COMPUTATIONAL INTELLIGENCE – ASSIGNMENT 3

AIM:

Implement a Neuro-Fuzzy Inference system using Python, execute the code and get the output.

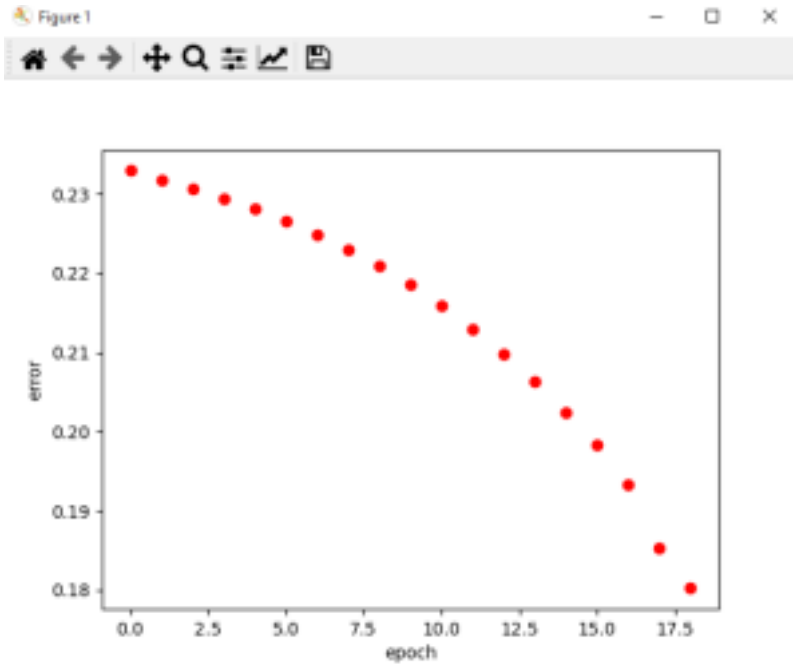
PROGRAM:

```
import anfis

import membership.mfDerivs

import membership.membershipfunction

import numpy

#
numpy.loadtxt('c:\\Python_fiddling\\myProject\\MF\\trainingSet.txt',usecols=[1,2,
3])  ts = numpy.loadtxt("trainingSet.txt", usecols=[1, 2, 3])
X = ts[:, 0:2]

Y = ts[:, 2]

mf = [[['gaussmf', {'mean': 0., 'sigma': 1.}], ['gaussmf', {'mean': -1., 'sigma': 2.}], ['gaussmf', {'mean':
-4.,  'sigma': 10.}], ['gaussmf', {'mean': -7., 'sigma': 7.}]], [['gaussmf', {'mean': 1., 'sigma': 2.}],
['gaussmf',  {'mean': 2., 'sigma': 3.}], ['gaussmf', {'mean': -2., 'sigma': 10.}], ['gaussmf', {'mean': -
10.5, 'sigma': 5.}]]]

mfc = membership.membershipfunction.MemFuncs(mf)

anf = anfis.ANFIS(X, Y, mfc)

anf.trainHybridJangOffLine(epochs=20)

print(round(anf.consequents[-1][0], 7))

print(round(anf.consequents[-2][0], 7))

print(round(anf.fittedValues[9][0], 7))

if round(anf.consequents[-1][0], 7) == -5.275538 and round(anf.consequents[-2][0], 6) == - 1.990703
and  round(anf.fittedValues[9][0], 6) == 0.002249:

print('Test is good') print("Error Plot")

anf.plotErrors()

print("Results Plot")

anf.plotResults()
```

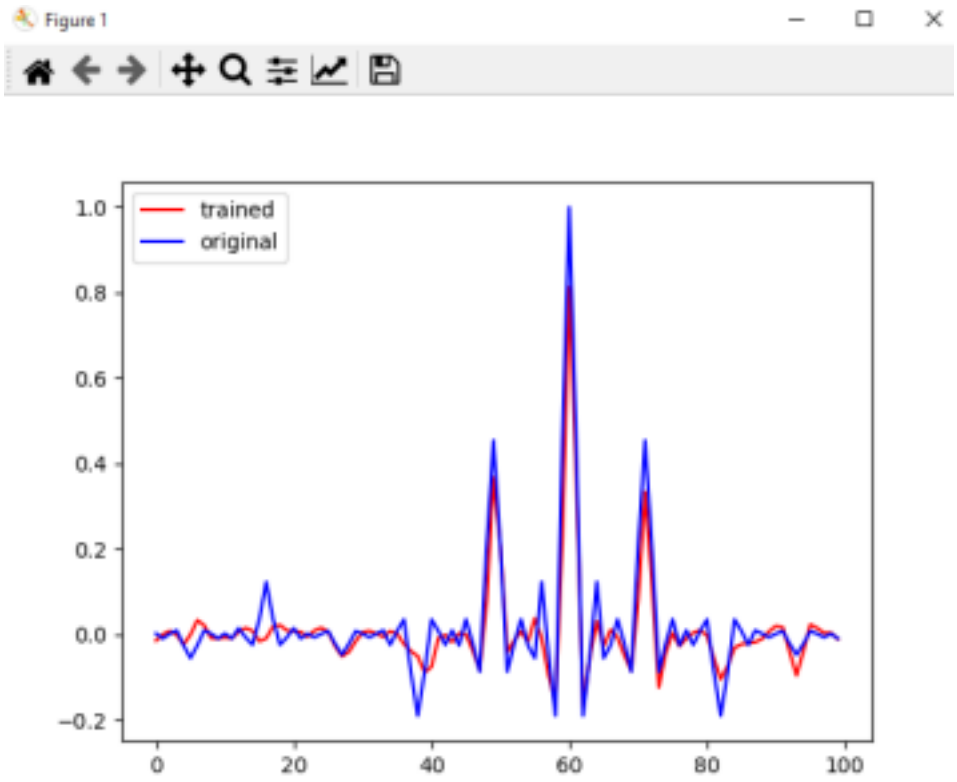
OUTPUT:

```
(base) C:\Users\hp\Desktop\Neuro-Fuzzy-main>python tests.py
current error: 0.23296034910053703
current error: 0.23183046381197941
current error: 0.23066704916256525
current error: 0.22947300226788322
current error: 0.22812866070173965
current error: 0.22661650417951065
current error: 0.22491793575823224
current error: 0.22301366839982864
current error: 0.22088433038067096
current error: 0.21851132183461777
current error: 0.2158778854343336
current error: 0.21297015637005143
current error: 0.2097774334577251
current error: 0.20628948581662387
current error: 0.20248430602942938
current error: 0.19828262288602072
current error: 0.19334729778344675
current error: 0.18530024116521293
current error: 0.1802272777542335
-0.0310883
0.0152347
-0.0088179
Error Plot
Results Plot
```

ERROR PLOT:



RESULTS PLOT:



RESULT:

Thus, implementation of a Neuro-Fuzzy Inference system using Python is executed and the code is verified.