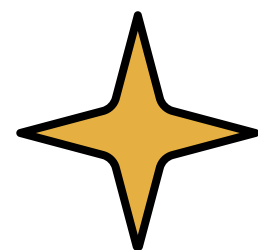


# Deep Learning



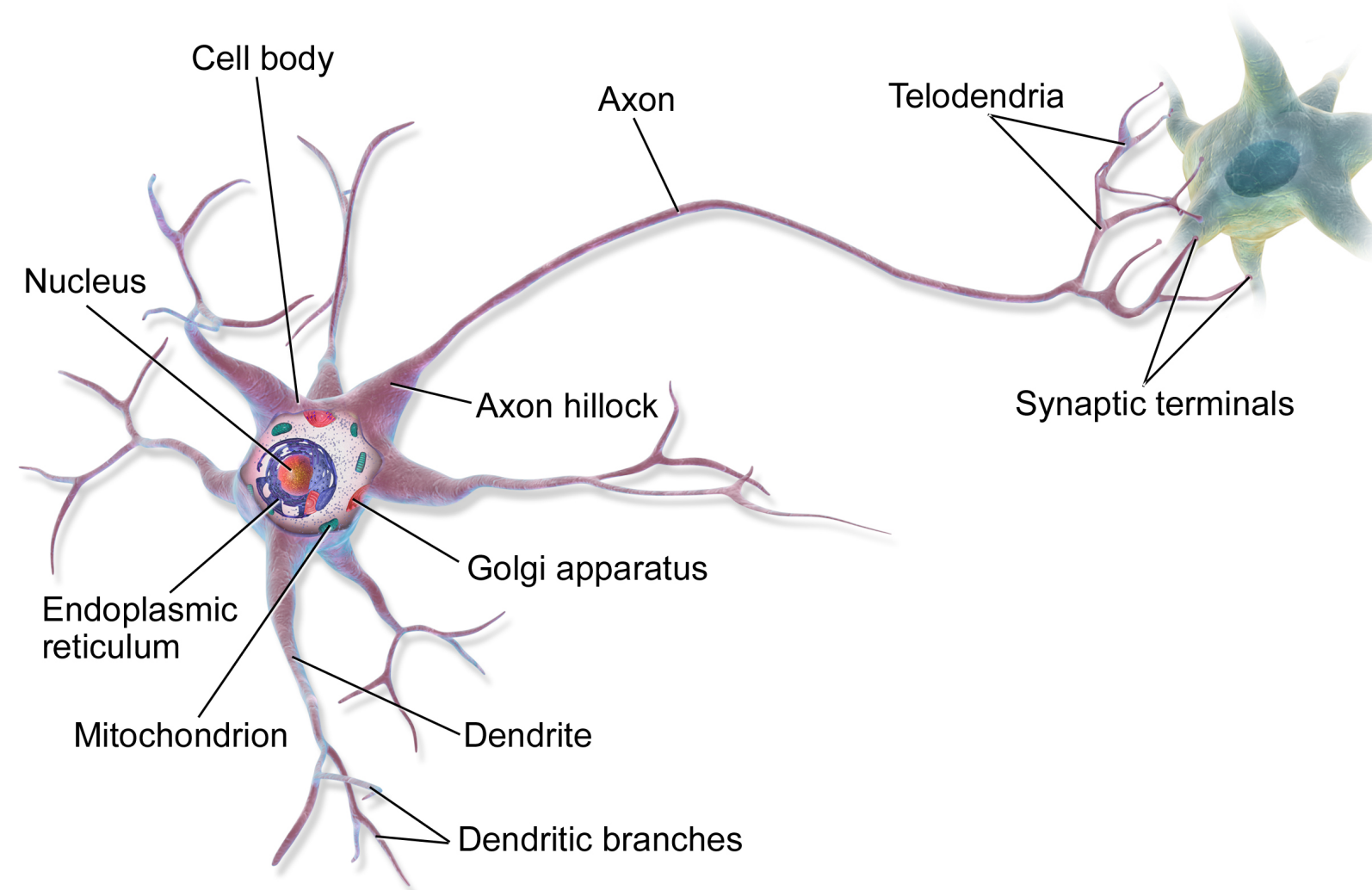


Hello!

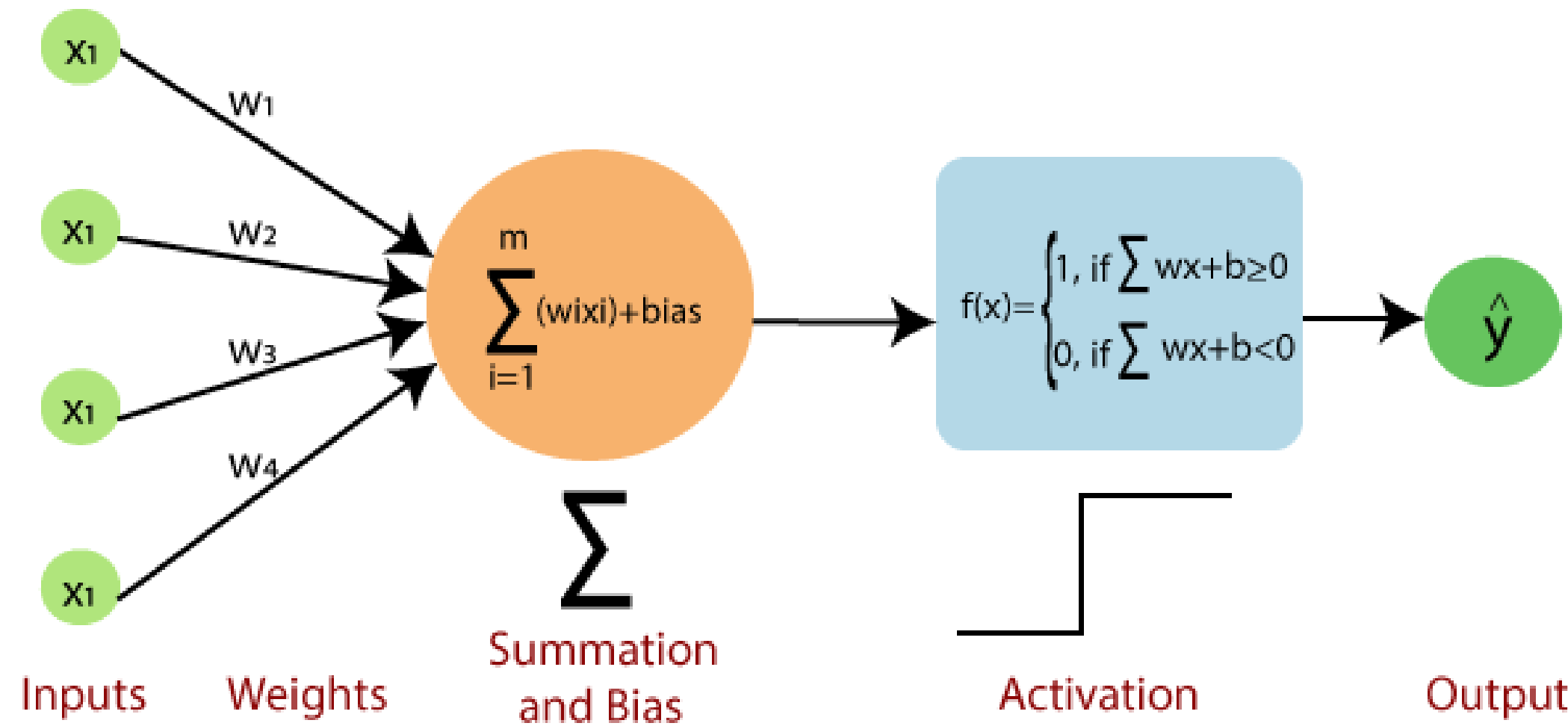


Hello and  
welcome to my  
**DL CLASS!**

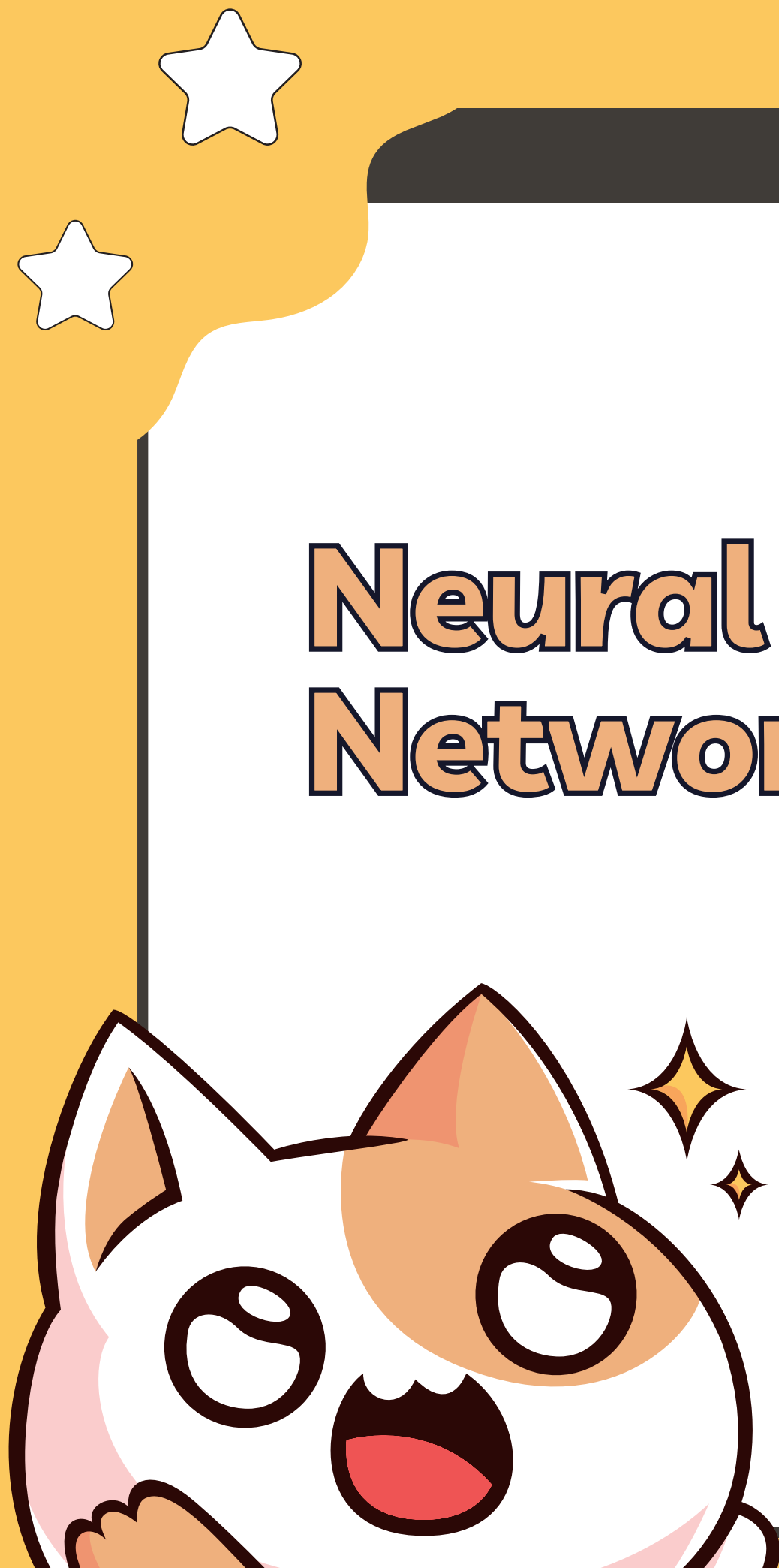
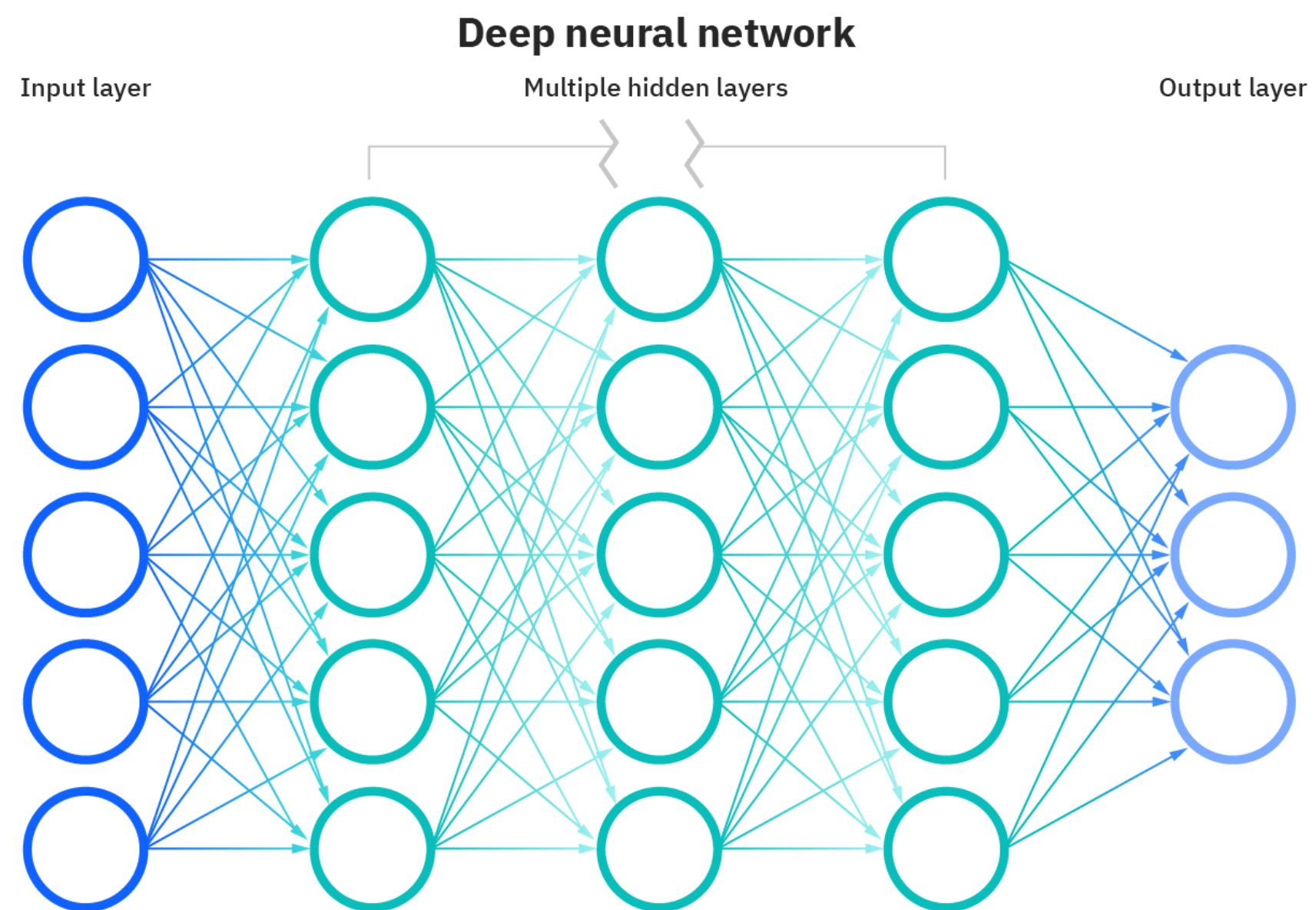
# INTRODUCTION TO NEURONS



# INTRODUCTION TO NEURONS

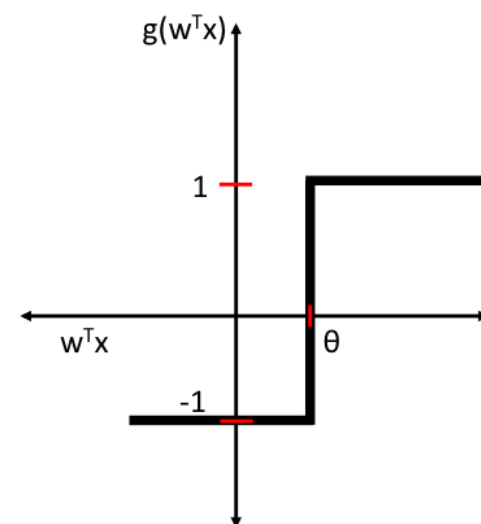


# Neural Networks

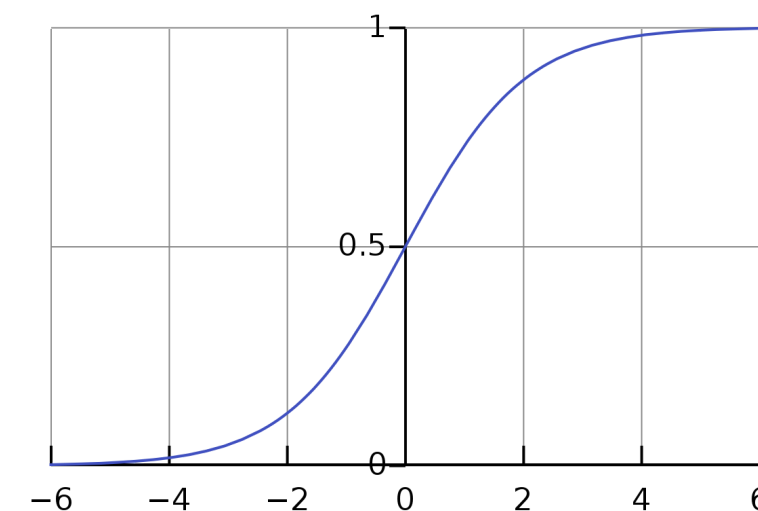


# Activation Functions

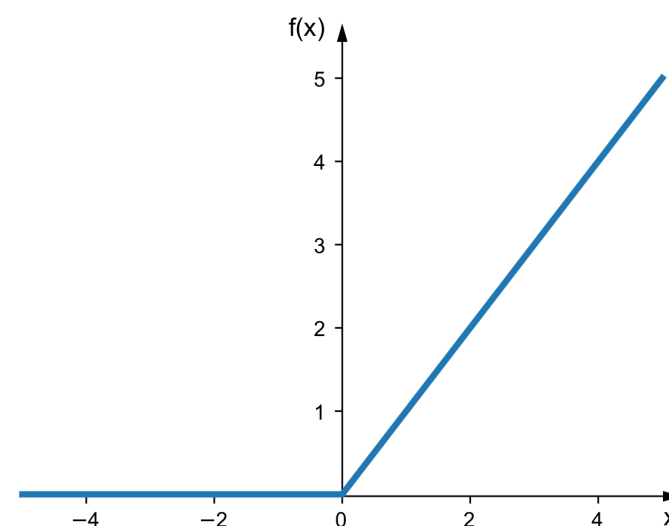
## Binary Step



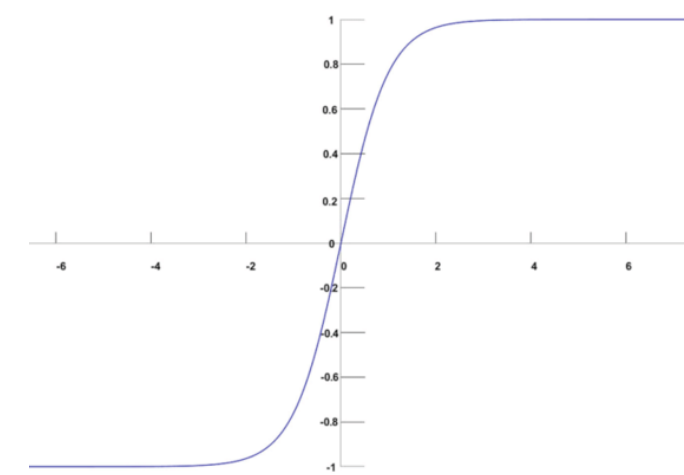
## Sigmoid



## ReLU



## Softmax



# ★ Types of Neural Networks

★ Artificial Neural Network: Text & Numeric

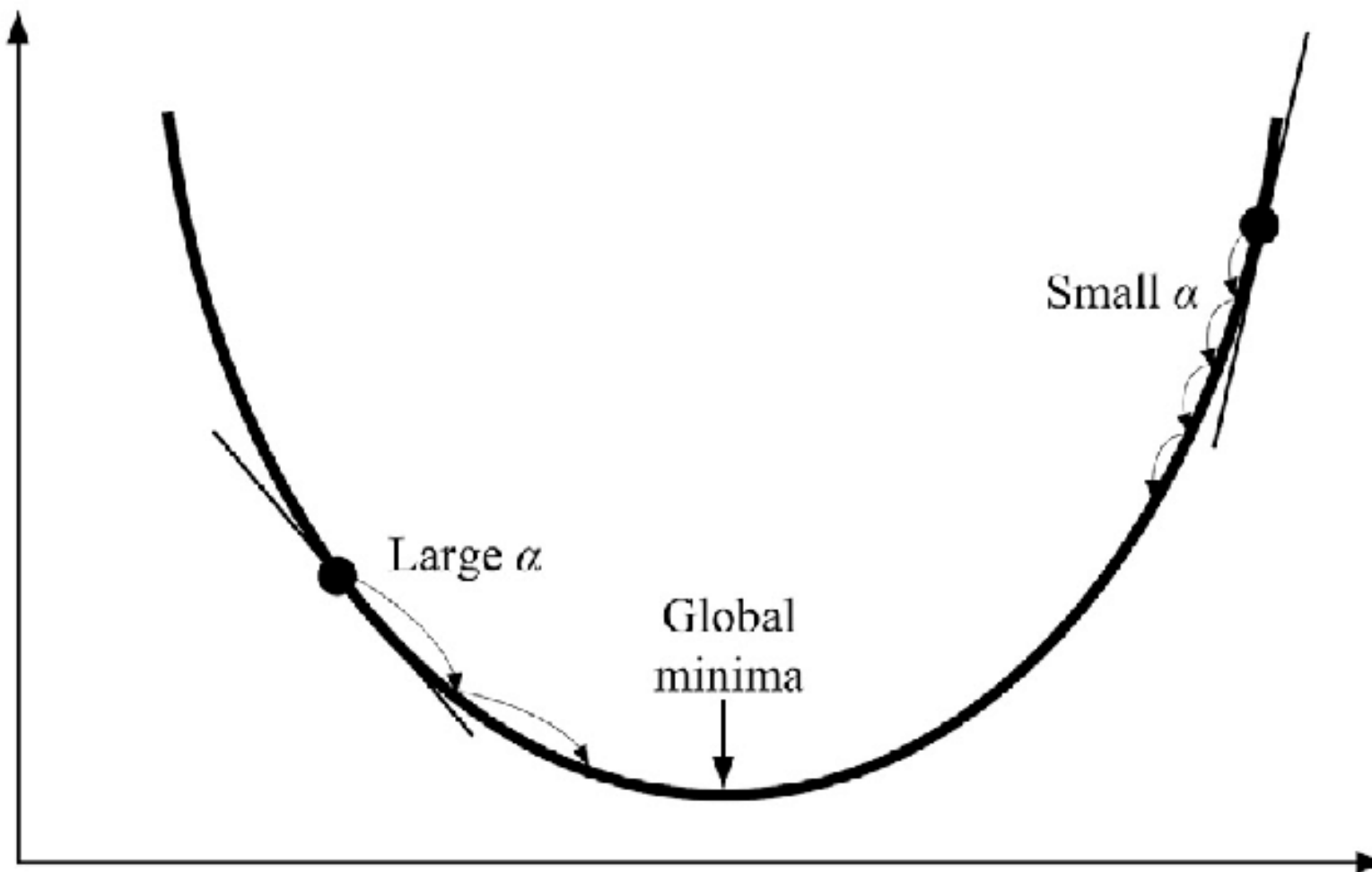
★ Convolutional Neural Network: Images

★ Recurrent Neural Network: Series



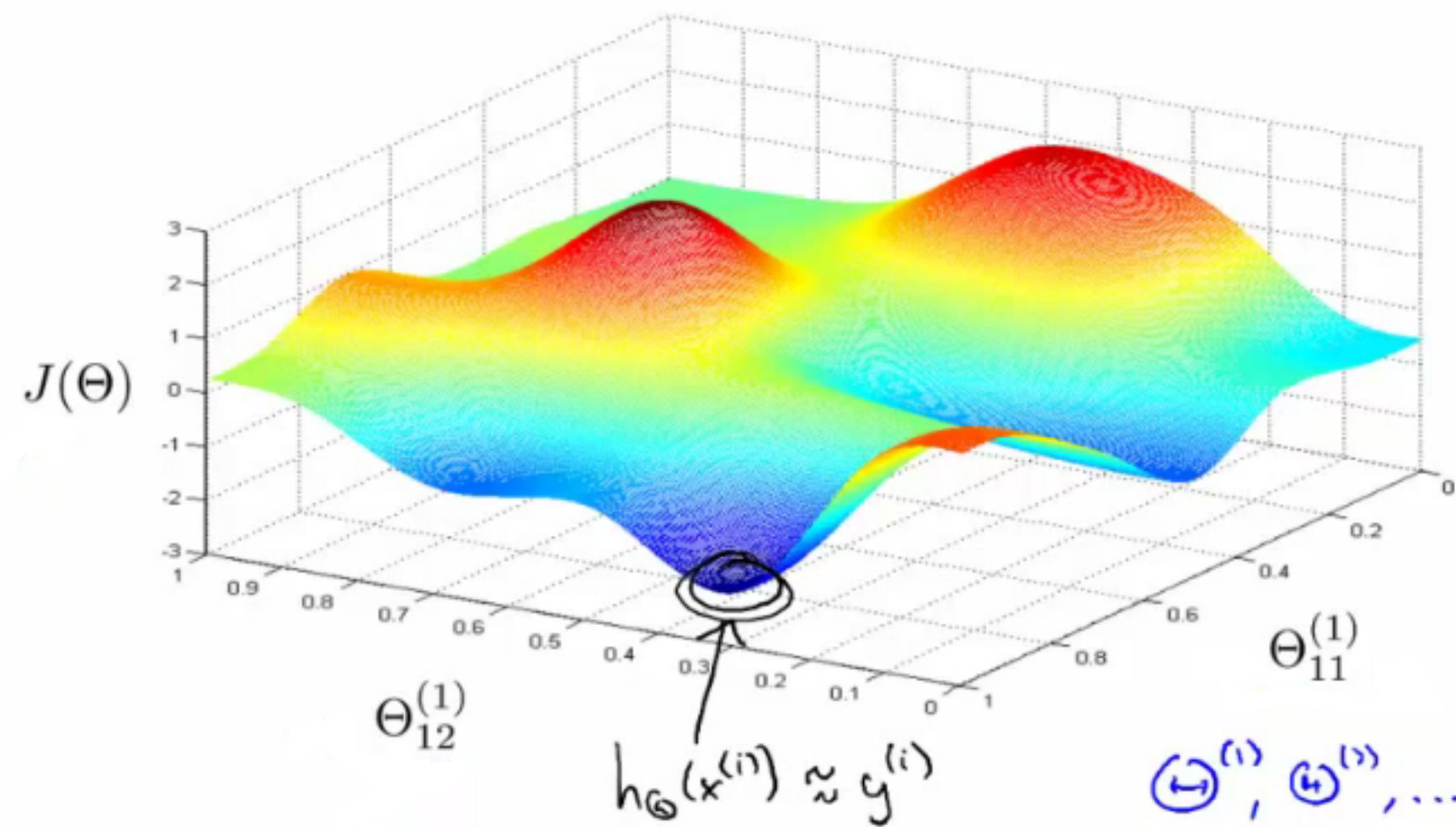
# COST FUNCTION

$\text{Cost}(W, b)$





# COST FUNCTION



## Finding Best Parameters

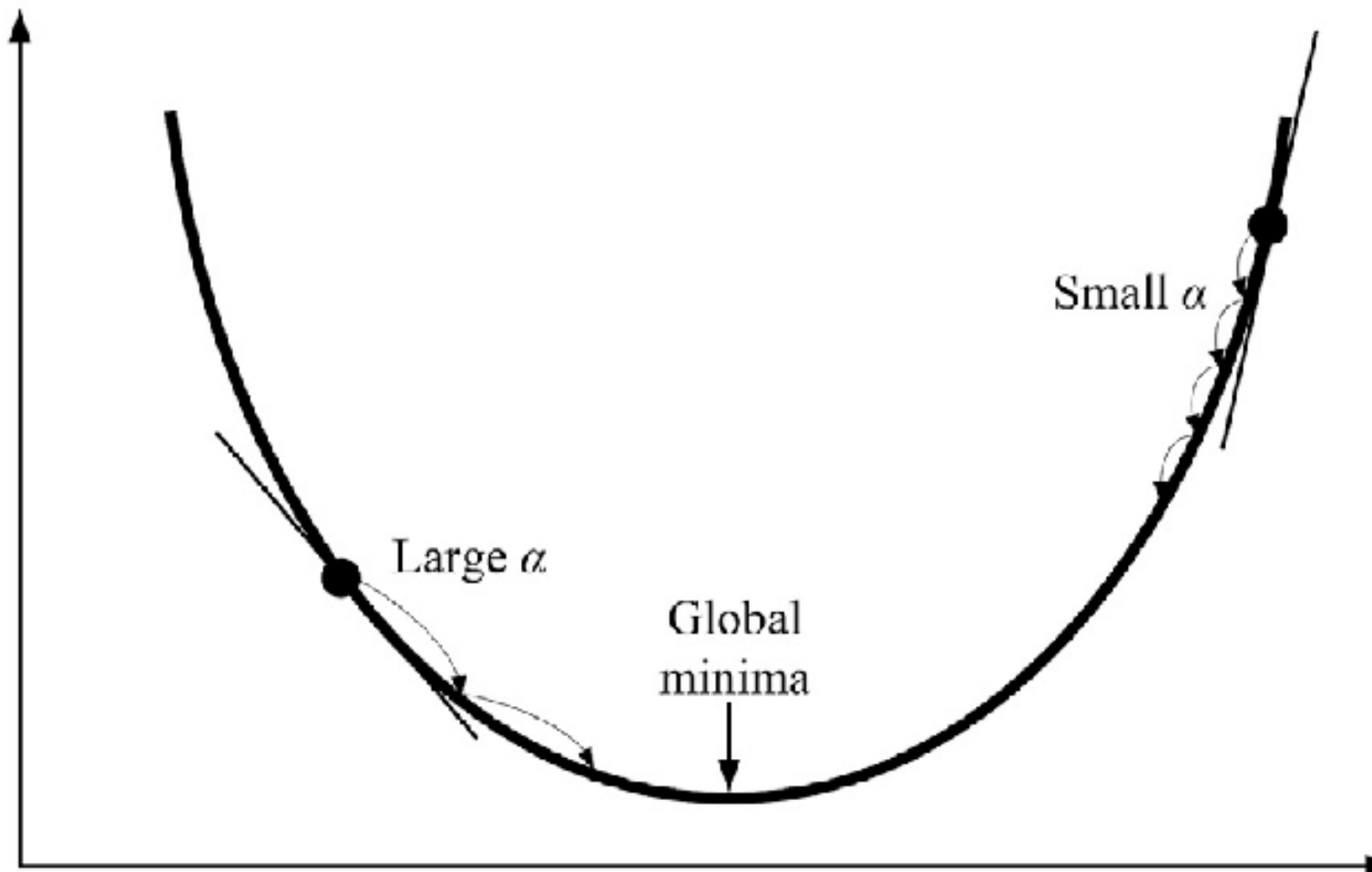


The best weights and biases for each neuron is decided using the cost function aka error. This is calculated by the Gradient Descent.



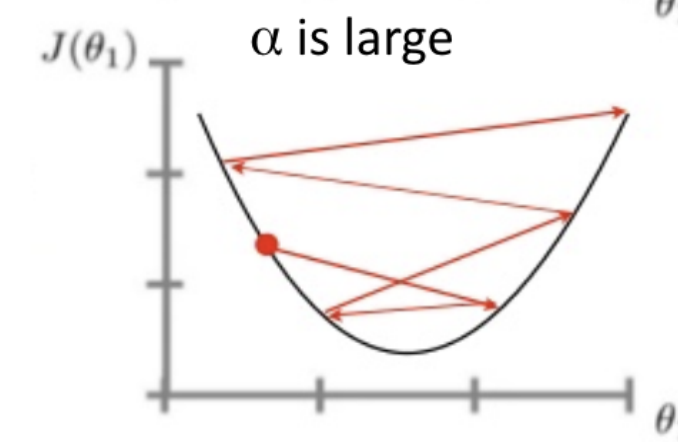
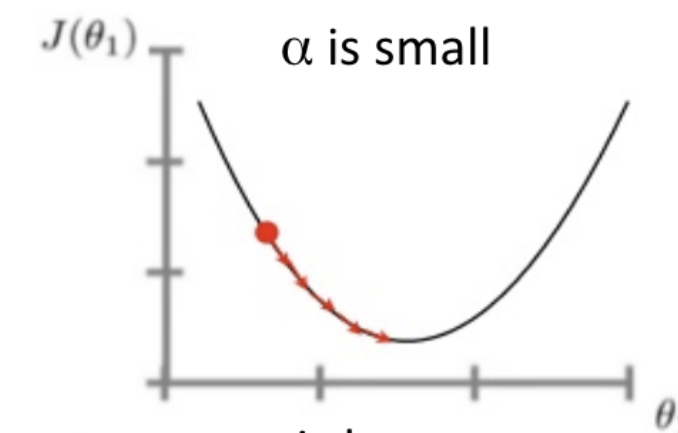
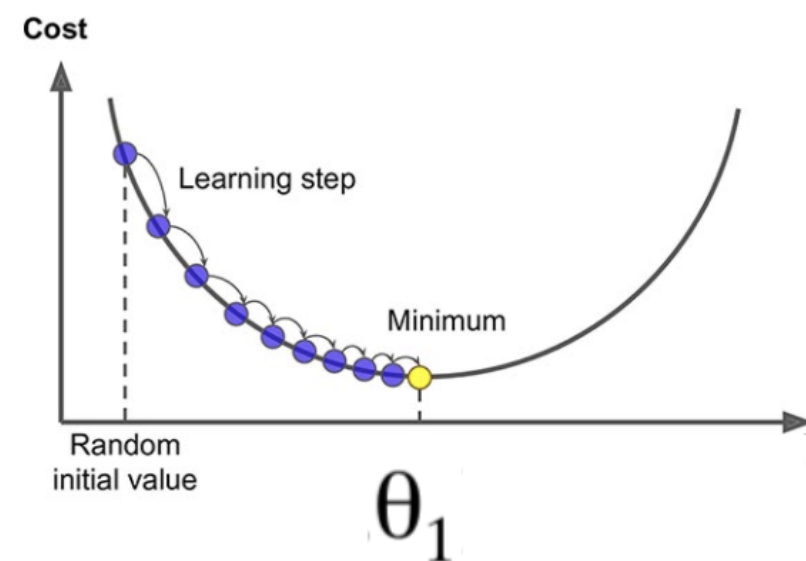
# GRADIENT DESCENT

$\text{Cost}(W, b)$



# GRADIENT DESCENT

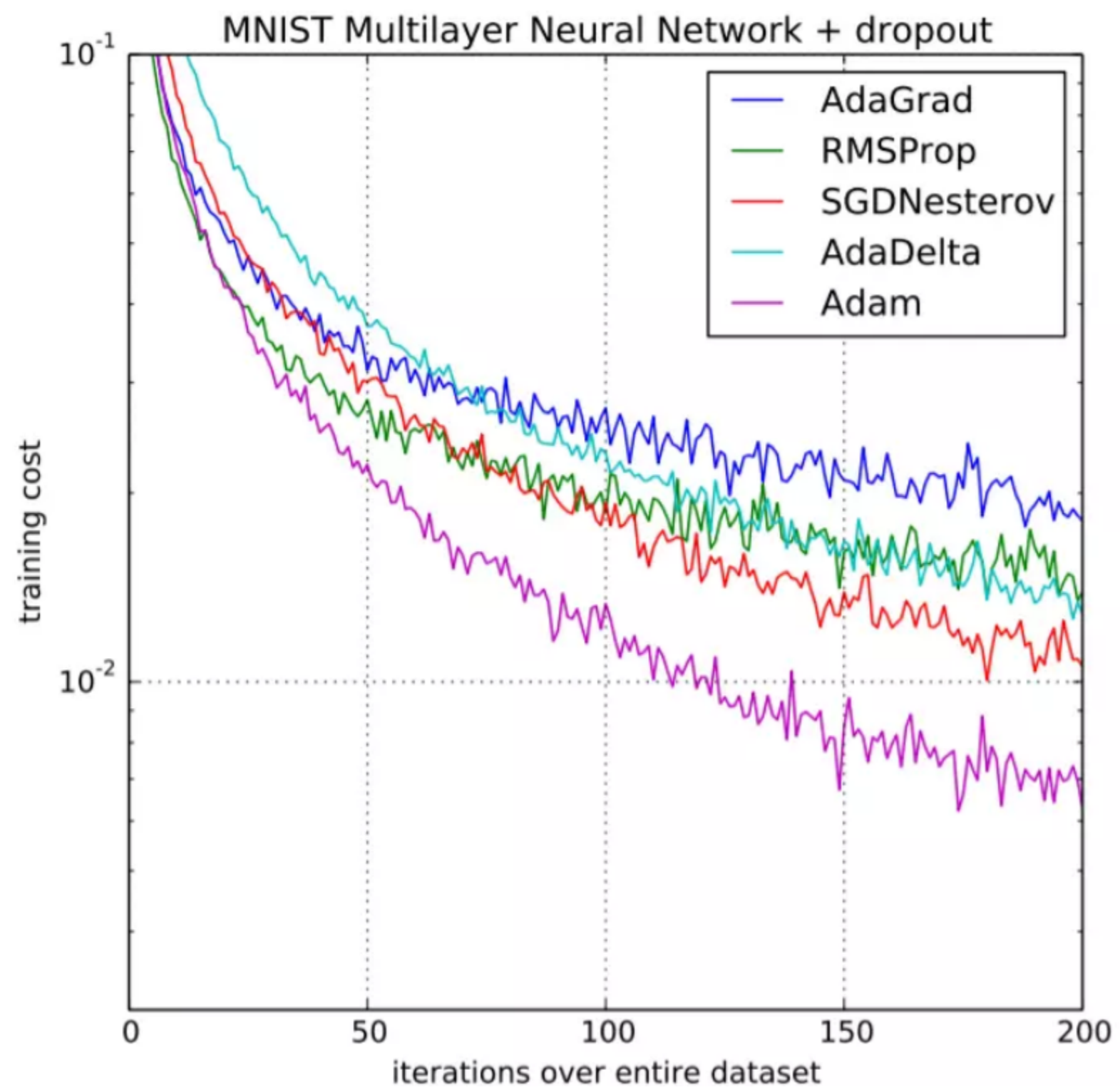
repeat until convergence {  
 $\theta_j := \theta_j - \alpha \frac{\partial}{\partial \theta_j} J(\theta_0, \theta_1)$   
(for  $j = 1$  and  $j = 0$ )  
}



# Learning Rate



This step size is called the learning rate. This can vary throughout the training process and is called adaptive gradient descent.





# ★ Loss Functions

★ Regression: Mean Squared Error

★ Binary Classification: Binary Crossentropy

★ Multi-class Classification: Categorical Crossentropy



# THANK YOU!

Do you have any questions  
for me before we go?

