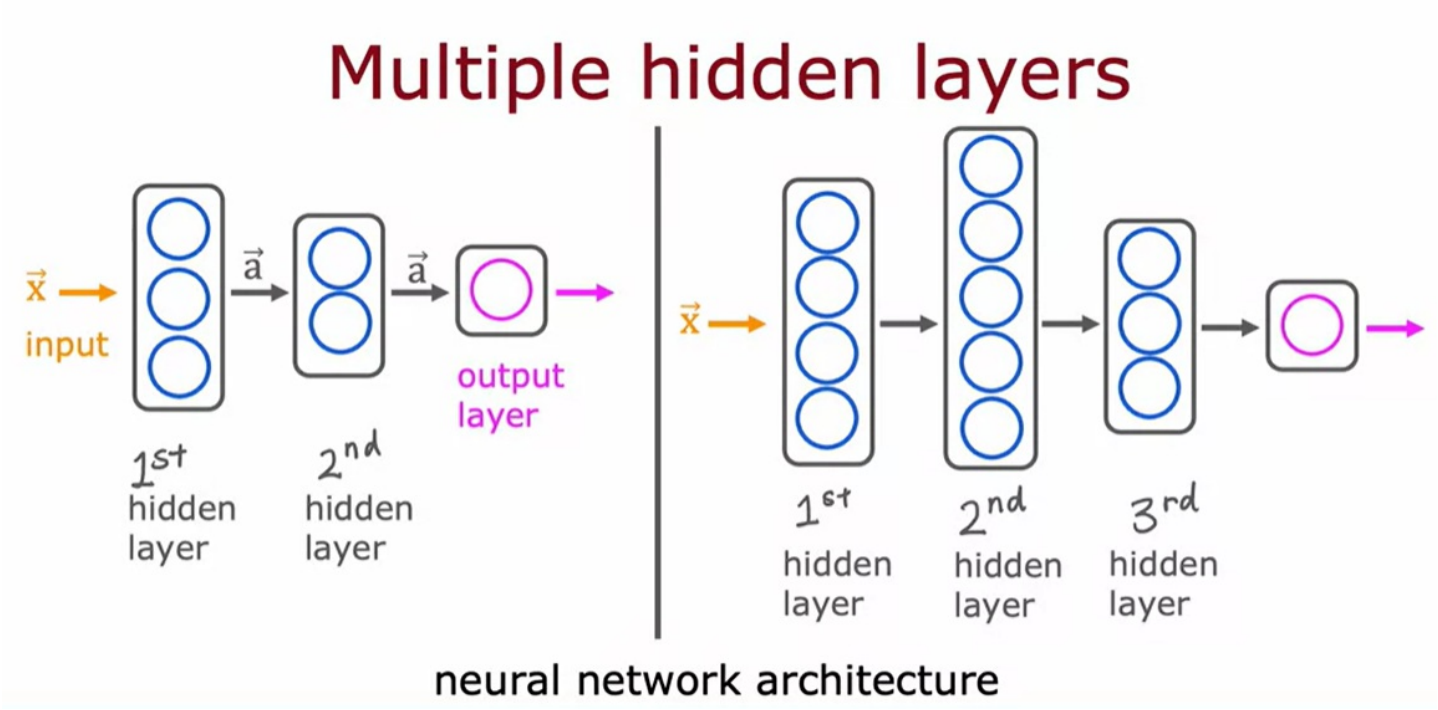
Layers

- Input layer, Hidden layer, Output layer
  - x,a,yx, a, yx, a, y
- From the example, 4 numbers from the input are fed into the hidden layer, which will compute 3 numbers, forming the activation values, then outputting a single number in the output layer
- Automated feature engineering → NN can learn its own features to make the problem easier for itself via some algorithm



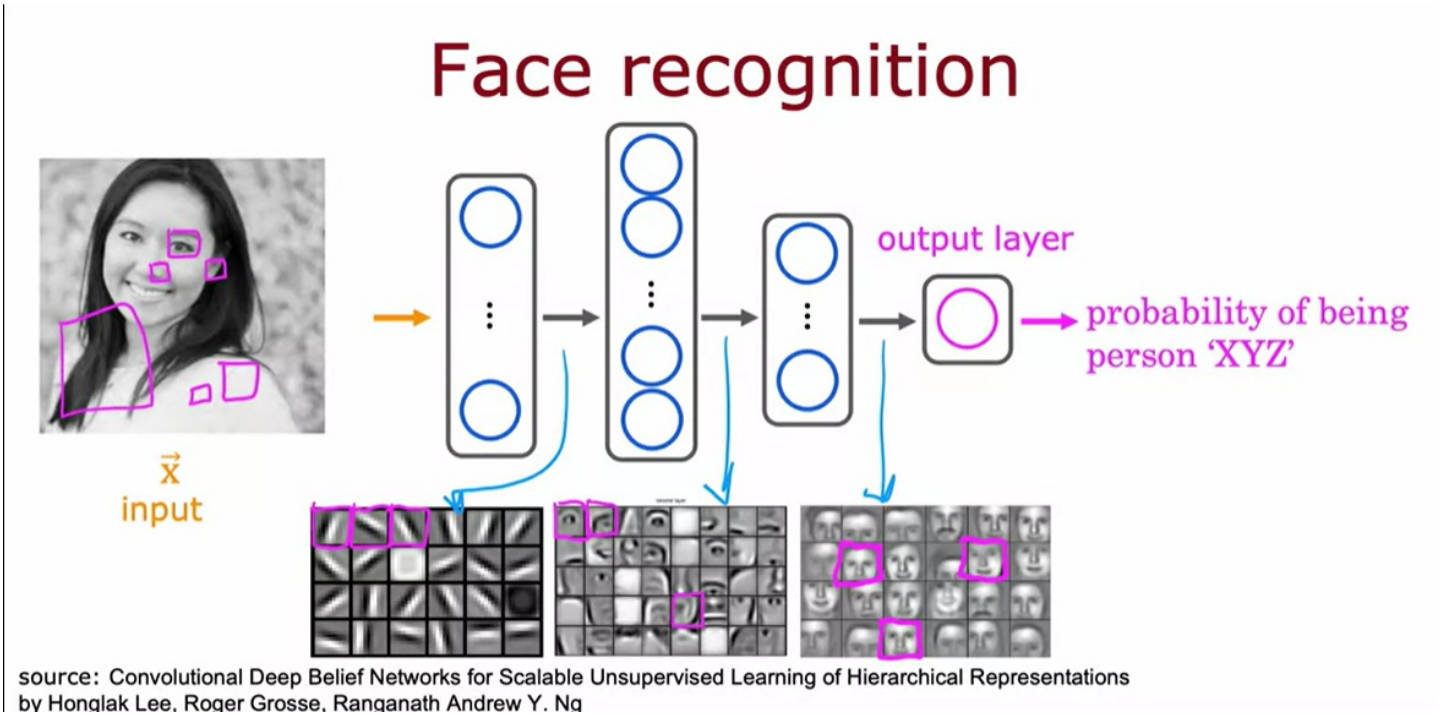
Multiple Hidden Layers

- Multilayer electron



Examples

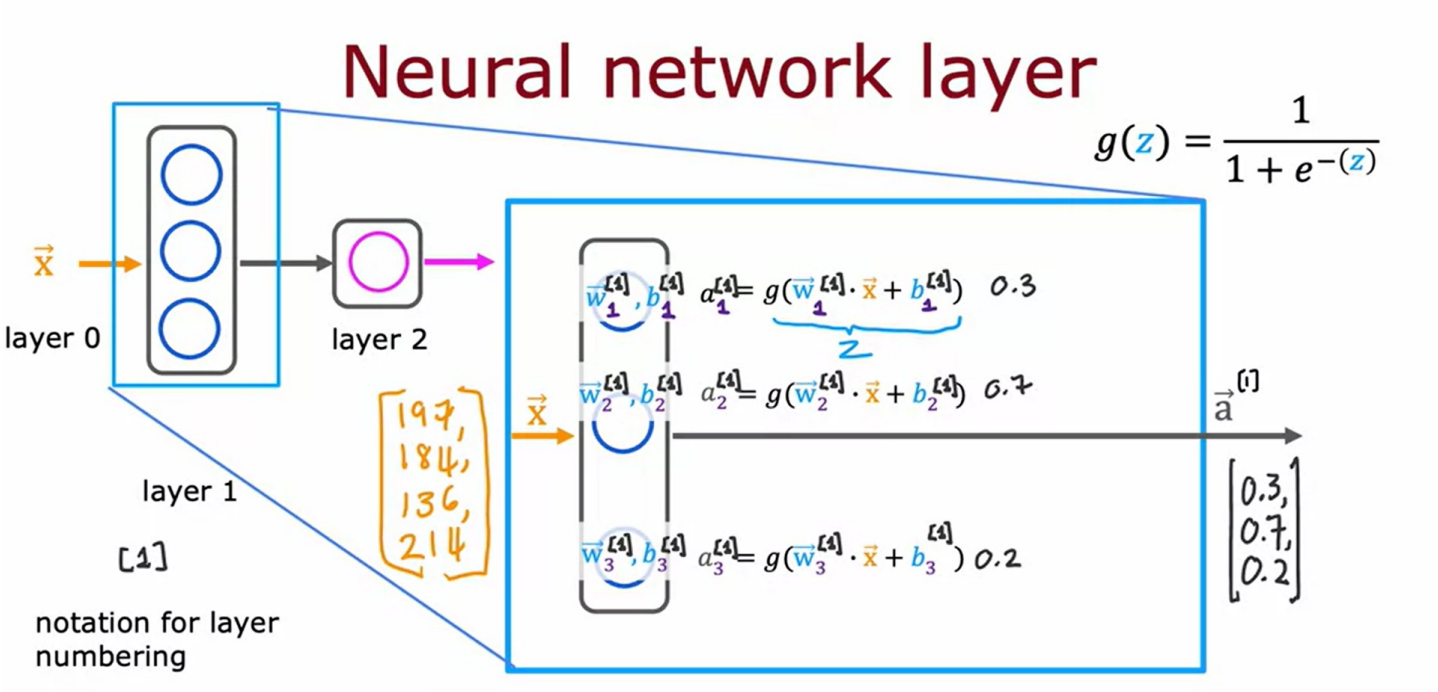
- Face Recognition
- Each layer is trying to identify a separate feature



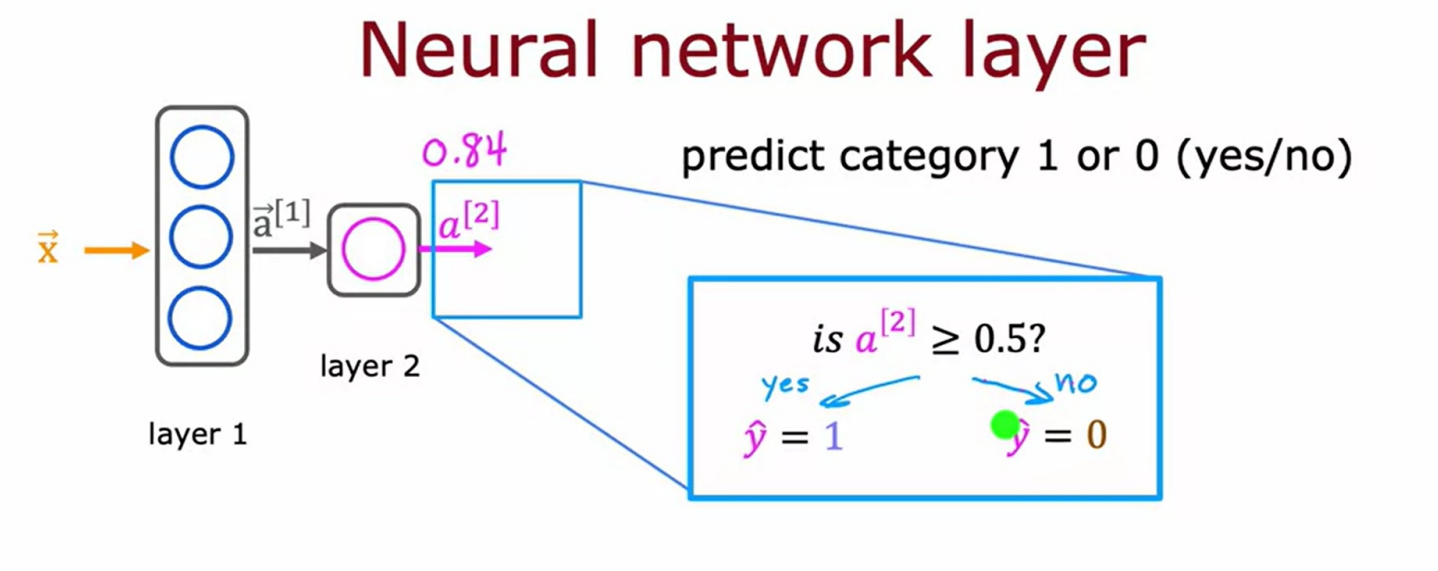
Neural Network Model

Notations

- Superscript [i] denotes the layer the variable is associated with

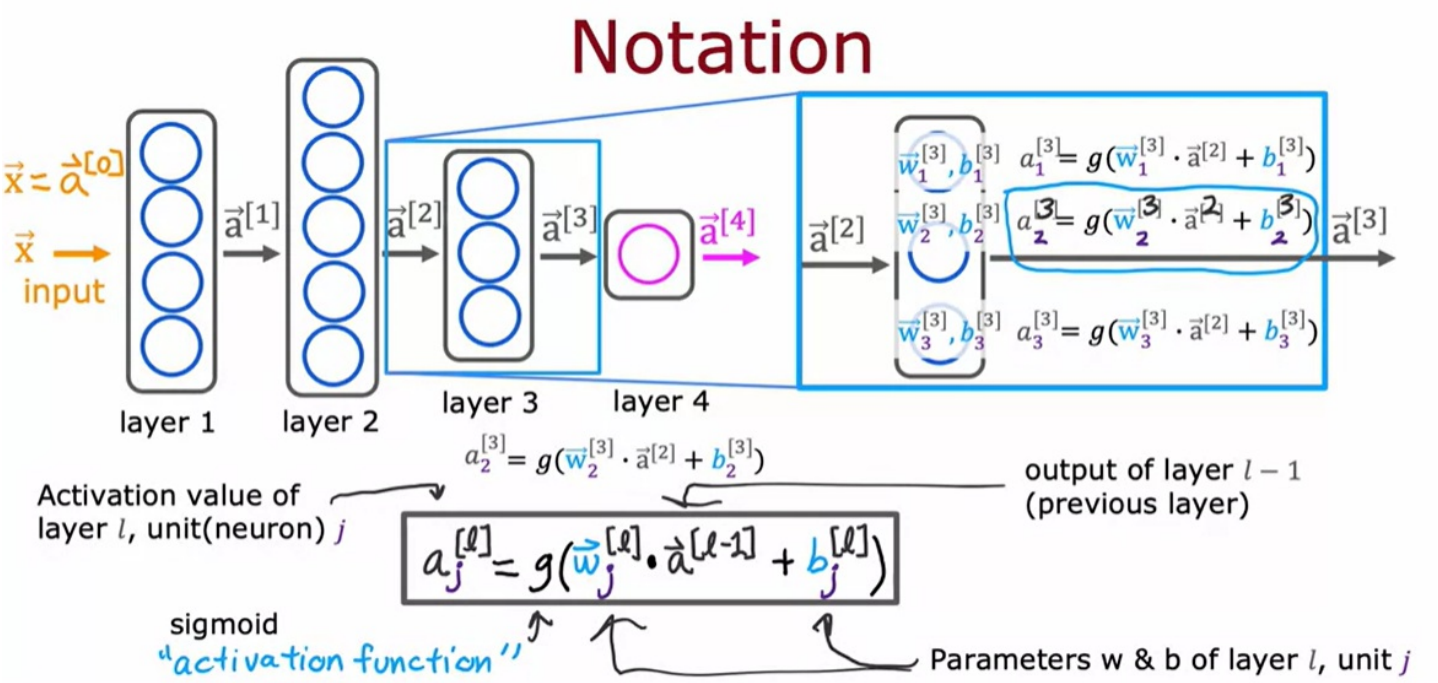


- Optional step to classify final output



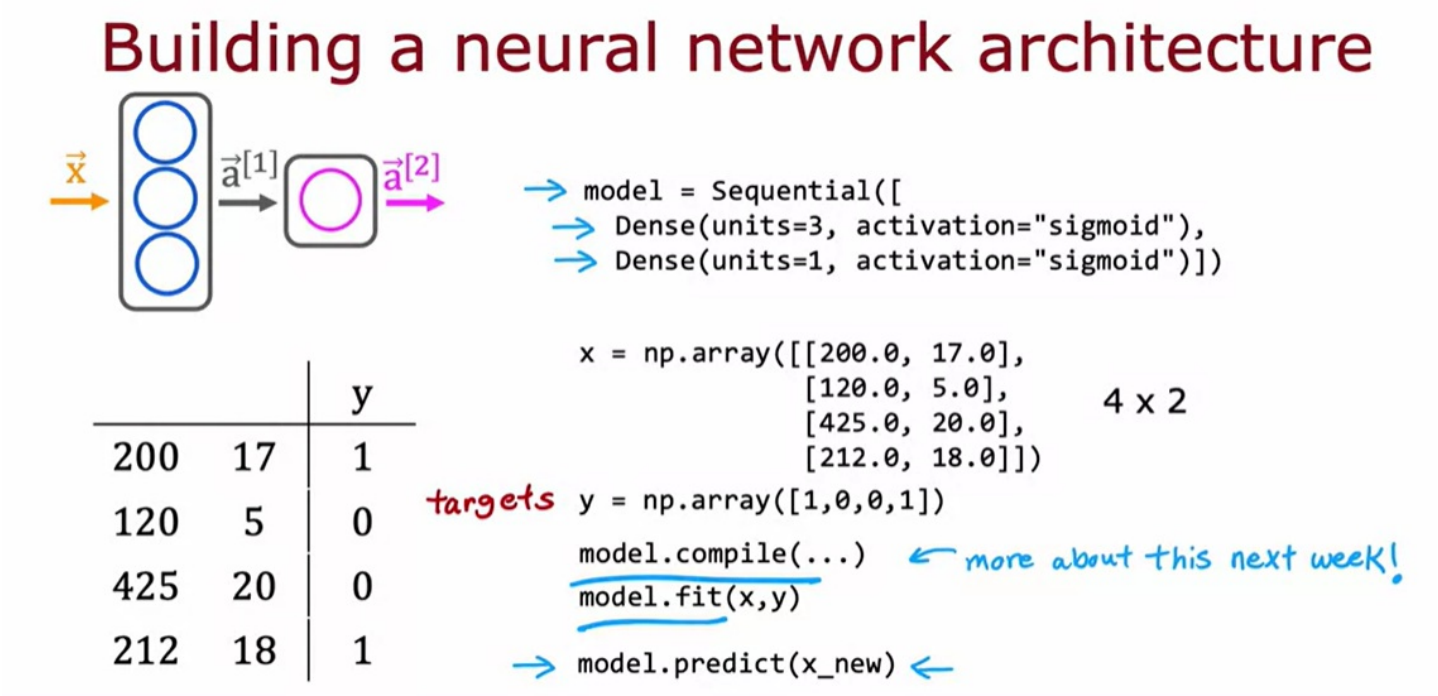
More Complex Neural Network

- Forward propagation
- General formula to compute the activation value of layer l:



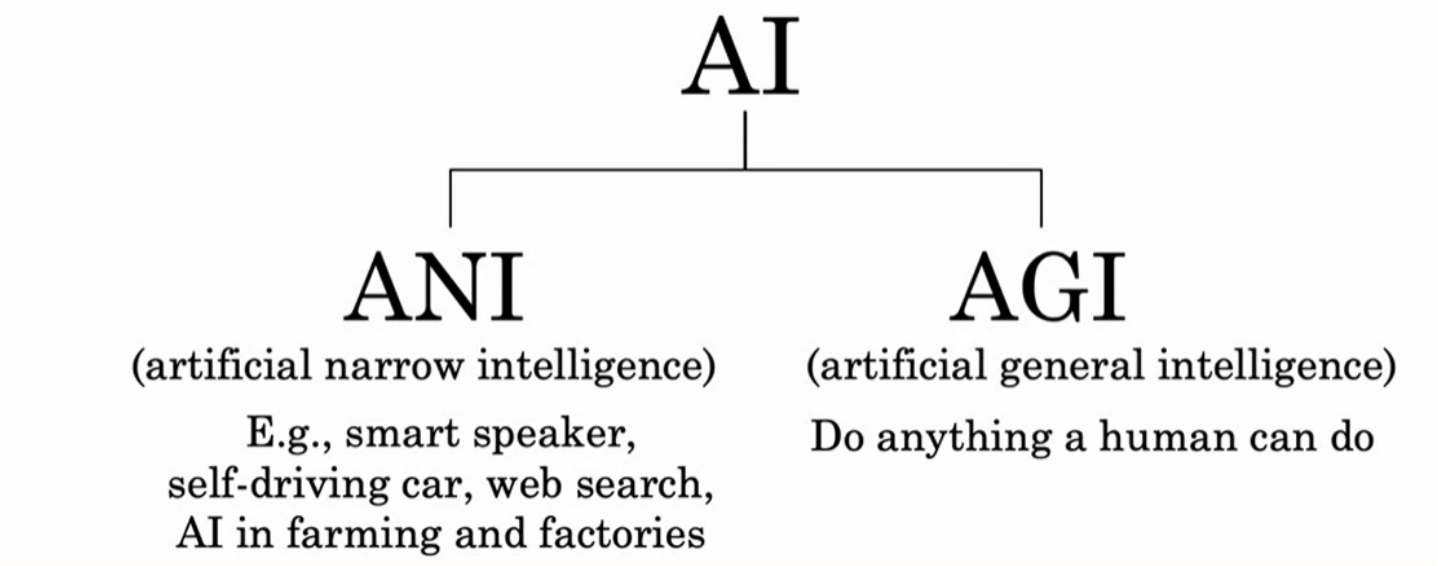
TensorFlow Implementation

Sequential() → Forward propagation



		y
200	17	1
120	5	0
425	20	0
212	18	1

Artificial General Intelligence (AGI)


AI
ANI
(artificial narrow intelligence)
E.g., smart speaker,
self-driving car, web search,
AI in farming and factories
AGI
(artificial general intelligence)
Do anything a human can do