 QUEST FOR EXCELLENCE	MARATHWADA INSTITUTE OF TECHNOLOGY, AURANGABAD		LABORATORY MANUAL
	PRACTICAL EXPERIMENT INSTRUCTION SHEET		
	DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING		
LABORATORY: - 420		YEAR:2018-19	
Class: BE CSE	PART:II	SUBJECT: Soft Computing	PAGE: Page 4 of 37

LABORATORY NO: 2	Title: OR function using McCulloch-Pitts neural net.
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Aim: Write a MATLAB program to generate OR function using McCulloch-Pitts neural net.

Objective:

Designing MP model for OR Function

Theory:

The OR function returns a high (1) if anyone of the input is high, returns a low (0) if none of the input is high.

The truth table for OR function is

X1	X2	Y
0	0	0
1	0	1
0	1	1
1	1	1

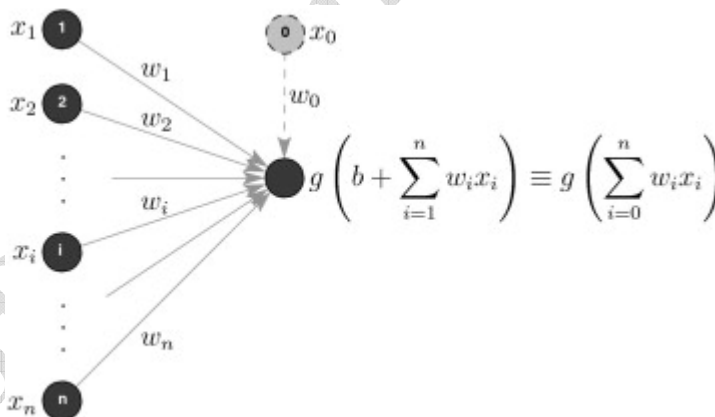



Fig: MP-model for OR gate function

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The output is given by,

$$Y = f(y_{in}) = 1, \text{ if } y_{in} \geq 1$$

$$= 0, \text{ if } y_{in} < 1$$

Example:

Assuming $w_1=1$, $w_2=1$ and Threshold=1,

Lets find out Y_{in} i.e. activation of neuron and

1. $X_1=0, X_2=0$

$$Y_{in} = X_1 * w_1 + X_2 * w_2$$

$$Y_{in} = (1) X_1 + (1) X_2$$

$$= (1) (0) + (1) (0)$$

$$\text{So, } Y=0 \text{ as } Y_{in} = 0 < 1 \dots\dots\dots 1$$

2. $X_1=1, X_2=0$

$$Y_{in} = X_1 * w_1 + X_2 * w_2$$

$$Y_{in} = (1) X_1 + (1) X_2$$

$$= (1) (1) + (1) (0)$$

$$\text{So, } Y=1 \text{ as } Y_{in} = 1 \geq 1 \dots\dots\dots 2$$

3. $X_1=0, X_2=1$

$$Y_{in} = X_1 * w_1 + X_2 * w_2$$

$$Y_{in} = (1) X_1 + (1) X_2$$

$$= (1) (0) + (1) (1)$$

$$\text{So, } Y=1 \text{ as } Y_{in} = 1 \geq 1 \dots\dots\dots 3$$


4. $X_1=X_2=1$

$$Y_{in} = X_1 * w_1 + X_2 * w_2$$

$$Y_{in} = (1) X_1 + (1) X_2$$

$$= (1) (1) + (1) (1)$$

$$\text{So, } y=1 \text{ as } Y_{in} = 2 > 1 \dots\dots\dots 4$$

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Hence, we got output $Y=[0 \ 1 \ 1 \ 1]$

EXPECTED OUTPUT / CALCULATION / RESULT:

Input:

Weights of Neuron:

$w_1=1$

$w_2=1$

Threshold:

$\Theta=1$

Output:

$w_1=1$

$w_2=1$

Threshold:

$\Theta=1$

With Output of Neuron:

0 1 1 1