|  |  |  |
| --- | --- | --- |
| **X1** | **X2** | **XOR** |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

***XOR GATE WITH PERCEPTRON***

*wo* + < 0

*wo* + ≥ 0

*wo* + ≥ 0

*wo* + ≤ 0

1. *w0*+ *w1* . 0 + *w2*. 0 < 0 => *w0* < 0
2. *w0*+ *w1* . 0 + *w2*. 1 ≥ 0 => *w0* ≥ *-w2*
3. *w0*+ *w1* . 1 + *w2*. 0 ≥ 0 => *w0* ≥ *-w1*
4. *w0*+ *w1* . 1 + *w2*. 1 ≥ 0 => *w0* ≤ *-w2 - w*1

Due to the inconsistency in the values of *w0* as seen from the equations II and III we can concur that mathematically the XOR gate isn’t linearly separable.

**Graphical Interpretation**

The line is formed by joining co-ordinates (0,1) and (1,0) and on either side of the line the graph has values ≤ 0 and just on the line itself the values are ≥ 0.

Thus, graphically XOR gate isn’t linearly separable.