

Sigmoid function

Sigmoid Function Formula:

$$\sigma(z) = \frac{1}{1 + \exp(-z)}$$

- Converts any real number Z into a value between 0 and 1
- Used in Logistic Regression to output probabilities
- When:
 - $\sigma(z) > 0.5 \rightarrow$ predicted class is 1 (positive)
 - $\sigma(z) < 0.5 \rightarrow$ predicted class is 0 (negative)

Logistic Regression computes:

$$Z = (w \cdot x) + b$$

Then applies sigmoid:

$$Y = \sigma(Z) = \frac{1}{1 + \exp(-Z)}$$