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Semester – 2

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course Name – Deep learning (Mtech – CSE)

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course

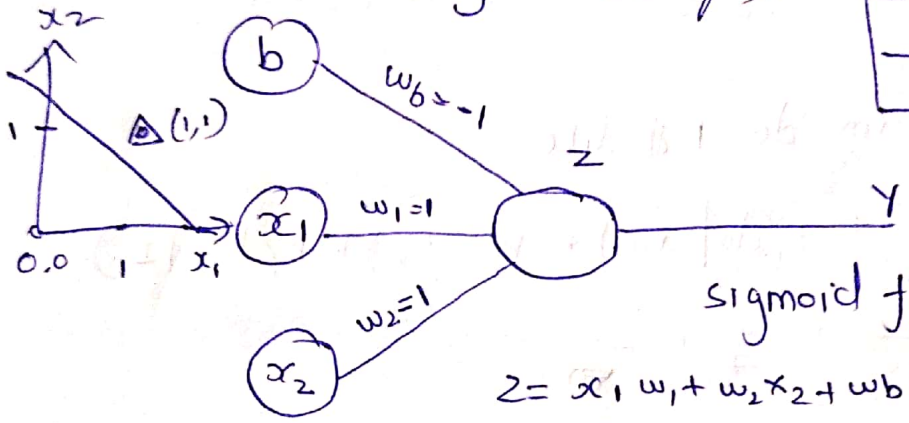
Assignment – 3

Q.1

$w_1, w_2 = 1$ $\quad wb = -1$

$y = act(z) = f(z)$

x_1	x_2	Y
0	0	
0	1	
1	0	
1	1	



sigmoid $f^n = \frac{1}{1+e^{(-x)}}$

$z = x_1 w_1 + w_2 x_2 + wb\, b$

x_1	x_2	x_1 and x_2	$(w_1x_1 + w_2x_2 - w_0)$ f^n	$a = f(w_1x$
0	0	0	$(1\times0 + 1\times0 - 1) = -1$	$0.2 = 0$
0	1	0	$(1\times0 + 1\times1 - 1) = 0$	$0.5 = 0$
1	0	0	$(1\times1 + 1\times0 - 1) = 0$	$0.5 = 0$
1	1	1	$(1\times1 + 1\times1 - 1) = 1$	$0.7 = 1$

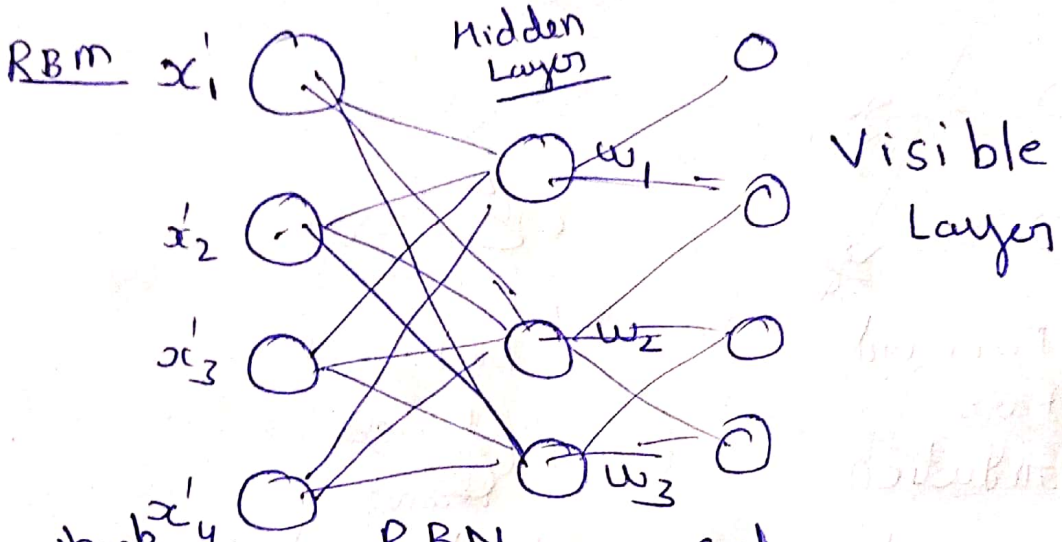
$$\text{Sigmoin} = \begin{cases} 0 & \text{if } x < 0 \\ 1 & \text{if } x > 0 \end{cases}$$

The above NN is an ~~NN~~ ~~AND~~ AND Gate

Q3

Yes Restricted Boltzman machine can do the same as encoder for dimensionality reduction

Since Auto encoders are simple 3 layer neural network and RBM are 2 layer Neural network



RBN

Drawback

→ Sinnce RBM does naut have an outputput ~~out~~ layer Reconstruction can only be done ~~visible~~ at visible layer in RBM

→ Reconstruction can be done using backward pass

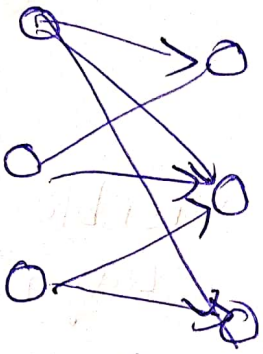
→ The visible layer bias help the RBM learn the reconstruction on backward pass

Advantage

→ ~~The~~ advantage of using RBM is that the neurons in the hidden layer that get influend are the only one corresponding input feature

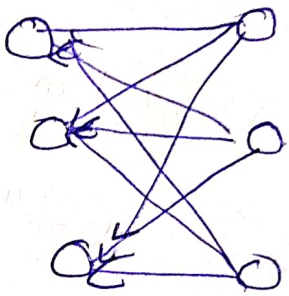
⇒ since RBM decide the important feature that should be kept, which cause dimensonality reduction, thus it needs only backward pass to do this

→ It can overcome vanishing gradient problem



Forward Pass for reduction

Forward Pass



Backward Pass for reconst

Backward Pass