```
Last login: Wed Mar 11 23:37:20 on ttys001
s-164-67-210-175:outDataClass Lin$ python main.py
__________________T-test Results_________________
Raw Data diff:
[]
Average Raw Data diff:
[[ 48.4534413]]
Raw Data diff:
[]
Average Raw Data diff:
[[ 46.78269231]]

**************T-Test Results:**************
>>>>>Positive Class<<<<<<
Mean:
[  73.89068826  122.34412955]

Standard Deviation:
[ 10.02104033  13.65446183]

Mean + - 2SD range
[[  93.93276892   53.8486076 ]
 [ 149.65305322   95.03520589]]

Mean + - 2SE range
[[  74.79333818   72.98803834]
 [ 123.57406162  121.11419749]]
****************T-Test End****************


**************T-Test Results:**************
>>>>>Negative Class<<<<<<
Mean:
[  78.12692308  124.90961538]

Standard Deviation:
[ 11.50381401  16.82687593]

Mean + - 2SD range
[[ 101.13455109   55.11929506]
 [ 158.56336725   91.25586352]]

Mean + - 2SE range
[[  79.13684586   77.1170003 ]
 [ 126.38685113  123.43237963]]
****************T-Test End****************

Positive and Negative Class conditions:
[[  74.79333818   72.98803834]
 [ 123.57406162  121.11419749]]
```

```
[[  79.13684586   77.1170003 ]
 [ 126.38685113  123.43237963]]
Positive and Negative Class conditions:
[[  74.79333818   72.98803834]
 [ 123.57406162  121.11419749]]
[[  79.13684586   77.1170003 ]
 [ 126.38685113  123.43237963]]
++Class T_test results:   Results:     Targets:
(39, 6)
[ 0.  1.  0.  2.  0.  0.  1.  1.  0.  1.  1.  1.  2.  0.  0.  0.
2.  1.
  0.  2.  1.  0.  1.  2.  2.  1.  1.  2.  1.  0.  1.  0.  2.  0.
1.  1.
  1.  2.  1.]
[ 0.  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.]
True Positive:   10
True Negative:   9
False Positive:  12
False Negative:  4
accuracy:    0.542857142857
precision:   0.454545454545
recall:  0.714285714286
sensitivity:     0.714285714286
specificity:     0.428571428571
F_measure:   0.555555555556
Confusion Matrix:
10.012.0
4.0 9.0
_____________DATASET________Targets_____________

[[   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.        ]
 [   6.35593652    7.08872344   47.07692308   40.39792899   50.25
1.        ]
 [   5.26923077    5.07590316   54.           27.7647929
25.7647929
     1.        ]
 [   6.14145387    6.99756932   42.38461538   37.71745562
48.96597633
```

```
     1.        ]
 [   6.45512502   10.75245947   42.15384615   41.66863905
115.61538462
     1.        ]
 [   5.35057924    8.4542801    47.15384615   28.62869822
71.47485207
     1.        ]
 [   3.54430955    7.33960643   46.           12.56213018
53.86982249
     1.        ]
 [   5.49784788    5.98914205   54.11538462   30.22633136
35.86982249
     1.        ]
 [   2.27963716    3.69971213   50.92307692    5.19674556
13.68786982
     1.        ]
 [   5.38475275    7.64843257   60.38461538   28.99556213
58.49852071
     1.        ]
 [   7.5816073     9.22571977   59.46153846   57.48076923
85.11390533
     1.        ]
 [   4.73076923    3.46495558   53.73076923   22.38017751
12.00591716
     1.        ]
 [   3.32464351    4.55359277   50.11538462   11.05325444
20.7352071
     1.        ]
 [   0.61538462    1.17417981   48.15384615    0.37869822
1.37869822
     1.        ]
 [   2.97524302    8.17386874   45.88461538    8.85207101
66.81213018
     1.        ]
 [   3.86476267    5.42021201   38.5          14.93639053
29.37869822
     1.        ]
 [   4.9805836     5.62656947   48.23076923   24.80621302
31.65828402
     1.        ]
 [   4.11394655    8.43185352   48.30769231   16.92455621
71.09615385
     0.        ]
 [   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.        ]
 [   4.18170855    4.54253403   58.38461538   17.48668639
20.63461538
     0.        ]
 [   5.17060994    8.91942896   46.19230769   26.7352071
79.55621302
     0.        ]
 [   5.47560485    4.8712719    42.73076923   29.98224852
23.72928994
     0.        ]
 [   4.76504158    6.4184691    48.30769231   22.7056213
41.19674556
     0.        ]
 [   7.94582247    9.2736185    53.69230769   63.13609467   86.
0.        ]
 [   5.57002226    9.67282841   52.23076923   31.02514793
93.56360947
     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.        ]
 [   3.77942108    8.53811503   45.30769231   14.28402367
72.89940828
     0.        ]
 [   6.23373624    9.86026633   48.34615385   38.85946746
97.22485207
     0.        ]
 [   5.27091495    7.36385302   48.07692308   27.78254438
54.22633136
     0.        ]
 [   4.64859844    3.06246604   44.84615385   21.60946746
9.37869822
     0.        ]
 [   0.61538462    1.17417981   48.15384615    0.37869822
1.37869822
     0.        ]
 [   4.03186274    6.5281593    46.92307692   16.25591716
42.61686391
     0.        ]
 [   3.9667628     6.04421578   46.65384615   15.7352071
36.53254438
     0.        ]]
Iteration:  0  Error:  4.90794621368
```

```
Iteration:  100  Error:  4.60777318672
Iteration:  200  Error:  4.4853307669
Iteration:  300  Error:  4.26756181796
Iteration:  400  Error:  4.67262496141
Iteration:  500  Error:  4.65997006525
Iteration:  600  Error:  4.65239937551
Iteration:  700  Error:  4.64696369259
Iteration:  800  Error:  4.50203409532
Iteration:  900  Error:  4.64049999448
Iteration:  1000  Error:  4.63823796873
Confusion matrix is:
[[  3.   2.]
 [ 17.  17.]]
Percentage Correct:  51.2820512821
_________________MLP Results With T-test________
before:

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

```
 [ 1.  0.  1.]
 [ 1.  1.  1.]
 [ 0.  1.  1.]
 [ 0.  1.  1.]
 [ 1.  2.  1.]
 [ 1.  1.  1.]]
after:

[[ 1.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  0.  0.]
 [ 1.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 0.  0.  0.]
 [ 1.  0.  0.]
 [ 0.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  0.]
 [ 1.  0.  0.]
 [ 1.  1.  0.]
 [ 1.  1.  1.]
 [ 1.  0.  1.]
 [ 0.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  0.  1.]
 [ 1.  1.  1.]
 [ 1.  0.  1.]
 [ 1.  1.  1.]
 [ 1.  0.  1.]
 [ 1.  1.  1.]
 [ 0.  1.  1.]
 [ 0.  1.  1.]
 [ 1.  1.  1.]
 [ 1.  1.  1.]]
__________________MLP Results With T-test Performance________
[ 0.  1.  0.  1.  0.  0.  1.  1.  0.  1.  1.  1.  1.  0.  0.  0.
1.  1.
```

```
  0.  1.  1.  0.  1.  1.  1.  1.  1.  1.  1.  0.  1.  0.  1.  0.
1.  1.
  1.  1.  1.]
[ 0.  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.]
True Positive:   15
True Negative:   9
False Positive:  11
False Negative:  4
accuracy:    0.615384615385
precision:   0.576923076923
recall:  0.789473684211
sensitivity:     0.789473684211
specificity:     0.45
F_measure:   0.666666666667
Confusion Matrix:
15.011.0
4.0 9.0
__________________END OF MLP Results With T-test
Performance________
___________________Single Layer Perceptron Results___________________
Input dataset count: 39
Initial weight:  [ 0.10680831  0.69004353]
Number of Iterations:    1000
Learning rate:       0.25
perceptron results:  [ 0.82083616  0.22058789]
____forward test Results____
[0 0 0 1 0 1 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 1 1 0 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 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0
 0 0]
___________________SLP Performance Results_____________________________
True Positive:   4
True Negative:   15
False Positive:  5
False Negative:  15
accuracy:    0.487179487179
precision:   0.444444444444
recall:  0.210526315789
sensitivity:     0.210526315789
specificity:     0.75
F_measure:   0.285714285714
Confusion Matrix:
4.0 5.0
15.015.0
```

```
__________________K-Nearest Neighbors Results_____________________
Number of datafiles: 39
__________________KNN Performance Results_____________________
True Positive:   17
True Negative:   8
False Positive:  12
False Negative:  2
accuracy:    0.641025641026
precision:   0.586206896552
recall:  0.894736842105
sensitivity:     0.894736842105
specificity:     0.4
F_measure:   0.708333333333
Confusion Matrix:
17.0 12.0
2.0  8.0
```