Computational Intelligence
Unit 3 Assignment

Implement Neuro-Fuzzy Inference system using Python

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

```python
import anfis
import membership.mfDerivs
import membership.membershipfunction
import numpy

ts = numpy.loadtxt("trainingSet.txt",
usecols=[1,2,3])#numpy.loadtxt('c:\\Python_fiddling\\myProject\\MF\\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],6))
print(round(anf.consequents[-2][0],6))
print(round(anf.fittedValues[9][0],6))
if round(anf.consequents[-1][0],6) == -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("Plotting errors")
anf.plotErrors()
print("Plotting results")
anf.plotResults()
```

OUTPUT:

```
PS D:\CI\anfis> pip install scikit-fuzzy
Collecting scikit-fuzzy
  Downloading scikit-fuzzy-0.4.2.tar.gz (993 kB)
current error: 0.26999511122096437
current error: 0.2674894301665315
current error: 0.26627301732834535
current error: 0.26617802150667086
current error: 0.26727702929233405
current error: 0.2697135932108857
current error: 0.2738759650428527
current error: 0.28074650385473404
0.103978
0.013947
0.001249
Plotting errors
Plotting results
```

Error Plotted Graph
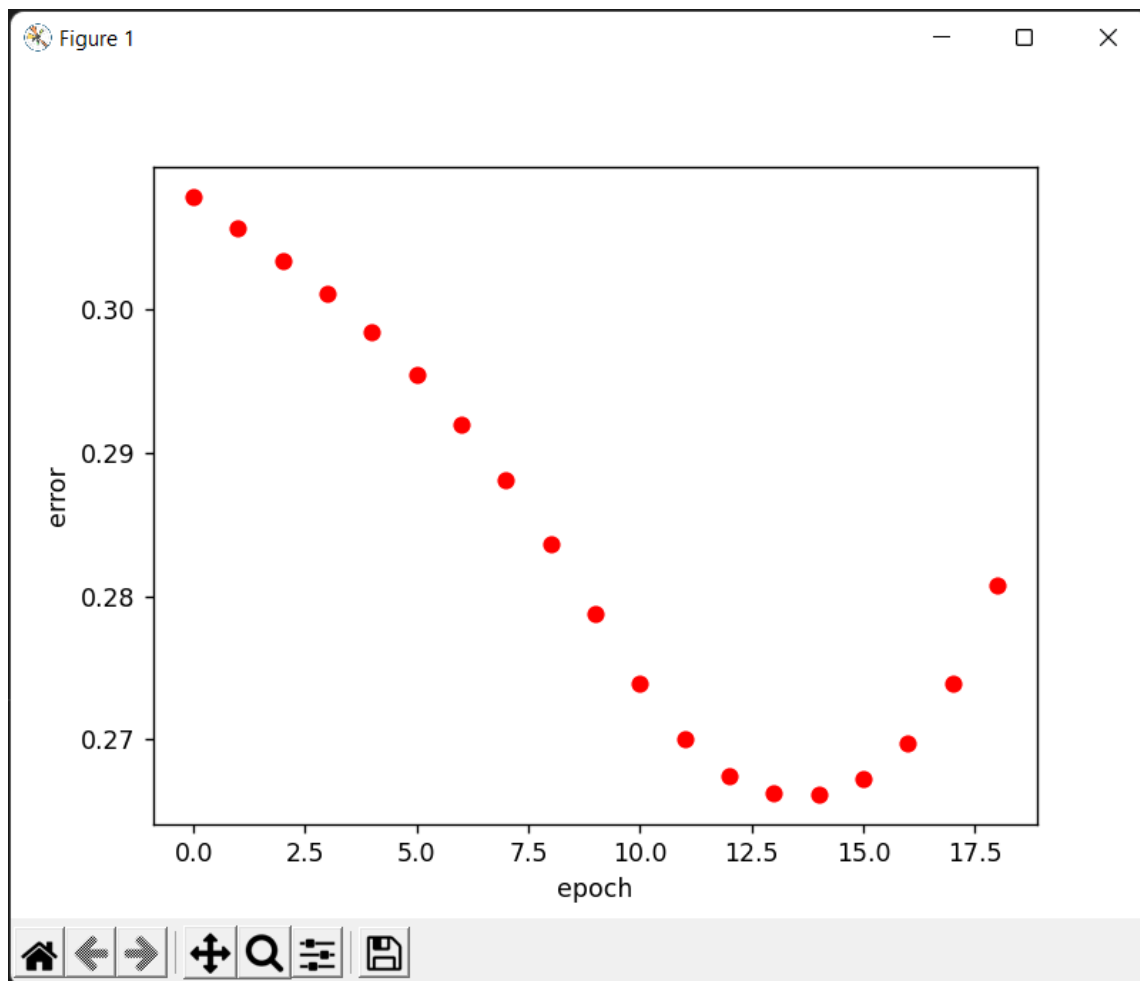
Result Plotted Graph
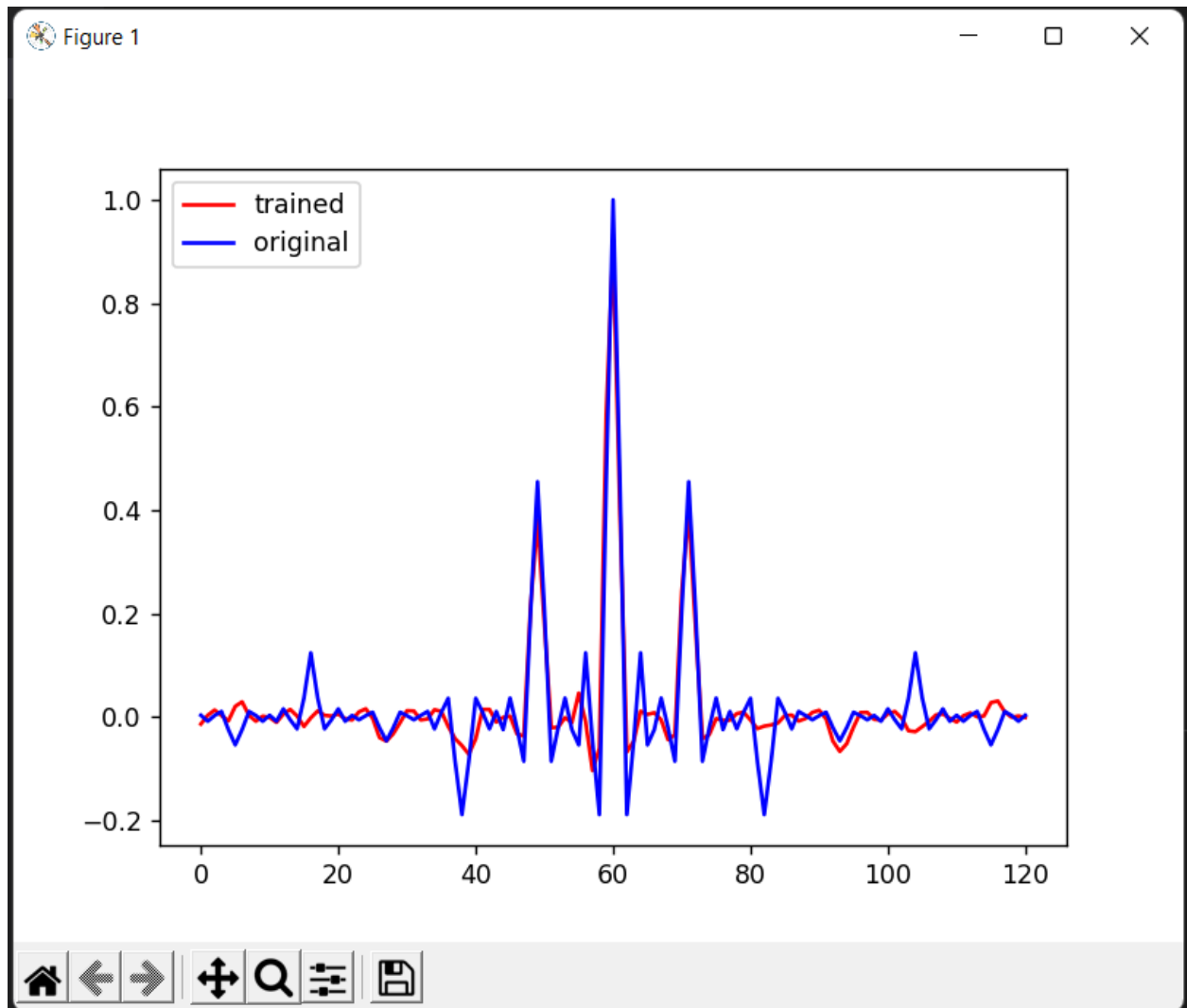
RESULT

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

GITHUB LINK: https://github.com/veroni-d20/neuro-fuzzy-system-implementation

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