In [3]:
```
#ID: 151-15-5131
#Rakibul Islam
```

In [4]:
```
x1 = [0, 0, 1, 1] #dataset
x2 = [0, 1, 0, 1]  #dataset
y = [0, 0, 0, 1]  #result of and operation dataset
m1 = 0.3 #Let's Assume and m1=θ_1
m2 = -0.1 #Let's Assume  and m2= θ_2
n = 0.1 # Learning Rate
th = 0.2 # Threshold
```

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 # Calculating the Y prediction value : h_

        if y_pred < th:   # If the predicted value is lesser than the threshold Y
            y_pred = 0
        else:             #If the predicted value is greater than the threshold Y
            y_pred = 1
        cost=y[j]-y_pred # Cost Function J(θ_1, θ_2) = actual value – predicted v
        temp.append(y_pred)
        error.append(cost)
        if temp == y:
# print final result of m1 and m2 where  m1=θ_1 and m2= θ_2
            print( 'Inputs:', x1[j], x2[j],'Result:', y[j], 'Old Weight:', m1_tem
                  cost, 'New Weight:', m1, m2)
            break
        else:
            m1_temp = m1
            m1 = m1 + n * x1[j] * cost
            m1 = float("{0:.2f}".format(m1))
            m2_temp = w2
            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, m
              '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 [ ]: