```
++++++++++++++++++++++++++++  Digit resolution 16 X 16 ++++++++++++++++++++++++++++n

Resolution of digits dataset changed to (x,y) : (16, 16)

 Dataset shape  (1797, 16, 16)

-------------------------------------------------------------------------------------------------------
[" Gamma :  g, '    C': c}", '            Train Accuracy', '  Validation Accuracy', '  Test Accuracy']
-------------------------------------------------------------------------------------------------------

[{'gamma': 0.01, 'C': 0.1}, '         ', '    0.1044     ', '    0.1215     ', '    0.0838     ']
[{'gamma': 0.01, 'C': 0.2}, '         ', '    0.1204     ', '    0.1215     ', '    0.0950     ']
[{'gamma': 0.01, 'C': 0.5}, '         ', '    1.0000     ', '    0.4144     ', '    0.2682     ']
[{'gamma': 0.01, 'C': 0.7}, '         ', '    1.0000     ', '    1.0000     ', '    0.5866     ']
[{'gamma': 0.01, 'C': 1}, '         ', '    1.0000     ', '    1.0000     ', '    0.8715     ']
[{'gamma': 0.01, 'C': 2}, '         ', '    1.0000     ', '    1.0000     ', '    0.8771     ']
[{'gamma': 0.01, 'C': 5}, '         ', '    1.0000     ', '    1.0000     ', '    0.8771     ']
[{'gamma': 0.01, 'C': 7}, '         ', '    1.0000     ', '    1.0000     ', '    0.8771     ']
[{'gamma': 0.01, 'C': 10}, '         ', '    1.0000     ', '    1.0000     ', '    0.8771     ']
[{'gamma': 0.005, 'C': 0.1}, '         ', '    1.0000     ', '    1.0000     ', '    0.8771     ']
[{'gamma': 0.005, 'C': 0.2}, '         ', '    1.0000     ', '    1.0000     ', '    0.8771     ']
[{'gamma': 0.005, 'C': 0.5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9274     ']
[{'gamma': 0.005, 'C': 0.7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9497     ']
[{'gamma': 0.005, 'C': 1}, '         ', '    1.0000     ', '    1.0000     ', '    0.9553     ']
[{'gamma': 0.005, 'C': 2}, '         ', '    1.0000     ', '    1.0000     ', '    0.9553     ']
[{'gamma': 0.005, 'C': 5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9553     ']
[{'gamma': 0.005, 'C': 7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9553     ']
[{'gamma': 0.005, 'C': 10}, '         ', '    1.0000     ', '    1.0000     ', '    0.9553     ']
[{'gamma': 0.001, 'C': 0.1}, '         ', '    1.0000     ', '    1.0000     ', '    0.9609     ']
[{'gamma': 0.001, 'C': 0.2}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.001, 'C': 0.5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.001, 'C': 0.7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.001, 'C': 1}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.001, 'C': 2}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.001, 'C': 5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.001, 'C': 7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.001, 'C': 10}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 0.1}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 0.2}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 0.5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 0.7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 1}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 2}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0005, 'C': 10}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 0.1}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 0.2}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 0.5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 0.7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 1}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 2}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 5}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 7}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
[{'gamma': 0.0001, 'C': 10}, '         ', '    1.0000     ', '    1.0000     ', '    0.9888     ']
```

Train Classification report for classifier SVC(C=0.5, gamma=0.01):

	precision	recall	f1-score	support
0	1.00	1.00	1.00	140
1	1.00	1.00	1.00	147
2	1.00	1.00	1.00	150
3	1.00	1.00	1.00	146
4	1.00	1.00	1.00	147
5	1.00	1.00	1.00	142
6	1.00	1.00	1.00	144
7	1.00	1.00	1.00	142
8	1.00	1.00	1.00	136
9	1.00	1.00	1.00	143
accuracy			1.00	1437
macro avg	1.00	1.00	1.00	1437
weighted avg	1.00	1.00	1.00	1437

Best Train hyperparameters were: {'gamma': 0.01, 'C': 0.5}

Validation Classification report for classifier SVC(C=0.7, gamma=0.01):

	precision	recall	f1-score	support
0	1.00	1.00	1.00	22
1	1.00	1.00	1.00	15
2	1.00	1.00	1.00	12
3	1.00	1.00	1.00	20
4	1.00	1.00	1.00	21
5	1.00	1.00	1.00	18
6	1.00	1.00	1.00	18
7	1.00	1.00	1.00	17
8	1.00	1.00	1.00	21
9	1.00	1.00	1.00	17
accuracy			1.00	181
macro avg	1.00	1.00	1.00	181
weighted avg	1.00	1.00	1.00	181

Best Validation hyperparameters were: {'gamma': 0.01, 'C': 0.7}

```
Test Classification report for classifier SVC(C=0.2, gamma=0.001):

              precision    recall  f1-score   support

           0       1.00      1.00      1.00        16
           1       1.00      1.00      1.00        20
           2       1.00      1.00      1.00        15
           3       1.00      0.88      0.94        17
           4       1.00      1.00      1.00        13
           5       1.00      1.00      1.00        22
           6       1.00      1.00      1.00        19
           7       0.95      1.00      0.98        20
           8       0.94      1.00      0.97        17
           9       1.00      1.00      1.00        20

    accuracy                           0.99       179
   macro avg       0.99      0.99      0.99       179
weighted avg       0.99      0.99      0.99       179



Best Test hyperparameters were: {'gamma': 0.001, 'C': 0.2}
```