

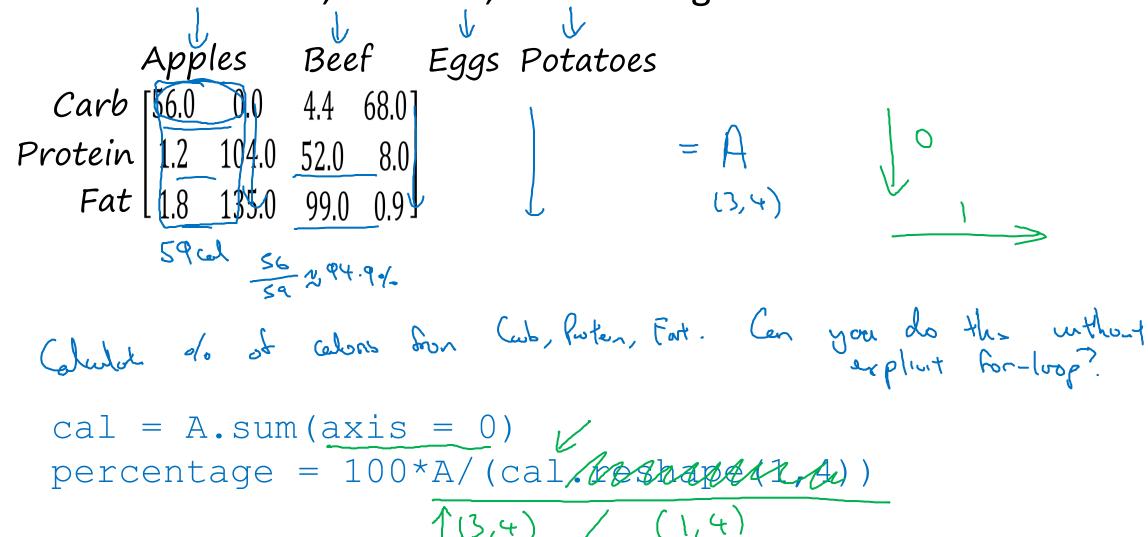
deeplearning.ai

Basics of Neural Network Programming

Broadcasting in Python

Broadcasting example

Calories from Carbs, Proteins, Fats in 100g of different foods:



Broadcasting example

$$\begin{bmatrix}
1 \\
2 \\
3 \\
4
\end{bmatrix} + \begin{bmatrix}
100 \\
100
\end{bmatrix}
100$$

$$\begin{bmatrix}
1 & 2 & 3 \\
4 & 5 & 6 \\
(m, n)
\end{bmatrix} + \begin{bmatrix}
100 & 200 & 300 \\
100 & 200 & 300 \\
100 & 200 & 300 \\
100 & 200 & 300
\end{bmatrix}$$

$$\begin{bmatrix}
1 & 2 & 3 \\
(m, n)
\end{bmatrix} + \begin{bmatrix}
100 & 100 & 100 \\
200 & 200 & 200
\end{bmatrix} = \begin{bmatrix}
100 & 100 & 100 \\
200 & 200 & 200
\end{bmatrix}$$

$$\begin{bmatrix}
1 & 2 & 3 \\
4 & 5 & 6
\end{bmatrix} + \begin{bmatrix}
100 & 100 & 100 \\
200 & 200 & 200
\end{bmatrix}$$

(m,i) (m,n)

General Principle

$$(m, n) \qquad + \qquad (n, n)$$

$$matrix \qquad + \qquad (m, i) \qquad m > (m, n)$$

$$(m, i) \qquad + \qquad R$$

$$\begin{bmatrix} n \\ 2 \\ 1 \end{bmatrix} \qquad + \qquad [n \\ 100 \qquad = \qquad [n] \qquad [n] \qquad [n]$$

$$[n, i] \qquad + \qquad [n] \qquad = \qquad [n] \qquad = \qquad [n]$$

$$[n, i] \qquad + \qquad [n] \qquad = \qquad [n] \qquad = \qquad [n] \qquad = \qquad [n]$$

$$[n, i] \qquad + \qquad [n] \qquad = \qquad [n] \qquad$$

Matlab/Octave: bsxfun