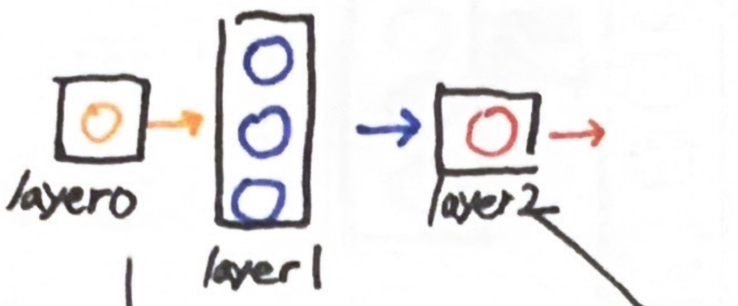
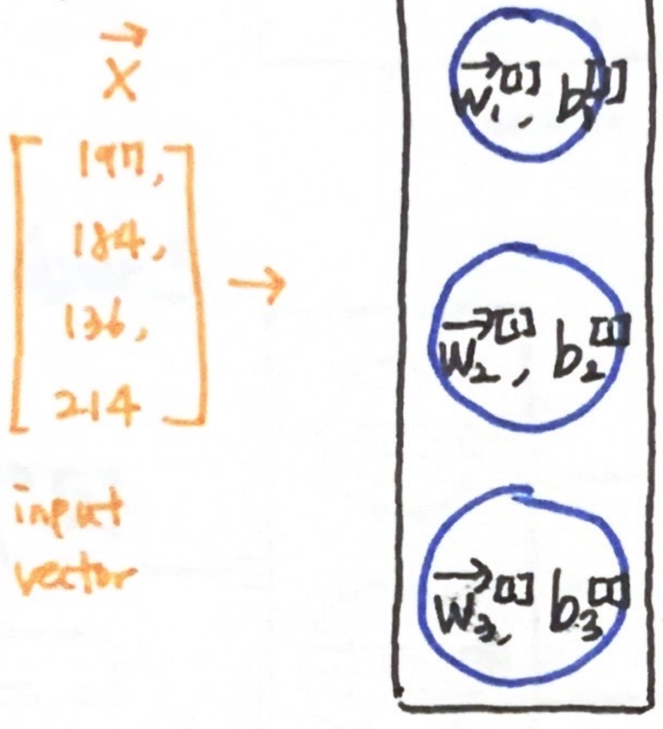
<Neural Network Layer>

i) single hidden layer





activation value

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

z

output

$a_1^{[1]} = g(\vec{w}_1^{[1]} \cdot \vec{x} + b_1^{[1]}) = ^{ex)} 0.3$

$a_2^{[1]} = g(\vec{w}_2^{[1]} \cdot \vec{x} + b_2^{[1]}) = ^{ex)} 0.7$

$a_3^{[1]} = g(\vec{w}_3^{[1]} \cdot \vec{x} + b_3^{[1]}) = ^{ex)} 0.2$

$\vec{a}^{[1]} = \begin{bmatrix} 0.3, \\ 0.7, \\ 0.2 \end{bmatrix}$

vectors of activation values from layer 1

$\vec{a}^{[1]}$

$\begin{bmatrix} 0.3, \\ 0.7, \\ 0.2 \end{bmatrix}$

$\vec{w}_1^{[2]}, b_1^{[2]} \longrightarrow a_1^{[2]} = g(\vec{w}_1^{[2]} \cdot \vec{a}^{[1]} + b_1^{[2]}) = ^{ex)} 0.84 \longrightarrow a^{[2]}$

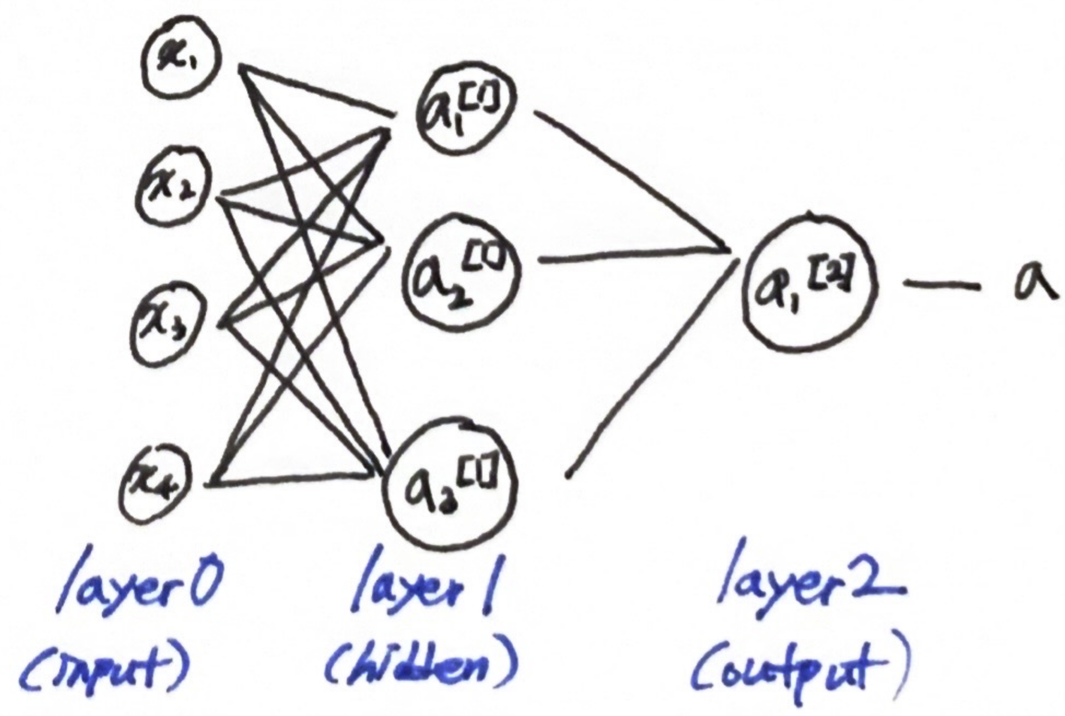
a scalar value

* Summarize

if binary prediction .. "threshold"

is $a^{[2]} \geq 0.5$?

yes → $\hat{y} = 1$ .. no → $\hat{y} = 0$ ..



- $a_i^{[j]}$: "activation" of unit i in layer j (neuron)