```
Last login: Wed Mar 11 23:41:28 on ttys002
s-164-67-210-175:outDataClassLDL Lin$ python main.py
_____T-test Results_____
Raw Data diff:
[]
Average Raw Data diff:
[[ 48.36923077]]
Raw Data diff:
[]
Average Raw Data diff:
[[ 46.78340081]]


*************T-Test Results:*************
>>>>>Positive Class<<<<<
Mean:
[  77.30769231  125.67692308]

Standard Deviation:
[ 10.47256207  13.91718107]

Mean + - 2SD range
[[  98.25281644   56.36256818]
 [ 153.51128522   97.84256093]]

Mean + - 2SE range
[[  78.22708122   76.3883034 ]
 [ 126.89871597  124.45513018]]
***************T-Test End***************


*************T-Test Results:*************
>>>>>Negative Class<<<<<
Mean:
[  74.75303644  121.53643725]

Standard Deviation:
[ 11.40760014  16.58891172]

Mean + - 2SD range
[[  97.56823672   51.93783615]
 [ 154.71426069   88.3586138 ]]

Mean + - 2SE range
[[  75.78058138   73.72549149]
 [ 123.03069126  120.04218323]]
***************T-Test End***************

Positive and Negative Class conditions:
[[  78.22708122   76.3883034 ]
 [ 126.89871597  124.45513018]]
```

```
[[  75.78058138   73.72549149]
 [ 123.03069126  120.04218323]]
Positive and Negative Class conditions:
[[  78.22708122   76.3883034 ]
 [ 126.89871597  124.45513018]]
[[  75.78058138   73.72549149]
 [ 123.03069126  120.04218323]]
++Class T_test results:   Results:    Targets:
(39, 6)
[ 1.  0.  0.  1.  1.  1.  0.  0.  1.  1.  2.  1.  0.  2.  1.  1.
2.  1.
  1.  0.  1.  0.  1.  0.  0.  0.  1.  1.  1.  1.  1.  0.  0.  0.
0.  1.
  1.  0.  1.]
[ 0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
0.  0.
  0.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.
1.  1.
  1.  1.  1.]
True Positive:   10
True Negative:   5
False Positive:  11
False Negative:  10
accuracy:   0.416666666667
precision:  0.47619047619
recall: 0.5
sensitivity:    0.5
specificity:    0.3125
F_measure:  0.487804878049
Confusion Matrix:
10.0 11.0
10.0 5.0
_____DATASET_____Targets_____

[[   4.11394655    8.43185352   48.30769231   16.92455621
71.09615385
       1.        ]
 [   3.11538462   11.6214961    48.73076923    9.7056213
135.0591716
       1.        ]
 [   5.53151273    5.36328191   42.03846154   30.59763314
28.7647929
       1.        ]
 [   3.5509812     5.69919023   41.57692308   12.60946746
32.48076923
       1.        ]
 [   4.18170855    4.54253403   58.38461538   17.48668639
20.63461538
       1.        ]
 [   5.17060994    8.91942896   46.19230769   26.7352071
```

```
   79.55621302
      1.        ]
 [  5.26923077   5.07590316  54.          27.7647929
   25.7647929
      1.        ]
 [  6.45512502  10.75245947  42.15384615  41.66863905
  115.61538462
      1.        ]
 [  5.35057924   8.4542801   47.15384615  28.62869822
   71.47485207
      1.        ]
 [  5.47560485   4.8712719   42.73076923  29.98224852
   23.72928994
      1.        ]
 [  3.54430955   7.33960643  46.          12.56213018
   53.86982249
      1.        ]
 [  5.57002226   9.67282841  52.23076923  31.02514793
   93.56360947
      1.        ]
 [  3.77942108   8.53811503  45.30769231  14.28402367
   72.89940828
      1.        ]
 [  6.23373624   9.86026633  48.34615385  38.85946746
   97.22485207
      1.        ]
 [  5.38475275   7.64843257  60.38461538  28.99556213
   58.49852071
      1.        ]
 [  4.73076923   3.46495558  53.73076923  22.38017751
   12.00591716
      1.        ]
 [  3.32464351   4.55359277  50.11538462  11.05325444
   20.7352071
      1.        ]
 [  4.64859844   3.06246604  44.84615385  21.60946746
    9.37869822
      1.        ]
 [  4.03186274   6.5281593   46.92307692  16.25591716
   42.61686391
      1.        ]
 [  4.9805836    5.62656947  48.23076923  24.80621302
   31.65828402
      1.        ]
 [  4.16735694   4.87476293  37.61538462  17.36686391
   23.76331361
      0.        ]
 [  8.45917799  15.89522834  60.76923077  71.55769231
  252.65828402
      0.        ]
```

```
[     3.06656912      2.48932633      41.23076923      9.40384615
6.19674556
        0.          ]
 [    6.35593652      7.08872344      47.07692308      40.39792899    50.25
0.          ]
 [    6.14145387      6.99756932      42.38461538      37.71745562
48.96597633
        0.          ]
 [    4.76504158      6.4184691       48.30769231      22.7056213
41.19674556
        0.          ]
 [    7.94582247      9.2736185       53.69230769      63.13609467    86.
0.          ]
 [    5.49784788      5.98914205      54.11538462      30.22633136
35.86982249
        0.          ]
 [    3.79290056      4.53128507      32.73076923      14.38609467
20.53254438
        0.          ]
 [    6.9146316       6.81453372      46.11538462      47.81213018
46.43786982
        0.          ]
 [    4.81937043     10.09862607      39.03846154      23.22633136
101.98224852
        0.          ]
 [    2.27963716      3.69971213      50.92307692      5.19674556
13.68786982
        0.          ]
 [    5.27091495      7.36385302      48.07692308      27.78254438
54.22633136
        0.          ]
 [    7.5816073       9.22571977      59.46153846      57.48076923
85.11390533
        0.          ]
 [    0.61538462      1.17417981      48.15384615      0.37869822
1.37869822
        0.          ]
 [    2.97524302      8.17386874      45.88461538      8.85207101
66.81213018
        0.          ]
 [    3.86476267      5.42021201      38.5             14.93639053
29.37869822
        0.          ]
 [    0.61538462      1.17417981      48.15384615      0.37869822
1.37869822
        0.          ]
 [    3.9667628       6.04421578      46.65384615      15.7352071
36.53254438
        0.          ]]
Iteration:  0  Error:  5.86878849858
```

```
Iteration:  100  Error:  4.35027253163
Iteration:  200  Error:  4.32062390332
Iteration:  300  Error:  4.30846848462
Iteration:  400  Error:  4.30231693705
Iteration:  500  Error:  4.29868983955
Iteration:  600  Error:  4.29632203197
Iteration:  700  Error:  4.29466373041
Iteration:  800  Error:  4.29344162014
Iteration:  900  Error:  4.29250564385
Iteration:  1000  Error:  4.29176697182
Confusion matrix is:
[[  4.   0.]
 [ 15.  20.]]
Percentage Correct:  61.5384615385
_____MLP Results With T-test_____
before:

[[ 1.  1.  0.]
 [ 1.  0.  0.]
 [ 1.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  0.  0.]
 [ 1.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  2.  0.]
 [ 1.  1.  0.]
 [ 1.  0.  0.]
 [ 1.  2.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  2.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  0.  1.]
 [ 1.  1.  1.]
 [ 1.  0.  1.]
 [ 0.  1.  1.]
 [ 1.  0.  1.]
 [ 1.  0.  1.]
 [ 1.  0.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 0.  0.  1.]
 [ 1.  0.  1.]
```

```
 [ 1.   0.   1.]
 [ 0.   0.   1.]
 [ 1.   1.   1.]
 [ 1.   1.   1.]
 [ 0.   0.   1.]
 [ 1.   1.   1.]]
after:

[[ 1.   1.   0.]
 [ 1.   0.   0.]
 [ 1.   0.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   0.   0.]
 [ 1.   0.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   0.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   1.   0.]
 [ 1.   0.   1.]
 [ 1.   1.   1.]
 [ 1.   0.   1.]
 [ 0.   1.   1.]
 [ 1.   0.   1.]
 [ 1.   0.   1.]
 [ 1.   0.   1.]
 [ 1.   1.   1.]
 [ 1.   1.   1.]
 [ 1.   1.   1.]
 [ 1.   1.   1.]
 [ 1.   1.   1.]
 [ 0.   0.   1.]
 [ 1.   0.   1.]
 [ 1.   0.   1.]
 [ 0.   0.   1.]
 [ 1.   1.   1.]
 [ 1.   1.   1.]
 [ 0.   0.   1.]
 [ 1.   1.   1.]]
_____MLP Results With T-test Performance_____
[ 1.   0.   0.   1.   1.   1.   0.   0.   1.   1.   1.   1.   0.   1.   1.   1.
  1.   1.
```

```
    1.  0.  1.  0.  1.  0.  0.  0.  1.  1.  1.  1.  1.  0.  0.  0.
 0.  1.
    1.  0.  1.]
 [ 0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
 0.  0.
    0.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.  1.
 1.  1.
    1.  1.  1.]
```

True Positive: 10
True Negative: 5
False Positive: 14
False Negative: 10
accuracy: 0.384615384615
precision: 0.416666666667
recall: 0.5
sensitivity: 0.5
specificity: 0.263157894737
F_measure: 0.454545454545
Confusion Matrix:
10.0 14.0
10.0 5.0
_____END OF MLP Results With T-test
Performance_____
_____Single Layer Perceptron Results_____
Input dataset count: 39
Initial weight: [0.51264414   0.67793638]
Number of Iterations: 1000
Learning rate: 0.25
perceptron results: [0.67451812   0.35432761]
____forward test Results____

```
[0 0 0 0 0 1 0 1 1 0 0 1 0 1 0 0 0 0 0 0 0 0 1 0 1 1 0 1 0 0 1 1 0
 0 1 0 0 0
  0 0]
[1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0
 0 0 0 0 0
  0 0]
```

_____SLP Performance Results_____
True Positive: 5
True Negative: 12
False Positive: 7
False Negative: 15
accuracy: 0.435897435897
precision: 0.416666666667
recall: 0.25
sensitivity: 0.25
specificity: 0.631578947368
F_measure: 0.3125
Confusion Matrix:
5.0 7.0
15.0 12.0

```
_____K–Nearest Neighbors Results_____
Number of datafiles: 39
_____KNN Performance Results_____
True Positive:    18
True Negative:    5
False Positive:   14
False Negative:   2
accuracy:    0.589743589744
precision:   0.5625
recall: 0.9
sensitivity:      0.9
specificity:      0.263157894737
F_measure:   0.692307692308
Confusion Matrix:
18.0 14.0
2.0 5.0
s–164–67–210–175:outDataClassLDL Lin$
```