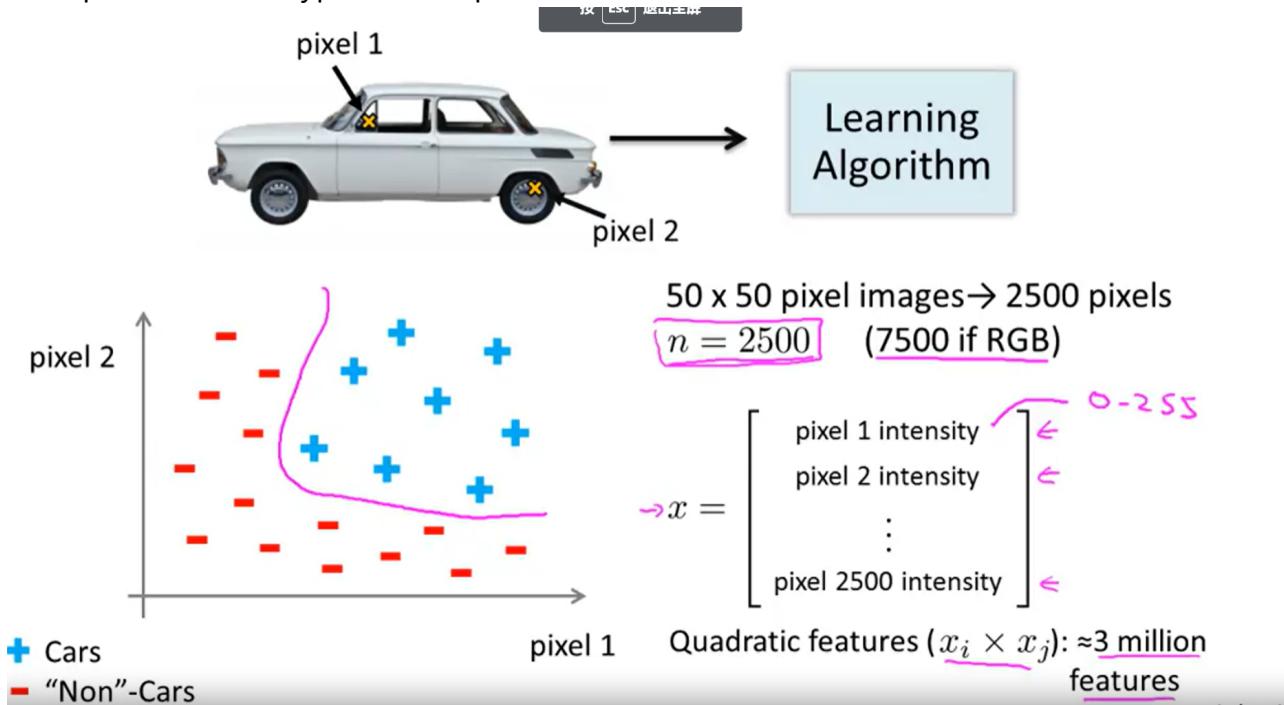


# Week 4.1 Neural Networks - Representation (Non-linear Hypotheses)

## Motivations

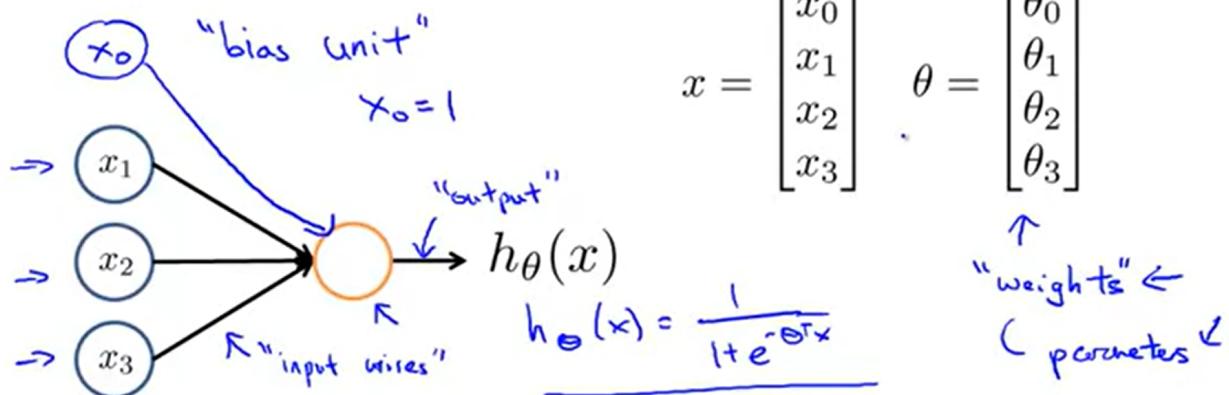
- example: nonlinear hypothesis explodes



## Neural Networks

- A single neuron (as a logistic unit)

### Neuron model: Logistic unit

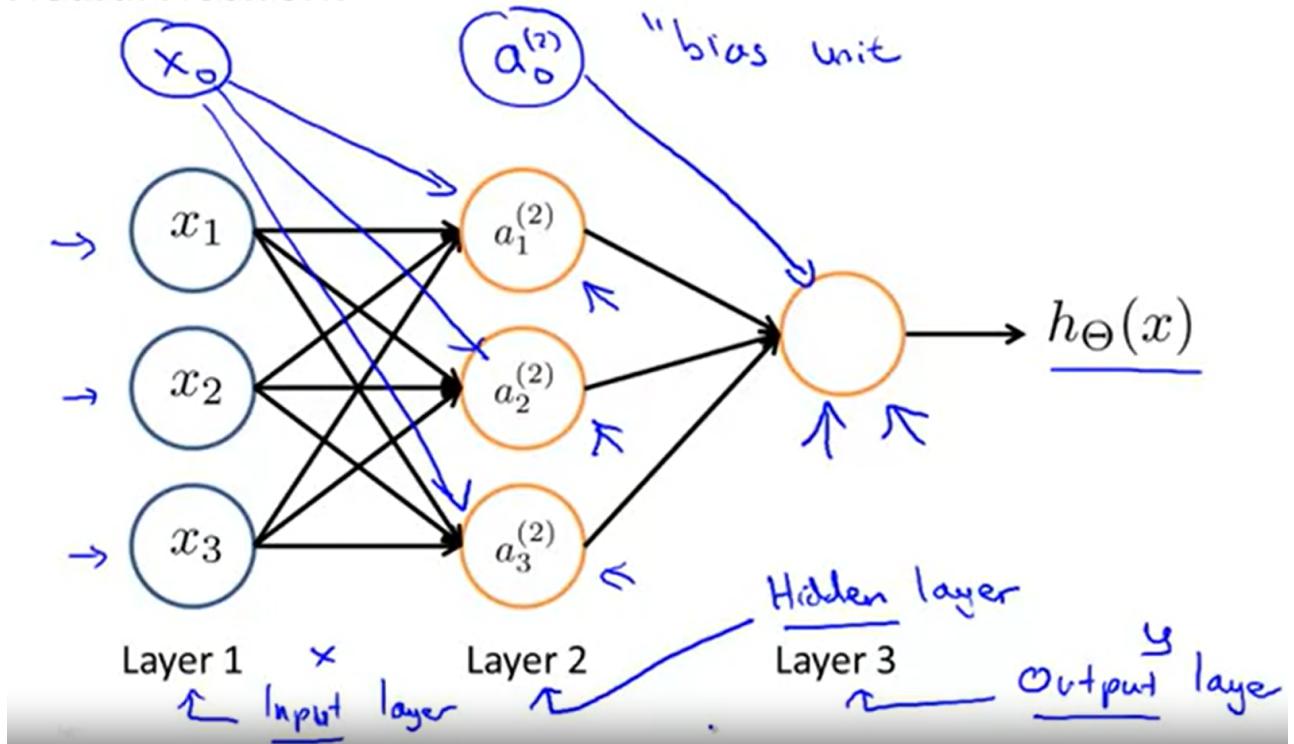


Sigmoid (logistic) activation function.

$$g(z) = \frac{1}{1 + e^{-z}}$$

- Neural Network

## Neural Network

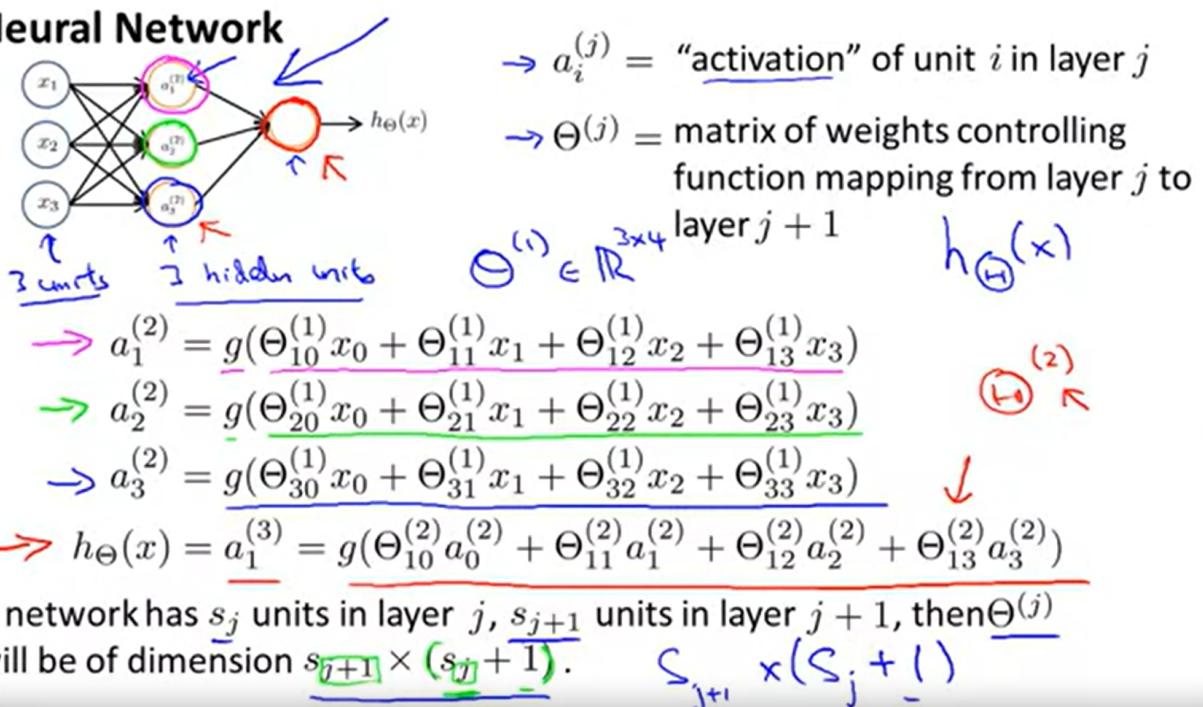


- symbols:

- $a_i^{(j)}$  : "activation" of unit  $i$  in layer  $j$
- $\Theta^{(j)}$ : matrix of weights controlling from layer  $j$  to layer  $j+1$

- forward propagation

## Neural Network



- learning its own features using hidden layer

## Neural Network learning its own features

