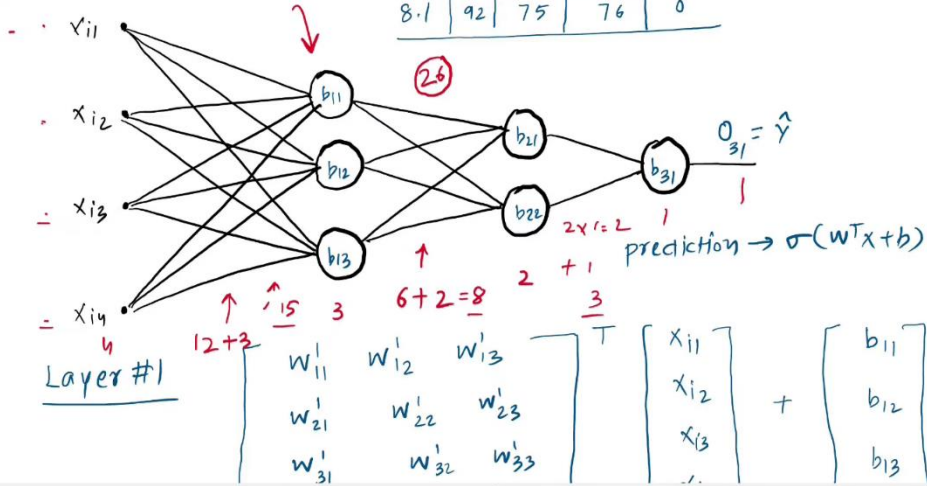


# Forward Propagation

03 March 2022 06:07

cgpa iq 10<sup>th</sup> m 12<sup>th</sup> m placed → # of trainable parameters

cgpa	iq	10 <sup>th</sup> m	12 <sup>th</sup> m	placed
7.2	72	69	81	1
8.1	92	75	76	0



$$\begin{matrix}
 \text{Layer \#1} \\
 \begin{matrix} \uparrow 12+3 \\ \uparrow 15 \\ 3 \end{matrix}
 \end{matrix}
 \begin{bmatrix}
 w'_{11} & w'_{12} & w'_{13} \\
 w'_{21} & w'_{22} & w'_{23} \\
 w'_{31} & w'_{32} & w'_{33} \\
 w'_{41} & w'_{42} & w'_{43}
 \end{bmatrix}^T
 \begin{bmatrix}
 x_{i1} \\
 x_{i2} \\
 x_{i3} \\
 x_{i4}
 \end{bmatrix}
 +
 \begin{bmatrix}
 b_{11} \\
 b_{12} \\
 b_{13}
 \end{bmatrix}$$

$4 \times 3 \xrightarrow{T} 3 \times 4$        $4 \times 1$        $3 \times 1$

$$= \begin{bmatrix}
 w'_{11}x_{i1} + w'_{21}x_{i2} + w'_{31}x_{i3} + w'_{41}x_{i4} \\
 w'_{12}x_{i1} + w'_{22}x_{i2} + w'_{32}x_{i3} + w'_{42}x_{i4} \\
 w'_{13}x_{i1} + w'_{23}x_{i2} + w'_{33}x_{i3} + w'_{43}x_{i4}
 \end{bmatrix}
 \begin{bmatrix}
 b_{11} \\
 b_{12} \\
 b_{13}
 \end{bmatrix}$$

$$\begin{aligned}
 & \text{3x1} \quad \left[ \begin{array}{c} w_{13}^1 x_{i1} + w_{23}^1 x_{i2} + w_{33}^1 x_{i3} + w_{43}^1 x_{i4} \end{array} \right] \\
 & = \sigma \left( \begin{bmatrix} w_{11}^1 x_{i1} + w_{21}^1 x_{i2} + w_{31}^1 x_{i3} + w_{41}^1 x_{i4} + b_{11} \\ w_{12}^1 x_{i1} + w_{22}^1 x_{i2} + w_{32}^1 x_{i3} + w_{42}^1 x_{i4} + b_{12} \\ w_{13}^1 x_{i1} + w_{23}^1 x_{i2} + w_{33}^1 x_{i3} + w_{43}^1 x_{i4} + b_{13} \end{bmatrix} \right) \\
 & = \begin{bmatrix} o_{11} \\ o_{12} \\ o_{13} \end{bmatrix}
 \end{aligned}$$

Layer #2

$$\begin{aligned}
 & \begin{bmatrix} w_{11}^2 & w_{12}^2 \\ w_{21}^2 & w_{22}^2 \\ w_{31}^2 & w_{32}^2 \end{bmatrix}^T \begin{bmatrix} o_{11} \\ o_{12} \\ o_{13} \end{bmatrix} + \begin{bmatrix} b_{21} \\ b_{22} \end{bmatrix} \\
 & \quad \quad \quad 3 \times 2 \xrightarrow{T} 2 \times 3 \quad \quad 3 \times 1 \quad \quad \quad 2 \times 1
 \end{aligned}$$

$$= \sigma \left( \begin{bmatrix} w_{11}^2 o_{11} + w_{21}^2 o_{12} + w_{31}^2 o_{13} + b_{21} \\ w_{12}^2 o_{11} + w_{22}^2 o_{12} + w_{32}^2 o_{13} + b_{22} \end{bmatrix} \right) = \begin{bmatrix} o_{21} \\ o_{22} \end{bmatrix}$$

