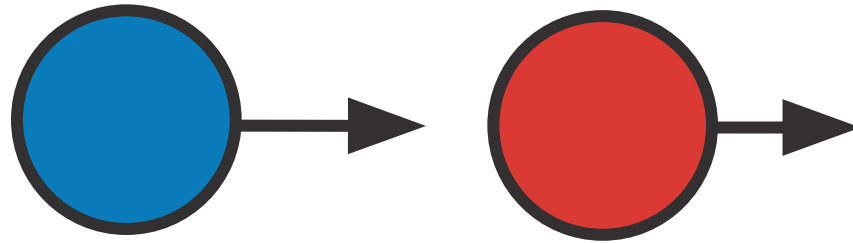


# Artificial Neural Networks Regression

Deep Learning Pre-Work

# Example



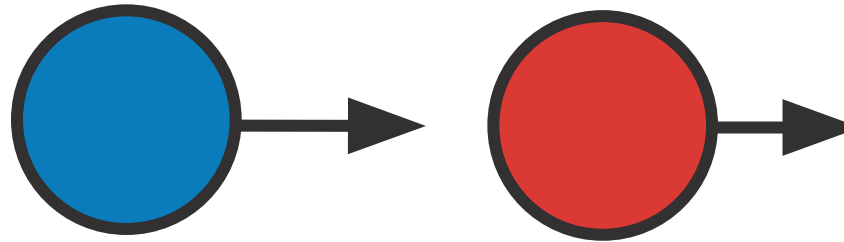
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# Example



Source: Wikimedia Commons



Source: Wikimedia Commons

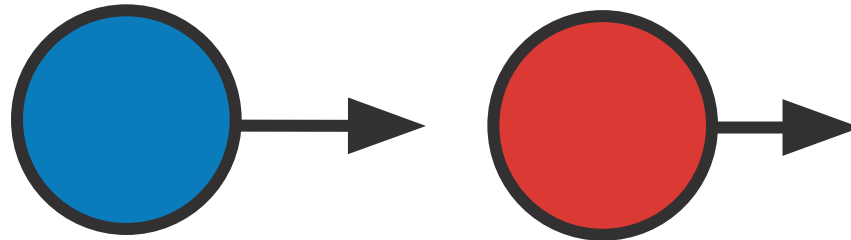
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# Example



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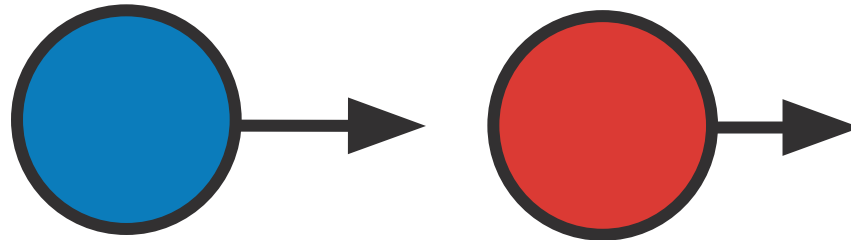
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# Example



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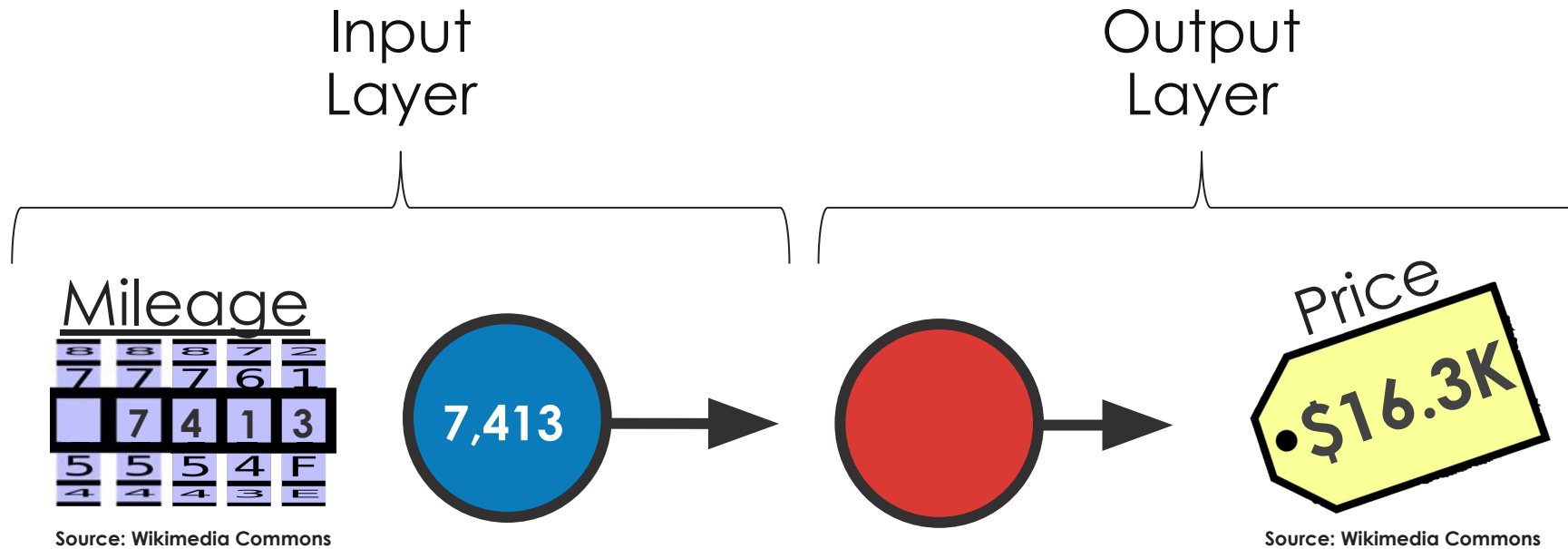


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# Input/Output Layers



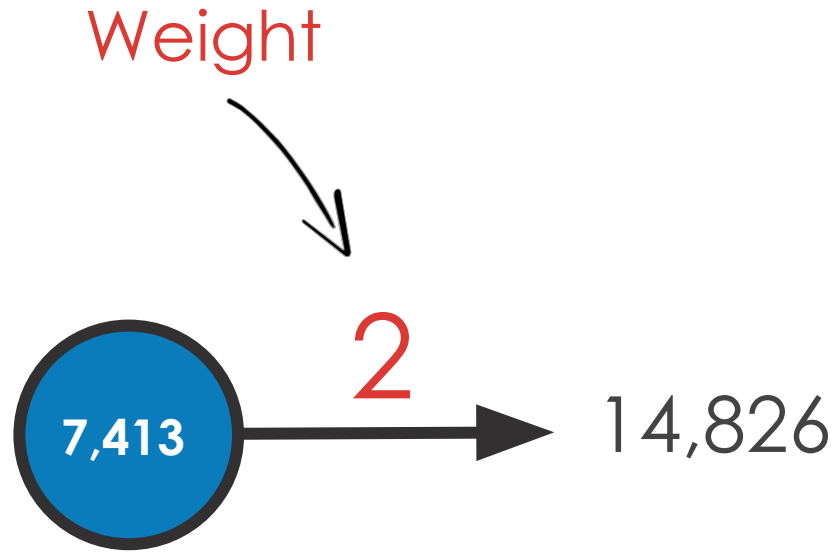
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# Weights



Source: Wikimedia Commons



Equation

$$X * \text{Weight}$$

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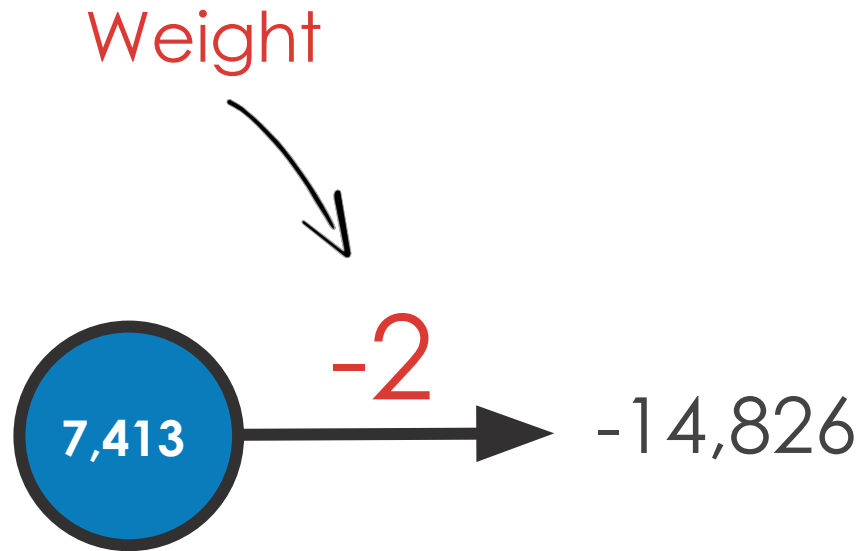
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# Weights

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



Equation

$$X * \text{Weight}$$

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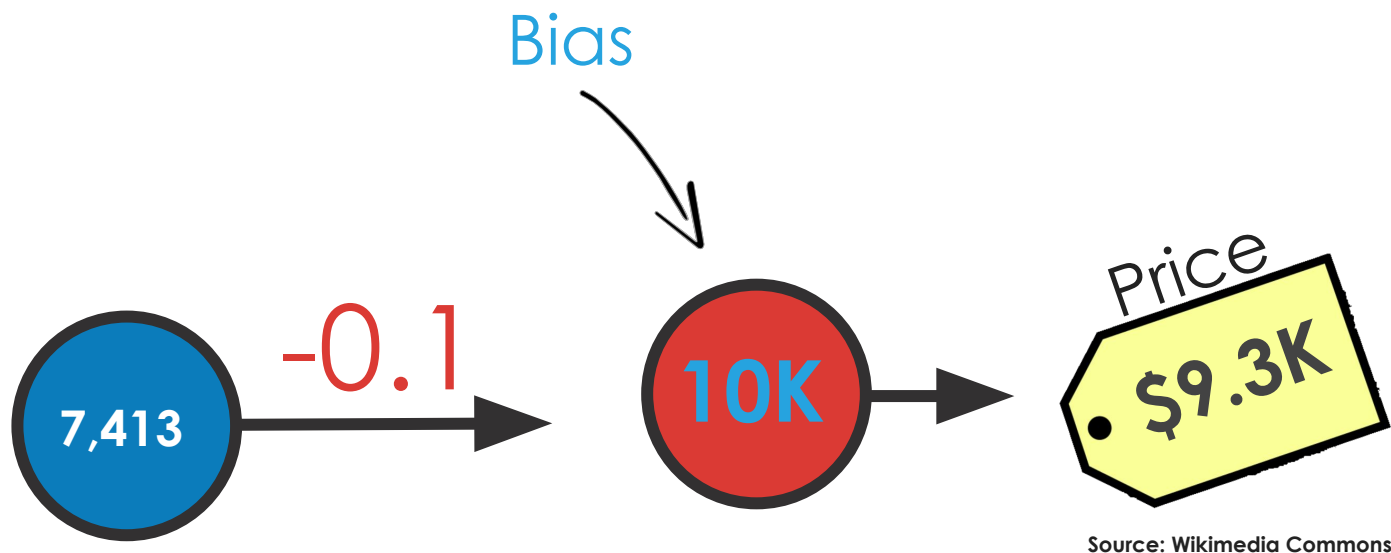


# Biases

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



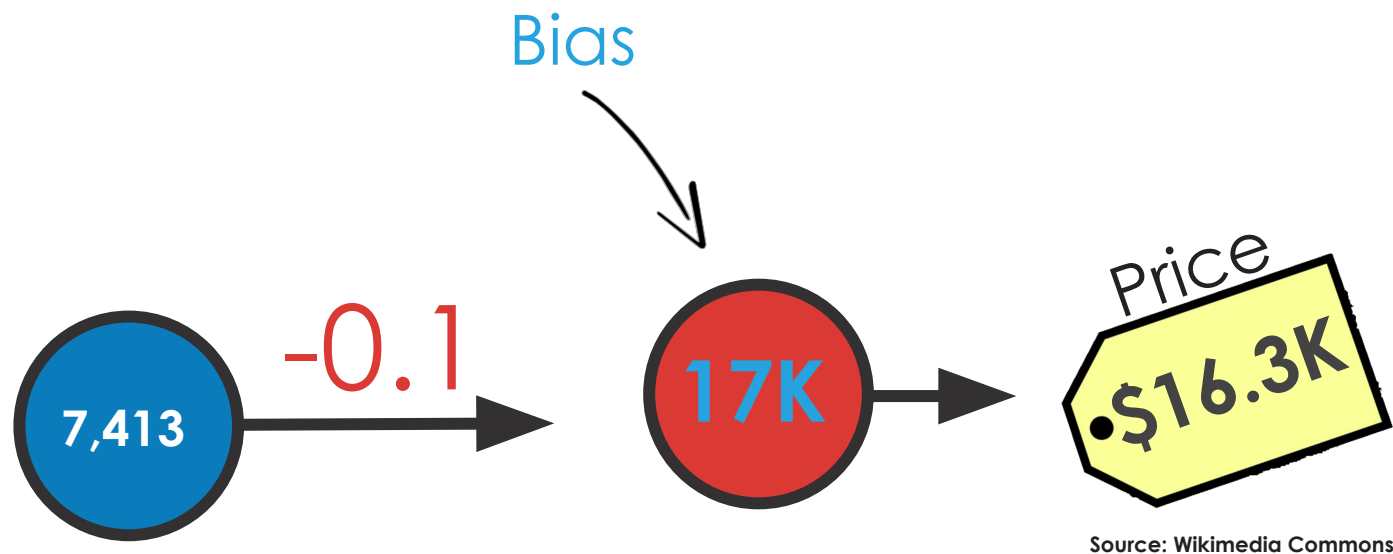
Equation

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

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# Biases



Equation

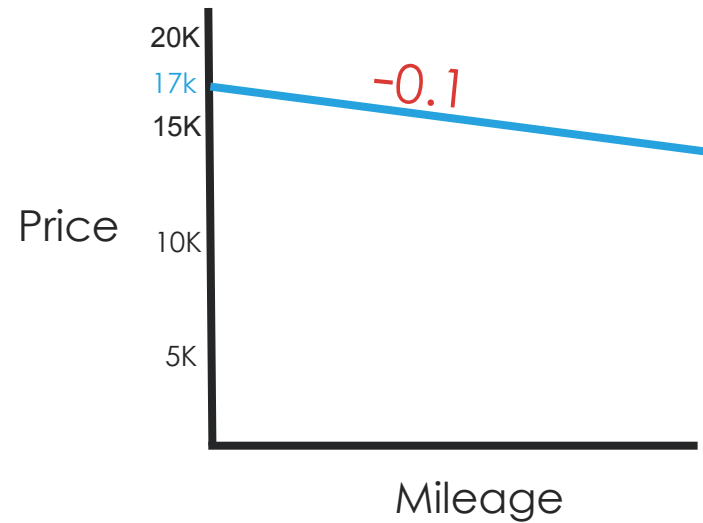
$$X * \text{Weight} + \text{Bias}$$

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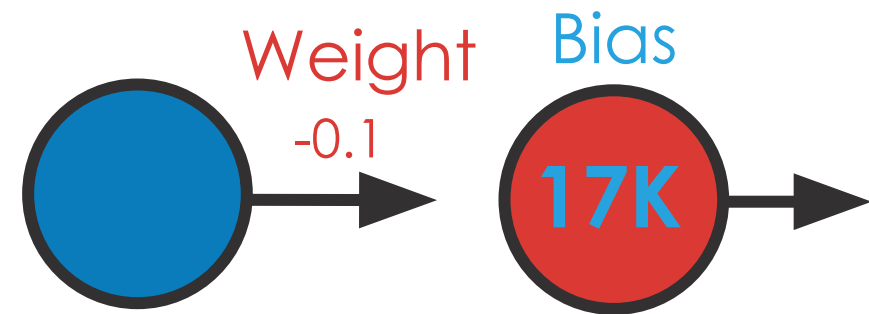
# Linear Regression

$$\hat{Y} = X * \text{Slope} + \text{Y-intercept}$$



# ANN

$$\hat{Y} = X * \text{Weight} + \text{Bias}$$



# Forward Propagation



Source: Wikimedia Commons

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

7,413

-0.1

17K

Price  
• \$16.3K

Source: Wikimedia Commons

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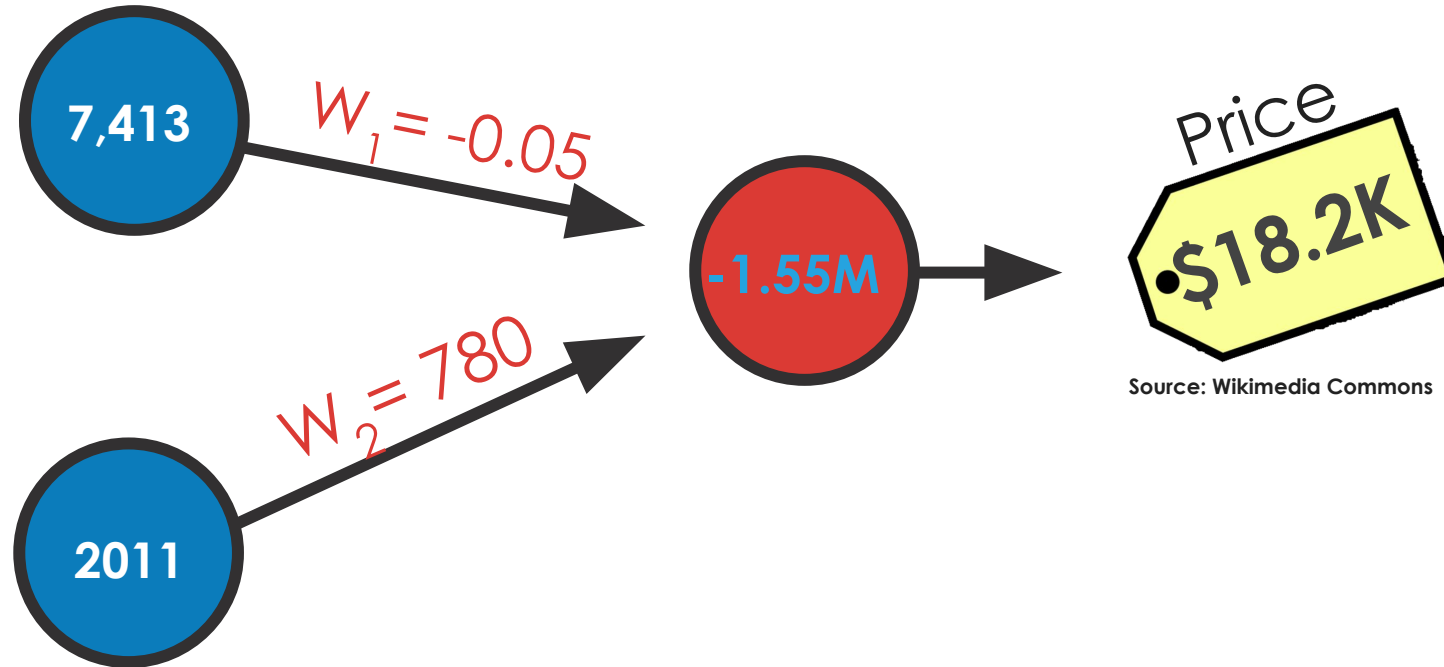
# Multiple Input Neurons

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

Year  
2011



Equation

$$X_1 * \text{Weight}_1 + X_2 * \text{Weight}_2 + \text{Bias}$$

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