

IE 345 - K “Introduction to Deep Learning: Fundamentals Concepts”

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Artificial Neural Network

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In [1]: import numpy as np

x = np.array([[0, 0, 1],[0, 1, 1],[1, 0, 1],[1, 1, 1]])
y = np.array([[0, 1, 1, 0]]).T
```

```
In [2]: syn0 = 2 * np.random.random((3, 4)) - 1
print('syn0 ', syn0)
syn1 = 2 * np.random.random((4, 1)) - 1
print('syn1 ', syn1)

for j in range(60000):
    l1 = 1/(1+np.exp(-np.dot(x, syn0)))
    l2 = 1/(1+np.exp(-np.dot(l1, syn1)))
    l2_delta = (y - l2) * (l2*(1 - l2))
    l1_delta = l2_delta.dot(syn1.T) * (l1*(1 - l1))
    syn1 += l1.T.dot(l2_delta)
    syn0 += x.T.dot(l1_delta)

syn0 [[ 0.79355961 -0.67929603 -0.41094768  0.59238071]
 [ 0.97289364 -0.17014102  0.07372848  0.80712291]
 [-0.44967428  0.9464371  0.40040037 -0.38305863]]
syn1 [[ 0.26258853]
 [-0.69370177]
 [ 0.89606077]
 [-0.01058487]]
```

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