Computational Intelligence – Assignment 3

Aim:

To Implement a Neuro-Fuzzy Inference system using Python, execute the code and upload theoutput snapshot in the Moodle with the code.

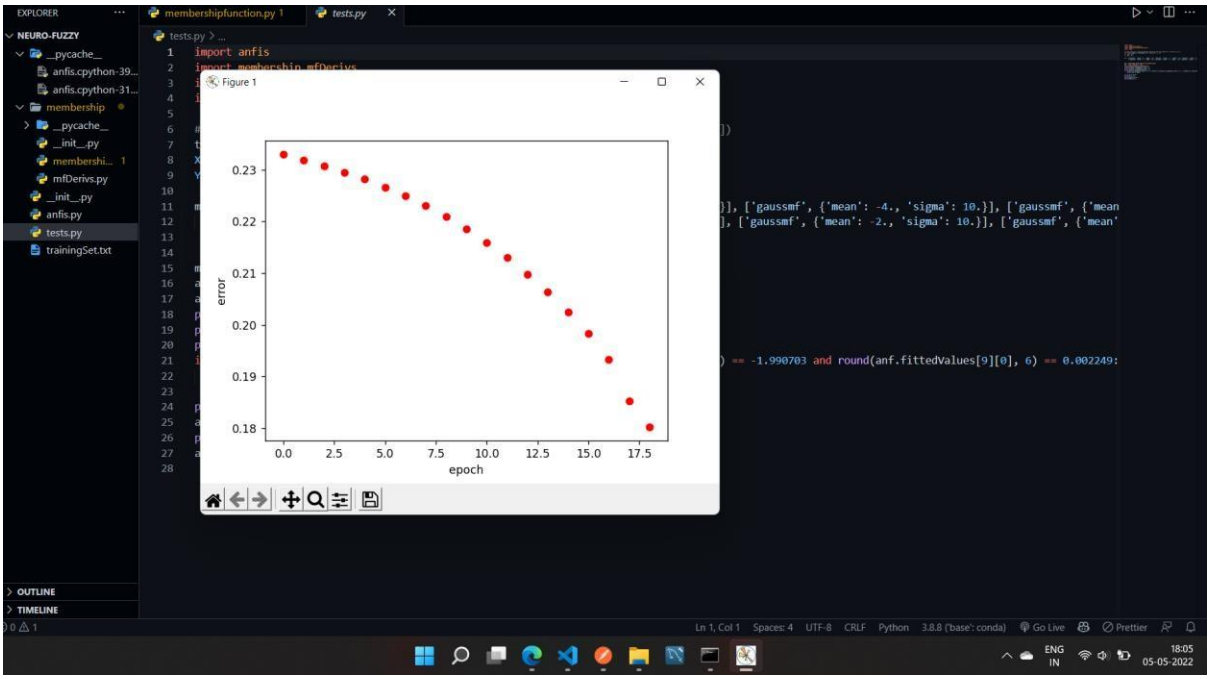
Program:

```
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()
```

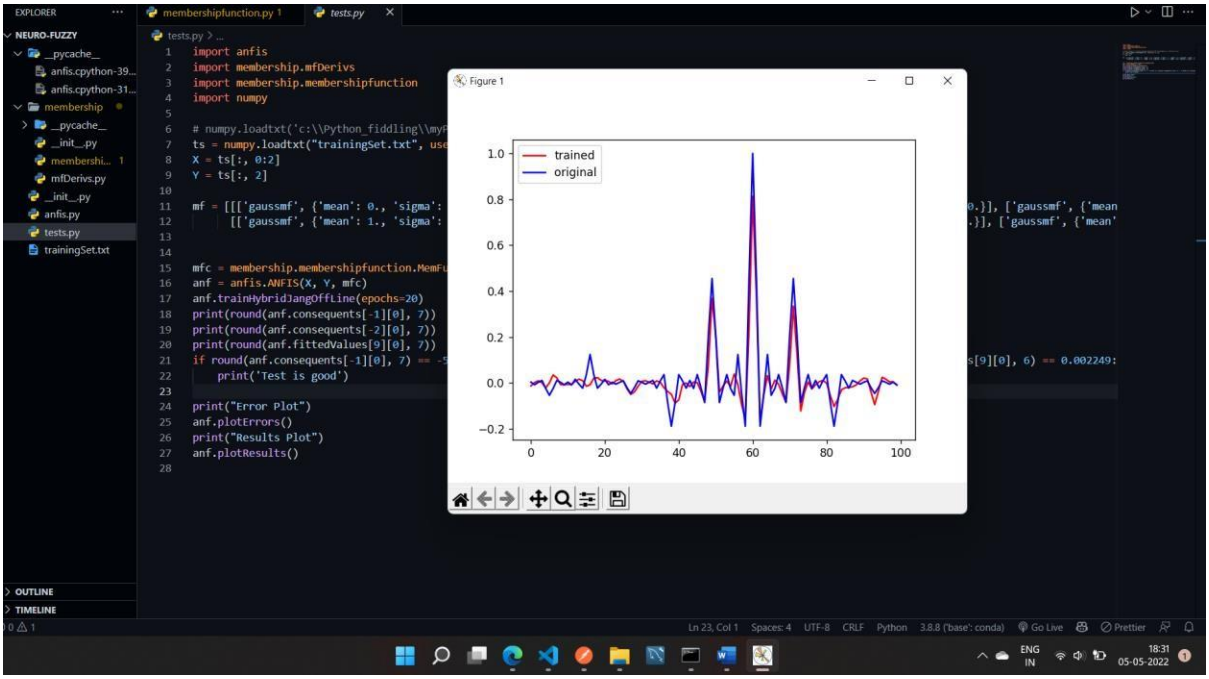
Output:

Error Plotted Graph

```
current error: 0.23296034910052635
current error: 0.231830463811818
current error: 0.23066704916231817
current error: 0.22947300226768125
current error: 0.22812866070176968
current error: 0.22661650417942178
current error: 0.22491793575814126
current error: 0.22301366839971112
current error: 0.22088433038073052
current error: 0.21851132183471828
current error: 0.2158778854344372
current error: 0.2129701563699756
current error: 0.20977743345759287
current error: 0.20628948581660947
current error: 0.20248430602957626
current error: 0.1982826228858566
current error: 0.1933472977835748
current error: 0.18530024116495003
current error: 0.18022727775340094
-0.0310883
0.0152347
-0.0088179
Error Plot
Results Plot
```



Result Plotted Graph



Result:

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