151-15-5420_lab3

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In [1]:
```
x1 = [0, 0, 1, 1]
x2 = [0, 1, 0, 1]
y = [0, 0, 0, 1]
w1 = 0.3
w2 = -0.1
n = 0.1
th = 0.2
```

In [6]:
```
for i in range(5):
    print('='*36, 'Epoch:', i+1, '='*36)
    error = []
    temp = []
    for j in range(len(x1)):
        y_pred =x1[j] * w1 + x2[j] * w2
        if y_pred < th:
            y_pred = 0
        else:
            y_pred = 1

        cost=y[j]-y_pred
        temp.append(y_pred)
        error.append(cost)
        if temp == y:
            print('Final Result: ')
            print( 'Inputs:', x1[j], x2[j],'Outputs:', y[j], 'Old Weight:', w1_temp, w1
            break
        else:
            w1_temp = w1
            w1 = w1 + n * x1[j] * cost
            w1 = float("{0:.2f}".format(w1))
            w2_temp = w2
            w2 = w2 + n * x2[j] * cost
            w2 = float("{0:.2f}".format(w2))
            print( 'Inputs:', x1[j], x2[j],'Outputs:', y[j], 'Old Weight:', w1_temp, w1
```

```
==================================== Epoch: 1 ====================================
Inputs: 0 0 Outputs: 0 Old Weight: 0.3 -0.1 Output:  0 Cost: 0 New Weight: 0.3 -0.1
Inputs: 0 1 Outputs: 0 Old Weight: 0.3 -0.1 Output:  0 Cost: 0 New Weight: 0.3 -0.1
```

```
Inputs: 1 0 Outputs: 0 Old Weight: 0.3 -0.1 Output:  1 Cost: -1 New Weight: 0.2 -0.1
Inputs: 1 1 Outputs: 1 Old Weight: 0.2 -0.1 Output:  0 Cost: 1 New Weight: 0.3 0.0
================================== Epoch: 2 ==================================
Inputs: 0 0 Outputs: 0 Old Weight: 0.3 0.0 Output:  0 Cost: 0 New Weight: 0.3 0.0
Inputs: 0 1 Outputs: 0 Old Weight: 0.3 0.0 Output:  0 Cost: 0 New Weight: 0.3 0.0
Inputs: 1 0 Outputs: 0 Old Weight: 0.3 0.0 Output:  1 Cost: -1 New Weight: 0.2 0.0
Inputs: 1 1 Outputs: 1 Old Weight: 0.2 0.0 Output:  1 Cost: 0 New Weight: 0.2 0.0
================================== Epoch: 3 ==================================
Inputs: 0 0 Outputs: 0 Old Weight: 0.2 0.0 Output:  0 Cost: 0 New Weight: 0.2 0.0
Inputs: 0 1 Outputs: 0 Old Weight: 0.2 0.0 Output:  0 Cost: 0 New Weight: 0.2 0.0
Inputs: 1 0 Outputs: 0 Old Weight: 0.2 0.0 Output:  1 Cost: -1 New Weight: 0.1 0.0
Inputs: 1 1 Outputs: 1 Old Weight: 0.1 0.0 Output:  0 Cost: 1 New Weight: 0.2 0.1
================================== Epoch: 4 ==================================
Inputs: 0 0 Outputs: 0 Old Weight: 0.2 0.1 Output:  0 Cost: 0 New Weight: 0.2 0.1
Inputs: 0 1 Outputs: 0 Old Weight: 0.2 0.1 Output:  0 Cost: 0 New Weight: 0.2 0.1
Inputs: 1 0 Outputs: 0 Old Weight: 0.2 0.1 Output:  1 Cost: -1 New Weight: 0.1 0.1
Inputs: 1 1 Outputs: 1 Old Weight: 0.1 0.1 Output:  1 Cost: 0 New Weight: 0.1 0.1
================================== Epoch: 5 ==================================
Inputs: 0 0 Outputs: 0 Old Weight: 0.1 0.1 Output:  0 Cost: 0 New Weight: 0.1 0.1
Inputs: 0 1 Outputs: 0 Old Weight: 0.1 0.1 Output:  0 Cost: 0 New Weight: 0.1 0.1
Inputs: 1 0 Outputs: 0 Old Weight: 0.1 0.1 Output:  0 Cost: 0 New Weight: 0.1 0.1
Final Result:
Inputs: 1 1 Outputs: 1 Old Weight: 0.1 0.1 Output:  1 Cost: 0 New Weight: 0.1 0.1
```