**PROGRAM-16**

**Aim:**Write a program in Python to implement Madaline Neural Network.

**Code:**

import numpy as np  
x=np.array([[1,1],[1,-1],[-1,1],[-1,-1]])  
t=np.array([[1],[1],[1],[-1]])  
w=np.array([[0],[0]])  
b=0  
theta=float(input("enter new theta"))  
alpha=float(input("enter new alpha"))  
yin=np.zeros(shape=(4,1))  
y=np.zeros(shape=(4,1))  
i=0  
found=0  
while(found==0):  
    yin=x[i][0]\*w[0]+x[i][1]\*w[1]  
    yin = yin+b  
    if(yin>theta):  
        y[i] = 1  
    elif(yin<=theta and yin>=-theta):  
        y[i]=0  
    else:  
        y[i]=-1  
    if (y[i]==t[i]):  
        print("NO UPDATION REQUIRED")  
        print(y[i])  
        if(i<3):  
            i=i+1  
        else:  
            i=0  
    else:  
        print("MODEL IS NOT TRAINED")  
        print("The value of output is")  
        print(y)  
         
        w[0]=w[0]+alpha\*x[i][0]\*t[i]  
        w[1]=w[1]+alpha\*x[i][1]\*t[i]  
        b = b+alpha\*t[i]  
        if(i<3):  
            i=i+1  
        else:  
            i=0  
    if(y==t).all():  
        found=1  
print("The final weight matrix is ")  
print(w)  
print("The final output is:")  
print(y)

**OUTPUT:**

