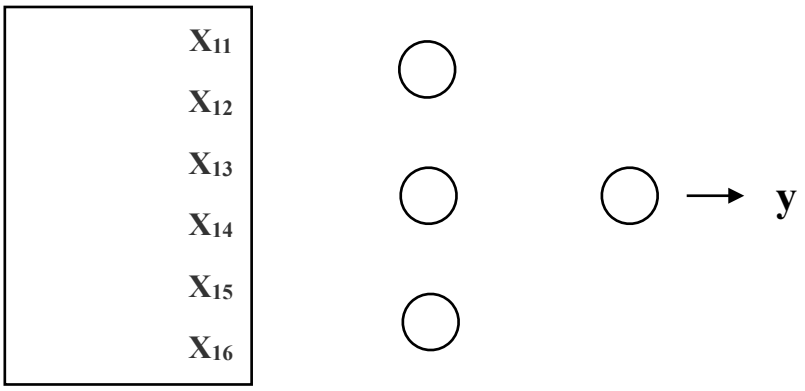
SC201 Lecture 11

< 2-layer NN >



X.shape ➠ (,)

Y.shape ➠ (,)

W1.shape ➠ (,)

B1.shape ➠ (,)

W2.shape ➠ (,)

B2.shape ➠ (,)

Foward pass

K1 = _____

A1 = _____

K2 = _____

H = _____

L = -(Y*np.log(H)+(1-Y)*np.log(1-H))

J = $\frac{1}{m}$ * np.sum(L)

Backward pass

W1 = W1 - α$\frac{dJ}{dW1}$ $\frac{dJ}{dK2}$ =

B1 = B1 - α$\frac{dJ}{dB1}$

W2 = W2 - α$\frac{dJ}{dW2}$ $\frac{dJ}{dA1}$ =

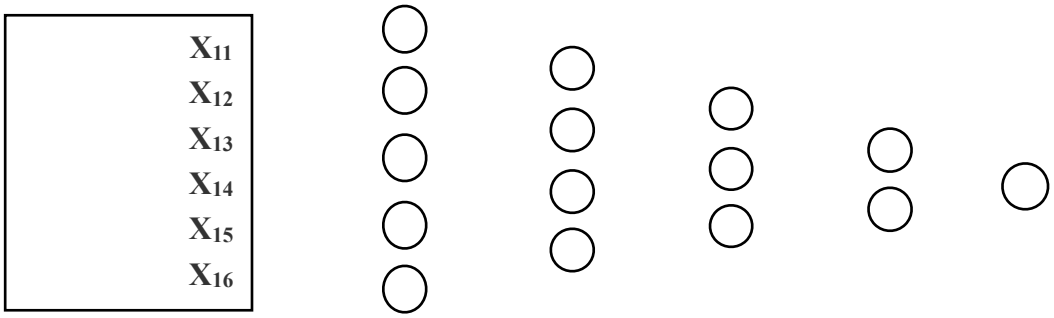
B2 = B2 - α$\frac{dJ}{dB2}$

$\frac{dJ}{dK1}$ =

Deep Neural Network (DNN)

stanCode

< 5-layer NN >



 # Init

W1 = np.random.rand(N0, N1)-0.5
B1 = np.random.rand(N1, 1)-0.5
W2 = np.random.rand(N1, N2)-0.5
B2 = np.random.rand(N2, 1)-0.5
⋮
W5 = np.random.rand(N4, N5)-0.5
B5 = np.random.rand(N5, 1)-0.5

Wi = _____

Bi = _____

 # Foward

K1 = np.dot(W1.T, A0)+B1
A1 = np.maximum(0, K1)
⋮
K4 = np.dot(W4.T, A3)+B4
A4 = np.maximum(0, K4)

Ki = _____

Ai = _____

scores = _____

H = _____

J = _____

 # Backward

dK5 = _____

dW5 = _____

dB5 = _____

dA4 = dK5 ? W5 = _____

dk4 = dA4* np.where(K4>0, 1, 0)

dW4 = dK4 ? A3 = _____

dB4 = np.sum(dk4, axis = 1, keepdims = True)
⋮

dAi

dKi

dWi

dBi