$$\Theta^1 = \begin{bmatrix} -3 & 0 & 1 \\ 2 & -3 & 1 \\ -2 & -2 & 1 \end{bmatrix} \quad X = \begin{bmatrix} 1 \\ 2 \end{bmatrix} \quad \Theta^2 = \begin{bmatrix} 1 & -2 & 3 & -4 \end{bmatrix}$$

Layer 2 Calculation

$$z^2 = \underset{1\times 3}{X} * \underset{3\times 3}{\Theta^1} = \underset{1\times 3}{\begin{bmatrix} -3+0+2 = z_1^2 = -1 \\ 2 \quad -3 \quad +2 = z_2^2 = 1 \\ -2 \quad -2 \quad +2 = z_3^2 = -2 \end{bmatrix}}$$

$$a^2 = g(z^2) = \begin{bmatrix} .27 \\ .73 \\ .12 \end{bmatrix}$$

Layer 3 Calculations

$$z^3 = a^2 * \Theta^2 = \begin{bmatrix} 1 + -2(.27) + 3(.73) \quad -4 \quad (.12) = 2.17 \end{bmatrix}$$

$$a^3 = g(z^3) = \begin{bmatrix} .89 \end{bmatrix}$$

Result

$$h(x_1, x_2) = .89$$