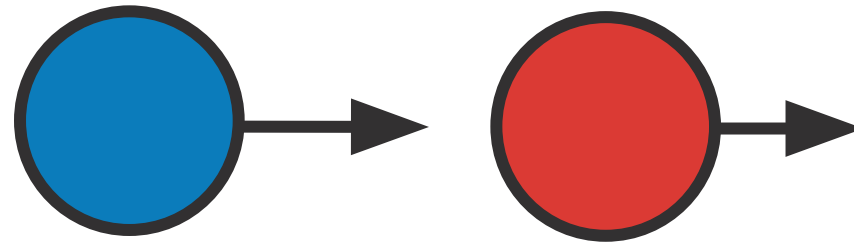


# Artificial Neural Networks Classification

Deep Learning Pre-Work

# Example



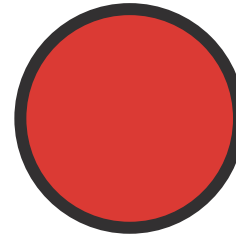
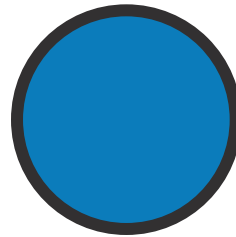
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# Example



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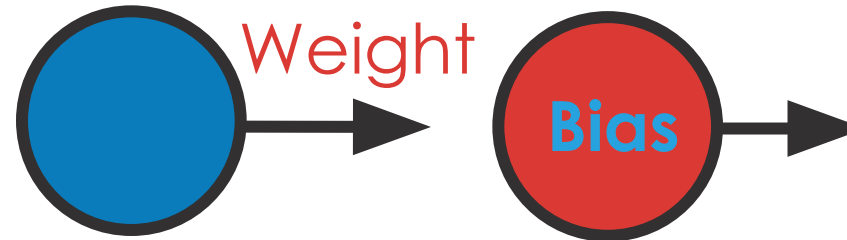
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# Example

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

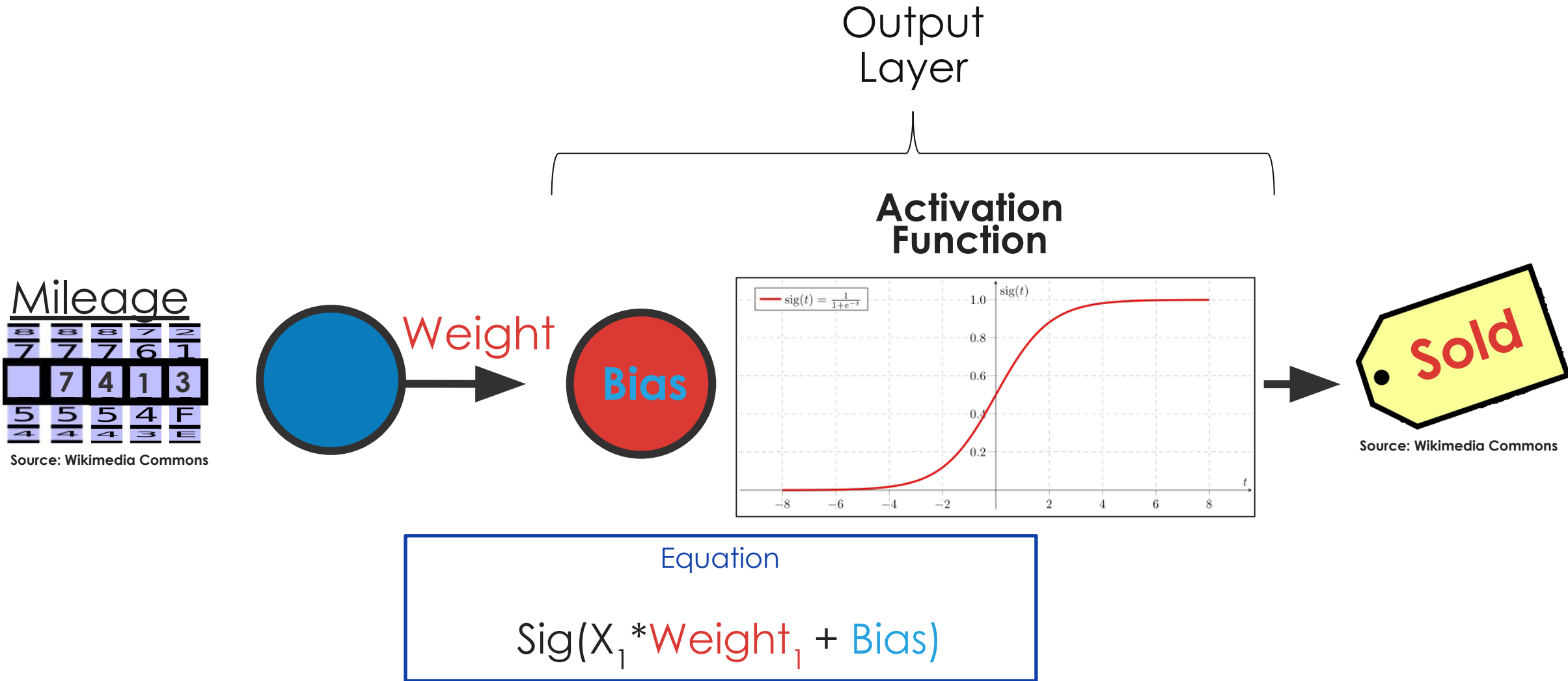
Equation

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

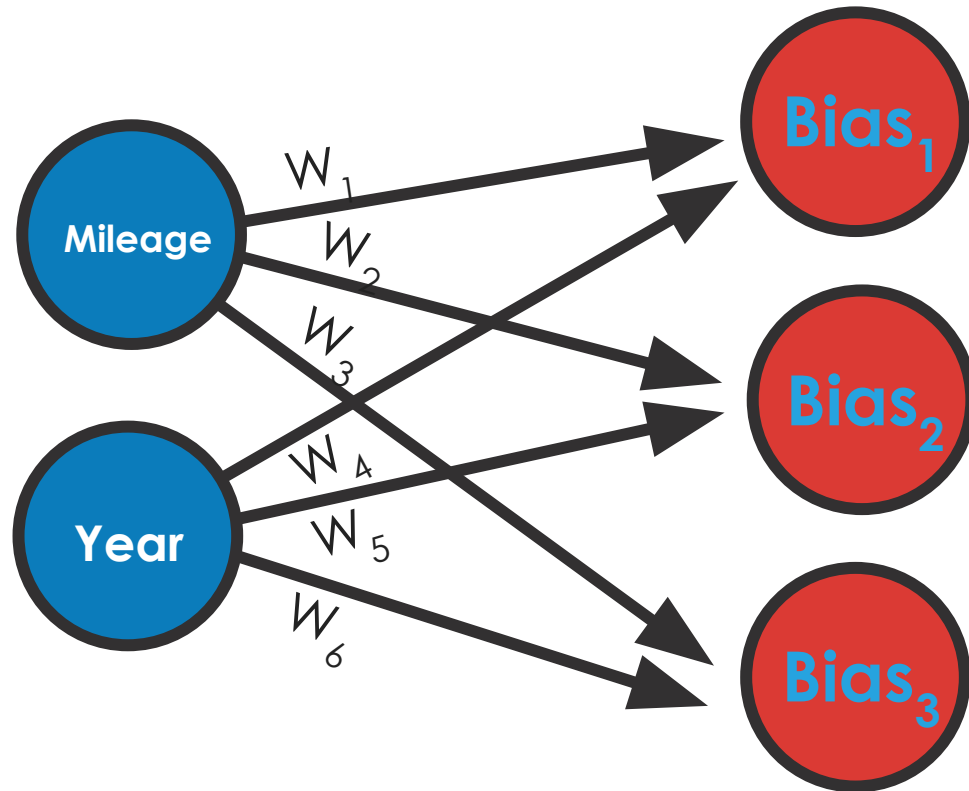
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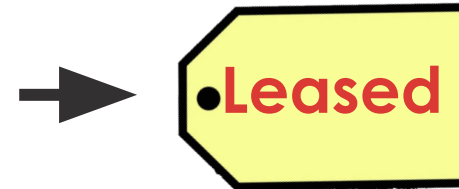
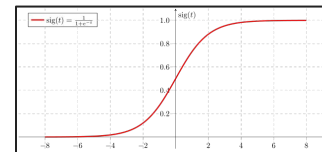
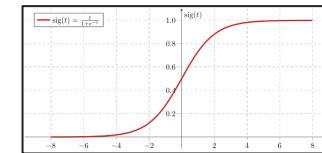
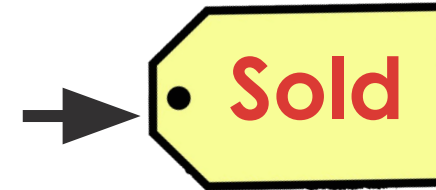
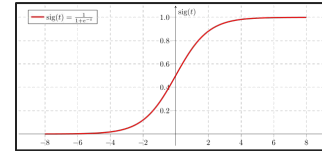
# Sigmoid Activation Function



# Multiclass Outcome



## Activation Function

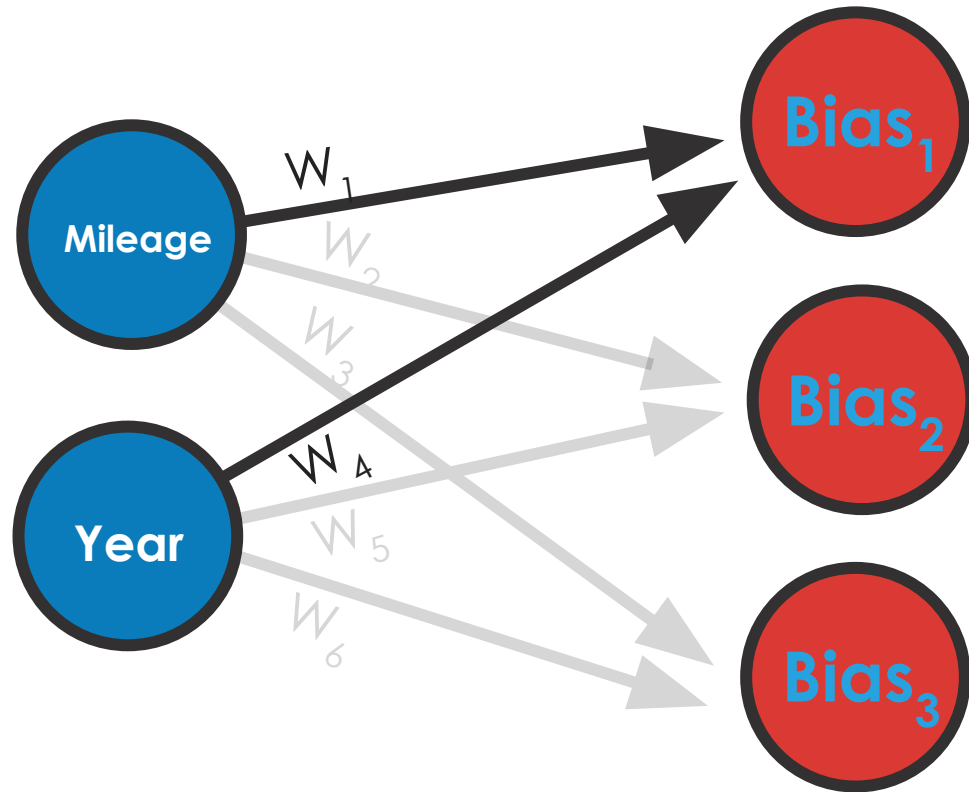


Source: Wikimedia Commons

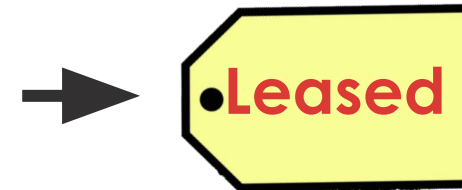
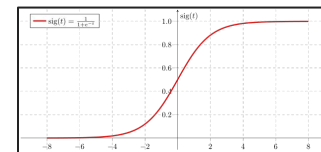
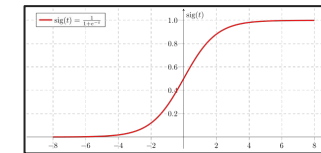
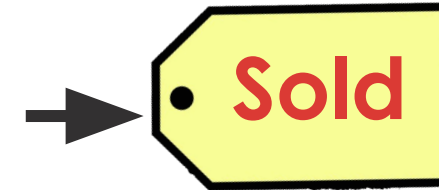
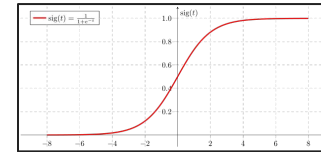
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# Multiclass Outcome



## Activation Function



Source: Wikimedia Commons

Equation

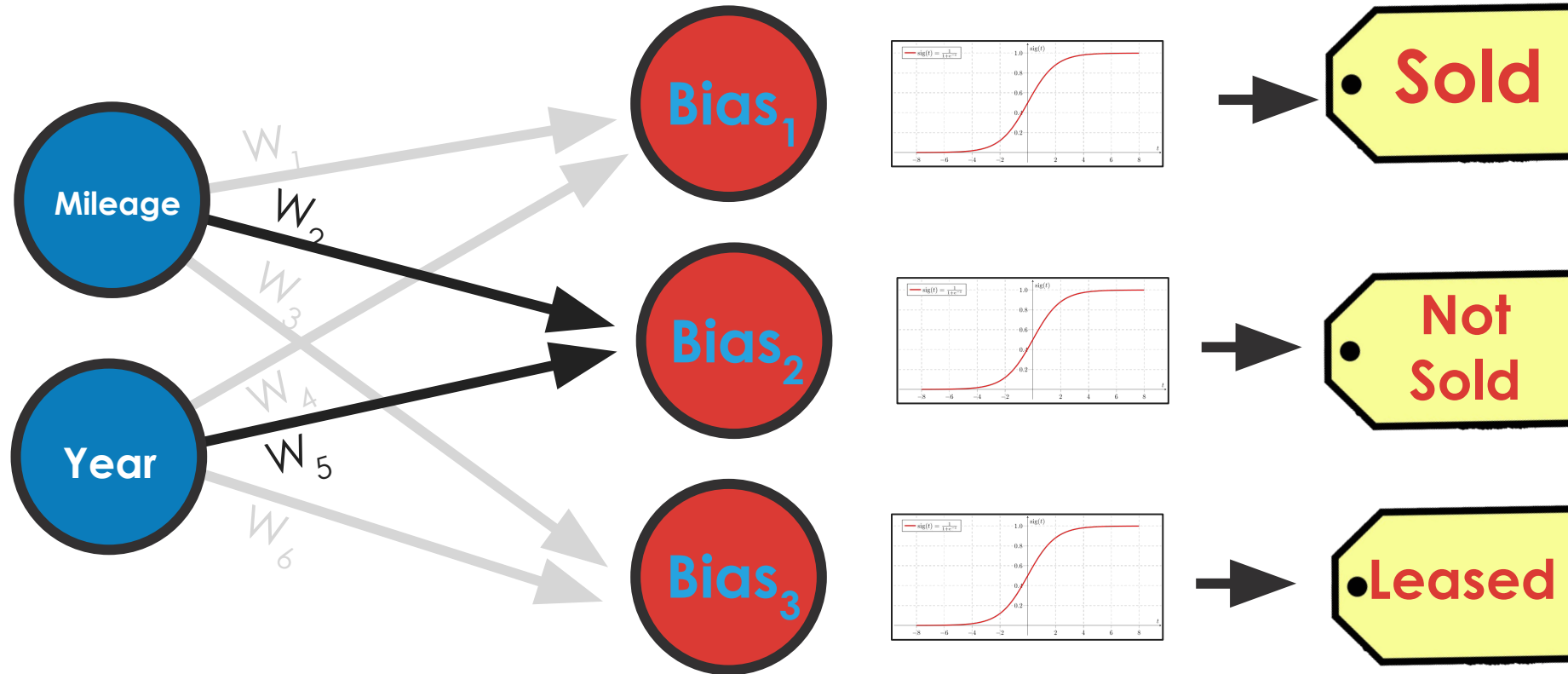
$$\text{Sig}(X_1 * W_1 + X_2 * W_4 + \text{Bias}_1)$$

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# Multiclass Outcome

## Activation Function



Source: Wikimedia Commons

Equation

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

Equation

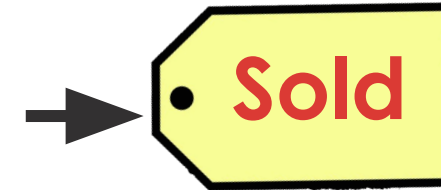
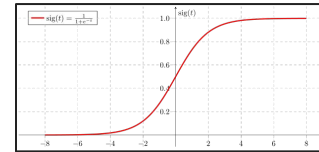
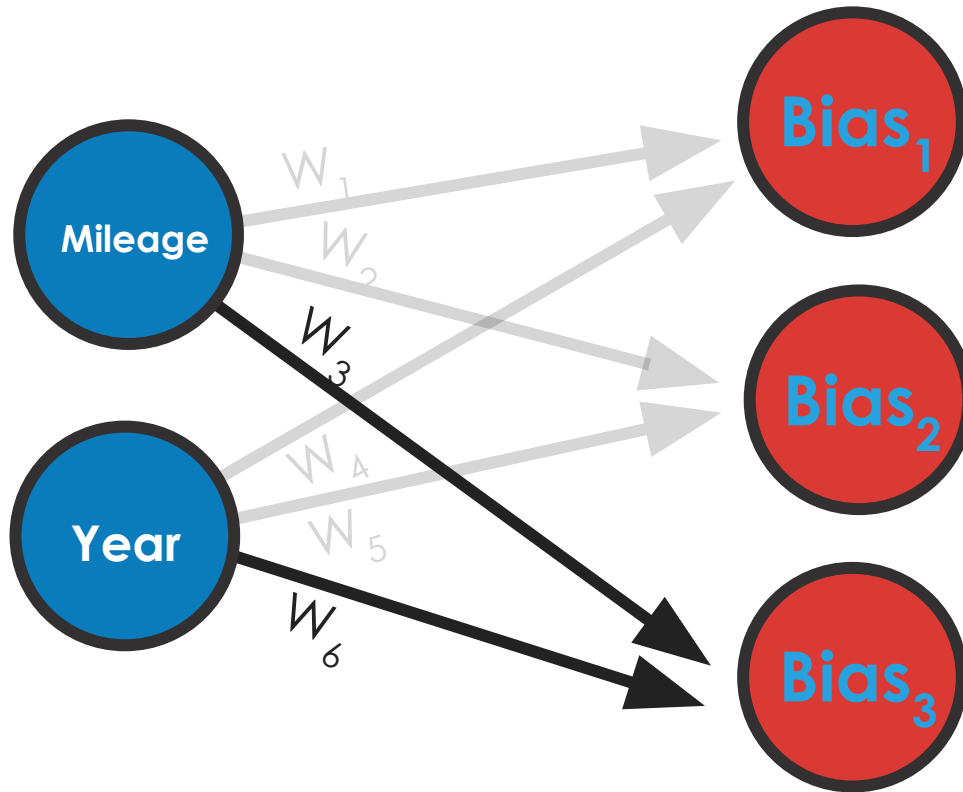
$$\text{Sig}(X_1 * W_2 + X_2 * W_5 + \text{Bias}_2)$$

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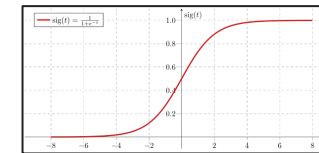


# Multiclass Outcome

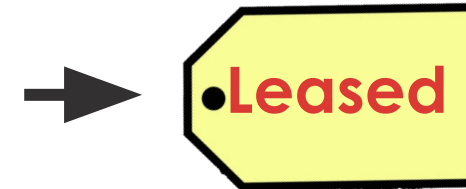
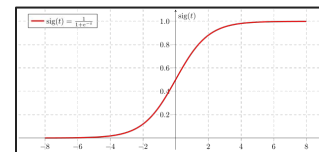
## Activation Function



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Source: Wikimedia Commons

Equation

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

Equation

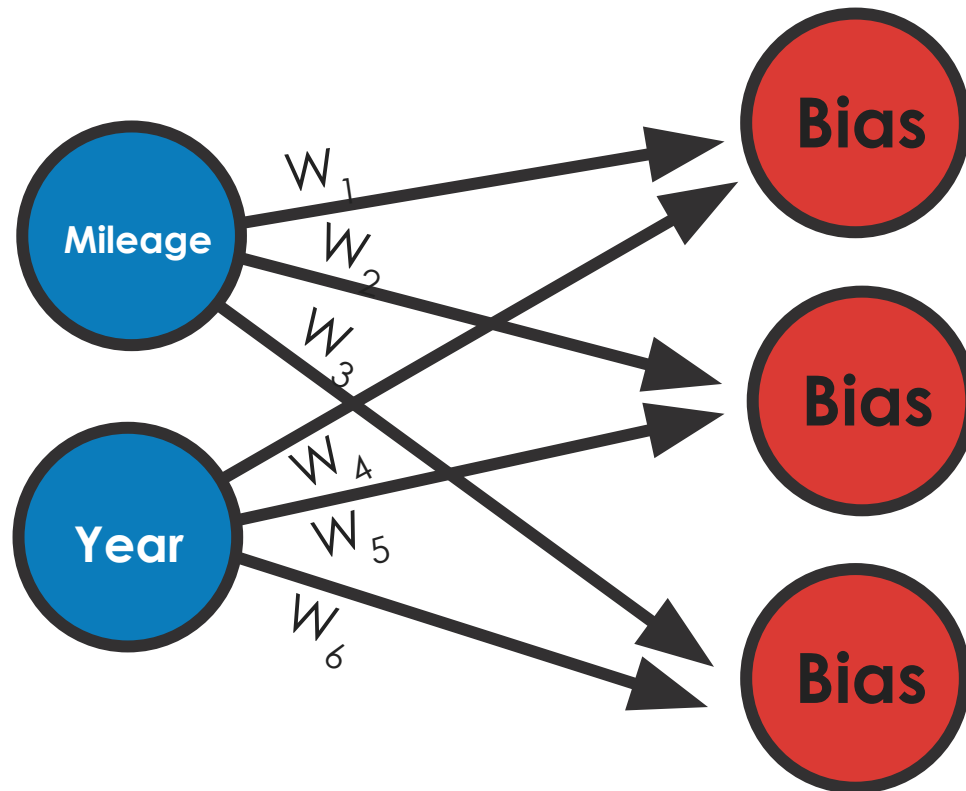
$$\text{Sig}(X_1 * W_2 + X_2 * W_5 + \text{Bias}_2)$$

Equation

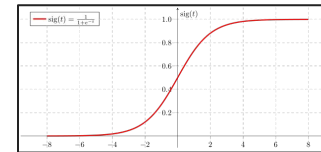
$$\text{Sig}(X_1 * W_3 + X_2 * W_6 + \text{Bias}_3)$$

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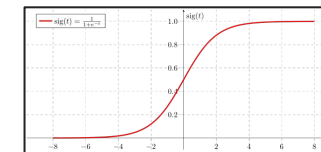
# Multiclass Outcome



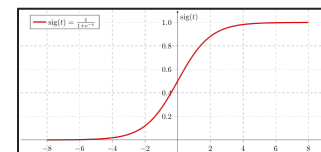
## Sigmoid Activation Function



0.5



0.2



0.4

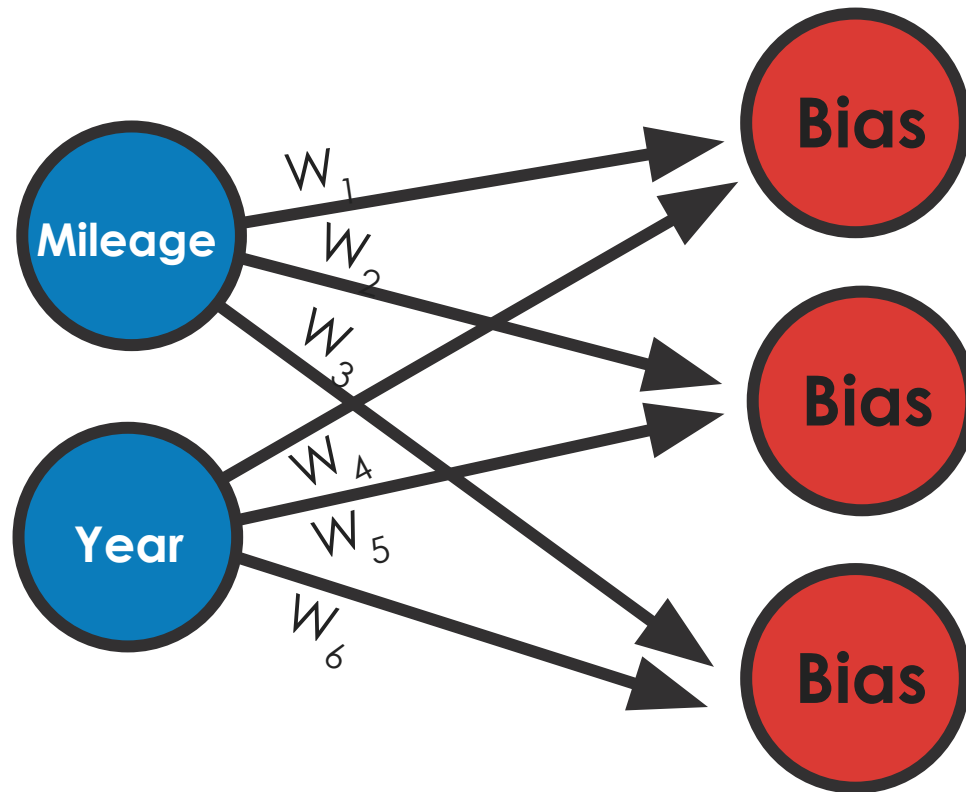


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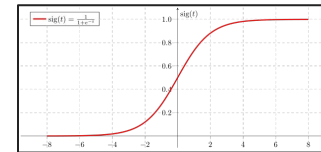
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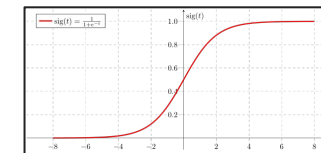
# Softmax Activation Function



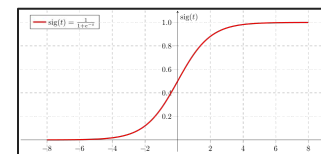
## Softmax Activation Function



0.5



0.2



0.3



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