ocqkuwmyd

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0.1 ML Lab Assignment 11

0.2 Forward NeuralNetwork

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Importing Required Libraries

```python
[2]: import numpy as np
     import matplotlib.pyplot as plt
```

```python
[3]: X = np.array([[6,2,3,1],[4,8,4,2],[5,6,3,3]])
     X
```

```
[3]: array([[6, 2, 3, 1],
            [4, 8, 4, 2],
            [5, 6, 3, 3]])
```

```python
[4]: X.shape
```

```
[4]: (3, 4)
```

```python
[5]: X = X.T
     X
```

```
[5]: array([[6, 4, 5],
            [2, 8, 6],
            [3, 4, 3],
            [1, 2, 3]])
```

```python
[6]: y = np.array([[1],[1],[0]])
     y = y.T
     y
```

```
[6]: array([[1, 1, 0]])
```

Model Architecture

```python
[7]: input_layer_neurons = X.shape[0]
     hidden_layer_neurons = 3
```

```
output_neuron = 1
```

[8]:
```
w_ih = np.random.uniform(size=(input_layer_neurons,hidden_layer_neurons))

w_ho = np.random.uniform(size=(hidden_layer_neurons,output_neuron))
```

[9]:
```
w_ih.shape, w_ho.shape
```

[9]: ((4, 3), (3, 1))

[10]:
```
def sigmoid(x):
    return 1/(1+np.exp(-x))
```

[11]:
```
hidden_layer_input = np.dot(w_ih.T, X)
hidden_layer_activations = sigmoid(hidden_layer_input)
hidden_layer_activations.shape
```

[11]: (3, 3)

[12]:
```
output_layer_input = np.dot(w_ho.T, hidden_layer_activations)
output = sigmoid(output_layer_input)
output.shape
```

[12]: (1, 3)

[13]:
```
output
```

[13]: array([[0.84675068, 0.84695771, 0.84723442]])

1 Error

[16]:
```
error = np.square(y-output)/2
error
```

[16]: array([[0.01174268, 0.01171097, 0.35890308]])