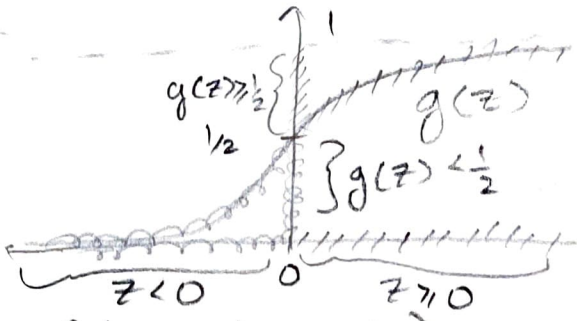
Decision Boundary

$$h_\theta(x) = g(\theta^T x)$$

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



$$h_\theta(x) = g(\theta^T x) = P(y=1 \mid x; \theta)$$

Suppose,

Predict "$y=1$" if $h_\theta(x) \geq 0.5$

Predict "$y=0$" if $h_\theta(x) < 0.5$

$\therefore$ $g(z) \geq 0.5$ when $z \geq 0$

$\therefore$ $h_\theta(x) = g(\theta^T x) \geq 0.5$ whenever $\theta^T x \geq 0$

Ily, $\because$ $g(z) < 0.5$ when $z < 0$

$\therefore$ $h_\theta(x) = g(\theta^T x) < 0.5$ whenever $\theta^T x < 0$

Let $h_\theta(x) = g(\theta_0 + \theta_1 x_1 + \theta_2 x_2)$

Let $\theta_0 = -3$; $\theta_1 = 1$, $\theta_2 = 1$

$\therefore$ $\theta = \begin{bmatrix} -3 \\ 1 \\ 1 \end{bmatrix}$

Predict $\Rightarrow y=1$ if $\underbrace{-3 + x_1 + x_2}_{\theta^T x} \geq 0$

$\Rightarrow x_1 + x_2 \geq 3$

$\Rightarrow y=0$ if $-3 + x_1 + x_2 < 0$

$\Rightarrow x_1 + x_2 < 3$