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Basics of Neural Network Programming

Logistic Regression Gradient descent

using computation graph

Logistic regression recap

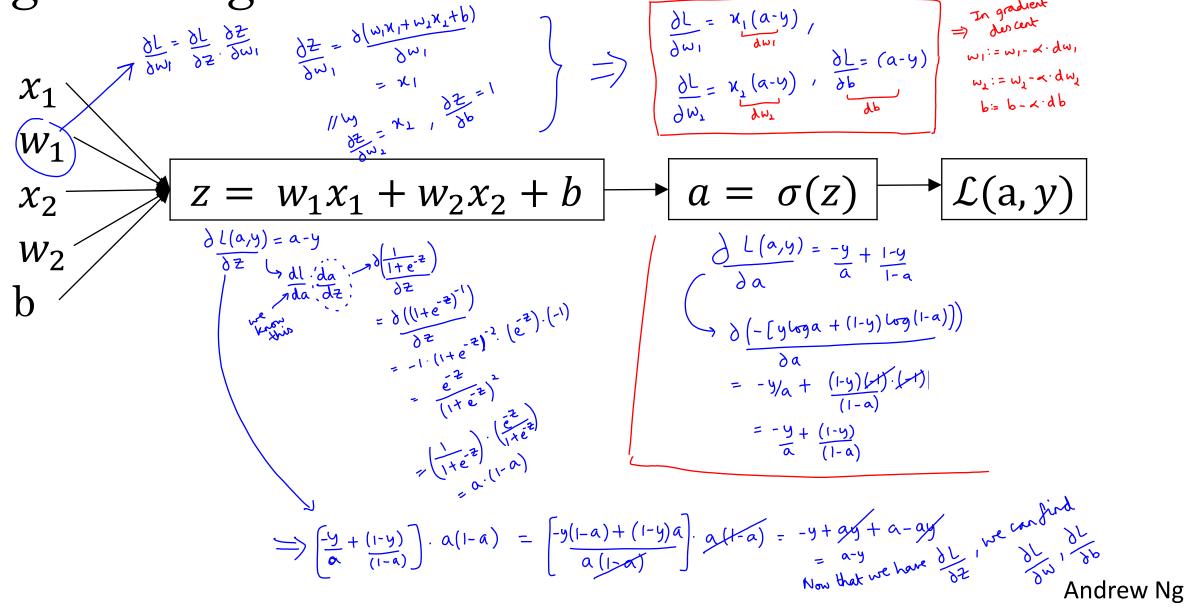
$$z = w^{T}x + b$$

$$\hat{y} = a = \sigma(z)$$

$$\mathcal{L}(a, y) = -(y \log(a) + (1 - y) \log(1 - a))$$

$$z = \omega_{1}x_{1} + \omega_{2}x_{1} + b \Rightarrow \hat{y} = \alpha^{-\frac{1}{2}}(z)$$

Logistic regression derivatives





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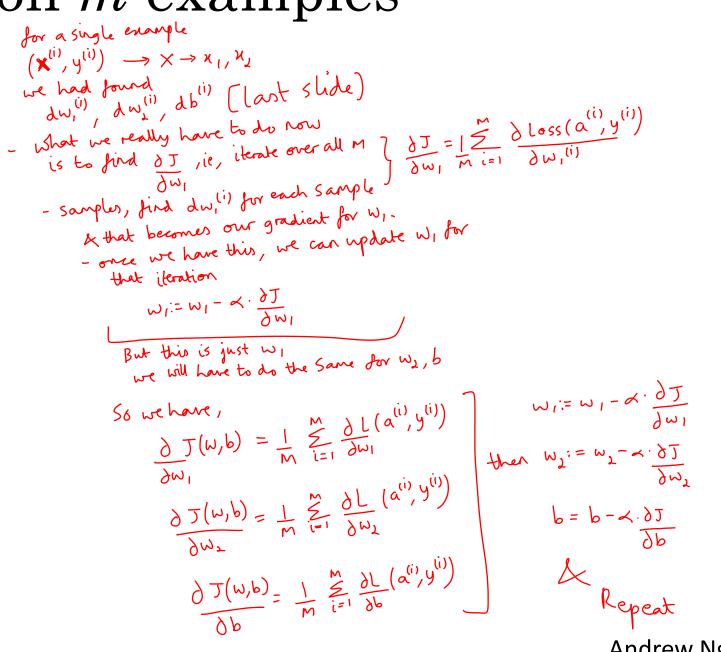
Basics of Neural Network Programming

Gradient descent on m examples

Logistic regression on m examples

$$\int (\omega,b) = \frac{1}{m} \sum_{i=1}^{\infty} L(\alpha^{(i)}, y^{(i)})$$
overall cost func
$$\alpha^{(i)} = \hat{y}^{(i)} = \sigma(\Xi^{(i)}) = \sigma(\omega^{T} X^{(i)} + b)$$

Remarker on Samples Samples Lors gune is on months of months on mo



Logistic regression on m examples

```
J=0, dw,=0, dw,=0, db=0
This part airs d(x) = a(x) + (1-y(x)) \cdot \log(1-a(x)) / cost fure = cost fure t loss fure for x^{(i)}, y^{(i)} is a summing this is assuming d(x) = a(x) - y^{(i)} + d(x) = a(x) - y^{(i)} which is assuming d(x) = a(x) - y^{(i)} + d(x) = a(x) -
                                                                                                                                                                                                                                                                                                     end For Now that you have found total loss, total dw, dw, db, find avg => divide by M
                                                                                                                                                                                                                                                                                                                                 Now you can update the weights as you're found \frac{\partial J}{\partial w_1}, \frac{\partial J}{\partial w_2}, \frac{\partial J}{\partial b}

W_1 = W_1 - \alpha \cdot dw_1

W_2 = W_2 - \alpha \cdot dw_2

This was 1 iteration

of updated weights, \hat{y} with

of updated weights, \hat{y} with

w_1 = w_2 - \alpha \cdot dw_2

Now 90 k find the new \hat{y} with

now 90 k find the new \hat{y} with

\hat{y} = \hat{y}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         this & repeat 10 K times,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        till there is no charge in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    weights in this section
```