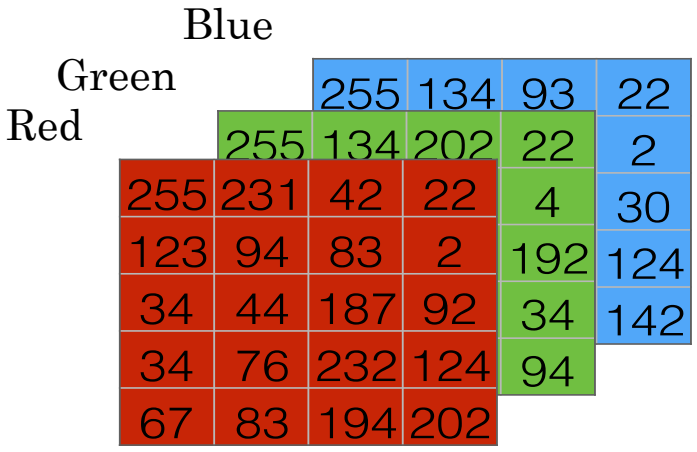
deeplearning.ai

Basics of Neural Network Programming

Binary Classification

Binary Classification



1 (cat) vs 0 (non cat)

Notation

deeplearning.ai

Basics of Neural Network Programming

Logistic Regression

Logistic Regression

deeplearning.ai

Basics of Neural Network Programming

Logistic Regression cost function

Logistic Regression cost function

$\hat{y} = \sigma(w^T x + b)$, where $\sigma(z) = \frac{1}{1+e^{-z}}$

Given $\{(x^{(1)}, y^{(1)}), \ldots, (x^{(m)}, y^{(m)})\}$, want $\hat{y}^{(i)} \approx y^{(i)}$.

Loss (error) function:

deeplearning.ai

Basics of Neural Network Programming

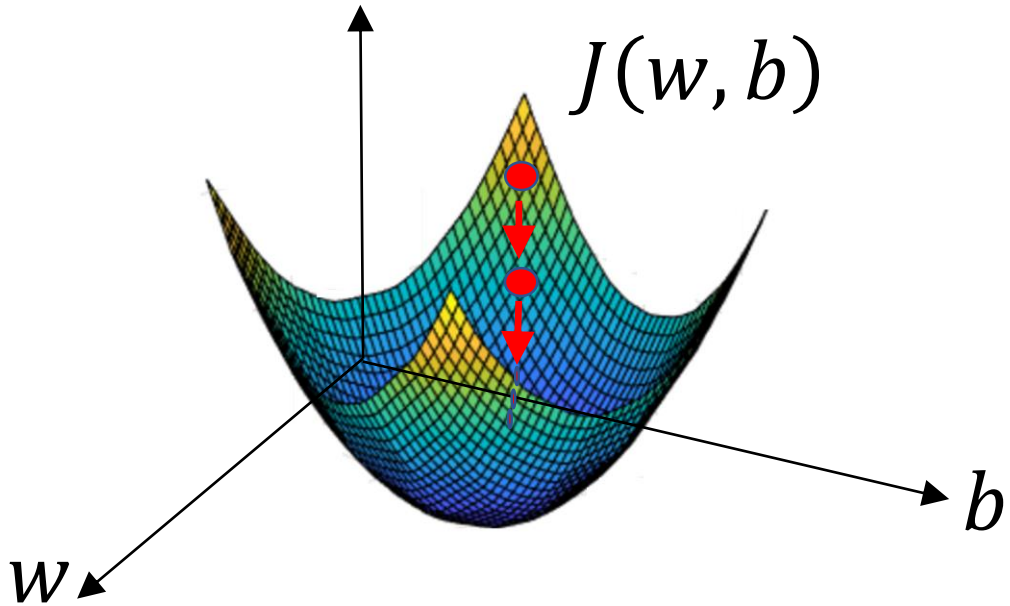
Gradient Descent

Gradient Descent

Recap: $\hat{y} = \sigma(w^T x + b)$, $\sigma(z) = \frac{1}{1+e^{-z}}$

$$J(w,b) = \frac{1}{m}\sum_{i=1}^{m} \mathcal{L}(\hat{y}^{(i)}, y^{(i)}) = -\frac{1}{m}\sum_{i=1}^{m} y^{(i)} \log \hat{y}^{(i)} + (1 - y^{(i)}) \log(1 - \hat{y}^{(i)})$$

Want to find w, b that minimize $J(w,b)$



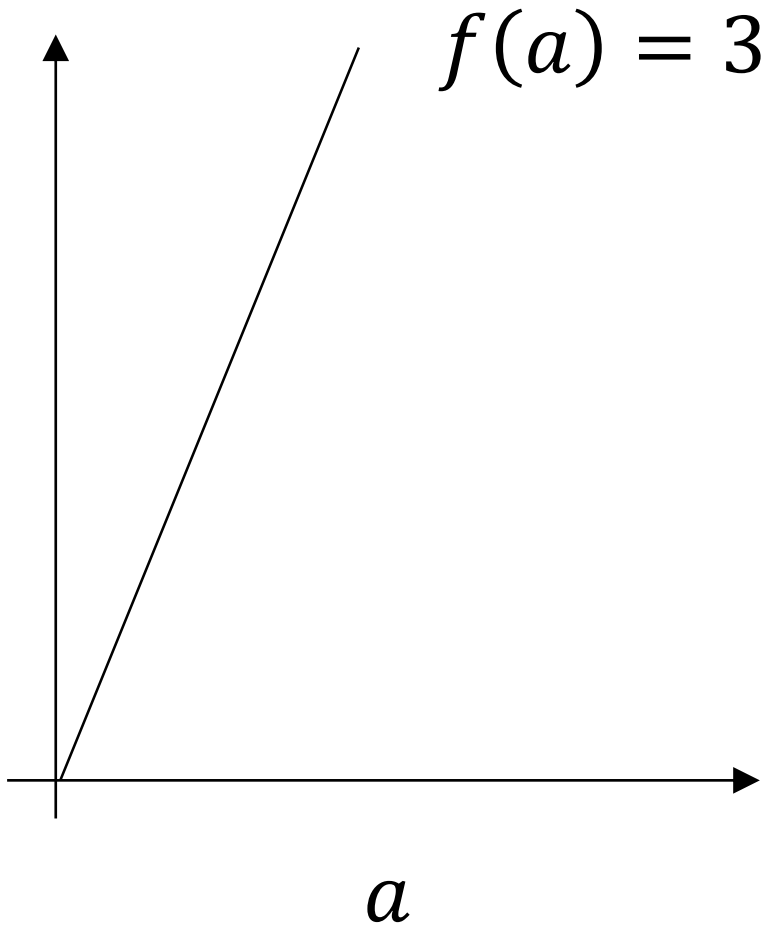
Gradient Descent

deeplearning.ai

Basics of Neural Network Programming

Derivatives

Intuition about derivatives

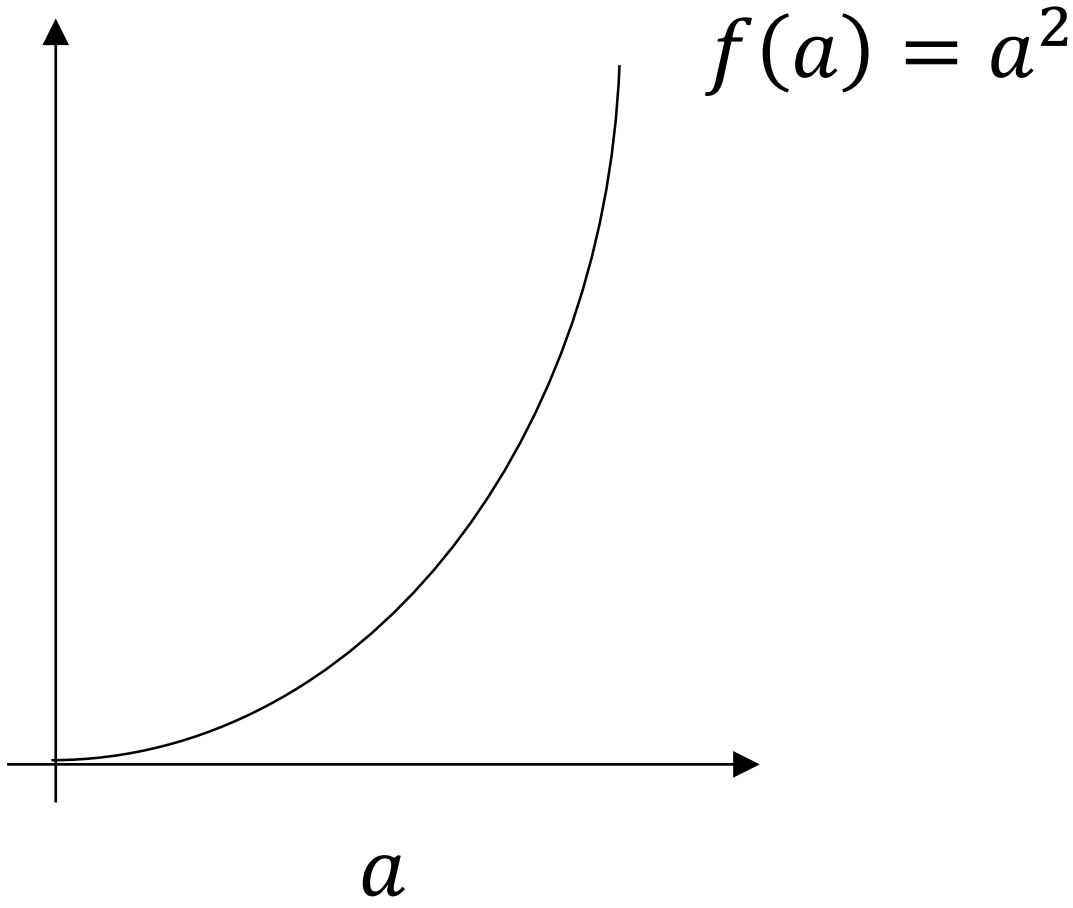


deeplearning.ai

Basics of Neural Network Programming

More derivatives examples

Intuition about derivatives



More derivative examples

deeplearning.ai

Basics of Neural Network Programming

Computation Graph

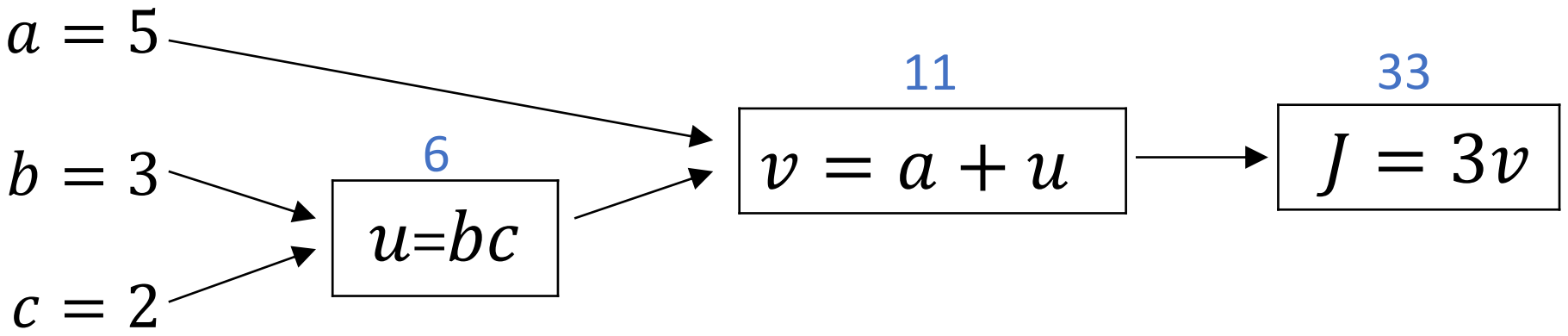
Computation Graph

deeplearning.ai

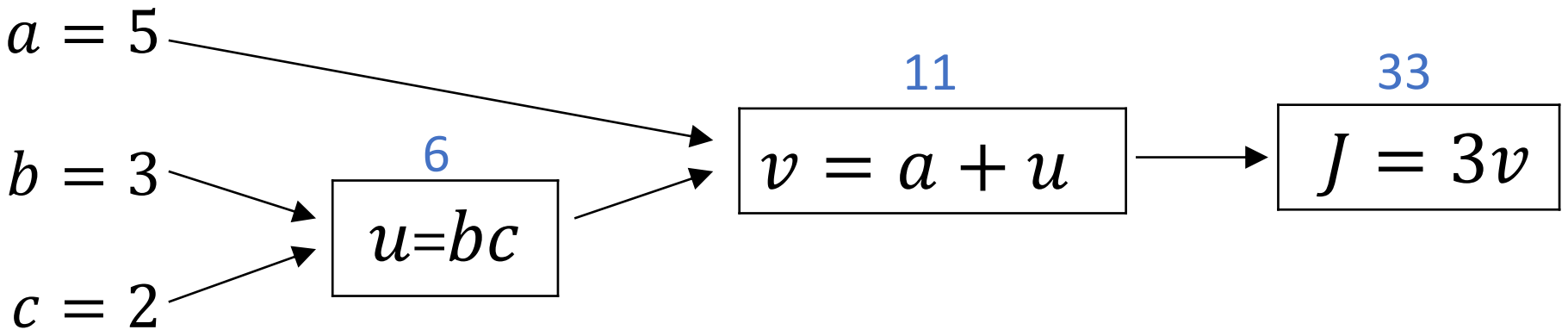
Basics of Neural Network Programming

Derivatives with a Computation Graph

Computing derivatives



Computing derivatives



deeplearning.ai

Basics of Neural Network Programming

Logistic Regression Gradient descent

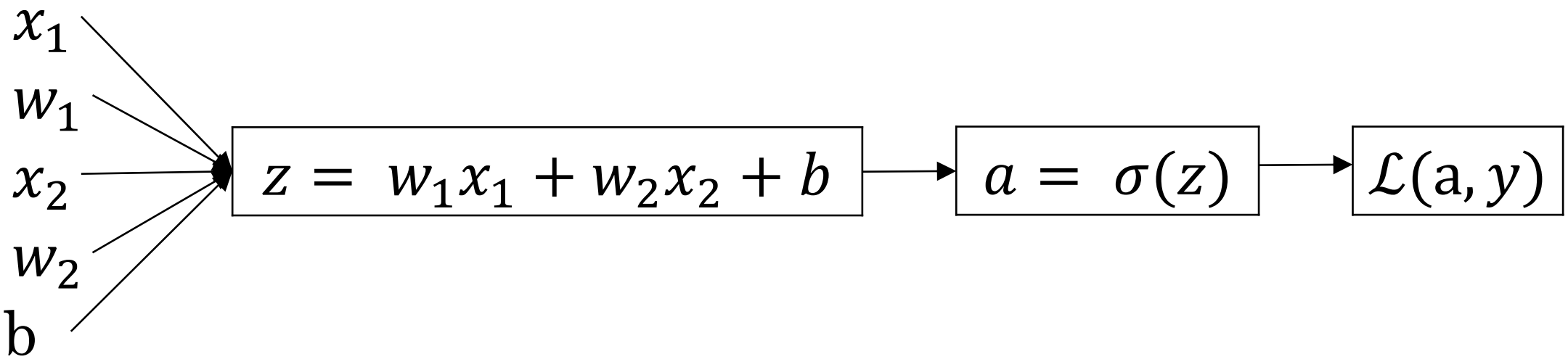
Logistic regression recap

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

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

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

Logistic regression derivatives



deeplearning.ai

Basics of Neural Network Programming

Gradient descent on m examples

Logistic regression on m examples

Logistic regression on m examples