

DL Assignment - 5

FAHAD SYED
(D016)

No. of RNN units = 2

$$w_x = \begin{bmatrix} 3 & -4 \end{bmatrix} \quad b_h = 0$$

$$w_h = \begin{bmatrix} 4 & -5 \\ -3 & 2 \end{bmatrix} \quad b_y = 10$$

$$w_y = \begin{bmatrix} -4 \\ 2 \end{bmatrix} \quad h_0 = [0 \ 0]$$

$$x_1 = 1, x_2 = 2, x_3 = 3$$

$$h_t = \tanh(w_x \cdot x_t + w_h \cdot h_{t-1} + b_h)$$

$$h_1 = \tanh(1 \times [3 \ -4] + 0 + 0) \\ = [0.99505 \ -0.99932]$$

$$h_2 = \tanh(2 \times [3 \ -4] + [0.99505 \ -0.99932] \begin{bmatrix} 4 & -5 \\ -3 & 2 \end{bmatrix} + 0) \\ = [0.99999 \ -1]$$

$$h_3 = \tanh(3 \times [3 \ -4] + [0.99999 \ -1] \begin{bmatrix} 4 & -5 \\ -3 & 2 \end{bmatrix} + 0) \\ = [1 \ -1]$$

$$\hat{y}_t = w_y \cdot h_t + b_y = [1 \ -1] \begin{bmatrix} -4 \\ 2 \end{bmatrix} + 10 = -6 + 10 \\ \hat{y}_t = 4$$

classmate

Q2.

Embedding $\rightarrow 71676$

$11,946 \times 6$

(input dim
= vocab length)

(required
output dim)

Simple RNN (1) $\rightarrow 4544$

$(64 \times 64) + (64 \times 6) + 64$

(recurrent weights
= no. of units \times
no. of units)

(no. of units \times
no. of features
from embedding)

(biases)
backprop

Simple RNN (2) $\rightarrow 3104$

$(32 \times 32) + (32 \times 64) + 32$

(recurrent weights)

(i/p weights =
no. of units \times
no. of units of prev layers)

(backprop)

Simple RNN (3) $\rightarrow 784$

$(16 \times 16) + (16 \times 32) + 16$

(recurrent weights)

(i/p weights)

(backprop)

Dense $\rightarrow 408$

$(24 \times 16) + 24$

(no. of units \times no. of units of
prev layers)

(backprop)

classmate

Dense (output layer) $\rightarrow 150$
 $(6 \times 24) + 6$

(no. of o/p units \times no. of units of previous layer) (backprop)