Hello world

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November 2023

1 Introduction

1.1 Writing an Inline Formula

A formula is inserted between two $s, like this $e^{\pi i} = -1$

1.2 Writing a Formula in display mode(centered)

Insert the formula between two $$s, like this

$$\mathscr{L} = \frac{1}{n}\sum_{i=1}^{n}(\hat{y} - y)^2$$

1.3 Non Autoscaling brackets

$$(\frac{1}{n} + 1)^n$$

1.4 Autoscaling brackets

$$\left(\frac{1}{n} + 1\right)^n$$

1.5 Limits

$$e = \lim_{n\to\infty}\left(\frac{1}{n} + 1\right)^n$$

1.6 n^{th} root

$$\sqrt[3]{8} = 2$$
$$\sqrt[2]{9} = 3$$
$$\sqrt[n]{x} = x^{\frac{1}{n}}$$

1.7 Numbered List of items

1. Mean Squared Error Loss

$$\mathscr{L} = \frac{1}{N}\sum_{i=1}^{n}(\hat{y} - y)^2$$

2. Softmax

$$P_{y_i} = \frac{e^{y_i}}{\sum_{j=1}^{n} e^{y_j}}$$

3. Cross Entropy Loss

$$\mathscr{L} = \sum_{i=1}^{N}(P_i * log(\frac{1}{Q_i}))$$

1.8 Unordered List of items

- Gradient of Loss wrt to output function

$$\nabla_y \mathscr{L} = -\frac{1}{y_l} e(l)$$

- Gradient of Loss wrt to output layer's pre-activation

$$\nabla_{a^L} \mathscr{L} = \frac{\partial \mathscr{L}}{\partial y} * \frac{\partial y}{\partial a^L} = -(e(l) - y)$$

- Gradient of Weights between last layer and output layer

$$\nabla_{W^L} \mathscr{L} = \frac{\partial \mathscr{L}}{\partial a^L} * \frac{\partial a^L}{\partial W^L} = -(e(l) - y) * (h^{L-1})^T$$

1.9 Vector dot product

$$\vec{v} \cdot \vec{w}$$

1.10 Matrices

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \cdot \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

1.11 Include Images