Machine Learning Assignment 94

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Problem A

$$\sigma(x) = \frac{1}{1 + e^{-x}}$$

$$\sigma(x) \left(1 + e^{-x}\right) = 1$$

$$(2)$$

$$\sigma(x)\left(1+e^{-x}\right) = 1\tag{2}$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\sigma(x)\left(1+e^{-x}\right) = 0 \tag{3}$$

$$\sigma'(x)\left(1+e^{-x}\right) - e^{-x}\sigma(x) = 0 \tag{4}$$

$$\sigma'(x) (1 + e^{-x}) - e^{-x} \sigma(x) = 0$$
(4)

$$\sigma'(x) = \sigma(x) \frac{e^{-x}}{1 + e^{-x}}$$

$$= \sigma(x) \frac{1 + e^{-x} - 1}{1 + e^{-x}}$$

$$= \sigma(x)(1 - \sigma(x))$$
(5)
$$(5)$$

$$= (5)$$

$$= (5)$$

$$= (5)$$

$$= (7)$$

$$= \sigma(x) \frac{1 + e^{-x} - 1}{1 + e^{-x}} \tag{6}$$

$$= \sigma(x)(1 - \sigma(x)) \tag{7}$$

(8)