



Tensors

Deep Learning Pre-Work

This file is meant for personal use by muratgguzel77@yahoo.com only.
Sharing or publishing the contents in part or full is liable for legal action.

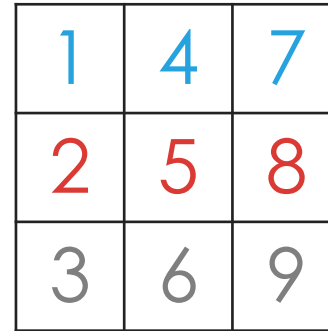
Tensors



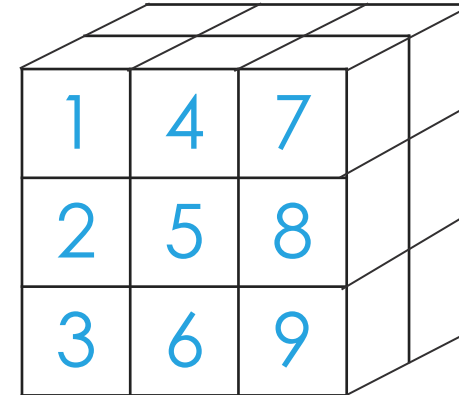
Scalar



Vector



Matrix



Cube

This file is meant for personal use by muratgguzel77@yahoo.com only.

Sharing or publishing the contents in part or full is liable for legal action.

Tensors



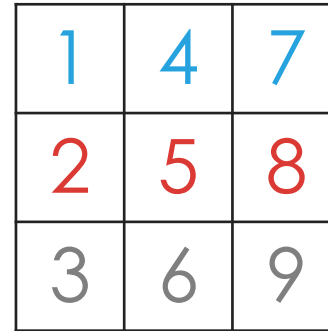
Scalar
Tensor
rank 0

e.g.,



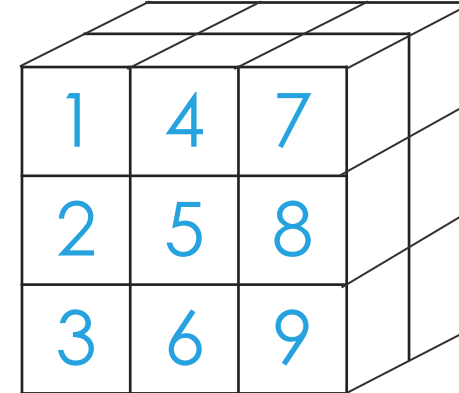
Vector
Tensor
rank 1

[3]



Matrix
Tensor
rank 2

[1,3]

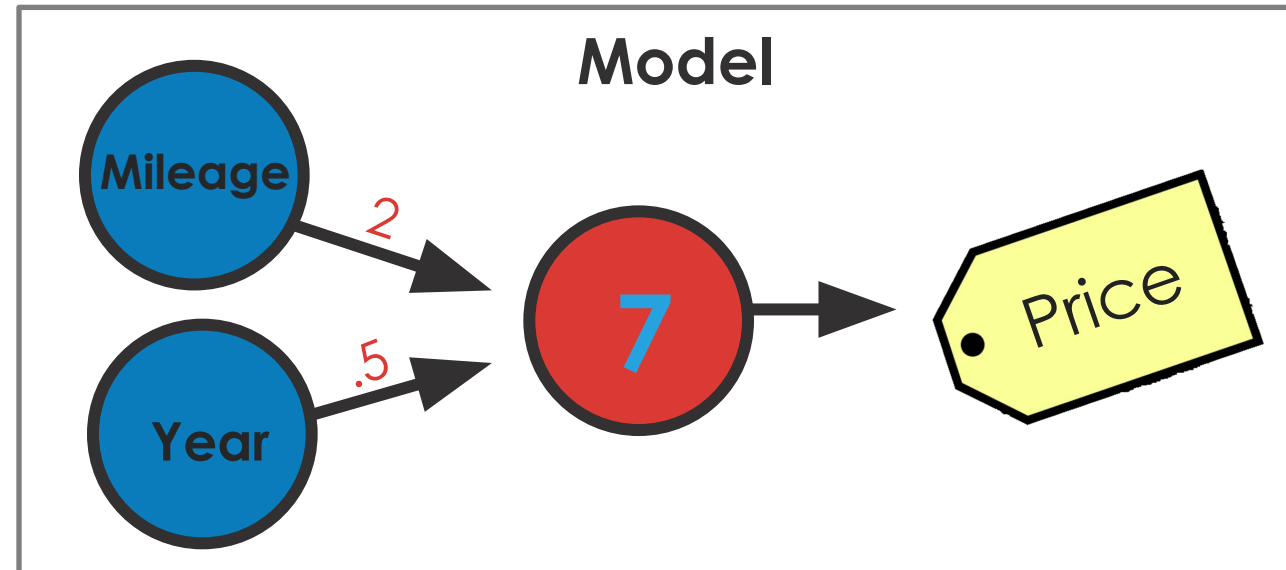


Cube
Tensor
rank 3

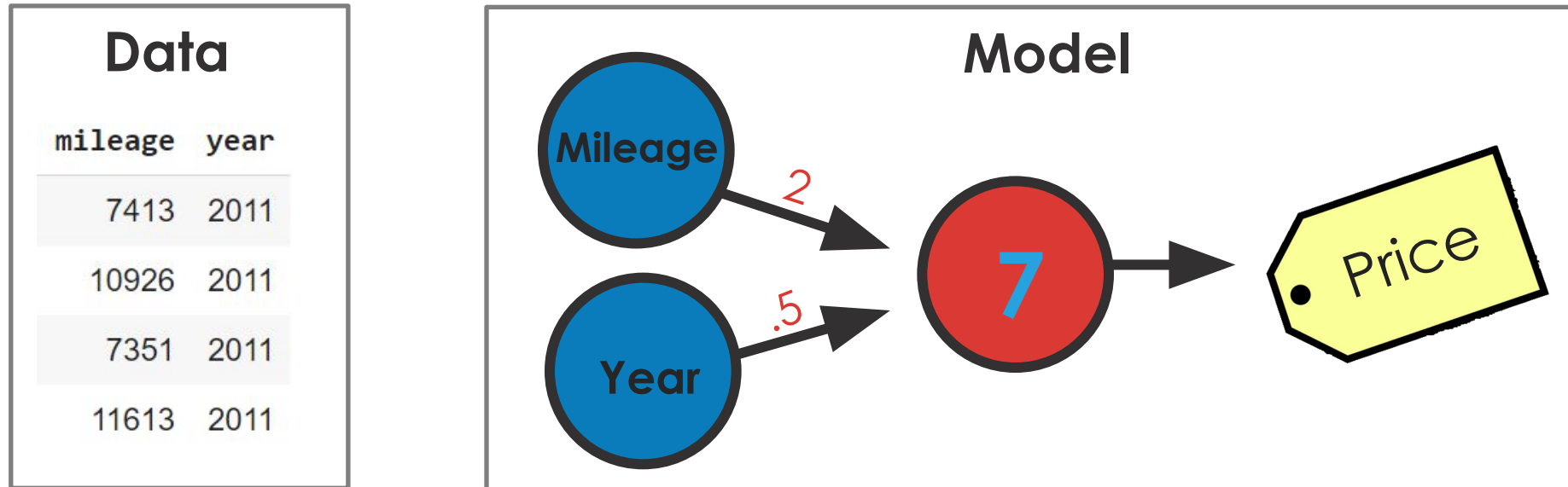
[1,3,1]

Tensors in Deep Learning

Data	
mileage	year
7413	2011
10926	2011
7351	2011
11613	2011



Tensors in Deep Learning



Equation

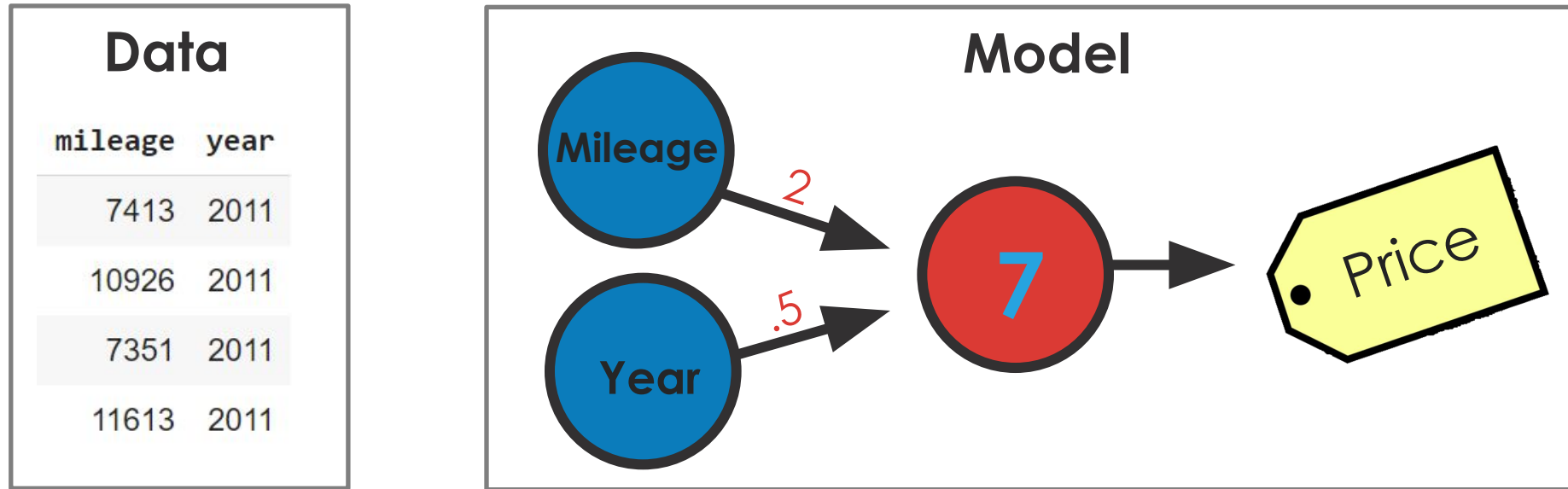
$$X * \text{Weight} + \text{Bias}$$

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

This file is meant for personal use by muratgguzel77@yahoo.com only.

Sharing or publishing the contents in part or full is liable for legal action.

Tensors in Deep Learning



Tensor rank 2

$$\begin{bmatrix} 7,413 & 2011 \\ 10,926 & 2011 \\ 7351 & 2011 \\ 11,613 & 2011 \end{bmatrix}$$

Tensor rank 1

$$\begin{bmatrix} 2 \\ .5 \end{bmatrix}$$

Tensor rank 0

$$+ 7$$

Tensor rank 1

$$= \begin{bmatrix} 15,839 \\ 22,865 \\ 15,714 \\ 22,239 \end{bmatrix}$$

The equation shows the calculation of the predicted price for each car. The input data (a 4x2 matrix of rank 2) is multiplied by the weights (a 2x1 vector of rank 1). The result is then added to the bias (a scalar of rank 0, 7) to produce the final predicted prices (a 4x1 vector of rank 1).

This file is meant for personal use by muratgguzel77@yahoo.com only.
Sharing or publishing the contents in part or full is liable for legal action.

Tensors in Deep Learning



This file is meant for personal use by muratgguzel77@yahoo.com only.

Sharing or publishing the contents in part or full is liable for legal action.



Tensor rank 2

Tensor rank 1

Tensor rank 0

Tensor rank 1

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

This file is meant for personal use by muratgguzel77@yahoo.com only.

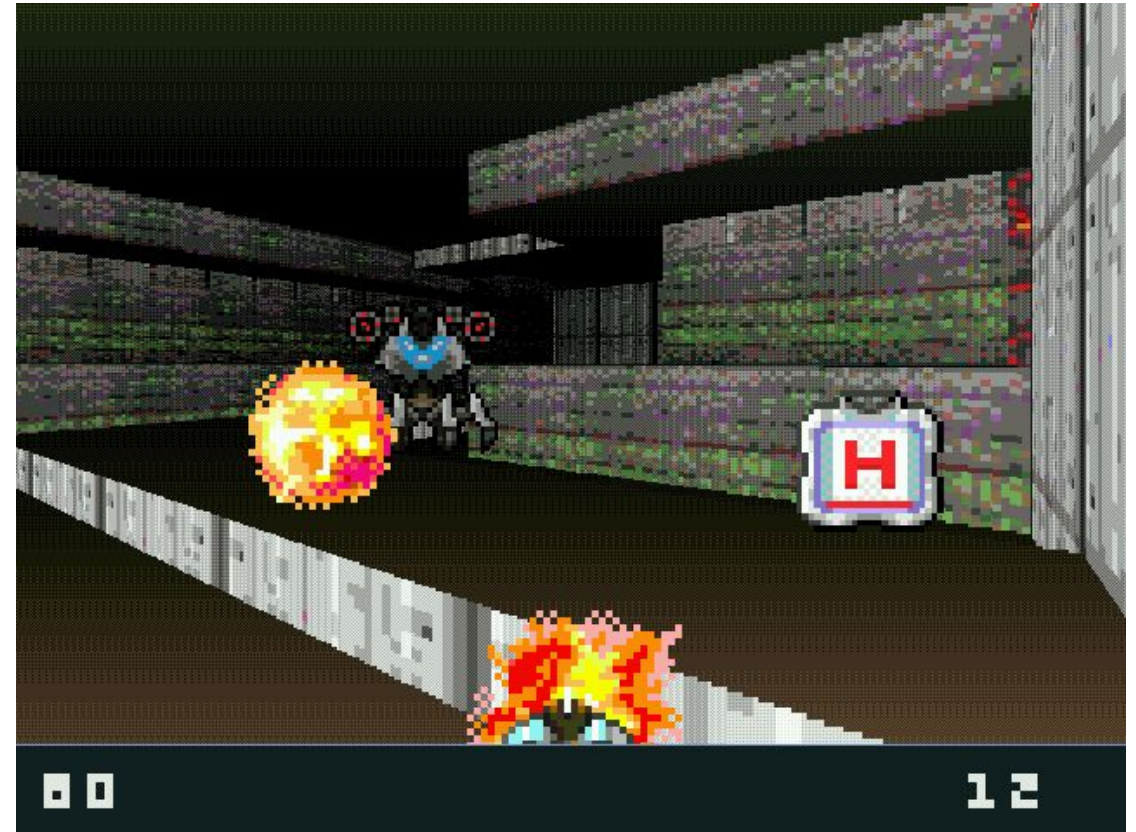
Sharing or publishing the contents in part or full is liable for legal action.

Graphical Processing Units

GPUs



Source: Wikimedia commons



Source: Wikimedia commons

This file is meant for personal use by muratgguzel77@yahoo.com only.

Sharing or publishing the contents in part or full is liable for legal action.