EE 6973: MACHINE LEARNING WITH BIG DATA ANALYTICS

ASSIGNMENT 2

By

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 # Assignmnet 2:
 # a:

```
import numpy as np
import math
import matplotlib.pyplot as plt
%matplotlib inline
# Input Layer
print ("Input Layer")
X1 = np.array ([2.00,0.26,1]
          )
print ("X1 =", X1)
B1 = np.array ([0,0])
W12 = np.array ([[-0.18, -0.16, -0.03, -.15],
           [0.166, -0.18, 0.01, -0.06],
           [0.14, -0.14, -0.065, -0.06]])
# Calculating weighted input + bias
B2 = np.array ([0])
Y2 = X1.dot(W12) + B2
print ("Weighted input values =", Y2)
#Hidden Layer
print ("Hidden Layer")
A2 =1/(1+np.exp(-Y2))
print ("After applying sigmoid function A2 =", A2)
```

```
Input Layer
('X1 =', array([ 2.  ,  0.26,  1.  ]))
('Weighted input values =', array([-0.17684, -0.5068 , -0.1224 , -0.3
756 ]))
Hidden Layer
('After applying sigmoid function A2 =', array([ 0.45590485,  0.37594
398,  0.46943815,  0.40718856]))
```

```
# Output Layer

print ("Output Layer")

W23 = np.array ([-1.01,-1.99,-0.25,-1.64])

Y3 = A2.dot(W23)

print ("Y3 =", Y3)

A3 =1/(1+np.exp(-Y3))

print ("A3 =", A3)

print ("Error: ",X1[2]-A3)
```

```
 Output Layer
('Y3 =', -1.9937411964582417)
('A3 =', 0.11986162400294022)
('Error: ', 0.8801383759970598)
```

 # Assignmnet 2:

 # b:

```
import numpy as np
import math
import matplotlib.pyplot as plt
%matplotlib inline
# Input Layer
print ("Input Layer")
X1 = np.array ([2.00,0.26,1]
        )

print ("X1 =", X1)
W12 = np.array ([[12.70, -0.20, -0.74, -0.19],
         [-1.49, -8.85, 7.08, -8.29],
         [-19.85, -2.61, -3.59, -2.70]])
print (" Weights from Input layer to Hiddel Layer W12 =")
print (W12)
# Calculation of weighted inputs
Y2 = X1.dot(W12)
print ("Weighted input values =", Y2)
#Hidden Layer
print ("Hidden Layer")
A2 =1/(1+np.exp(-Y2))
print ("After applying Sigmoid function A2 =", A2)
```

```
Input Layer
('X1 =', array([ 2.  ,  0.26,  1.  ]))
 Weights from Input layer to Hiddel Layer W12 =
[[ 12.7   -0.2   -0.74  -0.19]
```

```
 [ -1.49  -8.85   7.08  -8.29]
 [-19.85  -2.61  -3.59  -2.7 ]]
('Weighted input values =', array([ 5.1626, -5.311 , -3.2292, -5.
2354]))
Hidden Layer
('After applying Sigmoid function A2 =', array([ 0.99430582,  0.0
0491273,  0.03808154,  0.00529649]))
```

```
# Output Layer

print ("Output Layer")

W23 = np.array ([-1.01,-1.99,-0.25,-1.64])

Y3 = A2.dot(W23)

print ("Y3 =", Y3)

A3 =1/(1+np.exp(-Y3))

print ("A3 =", A3)

print ("Error: ",X1[2]-A3)
```

```
 Output Layer
('Y3 =', -1.032231848079229)
('A3 =', 0.26265164271181696)
('Error: ', 0.73734835728818304)
```