Computational Intelligence - Unit 3 Assignment

AIM

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

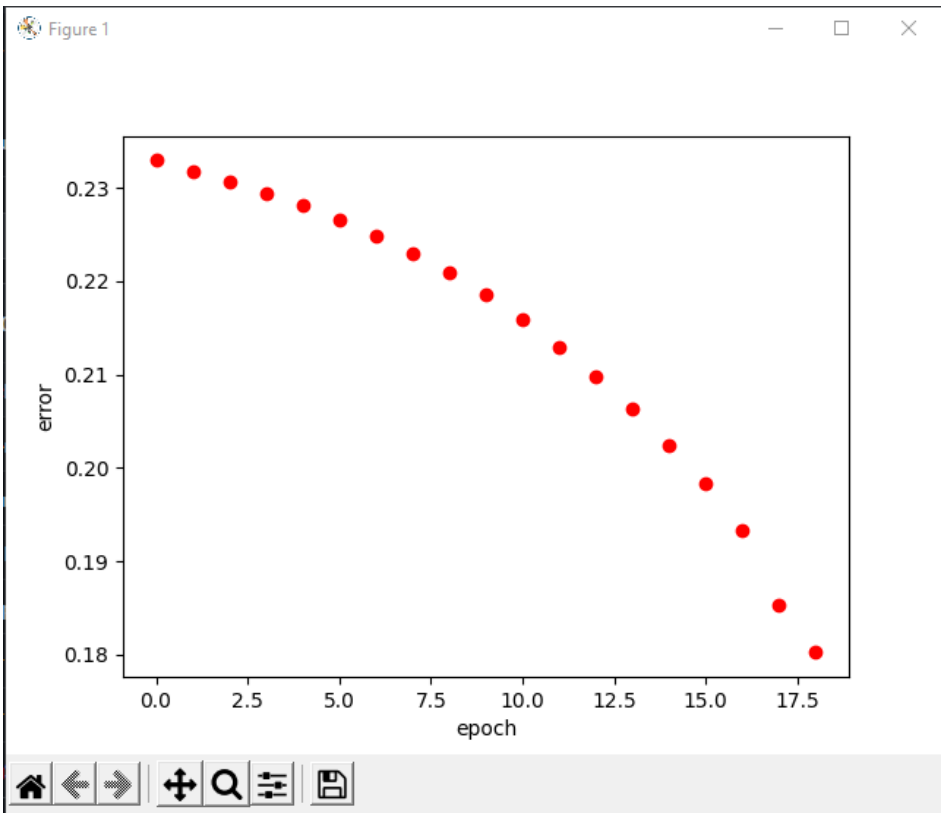
PROGRAM CODE

```
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()
```

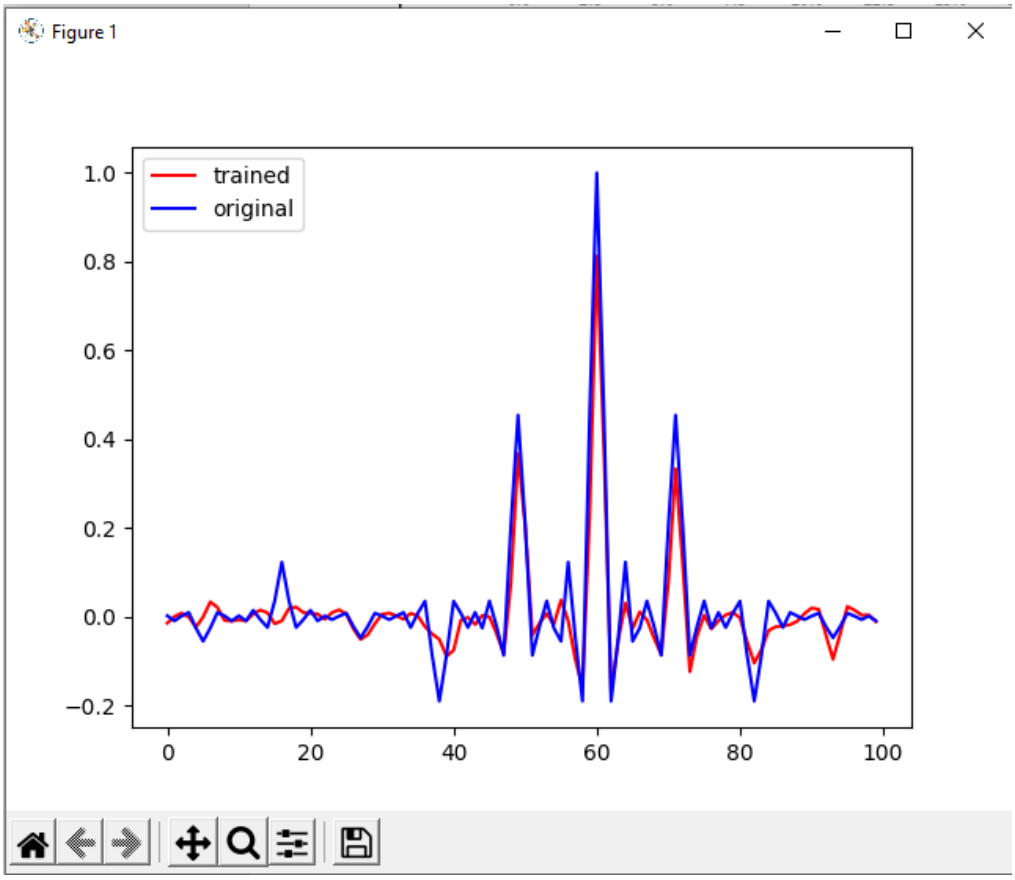
OUTPUT

```
➜raksha@Raksha  /mnt/c/Users/Girirajar/Documents/BDA/Neuro-Fuzzy-Inference-System git:(main) X /bin/python3 /mnt/c/Users/Gir
rajar/Documents/BDA/Neuro-Fuzzy-Inference-System/tests.py
current error: 0.2329603491004393
current error: 0.23183046381178207
current error: 0.23066704916244768
current error: 0.22947300226783454
current error: 0.22812866070187202
current error: 0.22661650417959403
current error: 0.22491793575824942
current error: 0.22301366839996203
current error: 0.22088433038074567
current error: 0.21587788543447017
current error: 0.21297015637009073
current error: 0.2097774334576513
current error: 0.20628948581655618
current error: 0.20248430602940182
current error: 0.19828262288582338
current error: 0.1933472977835141
current error: 0.18530024116501637
current error: 0.18022727775133016
-0.0310883
0.0152347
-0.0088179
Error Plot
Results Plot
➜raksha@Raksha  /mnt/c/Users/Girirajar/Documents/BDA/Neuro-Fuzzy-Inference-System git:(main) X
```

Error Plotted Graph



Result Plotted Graph



RESULT

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

GITHUB LINK

https://github.com/Raksha001/Neuro-Fuzzy-Inference-System