Perceptron Training Rule AND Gate

AND GATE

A	B	A ^ B
0	0	0
0	1	0
1	0	0
1	1	1

AND Gate - PERCEPTRON TRAINING RULE

w1 = 1.2, w2 = 0.6 Threshold = 1 and Learning Rate n = 0.5

A	B	A ^ B
0	0	0
0	1	0
1	0	0
1	1	1

1. A=0, B=0 and Target = 0
   - *wi.xi = 0*1.2 + 0*0.6 = 0*
   - This is not greater than the threshold of 1, so the output = 0
2. A=0, B=1 and Target = 0
   - *wi.xi = 0*1.2 + 1*0.6 = 0.6*
   - This is not greater than the threshold of 1, so the output = 0

AND Gate - PERCEPTRON TRAINING RULE

w1 = 1.2, w2 = 0.6 Threshold = 1 and Learning Rate n = 0.5

A	B	A ^ B
0	0	0
0	1	0
1	0	0
1	1	1

3. A=1, B=0 and Target = 0
   - *wi.xi = 1*1.2 + 0*0.6 = 1.2*
   - This is greater than the threshold of 1, so the output = 1

$$wi = wi + n(t - o)xi$$

$$w1 = 1.2 + 0.5(0 - 1)1 = 0.7$$

$$w2 = 0.6 + 0.5(0 - 1)0 = 0.6$$

W1 is now 0.7

W2 is now 0.6

Restart with this weights:

AND Gate - PERCEPTRON TRAINING RULE

w1 = 0.7, w2 = 0.6 Threshold = 1 and Learning Rate n = 0.5

A	B	A ^ B
0	0	0
0	1	0
1	0	0
1	1	1

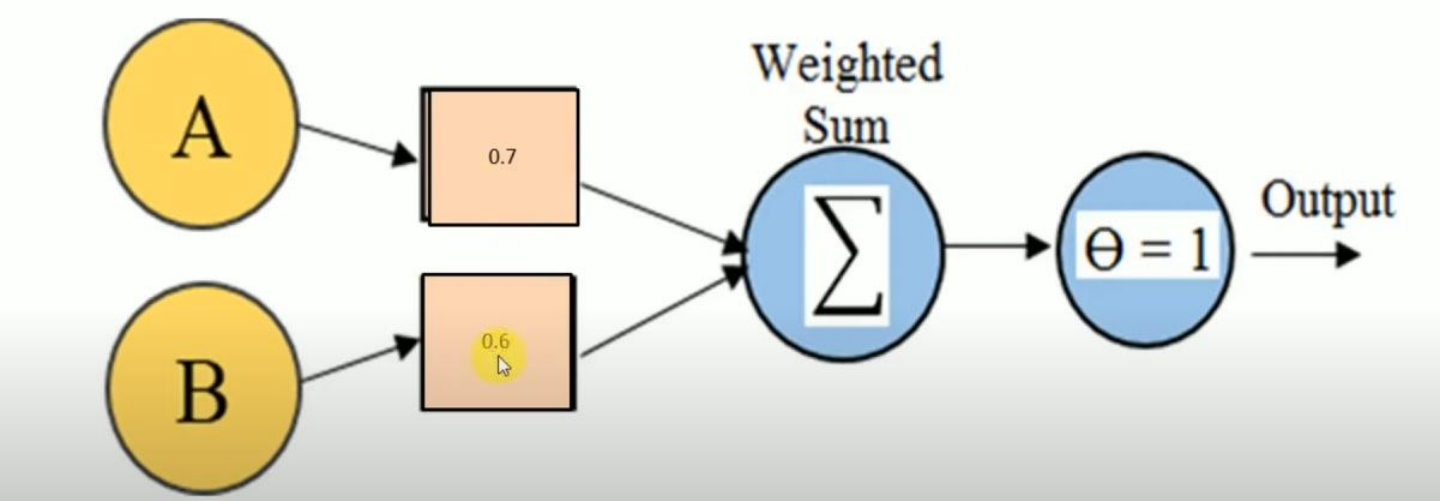
1. A=0, B=0 and Target = 0
   - *wi.xi = 0*0.7 + 0*0.6 = 0*
   - This is not greater than the threshold of 1, so the output = 0
2. A=0, B=1 and Target = 0
   - *wi.xi = 0*0.7 + 1*0.6 = 0.6*
   - This is not greater than the threshold of 1, so the output = 0

AND Gate - PERCEPTRON TRAINING RULE

w1 = 0.7, w2 = 0.6 Threshold = 1 and Learning Rate n = 0.5

A	B	A ^ B
0	0	0
0	1	0
1	0	0
1	1	1

3. A=1, B=0 and Target = 0
   - *wi.xi = 1*0.7 + 0*0.6 = 0.7*
   - This is not greater than the threshold of 1, so the output = 0
4. A=1, B=1 and Target = 1
   - *wi.xi = 1*0.7 + 1*0.6 = 1.3*
   - This is greater than the threshold of 1, so the output = 1



AND GATE Network

2 AND GATE Perceptron Training Rule | Artificial Neural Networks Machine Learning by Mahesh Huddar

Perceptron Training Rule OR Gate

OR GATE

A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

OR Gate - PERCEPTRON TRAINING RULE

w1 = 0.6, w2 = 0.6 Threshold = 1 and Learning Rate n = 0.5

A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

1. A=0, B=0 and Target = 0
   - $wi.xi = 0*0.6 + 0*0.6 = 0$
   - This is not greater than the threshold of 1, so the output = 0

OR Gate - PERCEPTRON TRAINING RULE

w1 = 0.6, w2 = 0.6 Threshold = 1 and Learning Rate n = 0.5

A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

2. A=0, B=1 and Target = 1
   - $wi.xi = 0*0.6 + 1*0.6 = 0.6$
   - This is not greater than the threshold of 1, so the output = 0

$$wi = wi + n(t - o)xi$$

$$w1 = 0.6 + 0.5(1 - 0)0 = 0.6$$

$$w2 = 0.6 + 0.5(1 - 0)1 = 1.1$$

W1 is now 0.6

W2 is now 1.1

Restart

OR Gate - PERCEPTRON TRAINING RULE

w1 = 0.6, w2 = 1.1 Threshold = 1 and Learning Rate n = 0.5

A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

1. A=0, B=0 and Target = 0
   - $wi.xi = 0*0.6 + 0*1.1 = 0$
   - This is not greater than the threshold of 1, so the output = 0
2. A=0, B=1 and Target = 1
   - $wi.xi = 0*0.6 + 1*1.1 = 1.1$
   - This is greater than the threshold of 1, so the output = 1

OR Gate - PERCEPTRON TRAINING RULE

w1 = 0.6, w2 = 1.1 Threshold = 1 and Learning Rate n = 0.5

A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

3. A=1, B=0 and Target = 1
   - $wi.xi = 1*0.6 + 0*1.1 = 0.6$
   - This is not greater than the threshold of 1, so the output = 0

$$wi = wi + n(t - o)xi$$

$$w1 = 0.6 + 0.5(1 - 0)1 = 1.1$$

$$w2 = 1.1 + 0.5(1 - 0)0 = 1.1$$

W1 is now 1.1

W2 is now 1.1

Restart

OR Gate - PERCEPTRON TRAINING RULE

w1 = 1.1, w2 = 1.1 Threshold = 1 and Learning Rate n = 0.5

A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

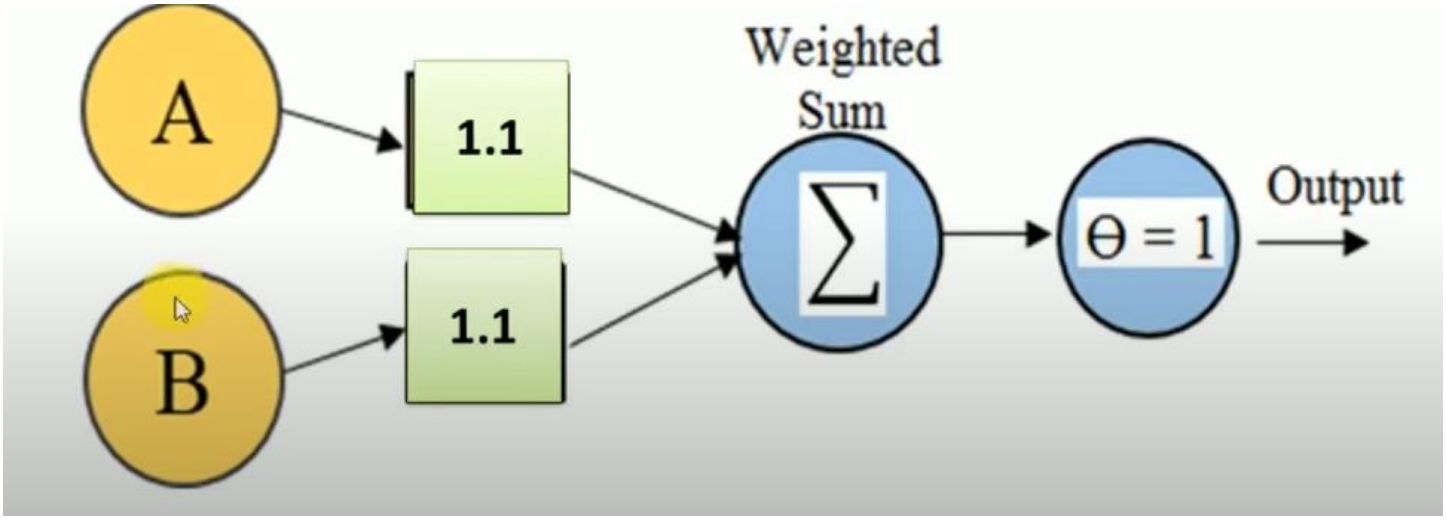
1. A=0, B=0 and Target = 0
   - *wi.xi = 0*1.1 + 0*1.1 = 0*
   - This is not greater than the threshold of 1, so the output = 0
2. A=0, B=1 and Target = 1
   - *wi.xi = 0*1.1 + 1*1.1 = 1.1*
   - This is greater than the threshold of 1, so the output = 1

OR Gate - PERCEPTRON TRAINING RULE

w1 = 1.1, w2 = 1.1 Threshold = 1 and Learning Rate n = 0.5

A	B	Y=A+B
0	0	0
0	1	1
1	0	1
1	1	1

3. A=1, B=0 and Target = 1
   - *wi.xi = 1*1.1 + 0*1.1 = 1.1*
   - This is greater than the threshold of 1, so the output = 1
4. A=1, B=1 and Target = 1
   - *wi.xi = 1*1.1 + 1*1.1 = 2.2*
   - This is greater than the threshold of 1, so the output = 1


A
B
1.1
1.1
Weighted
Sum
∑
Θ = 1
Output