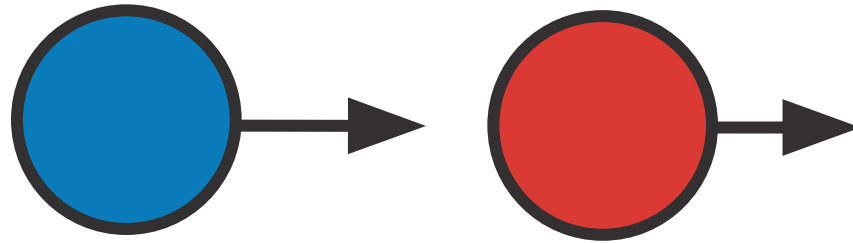




Artificial Neural Networks Classification

Deep Learning Pre-Work

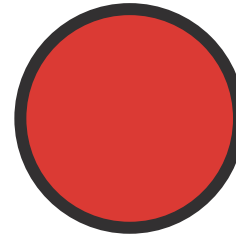
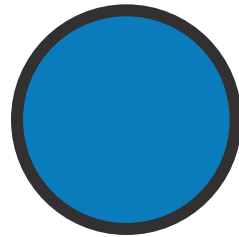
Example



Example



Source: Wikimedia Commons



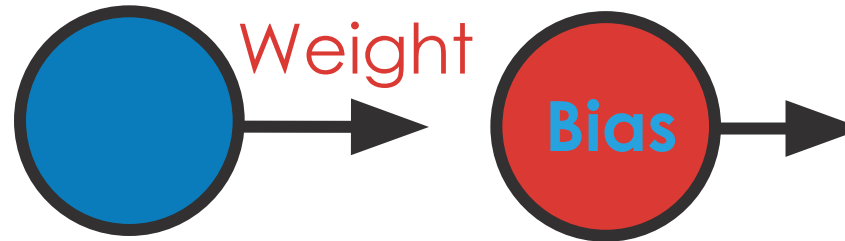
Source: Wikimedia Commons

Example

Mileage

8	8	8	7	2
7	7	7	6	1
	7	4	1	3
5	5	5	4	F
4	4	4	3	E

Source: Wikimedia Commons

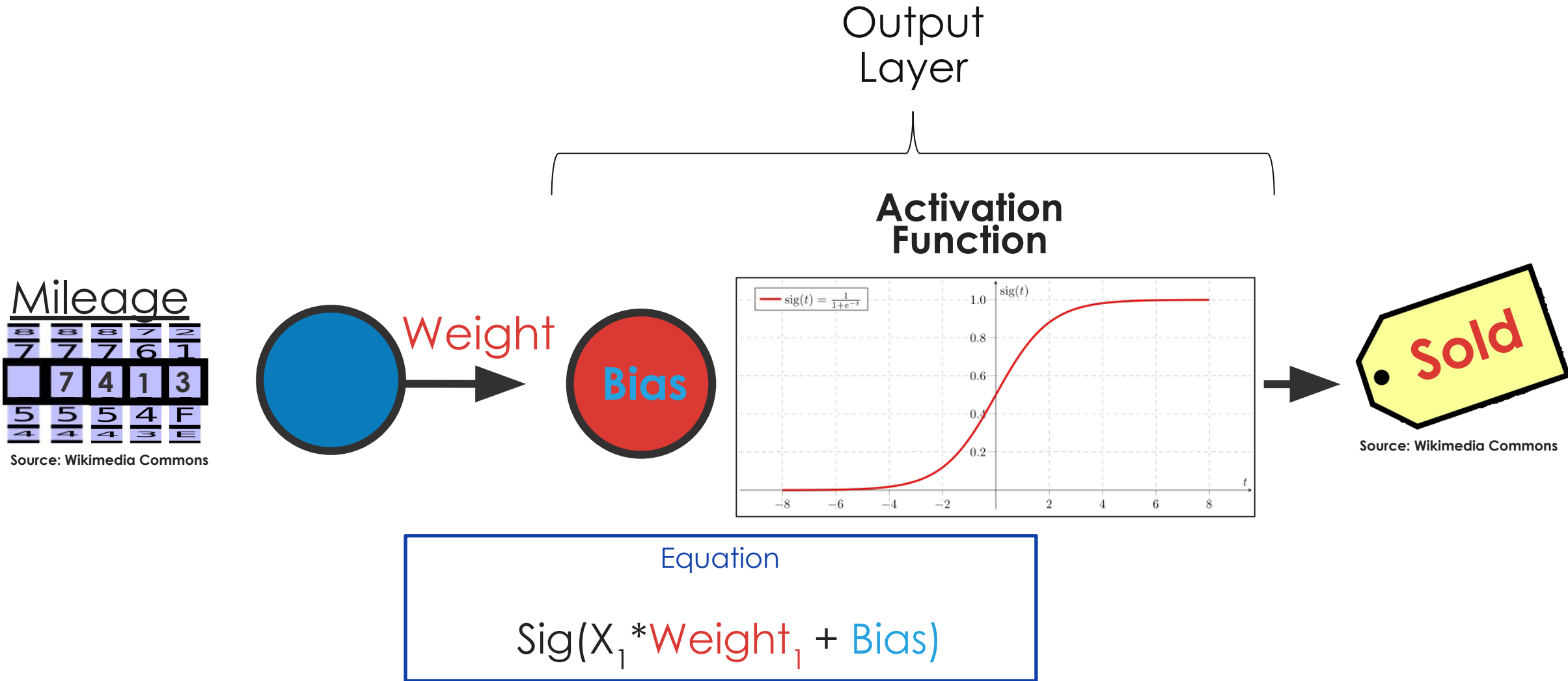


Source: Wikimedia Commons

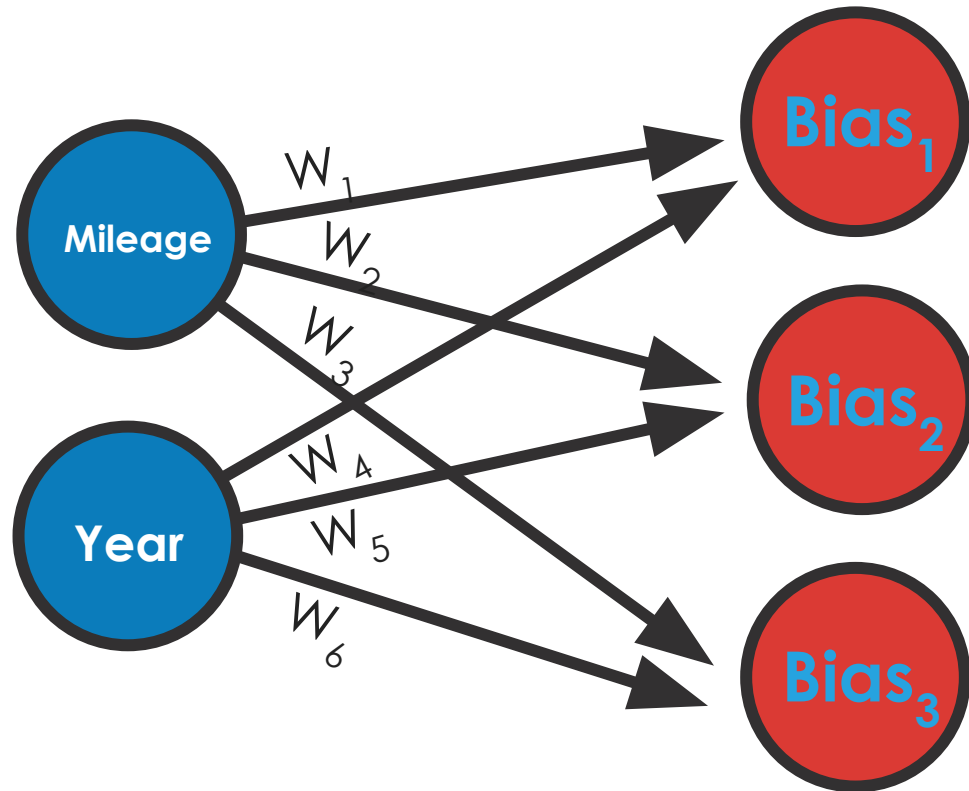
Equation

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

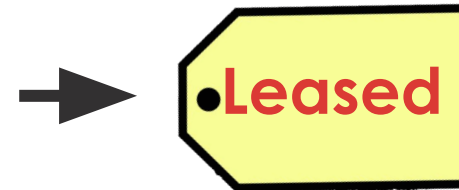
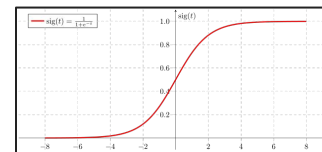
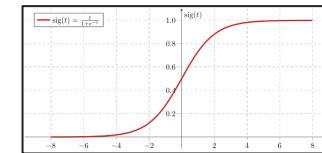
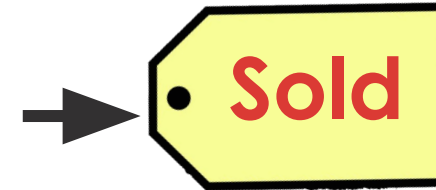
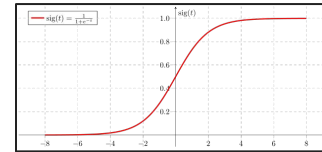
Sigmoid Activation Function



Multiclass Outcome

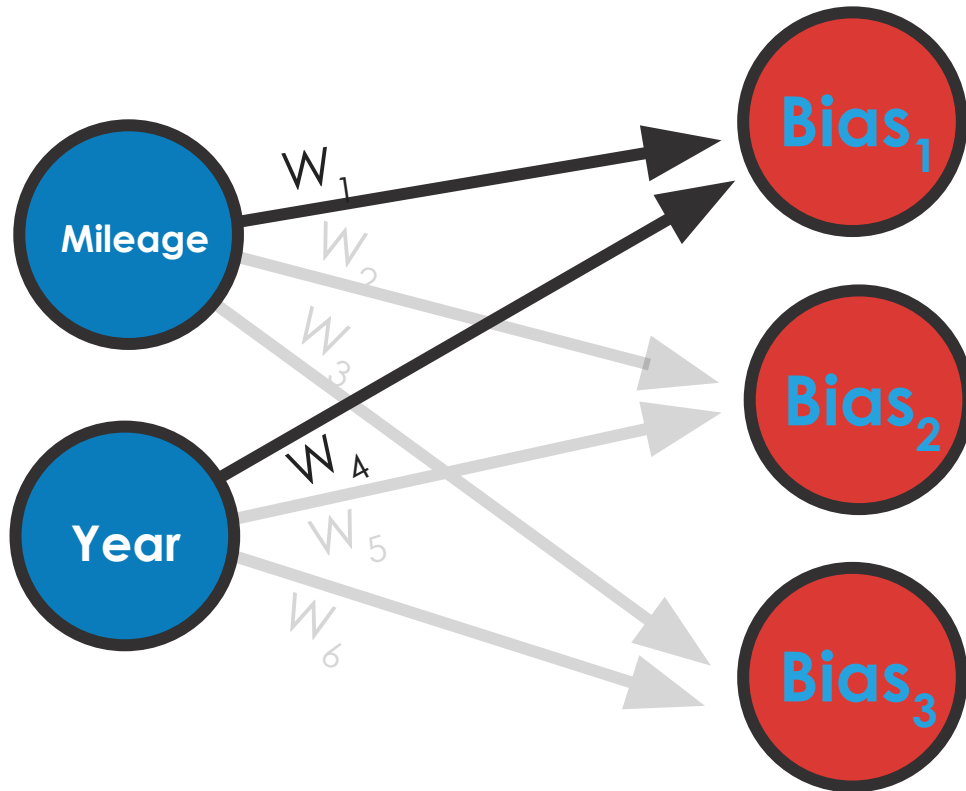


Activation Function

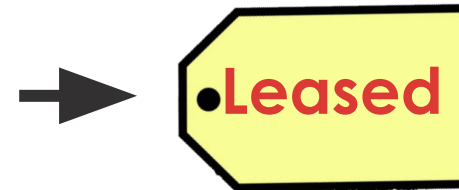
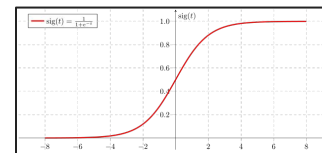
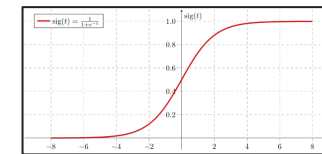
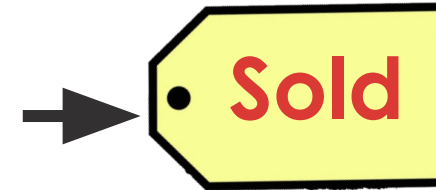
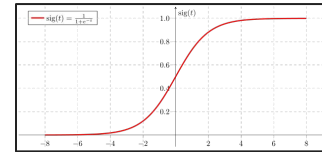


Source: Wikimedia Commons

Multiclass Outcome



Activation Function



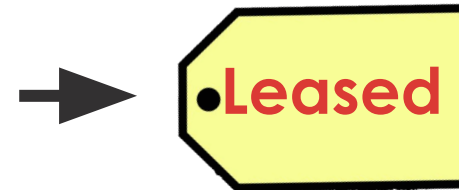
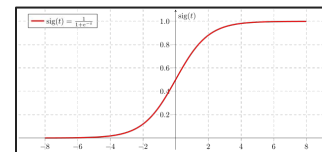
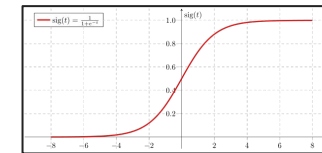
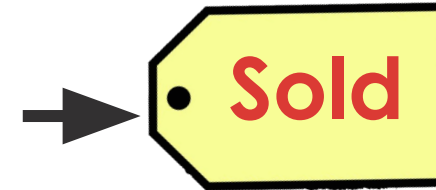
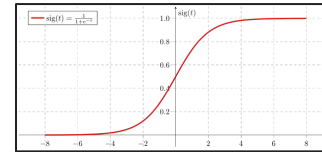
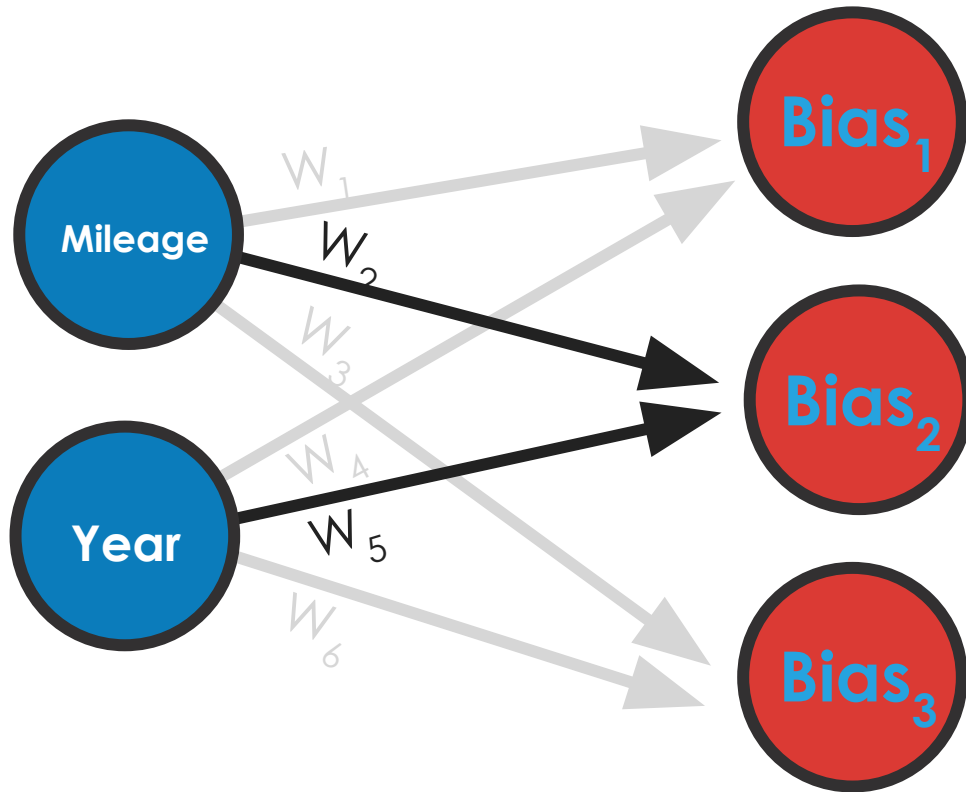
Source: Wikimedia Commons

Equation

$$\text{Sig}(X_1 * W_1 + X_2 * W_4 + \text{Bias}_1)$$

Multiclass Outcome

Activation Function



Source: Wikimedia Commons

Equation

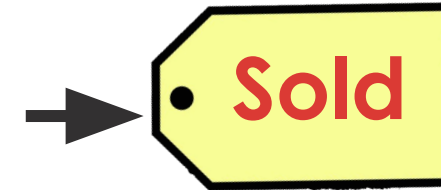
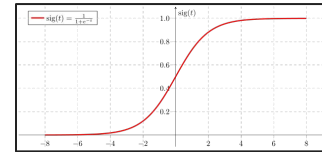
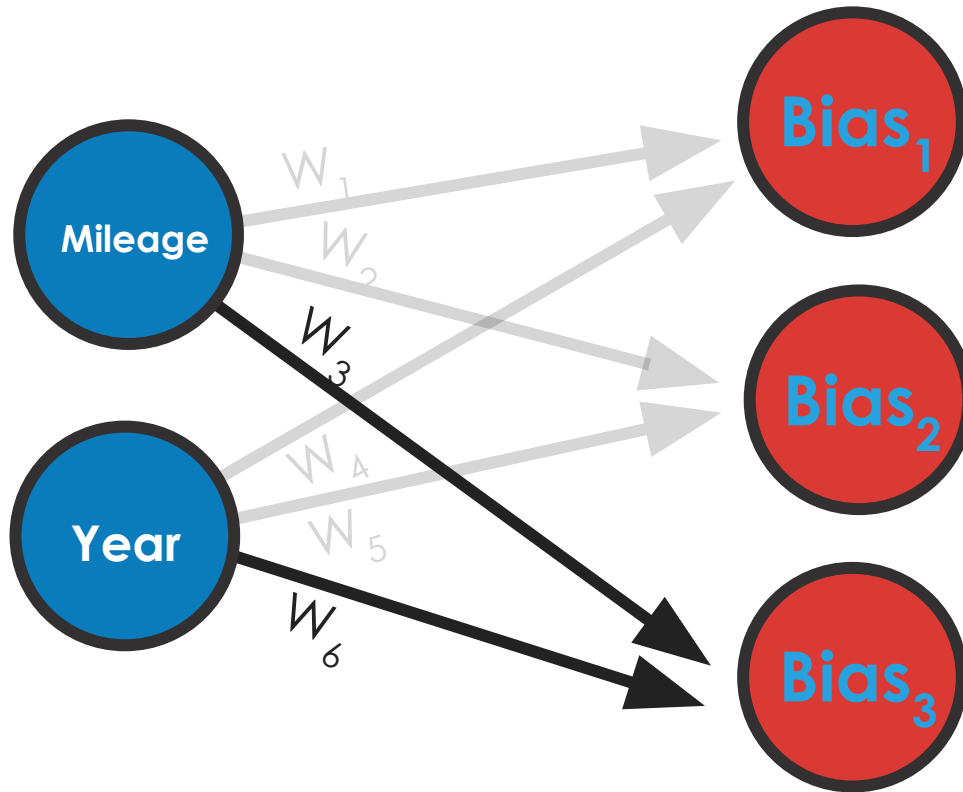
$$\text{Sig}(X_1 * W_1 + X_2 * W_4 + \text{Bias}_1)$$

Equation

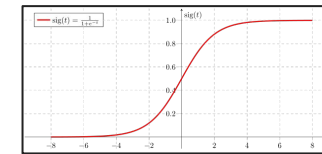
$$\text{Sig}(X_1 * W_2 + X_2 * W_5 + \text{Bias}_2)$$

Multiclass Outcome

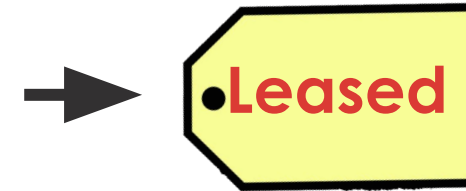
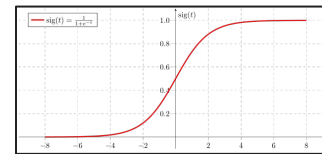
Activation Function



Source: Wikimedia Commons



Source: Wikimedia Commons



Source: Wikimedia Commons

Equation

$$\text{Sig}(X_1 * W_1 + X_2 * W_4 + \text{Bias}_1)$$

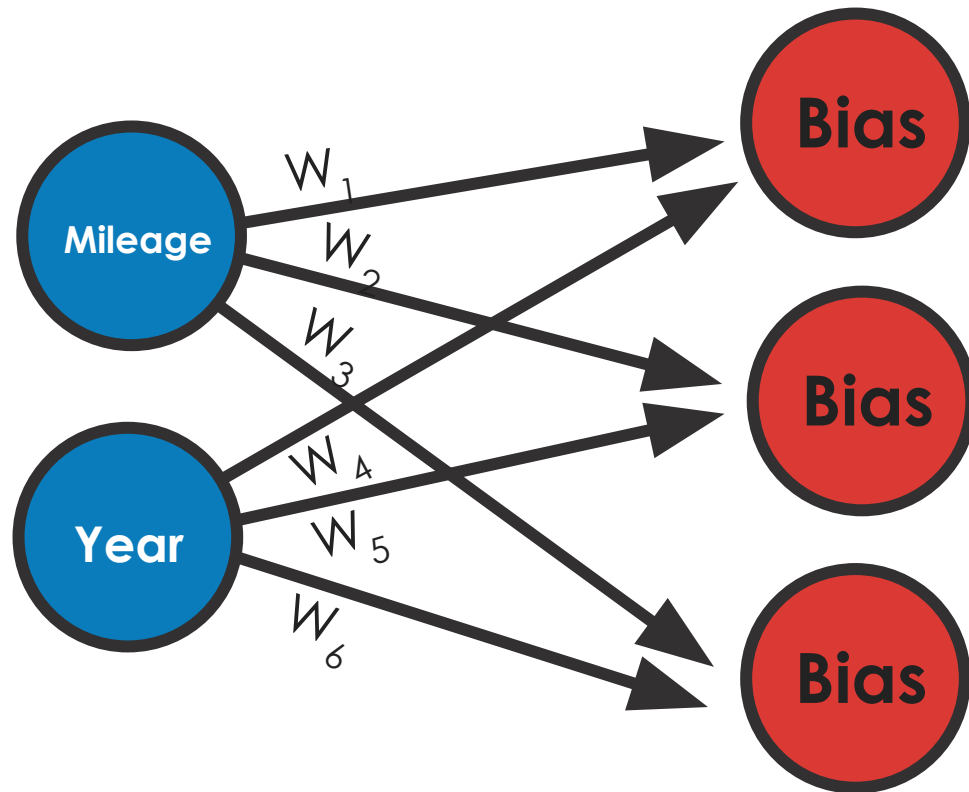
Equation

$$\text{Sig}(X_1 * W_2 + X_2 * W_5 + \text{Bias}_2)$$

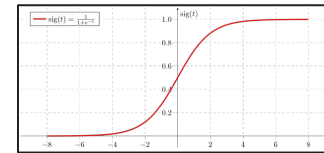
Equation

$$\text{Sig}(X_1 * W_3 + X_2 * W_6 + \text{Bias}_3)$$

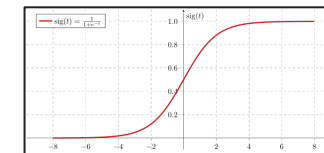
Multiclass Outcome



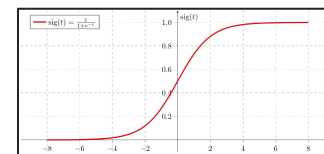
Sigmoid Activation Function



0.5



0.2

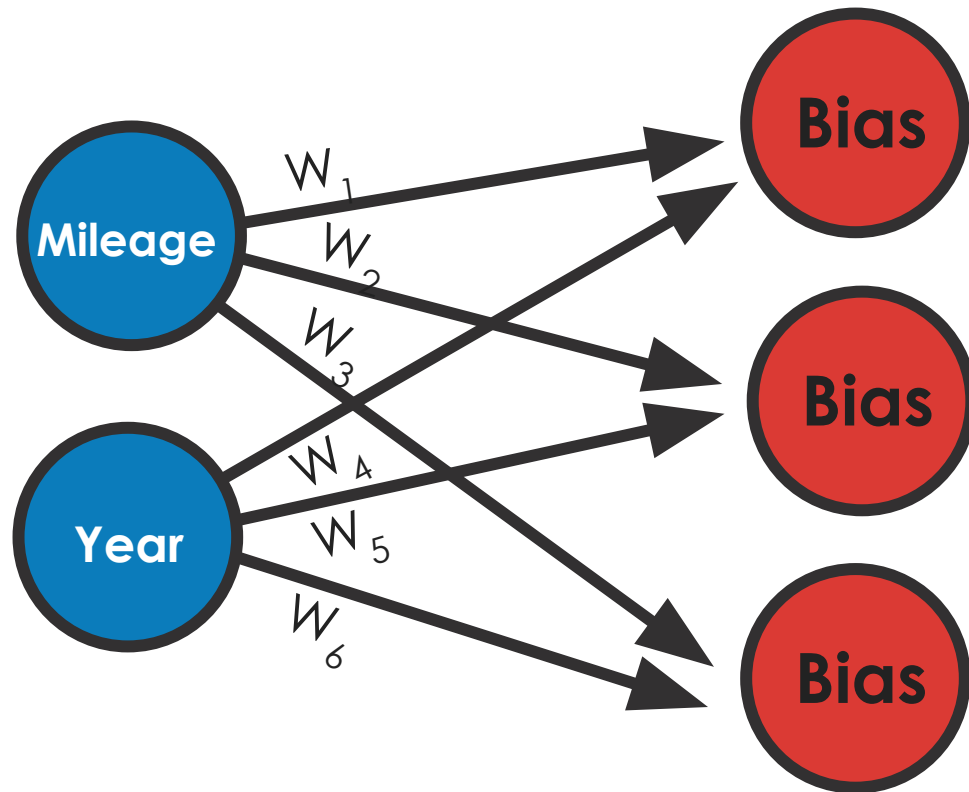


0.4

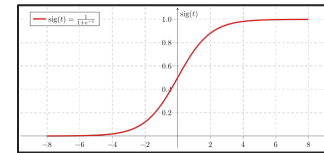


Source: Wikimedia Commons

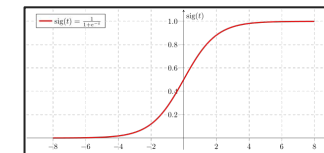
Softmax Activation Function



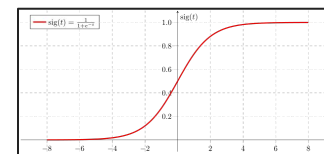
Softmax Activation Function



0.5



0.2



0.3



Source: Wikimedia Commons