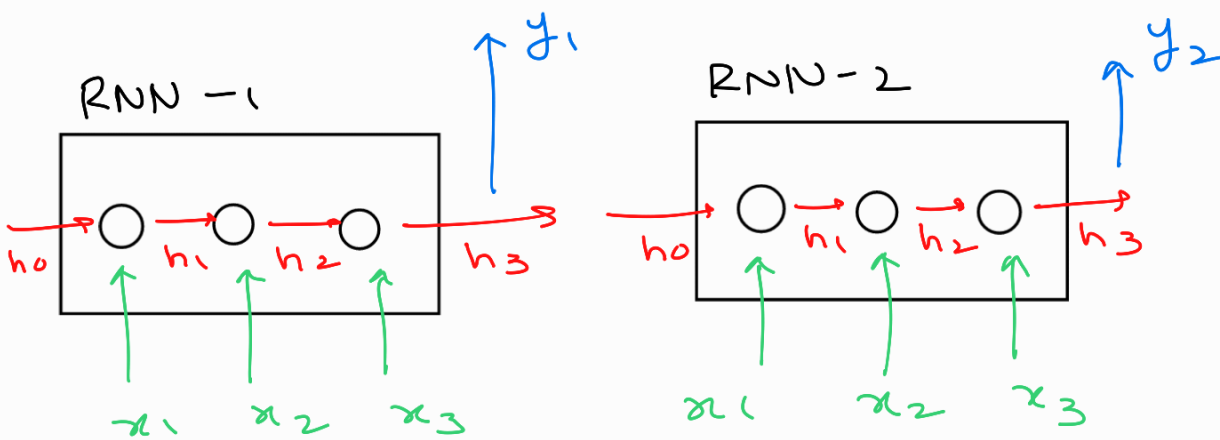


Assignment 05-a

Estimate the value of the network below:

Ans



$$w_x = \begin{bmatrix} 3 & -4 \end{bmatrix}$$

$$w_h = \begin{bmatrix} 4 & 5 \\ -3 & 2 \end{bmatrix}$$

$$w_y = \begin{bmatrix} -4 \\ 2 \end{bmatrix}$$

$$b_h = 0 \quad b_y = 10$$

$$h_0 = \begin{bmatrix} 0 & 0 \end{bmatrix}$$

$$x = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$$

$$x_1 = 1$$

$$x_2 = 2$$

$$x_3 = 3$$

→ Here are total 2 RNN units.

$$h_t = \tanh(\omega_x x_t + \omega_h h_{t-1} + b_h)$$

$$h_1 = \tanh(1 \times [3 \ -4] + 0 + 0)$$

$$= [0.99505 \quad -0.99932]$$

$$h_2 = \tanh(2 \times [3 \ -4] + [0.99505 \quad -0.99932])$$

$$\begin{bmatrix} 4 & -5 \\ -3 & 2 \end{bmatrix} \text{ to } \cdot$$

$$= [0.9999 \ -1]$$

$$h_3 = \tanh(3 + [3 \ -4] + [0.9999 \ -1])$$

$$\begin{bmatrix} 4 & -5 \\ 3 & 2 \end{bmatrix} + 10$$

$$= [1 \ -1]$$

$$\hat{y}_t = w_y \cdot h_t + b_y$$

$$\hat{y}_t = w_y \cdot h_3 + b_y$$

$$= [1 \ -1] \begin{bmatrix} -4 \\ 2 \end{bmatrix} + 10$$

$$= -6 + 10$$

$$\hat{y}_t$$

$$\boxed{f_z = 4}$$

