



$$= \sigma \left(w_{11}a_1^{(0)} + w_{21}a_2^{(0)} + \dots + w_{n1}a_n^{(0)} + b_1^{(1)} \right)$$

$$= \sigma \left(\sum_{i=1}^n w_{i1}a_i^{(0)} + b_1^{(1)} \right)$$

$$\begin{bmatrix} a_1^{(1)} \\ a_2^{(1)} \\ \vdots \\ a_m^{(1)} \end{bmatrix} = \sigma \left[\left(\begin{bmatrix} w_{11} & w_{12} & \dots & w_{1n} \\ w_{21} & w_{22} & \dots & w_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ w_{m1} & w_{m2} & \dots & w_{mn} \end{bmatrix} \right)^T \begin{bmatrix} a_1^{(0)} \\ a_2^{(0)} \\ \vdots \\ a_n^{(0)} \end{bmatrix} + \begin{bmatrix} b_1^{(1)} \\ b_2^{(1)} \\ \vdots \\ b_m^{(1)} \end{bmatrix} \right]$$

$$\mathbf{a}^{(1)} = \sigma \left((\mathbf{W}^{(1)})^T \mathbf{a}^{(0)} + \mathbf{b}^{(1)} \right)$$