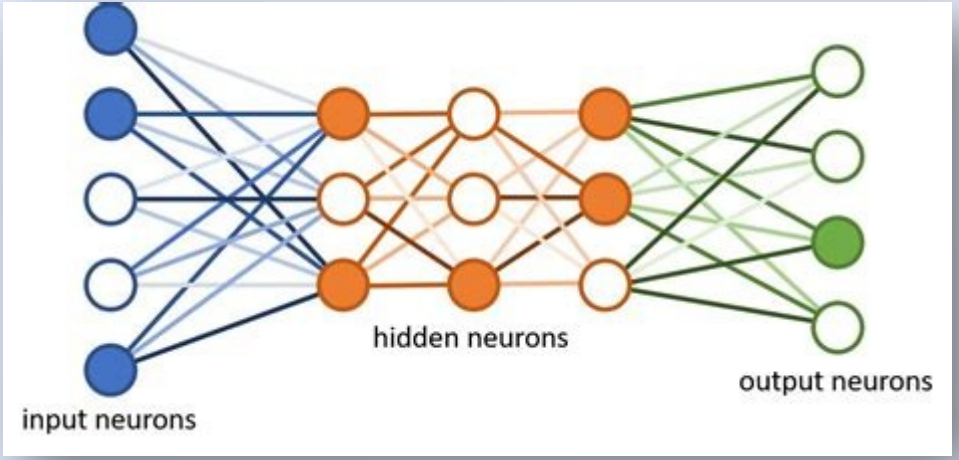
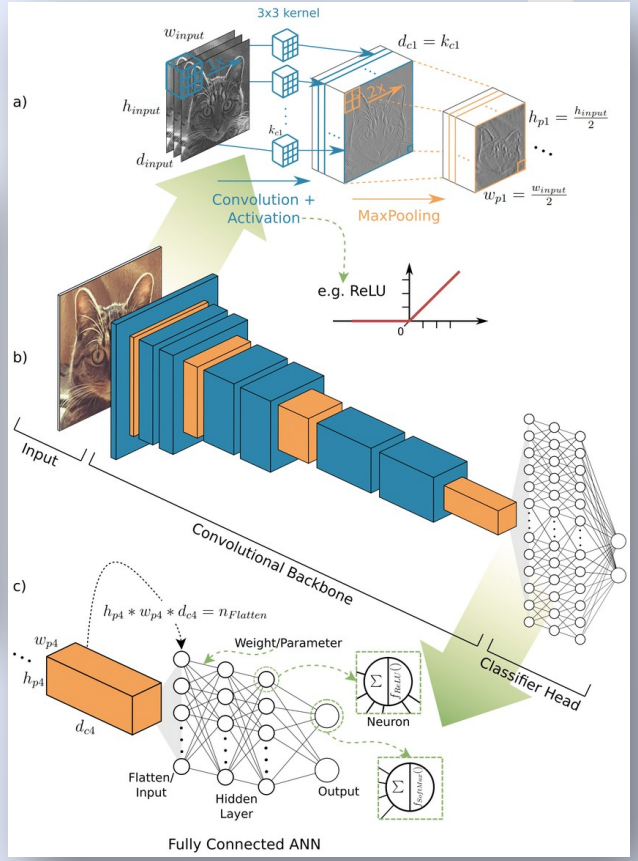
APRENDIZAJE PROFUNDO

Tema: Redes neuronales

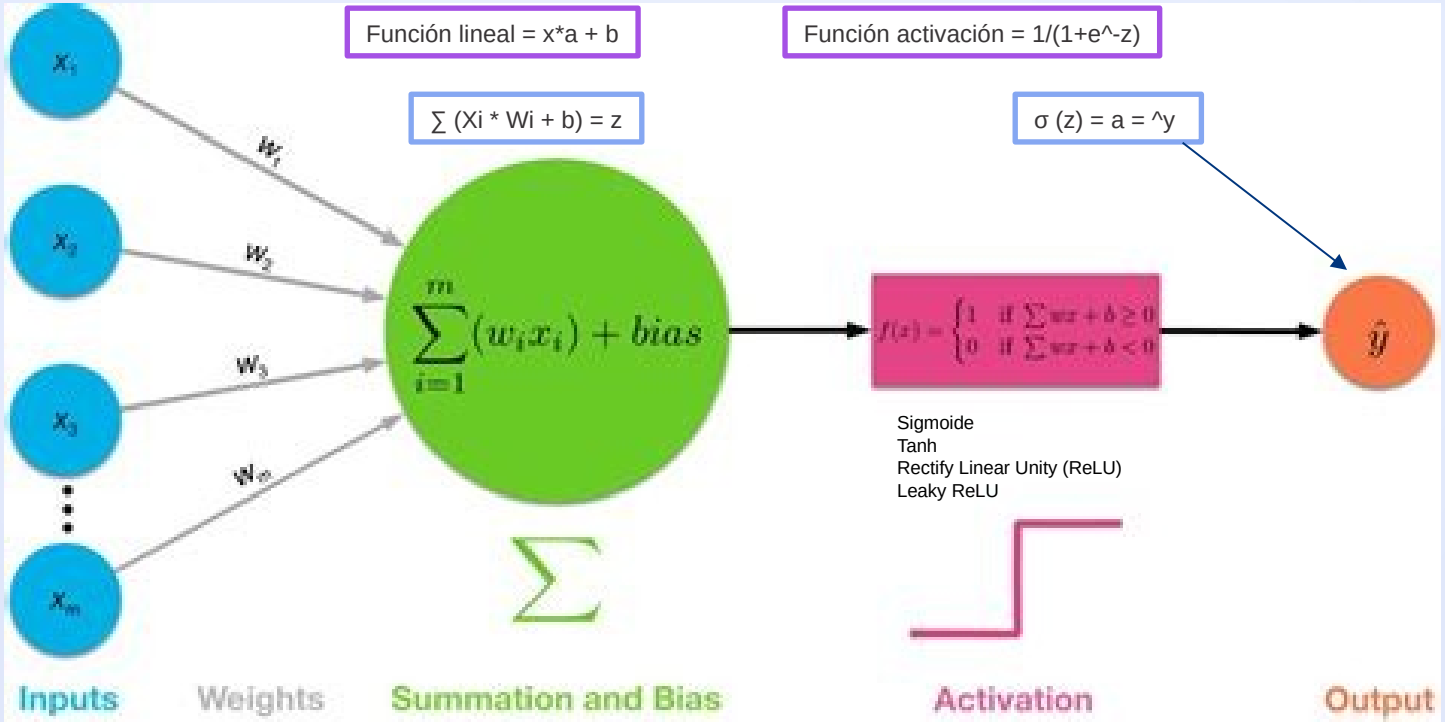
Redes Neuronales





Redes Neuronales

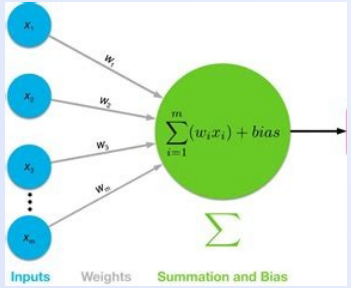
Perceptron



Redes Neuronales

Función lineal = x*m + b

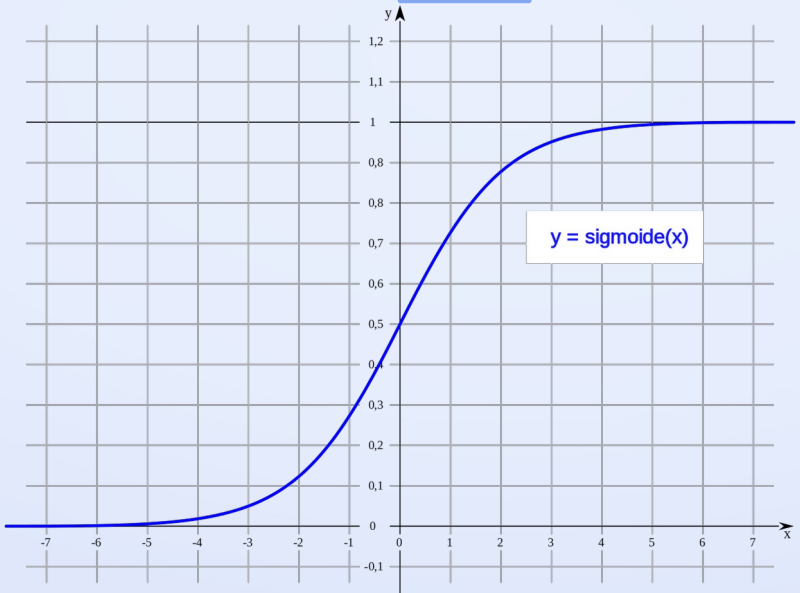
∑ (Xi * Wi + b) = z



Sigmoide

Función activación = 1/(1+e^-z)

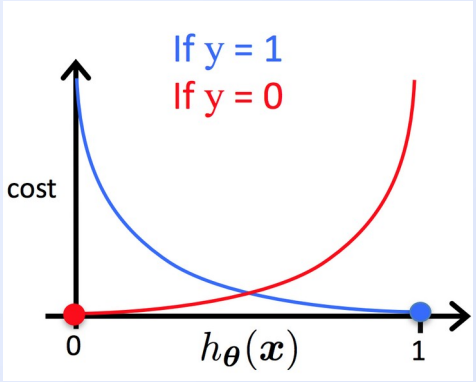
σ (z) = a



Entropía cruzada

Función perdida = L

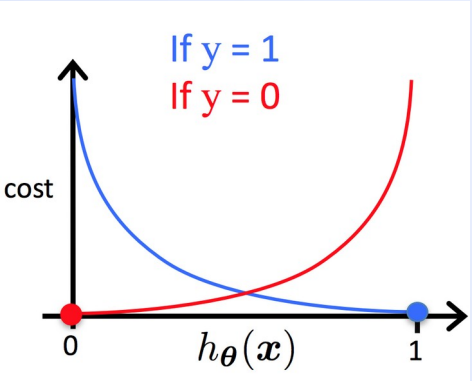
Función costo = J



Redes Neuronales

Función costo = J

Función perdida = L



1. Caso y = 1: L(^y, y) = - log ^y → Maximizar ^y para L (^y,y) minimice.
2. Caso y = 0: L(^y, y) = - log (1-^y) → Maximizar (1-^y) para L (^y,y) minimice, de tal forma que ^y tiene que minimizar.

Redes Neuronales

BACKPROPAGATION

Actualización parámetros ✉ Regla de la cadena

$$\frac{dy}{dx} = \frac{dy}{du} + \frac{du}{dx}$$

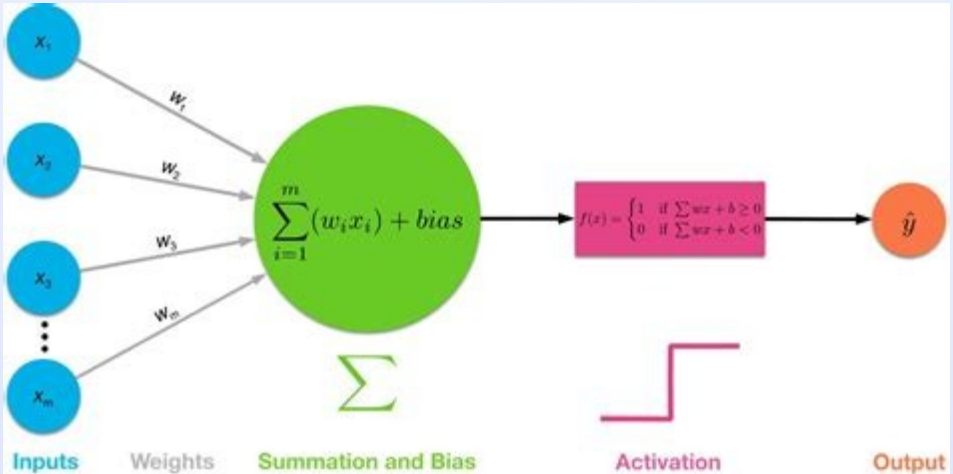
$$dz = \frac{dL(a,y)}{dz} = -\frac{y}{a} + \frac{(1-y)}{(1-a)}$$

+

+

w = w – α dw

b = b – α db



APRENDIZAJE PROFUNDO

Tema: Clasificador Binario

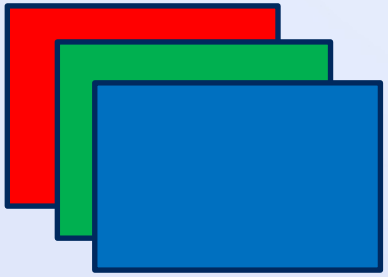
Clasificador Binario

Algoritmo de logistic regression

Hay gato ✉ y =1
No hay gato ✉ y = 0

Demasiadas conexiones

Z =



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[0.42382851, 0.7793706 , 0.95557697, 0.36313912],
[0.85210037, 0.85438949, 0.1558208 , 0.72611312]]

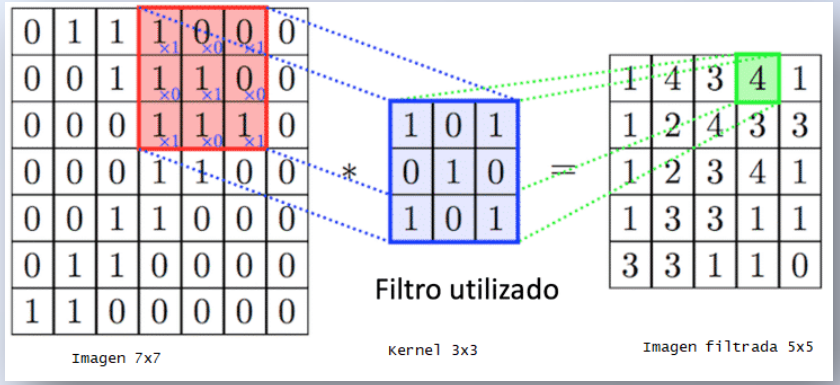
([[0.03906905, 0.97440963, 0.71961898, 0.32996325],
[0.69244103, 0.59412868, 0.71591308, 0.81801062],
[0.87850438, 0.20520954, 0.09388833, 0.6499204],
[0.41805232, 0.97656932, 0.1016103 , 0.49395151]])

([[0.69477392, 0.20554923, 0.17940824, 0.47703951],
[0.8679659 , 0.01558215, 0.3911708 , 0.67345343],
[0.34681257, 0.5883467 , 0.56270387, 0.01221303],
[0.20167319, 0.20900837, 0.25177722, 0.42471632]])

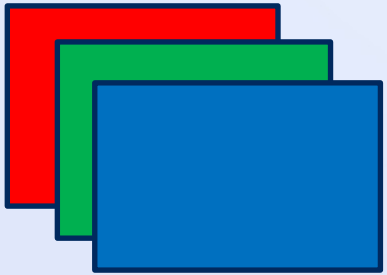
Clasificador Binario

Redes Neuronales Convolucionales

Hay gato ✉ y =1
No hay gato ✉ y = 0



Z =



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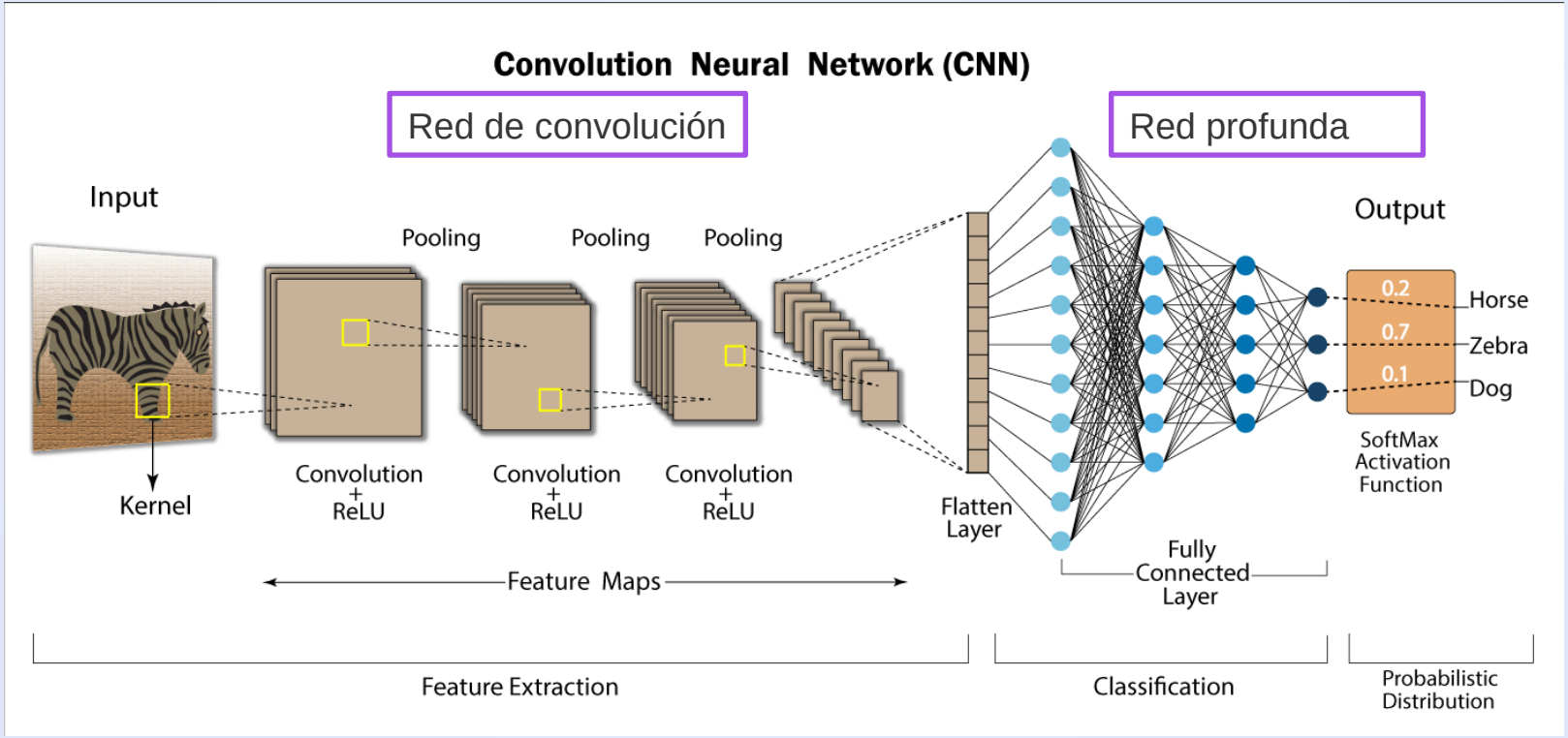
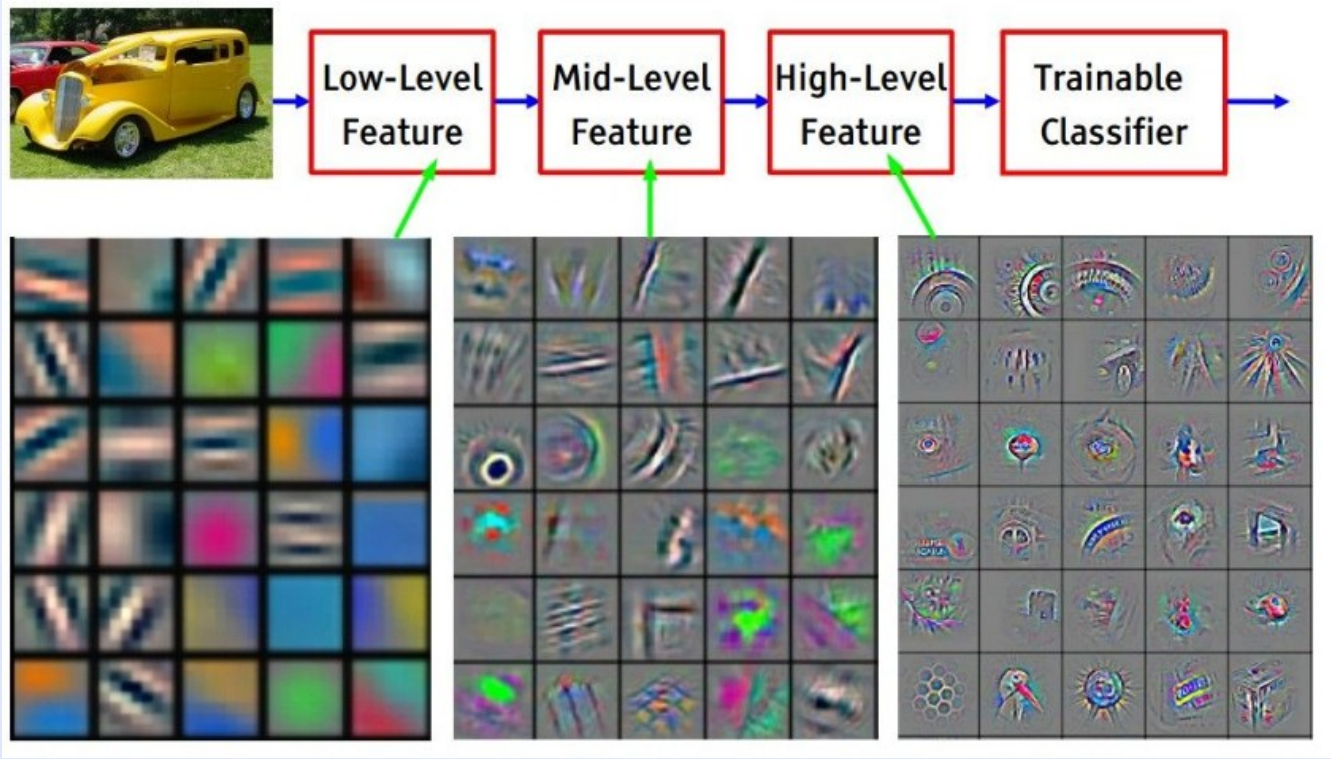
Clasificador Binario
Redes Neuronales



Clasificador Binario
Redes Neuronales



En resumen

CNN

Red encargada de extraer las características de cada imagen y así mejor el entrenamiento

01

02

Red neuronal fully connected

Es la encargada de aprender los features de la salida de la cnn.

03

Funcion de activacion softmax

Dicha función nos entregara un porcentaje de confianza de la clase que detectó.

Fuentes

Cursos

- Especialización en Deep Learning Coursera (cursos 1-4)
- Tensorflow Developer Certificate 2021 Udemy

Libros

- Deep Learning with Python – Francois Chollet
- Digital Image Processing – Rafael C. Gonzalez
- Hands-On Machine Learning with Scikit Learn and TensorFlow. Concepts, Tools, and Techniques to Build Intelligent Systems - Aurélien Géron

Muchas Gracias

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