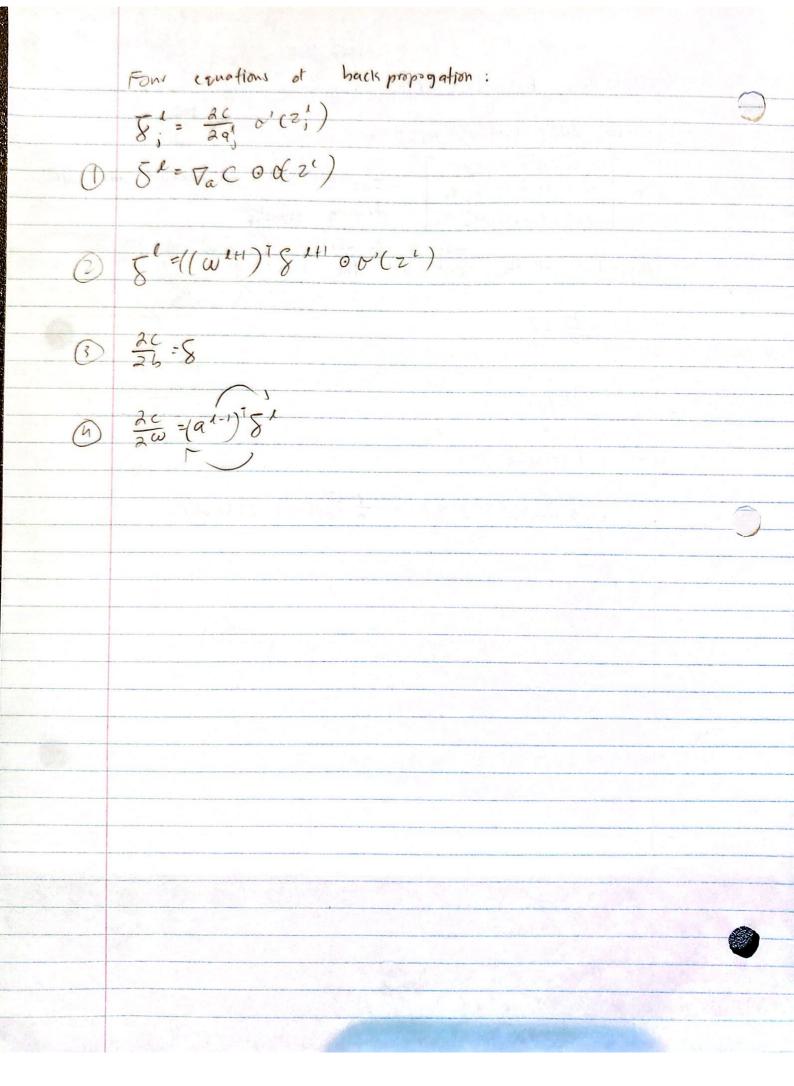


MSE: In E (4: - G) 20 = AC 20 20 20 20 1et v = 9- at 5h 2 (V)

2c 2c 2v 20 2 20 = 2 (y-a2) where V = y-a2 20 = -(1) (2a) (chain rule agam) (2) = 1 E (2V) = 1/2 ST V ac = 1 5 (v) 2C = 20 20  $= \frac{1}{m} \sum_{i=1}^{m} V(-1) \left( \frac{\partial a}{\partial \omega} \right)$ = I Si (0) T  $\frac{m}{n} = \frac{1}{n} \left\{ \frac{1}{n} + \frac{1$ ac = # El (wtxtb-4i) [ Y, Y, Y, Yn]

what does this book like? it we define (at x16-yi) asei The extrater x, the xx of Devivative of the cost wit the bias: 20 - 20 2a = CIM, = 5 ° (-(y-a!) = m 5 (wt x+b-y) = 1 5 ei (Scolar)



Imagine we want our neural network to be 784× 30×10 self. num\_layer = len(snes) = 3 passing in self. sizes = [784, 30, 10] Looping though rizes 30, 10 Need a blow vector of 30x1, and lox1 list of Biases append (mp. random . Vanda (4,1)) => creates a Vacampy arrays (2311), (10x1) numpy arrays weights need to be 30x 784, 10x 30 for dot products using the zie furction, Tir ( snes (:-1], snes (1,:1) -> x from first, up excluding last -> y tom second, excluding lust 7: 784, 30, y: 37,10 (7,x) = 20x784, 10x30 starting from the injut, teedforward runs though a loop For a training example 784 x1 30 + 30 , then apply signoid clement asise In all chements 10 apply sismoid element aise leasth of feet data => n-kst = 10,000 n= le-sh of fraining late = so, on Lapanythough opachs, Mmi-batches of Size mini batch I size => # of culturins = batch size # of epochs x # of but his = # of times gradient descent is priformed. 1) hatchs = 500, epochs =10 => 800 fmes

evente weight and bias matthes, matching the shapes already initialized we first initialize the motehing moters with zeros. Pricoing back popo gotion, we set 14 lot of matrices that match the shapes, at the genetical matrices. Thin, we subtract the gradients after multiplying by etal # at framingio In the back proprogation algorithm we are passing in a botch of framing examples. Initialize the activation x and actvahas as a list . Creak a list at the aceisthed Suns, and activations 051 = 7, Coo'(21) 5 8 = (( M/H) 28 HI OO (54) a) of tal-1) 151

