PROGRAM 8

AIM: Write a program in Python to implement Adaline Neural Network.

CODE:

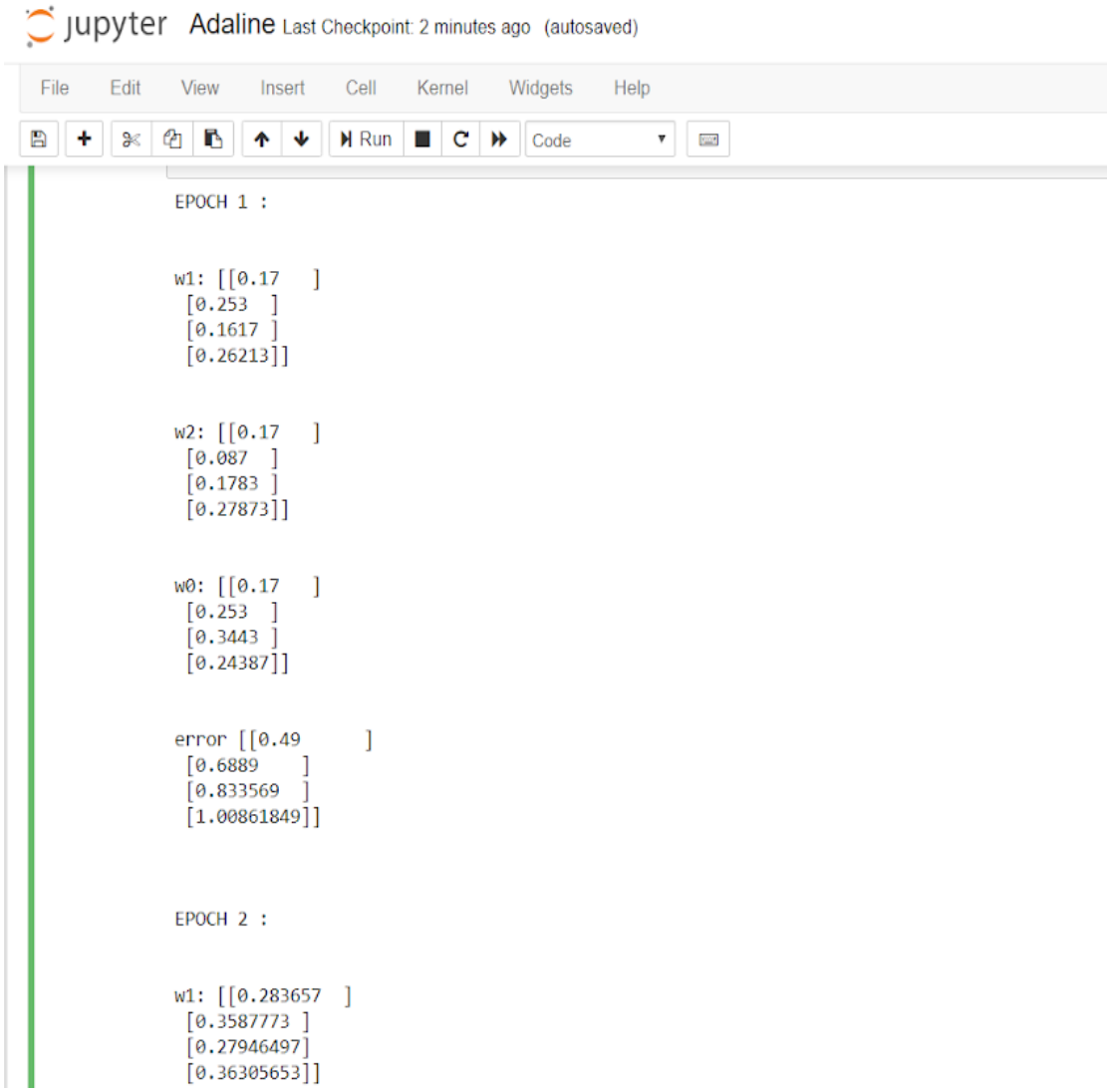
```
Import numpy as np
x1=np.array([[1,1,-1,-1]])
x2=np.array([[1,-1,1,-1]])
t=np.array([[1],[1],[1],[-1]])
w11=0.1
w21=0.1
w01=0.1
alpha=0.1
i=0
bias=1
w1=np.zeros((4,1))
w2=np.zeros((4,1))
w0=np.zeros((4,1))
Yin=np.zeros((4,1))
y=np.zeros((4,1))
error=np.zeros((4,1))
count=0
while(count!=3):
   i=0
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)
```

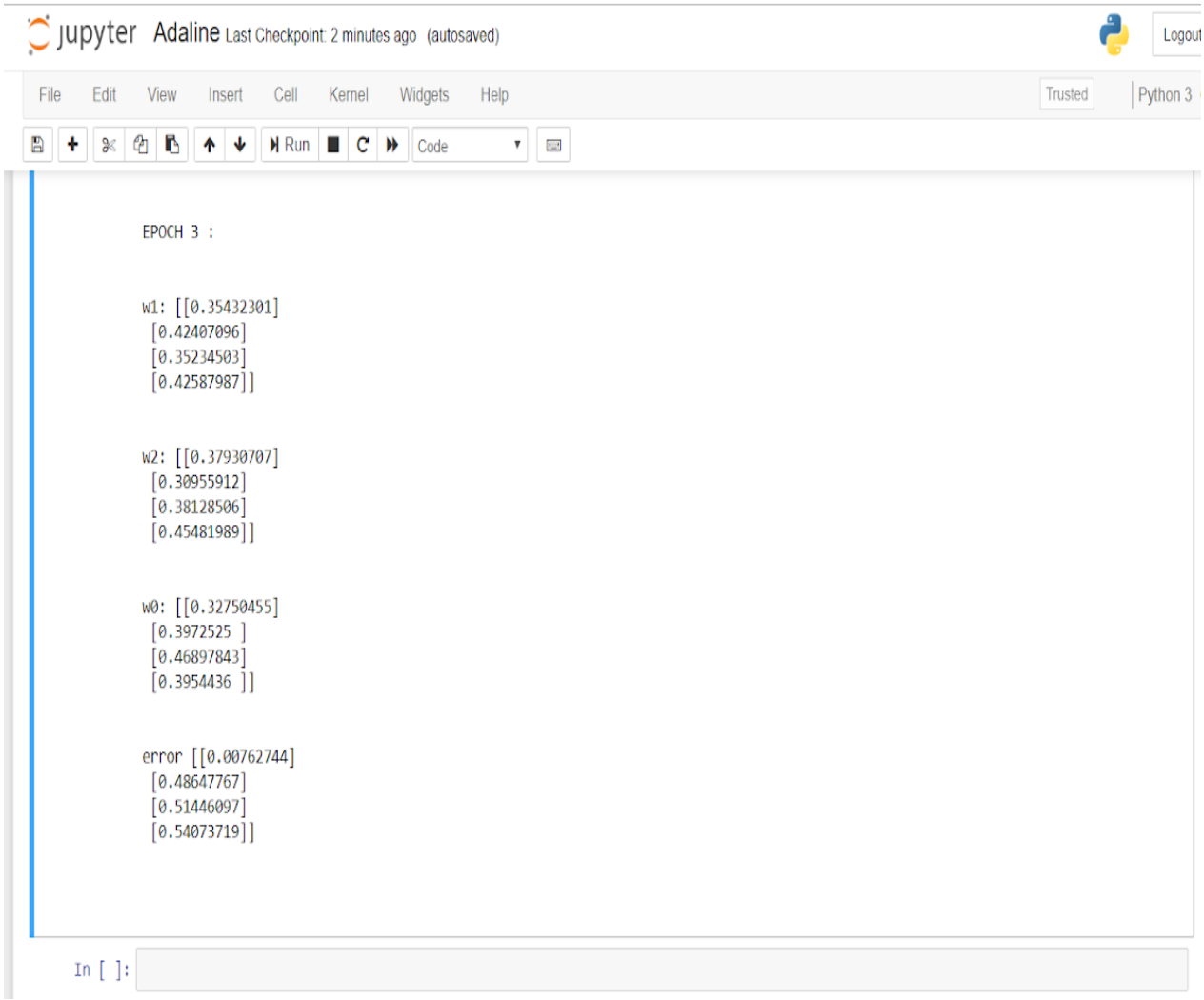
PROGRAM 8

```
print('\n')
print('w0:',w0)
print('\n')
print('error',error)
print('\n\n')
count=count+1
```

OUTPUT:



PROGRAM 8


jupyter Adaline Last Checkpoint: 2 minutes ago (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Trusted
Python 3
Run
Code
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 [[0.00762744]
[0.48647767]
[0.51446097]
[0.54073719]]
In [ ]:

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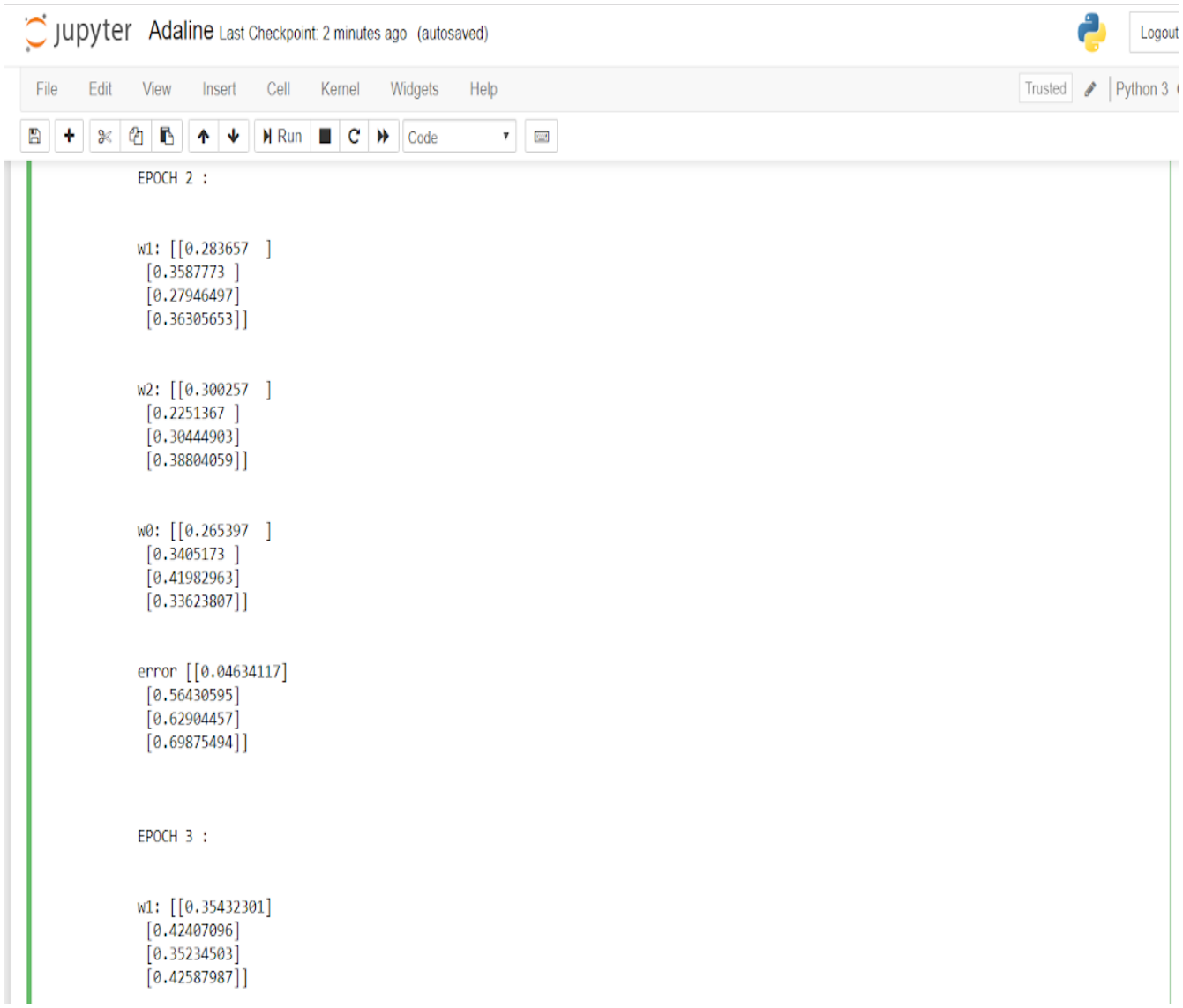
jupyter Adaline Last Checkpoint: 2 minutes ago (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Trusted
Python 3
Run
Code
EPOCH 2 :
w1: [[0.283657]
[0.3587773]
[0.27946497]
[0.36305653]]
w2: [[0.300257]
[0.2251367]
[0.30444903]
[0.38804059]]
w0: [[0.265397]
[0.3405173]
[0.41982963]
[0.33623807]]
error [[0.04634117]
[0.56430595]
[0.62904457]
[0.69875494]]
EPOCH 3 :
w1: [[0.35432301]
[0.42407096]
[0.35234503]
[0.42587987]]