

# AIM

- Write a program in Python to implement Adaline Neural Network.

In [7]:

```
import numpy as np
x1 = np.array([[1,1,-1,-1]])
x2 = np.array([[1,-1,1,-1]])
t = np.array([[1],[1],[1],[-1]])
w11 = 0.1
w21 = 0.1
w01 = 0.1
alpha = 0.1

i = 0
bias = 1

w1 = np.zeros((4,1))
w2 = np.zeros((4,1))
w0 = np.zeros((4,1))
Yin = np.zeros((4,1))
y = np.zeros((4,1))
error = np.zeros((4,1))

count = 0
while(count!=3):
    i=0
    if(count!=0):
        w11=w1[3]
        w21=w2[3]
        w01=w0[3]
    while(i!=4):
        if(i==0):
            Yin[i] = (x1[0][i]*w11)+(x2[0][i]*w21)+(bias*w01)
            y[i] = t[i][0]-Yin[i]
            w1[i]=w11+(alpha*y[i]*x1[0][i])
            w2[i]=w21+(alpha*y[i]*x2[0][i])
            w0[i]=w01+(alpha*y[i]*bias)
        else:
            if(i>0 & i<=4):
                Yin[i]= (x1[0][i]*w1[i-1])+(x2[0][i]*w2[i-1])+(bias*w0[i-1])
                y[i]=t[i][0]-Yin[i]
                w1[i]=w1[i-1]+(alpha*y[i]*x1[0][i])
                w2[i]=w2[i-1]+(alpha*y[i]*x2[0][i])
                w0[i]=w0[i-1]+(alpha*y[i]*bias)

            error[i]=(y[i])**2

        i=i+1
    print('EPOCH', (count+1), ':')
    print('\n')
    print('w1:',w1)
    print('\n')
    print('w2:',w2)
    print('\n')
    print('w0:',w0)
    print('\n')
    print('error',error)
    print('\n\n')
    count=count+1
```

EPOCH 1 :

```
w1: [[0.17   ]
      [0.253  ]
      [0.1617 ]
```

```
[0.26213]]

w2: [[0.17    ]
      [0.087   ]
      [0.1783  ]
      [0.27873]]

w0: [[0.17    ]
      [0.253   ]
      [0.3443  ]
      [0.24387]]

error [[0.          ]
        [0.6889     ]
        [0.833569   ]
        [1.00861849]]
```

EPOCH 2 :

```
w1: [[0.283657 ]
      [0.3587773 ]
      [0.27946497]
      [0.36305653]]

w2: [[0.300257  ]
      [0.2251367 ]
      [0.30444903]
      [0.38804059]]

w0: [[0.265397  ]
      [0.3405173 ]
      [0.41982963]
      [0.33623807]]

error [[0.          ]
        [0.56430595]
        [0.62904457]
        [0.69875494]]
```

EPOCH 3 :

```
w1: [[0.35432301]
      [0.42407096]
      [0.35234503]
      [0.42587987]]

w2: [[0.37930707]
      [0.30955912]
      [0.38128506]
      [0.45481989]]

w0: [[0.32750455]
      [0.3972525  ]
      [0.46897843]
      [0.3954436  ]]
```

```
error [[0.          ]
```

```
[0.48647767]  
[0.51446097]  
[0.54073719]]
```

In [ ]: