

In [3]: *#Lab 3 Task*

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In [4]: x1 = [0, 0, 1, 1]
        x2 = [0, 1, 0, 1]
        y = [0, 0, 0, 1]
        m1 = 0.3
        m2 = -0.1
        n = 0.1
        th = 0.2
```

```
In [14]: for i in range(5):
        print('='*36, 'Epoch:', i+1, '='*36)
        error = []
        temp = []
        for j in range(len(x1)):
            y_pred = x1[j] * m1 + x2[j] * m2

            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('Inputs:', x1[j], x2[j], 'Result:', y[j], 'Old Weight:', m1_temp,
                    cost, 'New Weight:', m1, m2)
                break
        else:
            m1_temp = m1
            m1 = m1 + n * x1[j] * cost
            m1 = float("{0:.2f}".format(m1))
            m2_temp = m2
            m2 = m2 + n * x2[j] * cost
            m2 = float("{0:.2f}".format(m2))
        print('Inputs:', x1[j], x2[j], 'Result:', y[j], 'Old Weight:', m1_temp, m2_temp,
            'New Weight:', m1, m2)
```

```
===== Epoch: 1 =====
===
Inputs: 0 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 0 1 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 1 Result: 1 Old Weight: 0.1 0.1 Output: 1 Cost: 0 New Weight: 0.1 0.
1
===== Epoch: 2 =====
===
Inputs: 0 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 0 1 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 1 Result: 1 Old Weight: 0.1 0.1 Output: 1 Cost: 0 New Weight: 0.1 0.
1
===== Epoch: 3 =====
===
Inputs: 0 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 0 1 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 1 Result: 1 Old Weight: 0.1 0.1 Output: 1 Cost: 0 New Weight: 0.1 0.
1
===== Epoch: 4 =====
===
Inputs: 0 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 0 1 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 1 Result: 1 Old Weight: 0.1 0.1 Output: 1 Cost: 0 New Weight: 0.1 0.
1
===== Epoch: 5 =====
===
Inputs: 0 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 0 1 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 0 Result: 0 Old Weight: 0.1 0.1 Output: 0 Cost: 0 New Weight: 0.1 0.
1
Inputs: 1 1 Result: 1 Old Weight: 0.1 0.1 Output: 1 Cost: 0 New Weight: 0.1 0.
1
```

In []:

