

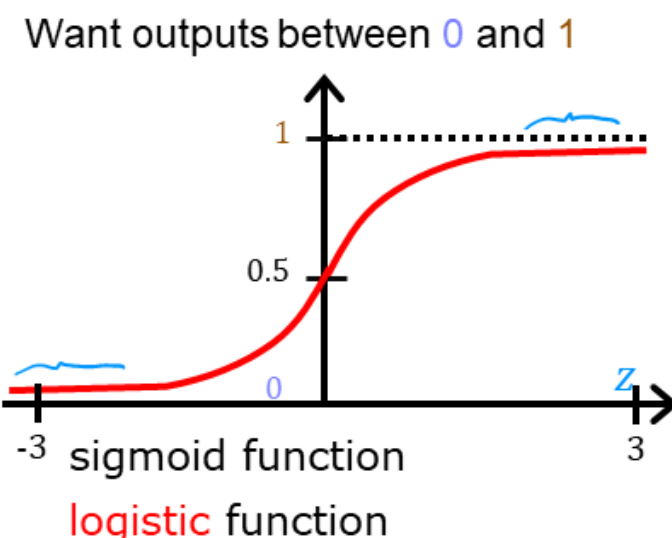
Optional Lab: Logistic Regression

In this ungraded lab, you will

- explore the sigmoid function (also known as the logistic function)
- explore logistic regression; which uses the sigmoid function

```
In [ ]: import numpy as np
import matplotlib widget
import matplotlib.pyplot as plt
from plt_one_addpt onclick import plt_one_addpt onclick
from lab_utils_common import draw_vthresh
plt.style.use('./deeplearning.mplstyle')
```

Sigmoid or Logistic Function



outputs between 0 and 1
 $g(z) = \frac{1}{1+e^{-z}}$ $0 < g(z) < 1$

As discussed in the lecture videos, for a classification task, we can start by using our linear regression model, $f_{w,b}(\mathbf{x}^{(i)}) = \mathbf{w} \cdot \mathbf{x}^{(i)} + b$, to predict y given x .

- However, we would like the predictions of our classification model to be between 0 and 1 since our output variable y is either 0 or 1.
- This can be accomplished by using a "sigmoid function" which maps all input values to values between 0 and 1.

Let's implement the sigmoid function and see this for ourselves.

Formula for Sigmoid function

The formula for a sigmoid function is as follows -

$$g(z) = \frac{1}{1+e^{-z}} \tag{1}$$