Assignment 3 - Computational Intelligence

Implementation of neuro fuzzy inference system

Aim:

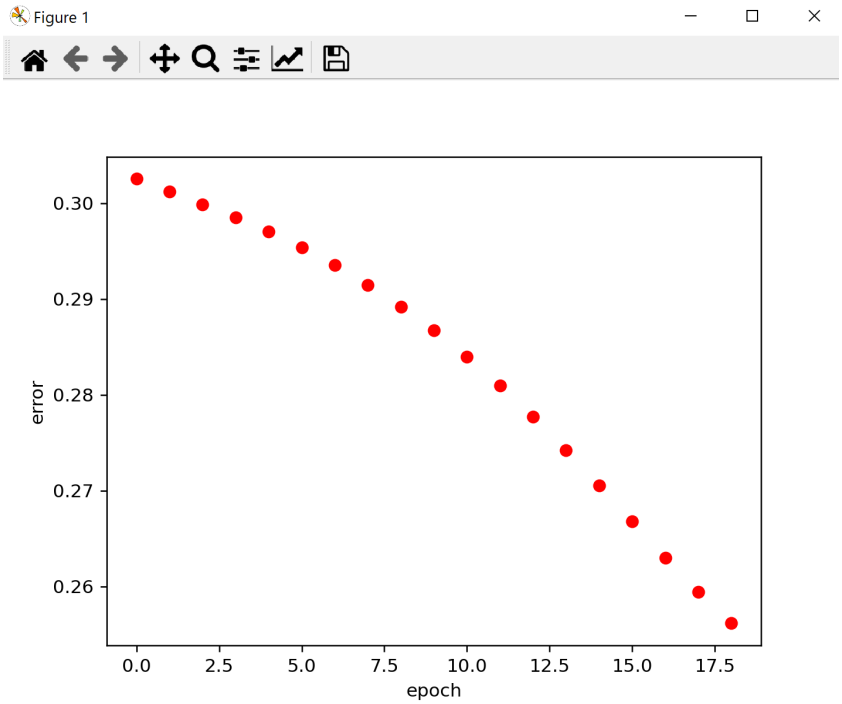
To Implement Neuro Fuzzy Inference system using Python.

Program:

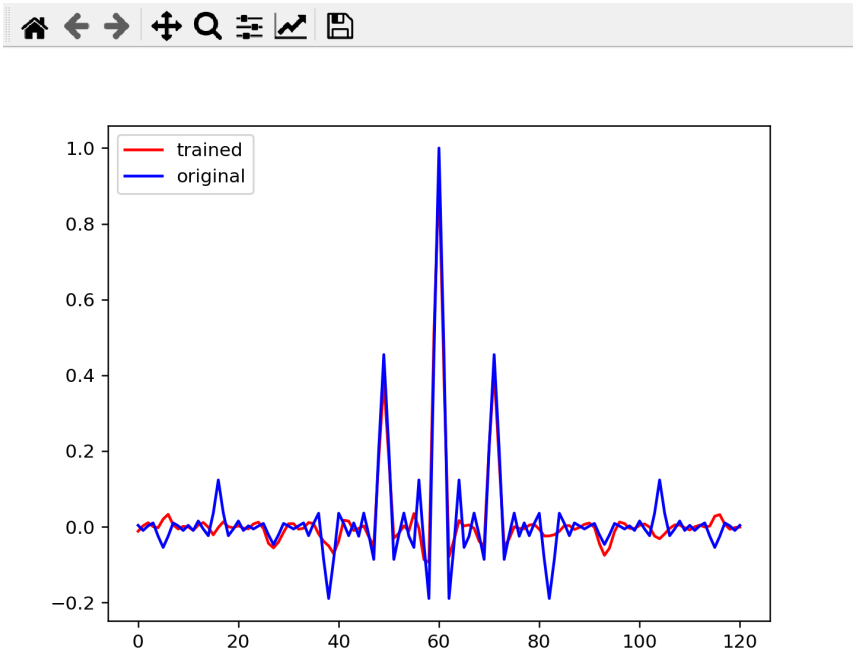
```
import anfis
import membership.mfDerivs
import membership.membershipfunction
import numpy

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],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:

Errors Plotted Graph



Result Graph



Console Output

```
PS C:\Projects\CollegeAssignments\neuro-fuzzy-inference-system> py tests.py
current error: 0.3025491368472857
current error: 0.30122896217525397
current error: 0.2998935510620827
current error: 0.29854387789166364
current error: 0.2970452589946006
current error: 0.29538150916332434
current error: 0.29353529051544697
current error: 0.29148846636977105
current error: 0.2892227919920223
current error: 0.28672114786421776
current error: 0.2839696189742461
current error: 0.28096082862049954
current error: 0.27769897439025615
current error: 0.2742067934659472
current error: 0.27053383262419245
current error: 0.26676352283482874
current error: 0.26301408048770547
current error: 0.25942791094539747
current error: 0.25615042129351123
0.089087
0.013432
0.001218
Plotting errors
Plotting results
```

Result:

Thus the Implementation of neuro fuzzy inference system is executed and the output is obtained.

Github link:
[roshie/neuro-fuzzy-inference-system (github.com)](https://github.com/roshie/neuro-fuzzy-inference-system)