

Introduction to Machine Learning

Justification report Assignment 8

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Question : Explaining network testing.

Dataset : Logics were used as a training data.

Inputs		Output
A	B	X
0	0	1
0	1	0
1	0	0
1	1	1

Verification:

1. For verification test data which varied slightly from the boolean values 0 and 1 was used. This is done as neural networks can identify data with slight variation from the absolute values.
2. Also as the values used for training were absolute boolean values, this data overfits our model.
3. The values for 0 were like 0.1, 0.3, -0.3, -0.1 and values for 1 were like 1.1, 1.3, 1.4, -0.7, -0.9, -0.8 etc.

Analysis:

Technique	Alpha	Epochs	Accuracy (in %)
XNOR	0.05	10000	100%

Model Output:

```
[[0.96800844]  
 [0.96930975]  
 [0.02602556]  
 [0.07319617]]
```

Actual Answer

```
[[1.]  
 [1.]  
 [0.]  
 [0.]]
```

Technique	Alpha	Epochs	Accuracy (in %)
XNOR	0.5	1000	100%

Model Output:

```
[[0.96317409]  
 [0.96646759]]
```

[0.11888092]
[0.19204825]]

Actual Answer

[[1.]
[1.]
[0.]
[0.]]

As can be seen from the outputs, on using different values of the inputs and different training parameters, we are getting 100% accuracy. The model is thus verified to have implemented the XNOR gate.