

PROGRAM 21

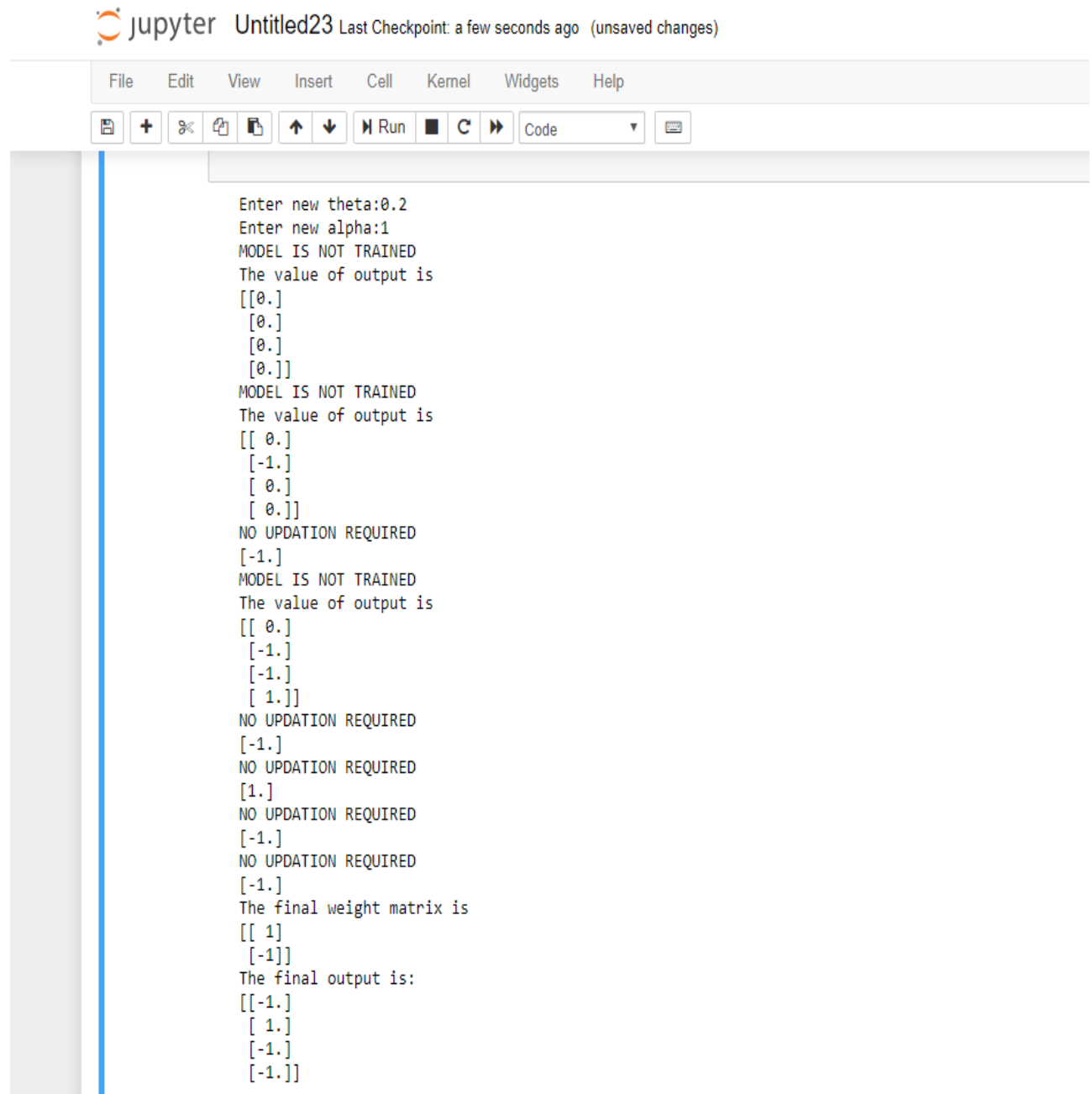
AIM: Write a program in Python to implement single layer perceptron for AND-NOT function.

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)
```

PROGRAM 21

OUTPUT:



The image shows a Jupyter Notebook interface with a single code cell. The notebook is titled 'Untitled23' and has a status bar indicating 'Last Checkpoint: a few seconds ago (unsaved changes)'. The menu bar includes 'File', 'Edit', 'View', 'Insert', 'Cell', 'Kernel', 'Widgets', and 'Help'. The toolbar contains icons for saving, adding cells, undo, redo, running, and other standard Jupyter actions. The code cell contains the following text:

```
Enter new theta:0.2
Enter new alpha:1
MODEL IS NOT TRAINED
The value of output is
[[0.]
 [0.]
 [0.]
 [0.]]
MODEL IS NOT TRAINED
The value of output is
[[ 0.]
 [-1.]
 [ 0.]
 [ 0.]]
NO UPDATION REQUIRED
[-1.]
MODEL IS NOT TRAINED
The value of output is
[[ 0.]
 [-1.]
 [-1.]
 [ 1.]]
NO UPDATION REQUIRED
[-1.]
NO UPDATION REQUIRED
[1.]
NO UPDATION REQUIRED
[-1.]
NO UPDATION REQUIRED
[-1.]
The final weight matrix is
[[ 1]
 [-1]]
The final output is:
[[-1.]
 [ 1.]
 [-1.]
 [-1.]]
```