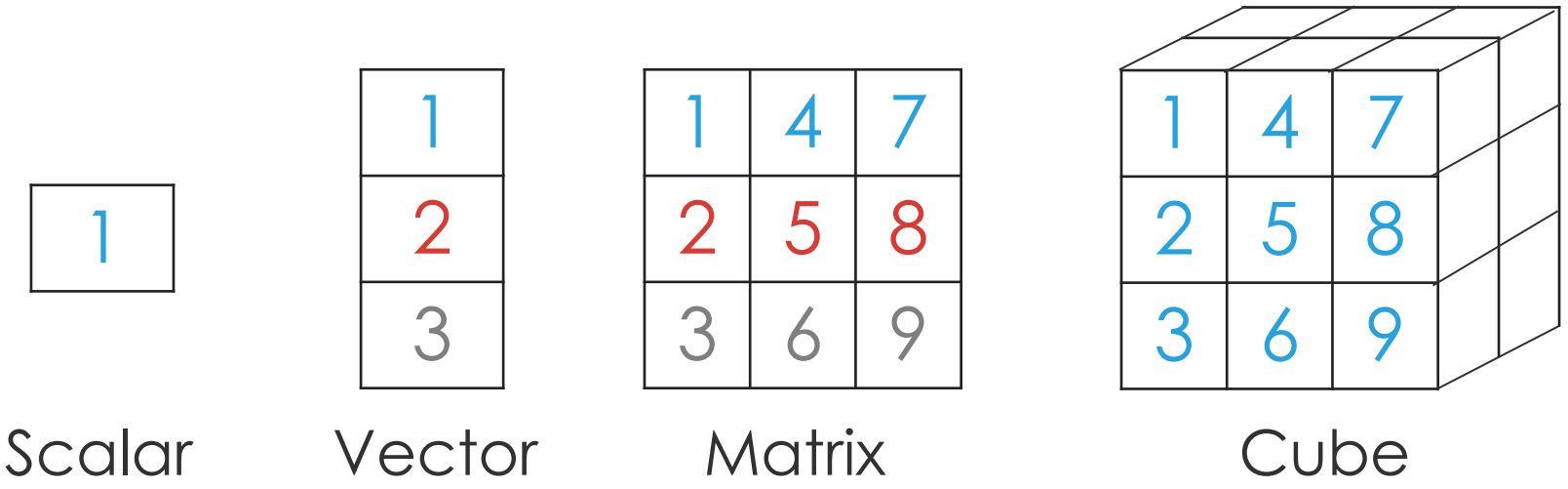
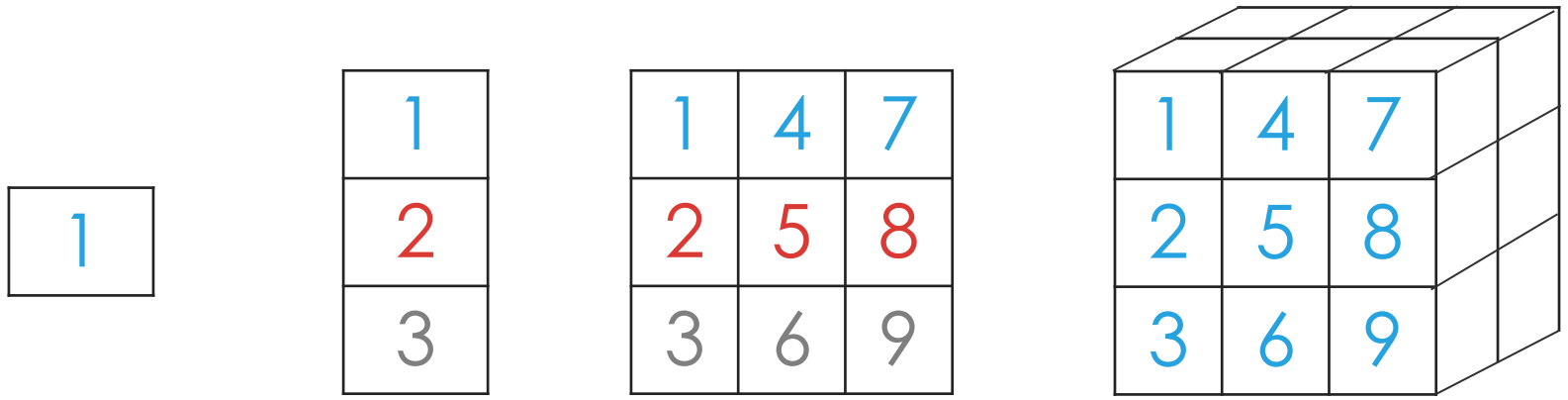
Tensors

Deep Learning Pre-Work

Tensors



Tensors

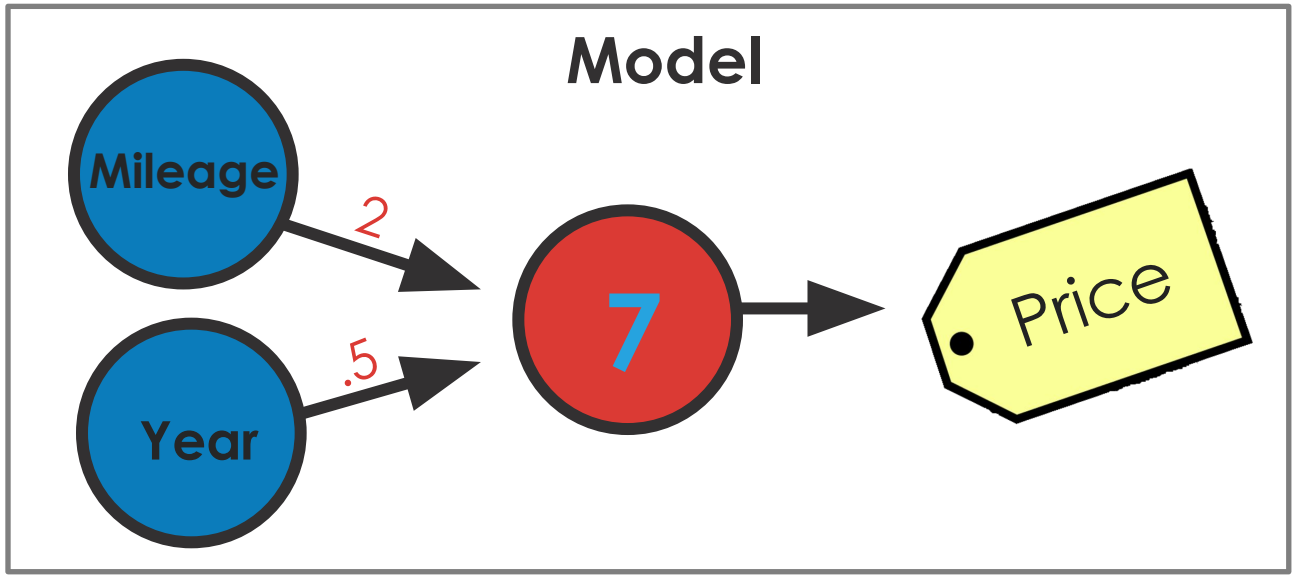


Scalar	Vector	Matrix	Cube
Tensor rank 0	**Tensor rank 1**	**Tensor rank 2**	**Tensor rank 3**
e.g.,	[3]	[1,3]	[1,3,1]

Tensors in Deep Learning

Data

mileage	year
7413	2011
10926	2011
7351	2011
11613	2011

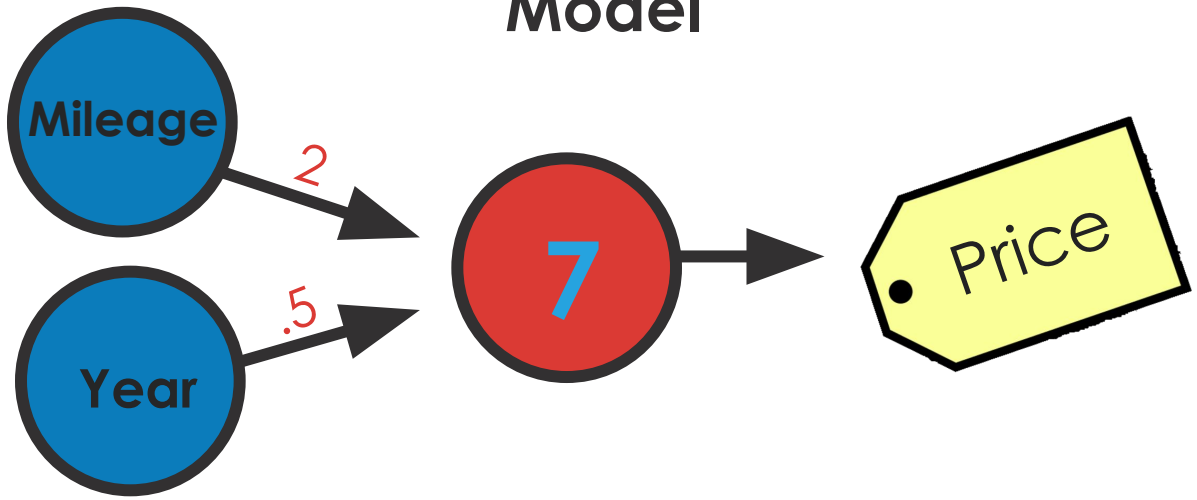


Tensors in Deep Learning

Data

mileage	year
7413	2011
10926	2011
7351	2011
11613	2011

Model



Equation

$$X * Weight + Bias$$

$$\begin{pmatrix} 7{,}413 & 2011 \\ 10{,}926 & 2011 \\ 7351 & 2011 \\ 11{,}613 & 2011 \end{pmatrix} * \begin{pmatrix} 2 \\ .5 \end{pmatrix} + 7 = \begin{pmatrix} 15{,}839 \\ 22{,}865 \\ 15{,}714 \\ 22{,}239 \end{pmatrix}$$

Tensors in Deep Learning

Data

mileage	year
7413	2011
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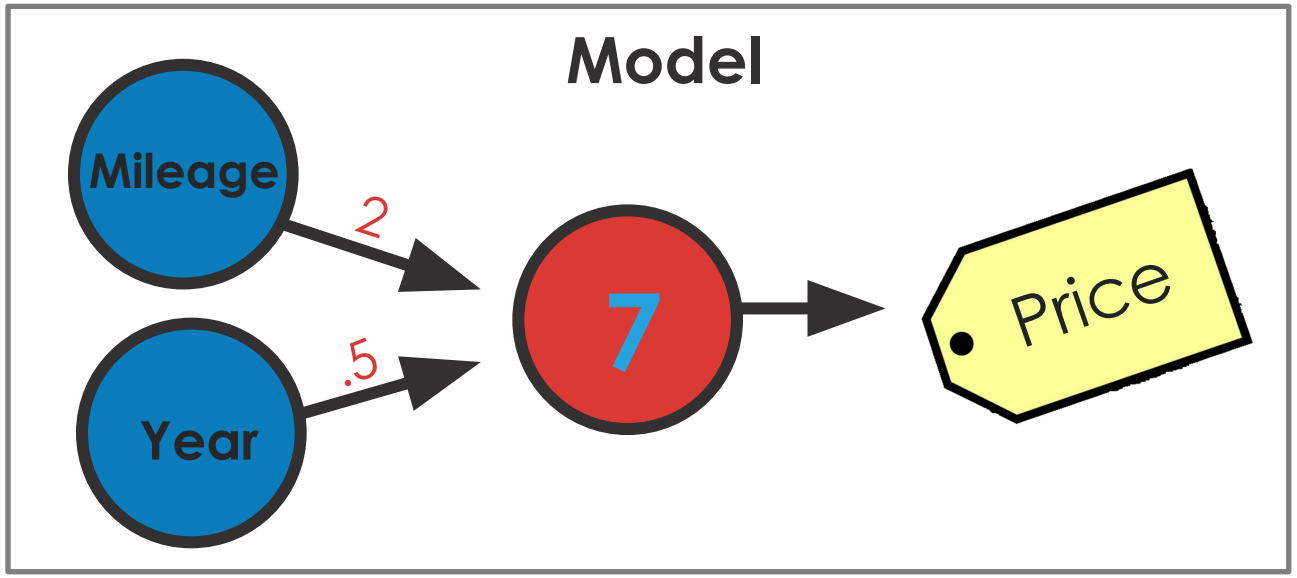
11613	2011



Tensor rank 2

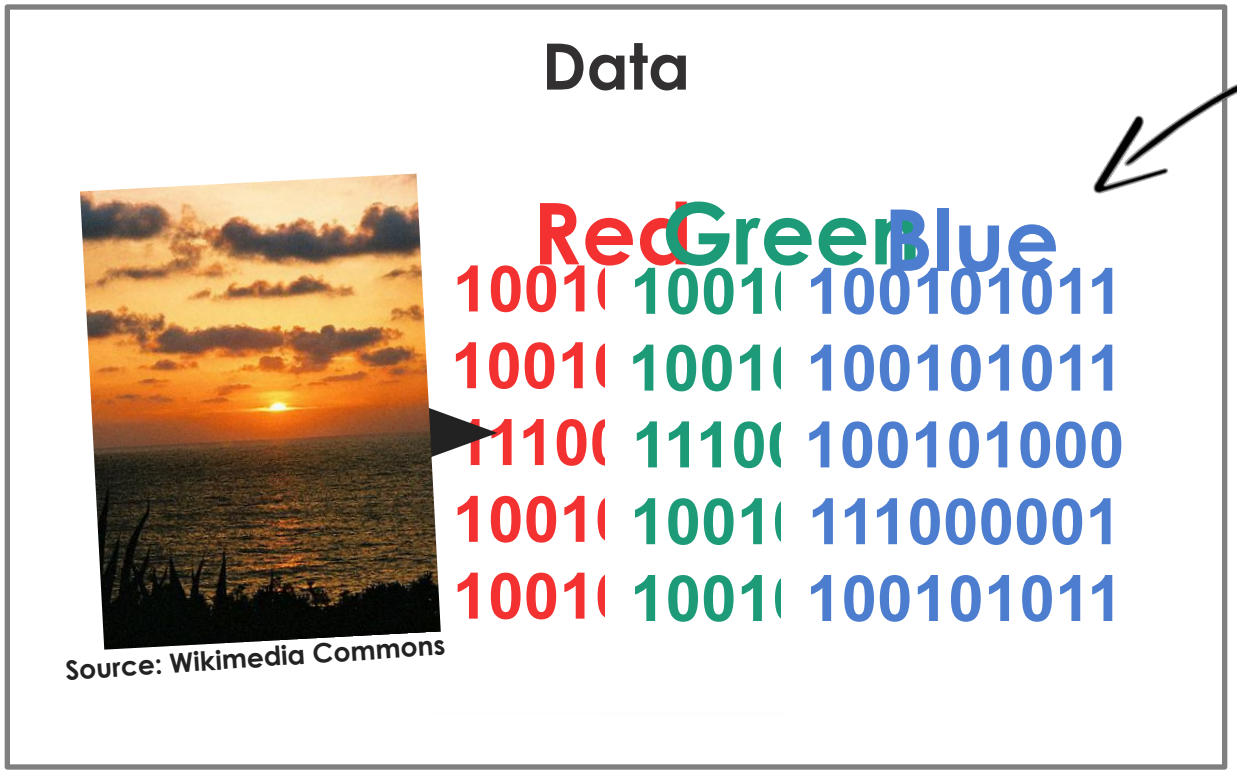
Tensor rank 1

Tensor rank 0

Tensor rank 1

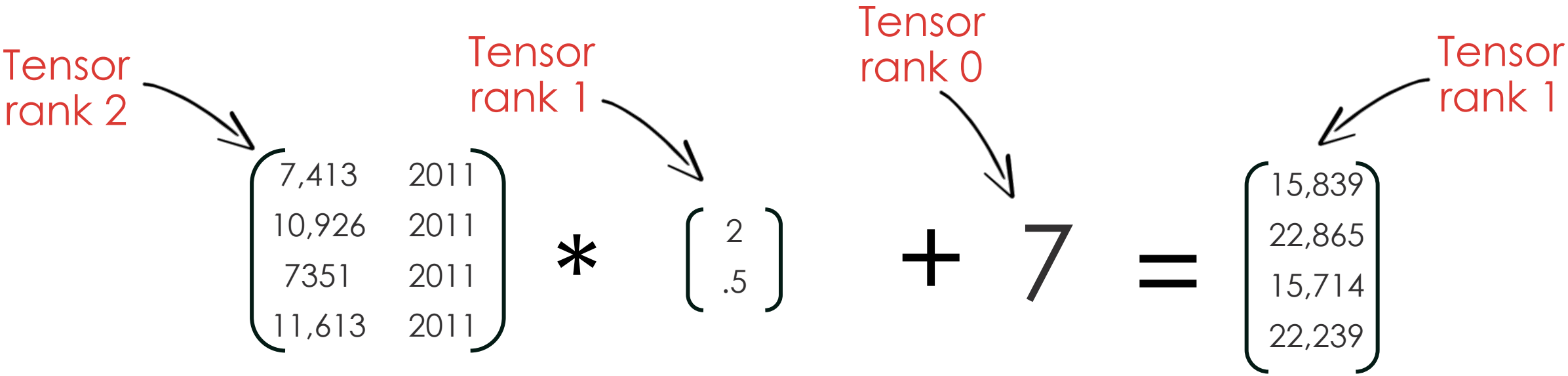
$$\begin{pmatrix} 7{,}413 & 2011 \\ 10{,}926 & 2011 \\ 7351 & 2011 \\ 11{,}613 & 2011 \end{pmatrix} * \begin{pmatrix} 2 \\ .5 \end{pmatrix} + 7 = \begin{pmatrix} 15{,}839 \\ 22{,}865 \\ 15{,}714 \\ 22{,}239 \end{pmatrix}$$

Tensors in Deep Learning



Tensors in Deep Learning

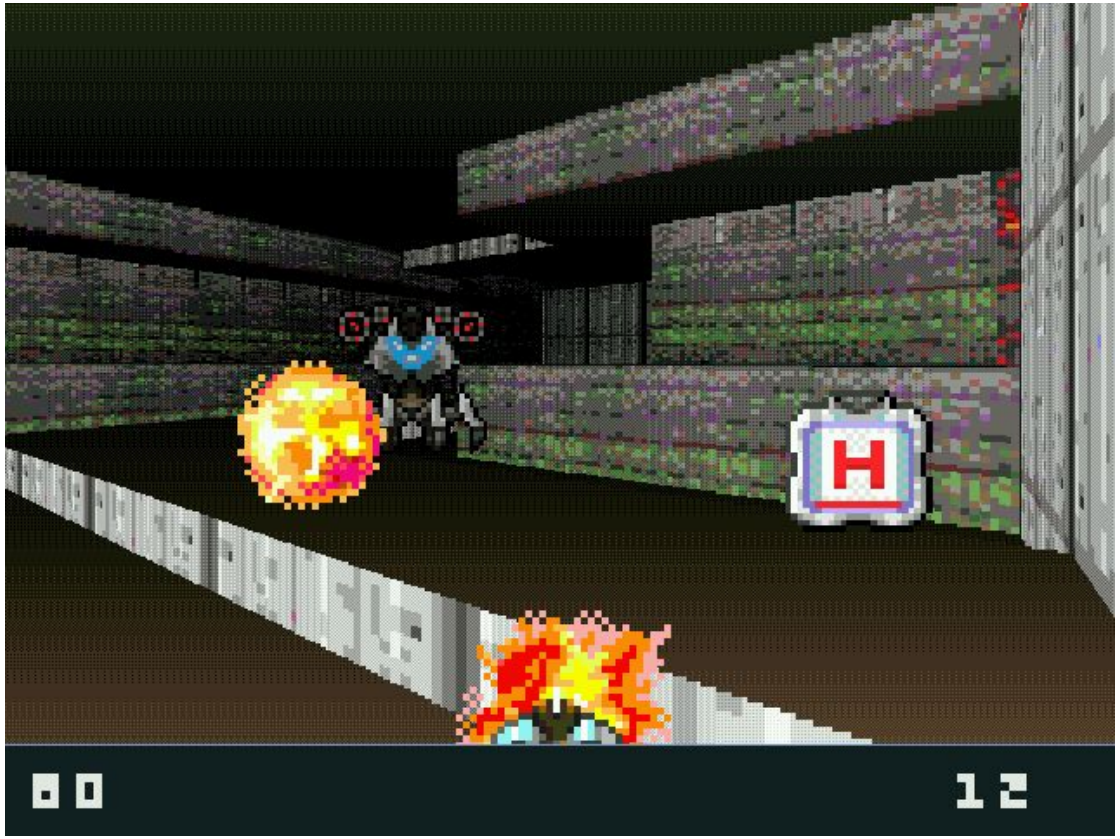
TensorFlow



Graphical Processing Units

GPUs

Source: Wikimedia commons



Source: Wikimedia commons