COMPUTATIONAL INTELLIGENCE
UNIT 3 ASSIGNMENT

AIM:
Implementa a Neuro Fuzzy Inference System using Python and execute the code.

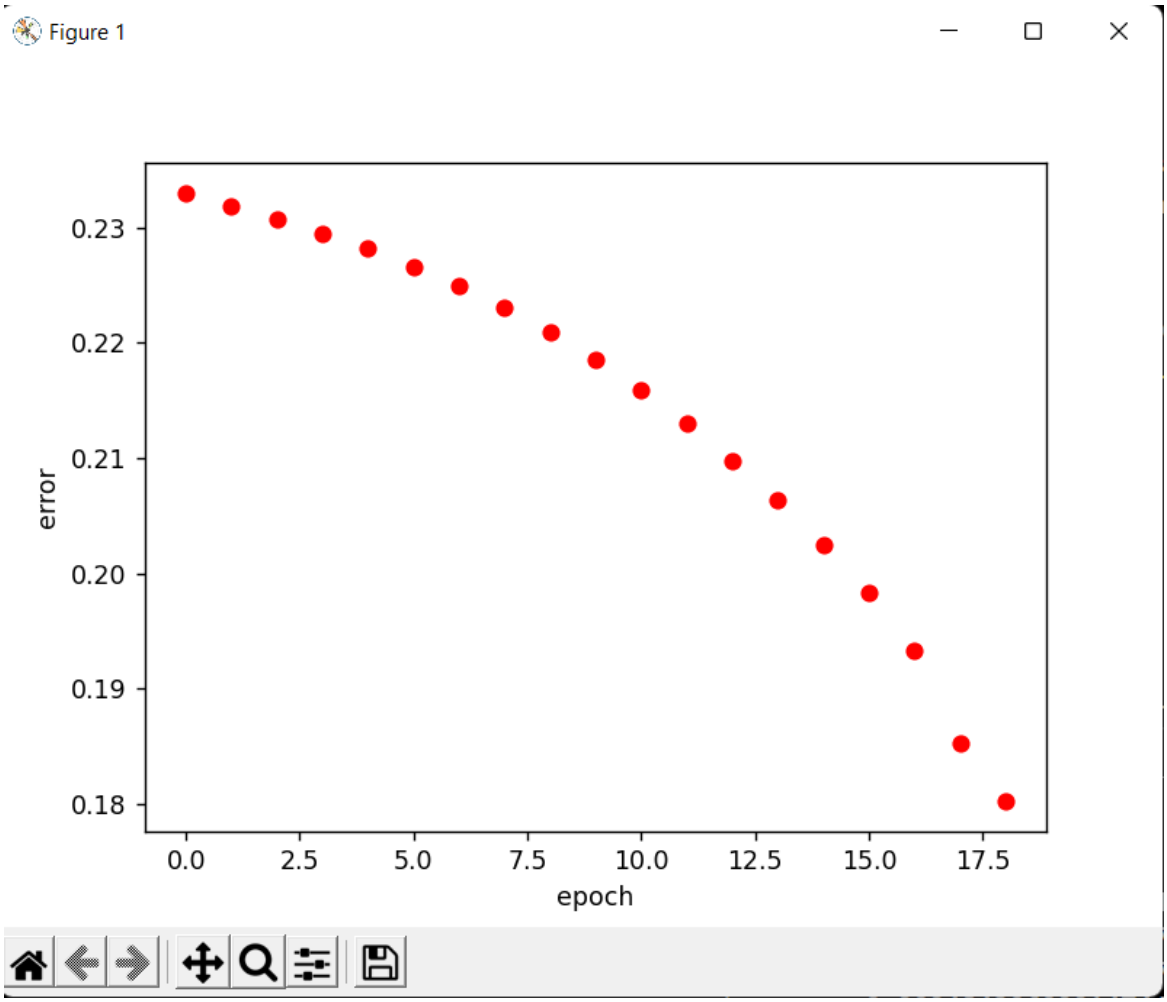
PROGRAM:

```
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], 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:

```
PS S:\Projects\Neuro-Fuzzy-Inference-System> & C:/Users/shirl/AppData/Local/Programs/Python/Python310
/python.exe s:/Projects/Neuro-Fuzzy-Inference-System/tests.py
current error: 0.2329603491004393
current error: 0.23183046381178207
current error: 0.23066704916246095
current error: 0.2294730022677959
current error: 0.22812866070177207
current error: 0.2266165041794935
current error: 0.19334729778319878
current error: 0.18530024116521301
current error: 0.1802272777543559
-0.0310883
0.0152347
-0.0088179
Error Plot
Results Plot
PS S:\Projects\Neuro-Fuzzy-Inference-System>
```

Error Plotted Graph



Result Plotted Graph