C:\ProgramData\Anaconda3\python.exe C:/Users/rpiO8/M/MT/MTP_AD/mainCodes/ allPre_FinalTest_CV/finalTest_CV.py

C:\ProgramData\Anaconda3\lib\site-packages\requests__init__.py:91:

RequestsDependencyWarning: urllib3 (1.26.2) or chardet (3.0.4) doesn't match a supported version!

opporteu version: RequestsDependencyWarning)

Name of corresponding python code file: finalTest_CV

doScaleAfterSplit= True approach.

shiftNumber: 2, windowLength: 2

makeNoiseByJitter: False

Number of Rows Aucual yXRolled_SelFeat_Transformed Total: 14520

Anomalies(positives): 89 (0.61% of total)

baseFileName of output Folders and Plots name: finalTest_CV

```
File - finalTest_CV
```

Shape of Actual npTrain dataset: (14520, 60)

Number of Actual npTrain labelled 0: 14431 Number of Actual npTrain labelled 1: 89

Start running time Fold_1: 210508_001339 ,----

Shape of Actual yXtrainRolled After Rolling Fold_1: (23108, 60)

Shape of Actual yXvalidShifted dataset: (2873, 60)

of Actual yXvalidRolled After Rolling Fold_1: (5744, 60)

---*** Train modelEvaluateVal without adding Augmented data

Shape of data after Transform ToOneRow to give Cross Validation Model

xtrain: (11554, 118), ytrain: (11554,) xvalid: (2872, 118), yvalid: (2872,)

Number of final label 0 in yXtrain_Fold_1: 11495

Number of final label 1 in yXtrain_Before_AddingAugedData_Fold_1: 59 Number of final label 1 in yXtrain_After_AddingAugedData_Fold_1: 59

Hyperparameters of Cross Validation Model:

epochs: 500, batch: 32, lr: 0.0001, numberOfSplits:5, flagSeed: True,

train_val_split_Shuffle: False, FitShuffle: True

Start Creating new folder for each run: 210508_001339

2021-05-08 00:13:39.624388: I tensorflow/core/platform/cpu_feature_guard.cc: 142] Your CPU supports instructions that this TensorFlow binary was not compiled to use: AVX AVX2

2021-05-08 00:13:39.628748: I tensorflow/core/common_runtime/process_util.cc: 147] Creating new thread pool with default inter op setting: 2. Tune using inter_op_parallelism_threads for best performance.

Cross Validation Model.summary():

Model: "sequential"

(type)	

(None, 236)

28084

(Dense)

dense

 dense_1 (Dense)	(None, 188)	44556
dense_2 (Dense)	(None, 36)	
3 (Dense)	(None, 1)	37
======================================		

': 'dense', 'trainable': True, 'batch_input_shape': (None, 118), 'dtype': 'float32', 'units': 236, 'activation': 'tanh', 'use_bias': True, 'kernet_initializer': {'class_name': 'GlorotUniform', 'config': {'seed': None}}, 'bias_initializer': {'class_name': 'Zeros', 'config': {}}, 'None, 'bias_regularizer': None, 'activity_regularizer': None, 'kernet_constraint': None, 'bias_constraint': None}}, {'class_name': 'float32', none, 'config': {'name': 'dense_1', 'trainable': True, 'dtype': 'float32', units': 188, 'activation': 'tanh', 'use_bias': True, 'kernet_initializer': { class_name': 'GlorotUniform', 'config': {'seed': None}}, 'bias_initializer
': {'class_name': 'Zeros', 'config': {}}, 'kernel_regularizer': {'class_name Cross Validation Model config: {'name': 'sequential', 'layers': [{'class_name': 'Dense', 'config': {'name

```
le - finalTest_CV
```

```
', 'config': {'seed': None}}, 'bias_initializer': {'class_name': 'Zeros', '
config': {}}, 'kernel_regularizer': {'class_name': 'L1L2', 'config': {'l1': 0.
0, 'L2': 0.0149999664723873}}, 'bias_regularizer': None, '
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      activity_regularizer': None, 'kernel_constraint': None, 'bias_constraint':
None}}, {'class_name': 'Dense', 'config': {'name': 'dense_3', 'trainable':
True, 'dtype': 'float32', 'units': 1, 'activation': 'sigmoid', 'use_bias':
True, 'kernel_initializer': {'class_name': 'GlorotUniform', 'config': {'seed': None}}, 'bias_initializer': {'class_name': 'Zeros', 'config': {}}, '
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      kernel_regularizer': None, 'bias_regularizer': None, 'activity_regularizer':
None, 'kernel_constraint': None, 'bias_constraint': None}}]}
': 'L1L2', 'config': {'L1': 0.0, 'L2': 0.01499999664723873}}, '
```

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========] - 2s 176us/sample - loss: 1.4942
                         11554/11554 [===========================] - 4s 364us/sample - loss: 3.0946
                                                                                                      11554/11554 [======
                                                  - accuracy: 0.9919
                                                                                                                                      - accuracy: 0.9949
                                                                                Epoch 2/500
Epoch 1/500
                                                                                                                                                                Epoch 3/500
```

Train on 11554 samples

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11554/11554 [==========================] - 2s 206us/sample - loss: 0.1399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11554/11554 [===========================] - 2s 186us/sample - loss: 0.0426
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3s 265us/sample - loss: 0.0394
 - 3s 233us/sample - loss: 0.6741
                                                                                                                                                                                                                                                                 11554/11554 [===========================] - 3s 226us/sample - loss: 0.0777
                                                                                                                                                                                                                                                                                                                                                          188us/sample - loss: 0.0544
                                                                                                                                                                                                                                                                                                                                                                                                                                               11554/11554 [===========================] - 3s 237us/sample - loss: 0.0457
                                                                                       ========] - 2s 187us/sample - loss: 0.2981
                                                                                                                                                                                                                                                                                                                                                          - 2s
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11554/11554 [================
                              - accuracy: 0.9949
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                                                          Epoch 4/500
```

```
11554/11554 [===========================] - 3s 233us/sample - loss: 0.0388
                                                                                                                                                                                                                              11554/11554 [==========================] - 3s 253us/sample - loss: 0.0380
                     11554/11554 [===========================] - 2s 208us/sample - loss: 0.0391
                                                                                                                                                                                                                                                                                                                                                                   - 2s 182us/sample - loss: 0.0381
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Epoch 17/500
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Epoch 12/500
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11554/11554 [===========================] - 2s 185us/sample - loss: 0.0363
                                                                                    197us/sample - loss: 0.0363
                                                                                                                                                    ========] - 2s 211us/sample - loss: 0.0360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               =====] - 2s 213us/sample - loss: 0.0352
                                                                                                                                                                                                                 11554/11554 [===========================] - 3s 230us/sample - loss: 0.0357
                                                                                                                                                                                                                                                                                                                                                                                                                196us/sample - loss: 0.0354
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                                                                                                         - accuracy: 0.9949
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                                                                Epoch 21/500
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Epoch 20/500
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- 2s 184us/sample - loss: 0.0349
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                                                                                                                                                                                                                                                                                                                                                             - 3s 255us/sample - loss: 0.0348
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ========] - 4s 330us/sample - loss: 0.0345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         398us/sample - loss: 0.0344
                                                                                                                                                                                                                                                                    11554/11554 [===========================] - 2s 206us/sample - loss: 0.0347
                                                                                        =========] - 3s 231us/sample - loss: 0.0351
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                              - accuracy: 0.9949
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Epoch 35/500
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                                                          Epoch 29/500
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11554/11554 [==========================] - 3s 269us/sample - loss: 0.0340
                                                                                                                                       11554/11554 [==========================] - 4s 352us/sample - loss: 0.0338
                                                                                                                                                                                                                             - 4s 303us/sample - loss: 0.0338
                                                                                                                                                                                                                                                                                                             11554/11554 [==========================] - 2s 206us/sample - loss: 0.0338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11554/11554 [===========================] - 3s 295us/sample - loss: 0.0336
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accuracy: 0.9949
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                          Epoch 37/500
```

```
========] - 3s 295us/sample - loss: 0.0330
                                                                                                                                                                                                                       11554/11554 [===========================] - 2s 185us/sample - loss: 0.0334
                                                                                        - 3s 282us/sample - loss: 0.0333
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Epoch 45/500
                                                                  Epoch 46/500
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```

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- 4s 381us/sample - loss: 0.0329
                                                                                                                                                                                                                                                                                          - 4s 320us/sample - loss: 0.0326
                                                                                                                                                                                                                                                                                                                                                                2s 208us/sample - loss: 0.0325
                                                                                                                                                                                                                                                                                                                                                                                                                                      ========] - 3s 233us/sample - loss: 0.0329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11554/11554 [===========================] - 4s 336us/sample - loss: 0.0326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3s 237us/sample - loss: 0.0326
                                                                                                                                           11554/11554 [===========================] - 4s 349us/sample - loss: 0.0327
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                        - accuracy: 0.9949
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                                               Epoch 54/500
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11554/11554 [==========================] - 2s 213us/sample - loss: 0.0325
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Epoch 62/500
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11554/11554 [===========================] - 4s 332us/sample - loss: 0.0325
                                                                                          - 3s 261us/sample - loss: 0.0322
                                                                                                                                                             ========] - 2s 206us/sample - loss: 0.0324
                                                                                                                                                                                                                             11554/11554 [==========================] - 2s 207us/sample - loss: 0.0323
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Epoch 70/500
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2s 202us/sample - loss: 0.0323
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                                                                                                                                                                                                                                                                           11554/11554 [===========================] - 3s 236us/sample - loss: 0.0323
                                                                                                                                                                                                                                                                                                                                                                       - 3s 247us/sample - loss: 0.0320
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11554/11554 [===========================] - 3s 236us/sample - loss: 0.0322
                                                                                           =========] - 3s 234us/sample - loss: 0.0321
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11554/11554 [===========================
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Epoch 85/500
                               - accuracy: 0.9949
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                                                          Epoch 79/500
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11554/11554 [==========================] - 4s 383us/sample - loss: 0.0324
                                                                                                                                                                                         - 3s 249us/sample - loss: 0.0322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11554/11554 [============================] - 4s 362us/sample - loss: 0.0321
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Epoch 87/500
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11554/11554 [===========================] - 2s 210us/sample - loss: 0.0322
                                                                                                                                                                     189us/sample - loss: 0.0321
                                                                                                                                 ========] - 3s 229us/sample - loss: 0.0321
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Epoch 95/500
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5s 466us/sample - loss: 0.0322
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11554/11554 [==================================
Epoch 107/500
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0.0319
                     11554/11554 [==========================] - 3s 251us/sample - loss: 0.0320
                                                                                             5s 476us/sample - loss: 0.0318
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Epoch 115/500
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Epoch 117/500
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Epoch 112/500
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11554/11554 [===========================] - 6s 510us/sample - loss: 0.0319
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Epoch 122/500
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11554/11554 [======
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Epoch 120/500
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- 2s 178us/sample - loss: 0.0319
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11554/11554 [======
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Epoch 135/500
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5s 398us/sample - loss: 0.0318
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                   - accuracy: 0.9949
Epoch 140/500
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Epoch 142/500
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Epoch 137/500
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11554/11554 [===========================] - 4s 321us/sample - loss: 0.0318
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Epoch 147/500
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Epoch 145/500
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11554/11554 [===========================] - 3s 270us/sample - loss: 0.0316
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Epoch 158/500
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Epoch 160/500
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11554/11554 [==========================] - 3s 294us/sample - loss: 0.0317
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Epoch 162/500
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11554/11554 [===========================] - 3s 263us/sample - loss: 0.0316
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Epoch 172/500
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Epoch 176/500
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Epoch 174/500
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11554/11554 [======
                                          - accuracy: 0.9949
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Epoch 170/500
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- 3s 274us/sample - loss: 0.0315
                                                                     5s 408us/sample - loss: 0.0316
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                        - accuracy: 0.9949
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11554/11554 [==========================] - 3s 250us/sample - loss: 0.0315
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Epoch 187/500
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11554/11554 [===========================] - 2s 206us/sample - loss: 0.0315
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11554/11554 [======
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Epoch 195/500
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5s 404us/sample - loss: 0.0313
5s 417us/sample - loss: 0.0315
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11554/11554 [==========================] - 5s 433us/sample - loss: 0.0314
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Epoch 217/500
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Epoch 212/500
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11554/11554 [===========================] - 3s 267us/sample - loss: 0.0315
                               11554/11554 [===========================] - 4s 345us/sample - loss: 0.0313
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Epoch 220/500
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- 4s 305us/sample - loss: 0.0314
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11554/11554 [==================================
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11554/11554 [==========================] - 4s 389us/sample - loss: 0.0312
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Epoch 237/500
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11554/11554 [===========================] - 3s 256us/sample - loss: 0.0313
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Epoch 245/500
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5s 394us/sample - loss: 0.0312
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11554/11554 [==========================] - 5s 469us/sample - loss: 0.0312
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Epoch 262/500
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========] - 4s 341us/sample - loss: 0.0312
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Epoch 272/500
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Epoch 276/500
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Epoch 270/500
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11554/11554 [==========================] - 4s 330us/sample - loss: 0.0312
 - 2s 205us/sample - loss: 0.0314
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11554/11554 [===========================] - 4s 333us/sample - loss: 0.0312
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Epoch 287/500
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11554/11554 [===========================] - 2s 163us/sample - loss: 0.0310
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Epoch 295/500
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- 2s 186us/sample - loss: 0.0310
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11554/11554 [===========================] - 2s 178us/sample - loss: 0.0309
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11554/11554 [===========================] - 2s 175us/sample - loss: 0.0309
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Epoch 320/500
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11554/11554 [==========================] - 2s 182us/sample - loss: 0.0309
                                                                                               11554/11554 [===========================] - 2s 213us/sample - loss: 0.0309
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11554/11554 [==================================
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Epoch 340/500
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Epoch 344/500
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Epoch 342/500
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Epoch 337/500
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11554/11554 [===========================] - 4s 357us/sample - loss: 0.0309
                                                                                    - 3s 217us/sample - loss: 0.0310
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Epoch 347/500
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Epoch 351/500
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Epoch 345/500
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- 4s 347us/sample - loss: 0.0310
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11554/11554 [======
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Epoch 358/500
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Epoch 356/500
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Epoch 360/500
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11554/11554 [==========================] - 4s 382us/sample - loss: 0.0308
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11554/11554 [==================================
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Epoch 363/500
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Epoch 367/500
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Epoch 362/500
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11554/11554 [===========================] - 3s 289us/sample - loss: 0.0308
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11554/11554 [=============
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Epoch 372/500
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Epoch 376/500
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Epoch 374/500
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Epoch 370/500
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- 3s 293us/sample - loss: 0.0309
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11554/11554 [==================================
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Epoch 385/500
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11554/11554 [==========================] - 3s 272us/sample - loss: 0.0307
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Epoch 387/500
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11554/11554 [==========================] - 3s 281us/sample - loss: 0.0308
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11554/11554 [======
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Epoch 395/500
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- 3s 252us/sample - loss: 0.0308
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11554/11554 [==================================
11554/11554 [===============
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11554/11554 [======
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11554/11554 [==========================] - 3s 245us/sample - loss: 0.0309
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11554/11554 [==================================
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Epoch 412/500
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11554/11554 [===========================] - 3s 245us/sample - loss: 0.0307
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Epoch 420/500
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- 3s 266us/sample - loss: 0.0306
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11554/11554 [==================================
11554/11554 [===============
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11554/11554 [======
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11554/11554 [===========================] - 3s 266us/sample - loss: 0.0305
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Epoch 437/500
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11554/11554 [===========================] - 3s 236us/sample - loss: 0.0304
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11554/11554 [==================================
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Epoch 445/500
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- 3s 234us/sample - loss: 0.0306
                                                                                ========] - 3s 264us/sample - loss: 0.0304
                                                                                                                                                                                                                                            11554/11554 [===========================] - 3s 258us/sample - loss: 0.0306
                                                                                                                                                                                                                                                                                                                                                                                                        11554/11554 [==========================] - 3s 265us/sample - loss: 0.0302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ========] - 3s 242us/sample - Loss: 0.0306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11554/11554 [===========================] - 3s 261us/sample - loss: 0.0306
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11554/11554 [==================================
11554/11554 [===============
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11554/11554 [======
                           - accuracy: 0.9949
                                                                                                        - accuracy: 0.9949
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                                                     Epoch 454/500
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11554/11554 [==========================] - 3s 263us/sample - loss: 0.0304
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                                                                                    11554/11554 [===========================] - 3s 243us/sample - loss: 0.0306
                                                                                                                                                                                                              loss:
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                                                                                                                                                                      - accuracy: 0.9949
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                                                              Epoch 463/500
Epoch 462/500
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11554/11554 [===========================] - 3s 261us/sample - loss: 0.0305
                                                                                     - 3s 241us/sample - loss: 0.0305
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                                                                                                                                                                                                                                                                                   11554/11554 [===========================] - 3s 262us/sample - loss: 0.0304
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                                                                                                                                                                                                                                                                                                                                                                      - accuracy: 0.9949
Epoch 476/500
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11554/11554 [======
                                                                                                        - accuracy: 0.9949
                                          - accuracy: 0.9949
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Epoch 470/500
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```

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- 3s 259us/sample - loss: 0.0305
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                                                                                ========] - 3s 244us/sample - loss: 0.0307
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11554/11554 [==================================
11554/11554 [===============
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11554/11554 [======
                           - accuracy: 0.9949
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                                                     Epoch 479/500
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11554/11554 [==========================] - 3s 240us/sample - loss: 0.0304
                                                                                                            11554/11554 [===========================] - 3s 247us/sample - loss: 0.0305
                                                                                                                                                                                              - 3s 238us/sample - loss: 0.0306
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11554/11554 [==================================
                                                                                                                                                                                                                        - accuracy: 0.9949
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                                                                               Epoch 488/500
Epoch 487/500
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```

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File - finalTest_CV
```

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11554/11554 [===========================] - 3s 264us/sample - loss: 0.0304
                                                                                                                         11554/11554 [=========================== ] - 3s 236us/sample - loss: 0.0306
                                                                                                                                                                                                                           ========] - 3s 261us/sample - Loss: 0.0304
                                                                                                                                                                                                                                                                                                                      11554/11554 [===========================] - 3s 270us/sample - loss: 0.0305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 class_weight_Fold_1: {0: 0.40205306655067424, 1: 117.49830508474575}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2872/2872 [======================== ] - 1s 217us/sample
                                                                                                                                                                                                                         11554/11554 [================
                                                                                                                                                            - accuracy: 0.9949
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                                                                                                                                                                                           Epoch 497/500
                                                                                             Epoch 496/500
Epoch 495/500
```

pos_weight: 0.6
thresholdNum: 0.5

Average of yPredProbability Fold_1: 0.0043 Average of train loss Fold_1: 0.0429

classification_report_Fold_1:

support	2845	2872 2872 2872
f1-score	1.00	0.99
recall	1.00	0.50
precision	0.99	0.50
	Normal O Anomaly 1	accuracy macro avg weighted avg

confusion_matrix_Fold_1:

2845 0 27 True Negatives: False Positives:

False Negatives: True Positives:

End running time Fold_1: 210508_004108 ,

Start running time Fold_2: 210508_004108

Shape of Actual yXtrainRolled After Rolling Fold_2: (23070, 60)

Shape of Actual yXvalidShifted dataset: (2892, 60) Shape of Actual yXvalidRolled After Rolling Fold_2: (5782, 60)

---*** Train modelEvaluateVal without adding Augmented data

Shape of data after Transform ToOneRow to give Cross Validation Model

xtrain: (11535, 118), ytrain: (11535,) xvalid: (2891, 118), yvalid: (2891,)

Number of final label 0 in yXtrain_Fold_2: 11459

Number of final label 1 in yXtrain_Before_AddingAugedData_Fold_2: 76 Number of final label 1 in yXtrain_After_AddingAugedData_Fold_2: 76

Train on 11535 samples Epoch 1/500

```
5s 413us/sample - loss: 2.9979
                                                                        - 3s 223us/sample - loss: 1.3688
                                                                                                                                                                                                                     11535/11535 [==========================] - 3s 226us/sample - loss: 0.2538
                                                                                                                                                                                                                                                                                              3s 256us/sample - loss: 0.1218
                                                                                                                                                                                                                                                                                                                                                                    loss: 0.0740
                                                                                                                                                                                                                                                                                                                                                                                                                                          ========] - 3s 251us/sample - loss: 0.0568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11535/11535 [===========================] - 3s 236us/sample - loss: 0.0508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3s 252us/sample - loss: 0.0486
                                                                                                                                            11535/11535 [============================ ] - 3s 261us/sample - loss: 0.5891
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11535/11535 [===============
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                        - accuracy: 0.9933
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                                                                                                                                                                                                                                                                     Epoch 5/500
                                                                                                                                                                                                                                                                                                                                           Epoch 6/500
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Epoch 9/500
                                               Epoch 2/500
```

```
- 3s 239us/sample - loss: 0.0465
                                                                                                                                                                                                                                                           0.0445
                                                                            11535/11535 [===========================] - 3s 248us/sample - loss: 0.0457
                                                                                                                                                                                                                                                                                                                        11535/11535 [===========================] - 3s 253us/sample - loss: 0.0451
                                                                                                                                                                                                                                                                                                                                                                                                                                                 loss:
                                                                                                                                                                                                                                                                                                                                                                                                                                              11535/11535 [========================== ] - 3s 243us/sample -
                                                                                                                                      - accuracy: 0.9934
Epoch 15/500
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                                      - accuracy: 0.9934
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Epoch 10/500
```

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11535/11535 [===========================] - 3s 251us/sample - loss: 0.0443
                                                                                                                                                                               ========] - 3s 244us/sample - loss: 0.0440
                                                                                                                                                                                                                                                                                                                                     11535/11535 [===========================] - 3s 257us/sample - loss: 0.0438
                                                                                                                                                                                                                                                                                                                                                                                                            11535/11535 [==========================] - 3s 259us/sample - loss: 0.0430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     =====] - 3s 225us/sample - loss: 0.0428
                                                                                                                                                                                                                                                       - 3s 252us/sample - loss: 0.0441
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                                                 - accuracy: 0.9934
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Epoch 18/500
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```

```
- 3s 272us/sample - loss: 0.0429
                                                                                     ========] - 3s 226us/sample - loss: 0.0423
                                                                                                                                                                     11535/11535 [===========================] - 3s 275us/sample - loss: 0.0422
                                                                                                                                                                                                                                                                                                                                                 - 3s 274us/sample - loss: 0.0419
                                                                                                                                                                                                                                                                                                                                                                                                                                  11535/11535 [===========================] - 3s 224us/sample - loss: 0.0417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ========] - 3s 270us/sample - Loss: 0.0416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11535/11535 [===========================] - 3s 228us/sample - loss: 0.0415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3s 258us/sample - loss: 0.0419
                                                                                                                                                                                                                                                            11535/11535 [============================] - 3s 227us/sample - loss: 0.0421
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11535/11535 [================
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                             - accuracy: 0.9934
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11535/11535 [===========================] - 3s 236us/sample - loss: 0.0414
                                                                                                                                                                                      - 3s 239us/sample - loss: 0.0412
                                                                                                                                                                                                                                                                11535/11535 [==========================] - 3s 254us/sample - loss: 0.0412
                                                                                                                                                                                                                                                                                                                                                                                                                          11535/11535 [===========================] - 3s 252us/sample - loss: 0.0409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0.0410
                                                                                                       11535/11535 [===========================] - 3s 253us/sample - loss: 0.0414
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Epoch 35/500
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11535/11535 [===========================] - 3s 234us/sample - loss: 0.0408
                                                                                                                - 3s 243us/sample - loss: 0.0406
                                                                                                                                                                                                  ========] - 3s 245us/sample - loss: 0.0405
                                                                                                                                                                                                                                                                                  11535/11535 [===========================] - 3s 241us/sample - loss: 0.0404
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Epoch 43/500
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- 3s 276us/sample - loss: 0.0404
                                                                          ========] - 3s 222us/sample - loss: 0.0402
                                                                                                                                                                                                                          11535/11535 [===========================] - 3s 219us/sample - loss: 0.0402
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                                                                                                                                                                                                                                                                                                                                                                             loss: 0.0399
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11535/11535 [================
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                                                 Epoch 52/500
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```
0.0398
                 - 3s 235us/sample - loss: 0.0399
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                                                                              11535/11535 [============================] - 3s 248us/sample - loss: 0.0401
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Epoch 65/500
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Epoch 60/500
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11535/11535 [===========================] - 3s 236us/sample - loss: 0.0397
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11535/11535 [======
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Epoch 68/500
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- 3s 260us/sample - loss: 0.0395
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- 3s 231us/sample - loss: 0.0395
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Epoch 85/500
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11535/11535 [===========================] - 3s 261us/sample - loss: 0.0393
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Epoch 93/500
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- 3s 252us/sample - loss: 0.0393
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11535/11535 [================
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11535/11535 [======
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11535/11535 [==========================] - 3s 232us/sample - loss: 0.0392
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Epoch 113/500
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Epoch 110/500
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11535/11535 [==========================] - 4s 363us/sample - loss: 0.0392
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11535/11535 [======
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Epoch 118/500
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2s 200us/sample - loss: 0.0392
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Epoch 131/500
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Epoch 133/500
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11535/11535 [==========================] - 3s 265us/sample - loss: 0.0389
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Epoch 138/500
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Epoch 140/500
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Epoch 135/500
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11535/11535 [===========================] - 3s 227us/sample - loss: 0.0390
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11535/11535 [==================================
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Epoch 143/500
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- 3s 232us/sample - loss: 0.0387
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Epoch 155/500
11535/11535 [==================================
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Epoch 156/500
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11535/11535 [==========================] - 4s 343us/sample - loss: 0.0388
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Epoch 160/500
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- 3s 249us/sample - loss: 0.0389
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                     11535/11535 [===========================] - 2s 195us/sample - loss: 0.0387
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11535/11535 [======
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Epoch 170/500
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Epoch 174/500
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Epoch 168/500
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- 2s 213us/sample - loss: 0.0389
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Epoch 180/500
11535/11535 [==================================
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11535/11535 [==========================] - 3s 224us/sample - loss: 0.0386
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Epoch 185/500
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11535/11535 [===========================] - 3s 224us/sample - loss: 0.0385
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Epoch 193/500
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- 3s 242us/sample - loss: 0.0386
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11535/11535 [==========================] - 4s 328us/sample - loss: 0.0386
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Epoch 210/500
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11535/11535 [===========================] - 3s 236us/sample - loss: 0.0386
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- 3s 236us/sample - loss: 0.0384
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11535/11535 [==========================] - 3s 235us/sample - loss: 0.0384
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Epoch 235/500
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11535/11535 [===========================] - 3s 226us/sample - loss: 0.0384
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Epoch 243/500
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- 3s 232us/sample - loss: 0.0382
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11535/11535 [==========================] - 3s 263us/sample - loss: 0.0382
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Epoch 260/500
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194us/sample - loss: 0.0382
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                     11535/11535 [============================] - 2s 185us/sample - loss: 0.0381
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Epoch 268/500
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- 3s 239us/sample - loss: 0.0380
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Epoch 279/500
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11535/11535 [===========================] - 2s 210us/sample - loss: 0.0379
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               188us/sample - loss: 0.0381
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Epoch 285/500
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11535/11535 [===========================] - 3s 223us/sample - loss: 0.0380
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Epoch 293/500
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- 3s 234us/sample - loss: 0.0380
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                                                                                                                                                                                                                                                                                                                                                                    2s 205us/sample - loss: 0.0378
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                                                                                                                                                                                                                                                                                             - 3s 242us/sample - loss: 0.0380
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11535/11535 [==================================
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11535/11535 [======
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Epoch 306/500
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Epoch 308/500
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11535/11535 [===========================] - 2s 196us/sample - loss: 0.0378
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Epoch 313/500
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Epoch 315/500
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Epoch 310/500
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11535/11535 [===========================] - 3s 226us/sample - loss: 0.0379
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Epoch 318/500
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- 2s 210us/sample - loss: 0.0378
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11535/11535 [==================================
11535/11535 [================
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Epoch 333/500
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11535/11535 [===========================] - 3s 217us/sample - loss: 0.0378
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                   - 3s 241us/sample - loss: 0.0377
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11535/11535 [==================================
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Epoch 340/500
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Epoch 335/500
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11535/11535 [===========================] - 2s 202us/sample - loss: 0.0376
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                                                                                             195us/sample - loss: 0.0376
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Epoch 349/500
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Epoch 343/500
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- 3s 220us/sample - loss: 0.0380
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11535/11535 [======
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Epoch 356/500
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Epoch 358/500
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11535/11535 [===========================] - 3s 246us/sample - loss: 0.0375
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                                                                                   11535/11535 [===========================] - 3s 236us/sample - loss: 0.0376
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11535/11535 [==================================
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Epoch 363/500
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Epoch 365/500
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Epoch 360/500
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11535/11535 [===========================] - 3s 228us/sample - loss: 0.0376
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11535/11535 [==================================
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Epoch 370/500
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Epoch 374/500
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Epoch 368/500
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- 2s 197us/sample - loss: 0.0375
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11535/11535 [==================================
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Epoch 383/500
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Epoch 379/500
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11535/11535 [===========================] - 2s 201us/sample - loss: 0.0375
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11535/11535 [==================================
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Epoch 390/500
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Epoch 385/500
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11535/11535 [===========================] - 2s 202us/sample - loss: 0.0375
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11535/11535 [======
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Epoch 393/500
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- 2s 206us/sample - loss: 0.0374
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11535/11535 [==================================
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11535/11535 [=====
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11535/11535 [==========================] - 3s 223us/sample - loss: 0.0374
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11535/11535 [==================================
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Epoch 413/500
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Epoch 415/500
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Epoch 410/500
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11535/11535 [===========================] - 3s 219us/sample - loss: 0.0372
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                                                                                        - 2s 216us/sample - loss: 0.0373
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11535/11535 [======
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Epoch 418/500
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- 2s 198us/sample - loss: 0.0373
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11535/11535 [======
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11535/11535 [===========================] - 2s 203us/sample - loss: 0.0372
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                  - 2s 205us/sample - loss: 0.0371
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Epoch 435/500
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11535/11535 [===========================] - 3s 221us/sample - loss: 0.0372
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11535/11535 [==================================
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Epoch 443/500
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- 2s 197us/sample - loss: 0.0374
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11535/11535 [===========================] - 3s 245us/sample - loss: 0.0375
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11535/11535 [==================================
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Epoch 460/500
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                        11535/11535 [============================] - 3s 225us/sample - loss: 0.0371
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Epoch 468/500
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- 3s 217us/sample - loss: 0.0370
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11535/11535 [==========================] - 2s 214us/sample - loss: 0.0369
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                   - 2s 207us/sample - loss: 0.0371
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Epoch 485/500
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11535/11535 [===========================] - 2s 191us/sample - loss: 0.0370
                                                                                                2s 203us/sample - loss: 0.0369
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Epoch 493/500
```

class_weight_Fold_2: {0: 0.40265293655641854, 1: 91.0657894736842}

pos_weight: 0.6

thresholdNum: 0.5

Average of train loss Fold_2: 0.049 Average of yPredProbability Fold_2: 0.0071

classification_report_Fold_2:

support	2881 10	2891 2891 2891
f1-score	1.00	1.00 0.50 0.99
recall	1.00	0.50
precision	1.00	0.50
	Normal 0 Anomaly 1	accuracy macro avg weighted avg

confusion_matrix_Fold_2:

True Negatives: 2881

False Positives: 0

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```
File - finalTest_CV
```

False Negatives: True Positives: End running time Fold_2: 210508_010318

Start running time Fold_3: 210508_010318 ,---

Shape of Actual yXtrainRolled After Rolling Fold_3: (23080, 60)

of Actual yXvalidRolled After Rolling Fold_3: (5774, 60) Shape of Actual yXvalidShifted dataset: (2888, 60)

--*** Train modelEvaluateVal without adding Augmented data

Shape of data after Transform ToOneRow to give Cross Validation Model in

xtrain: (11540, 118), ytrain: (11540,) xvalid: (2887, 118), yvalid: (2887,)

Number of final label 0 in yXtrain_Fold_3: 11469

Number of final label 1 in yXtrain_Before_AddingAugedData_Fold_3: 71 Number of final label 1 in yXtrain_After_AddingAugedData_Fold_3: 71

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11540/11540 [==========================] - 2s 204us/sample - loss: 1.3680
                                                                                                                                                                                      196us/sample - loss: 0.5872
                                                                                                                                                                                                                                                        loss: 0.2510
                                                                                                                                                                                                                                                                                                                           ========] - 3s 244us/sample - loss: 0.1189
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Train on 11540 samples
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11540/11540 [==========================] - 3s 222us/sample - loss: 0.0455
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Epoch 13/500
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                     Epoch 8/500
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========] - 2s 203us/sample - loss: 0.0418
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                                11540/11540 [===========================] - 2s 203us/sample - loss: 0.0421
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Epoch 16/500
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2s 208us/sample - loss: 0.0402
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- 2s 148us/sample - loss: 0.0364
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11540/11540 [==========================] - 2s 141us/sample - loss: 0.0364
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Epoch 133/500
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11540/11540 [==========================] - 2s 142us/sample - loss: 0.0362
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Epoch 141/500
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11540/11540 [=========================] - 2s 191us/sample - loss: 0.0360
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150us/sample - loss: 0.0360
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Epoch 166/500
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- 3s 257us/sample - loss: 0.0359
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11540/11540 [===========================] - 2s 174us/sample - loss: 0.0358
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11540/11540 [==========================] - 1s 124us/sample - loss: 0.0359
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Epoch 191/500
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1s 123us/sample - loss: 0.0358
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11540/11540 [==========================] - 2s 132us/sample - loss: 0.0357
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Epoch 216/500
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2s 134us/sample - loss: 0.0355
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2s 149us/sample - loss: 0.0356
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11540/11540 [=========================] - 2s 139us/sample - loss: 0.0352
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11540/11540 [==========================] - 2s 135us/sample - loss: 0.0357
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11540/11540 [==========================] - 1s 126us/sample - loss: 0.0353
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11540/11540 [==========================] - 2s 144us/sample - loss: 0.0349
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11540/11540 [==========================] - 2s 148us/sample - loss: 0.0350
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2s 147us/sample - loss: 0.0350
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11540/11540 [=========================] - 2s 162us/sample - loss: 0.0348
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11540/11540 [==========================] - 2s 135us/sample - loss: 0.0346
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11540/11540 [==========================] - 2s 131us/sample - loss: 0.0346
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2s 130us/sample - loss: 0.0347
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11540/11540 [=========================] - 2s 132us/sample - loss: 0.0344
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11540/11540 [==========================] - 1s 127us/sample - loss: 0.0345
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1s 125us/sample - loss: 0.0345
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11540/11540 [=========================] - 2s 132us/sample - loss: 0.0344
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11540/11540 [==========================] - 1s 127us/sample - loss: 0.0342
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Epoch 491/500
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```
File - finalTest_CV
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```
- 1s 129us/sample - loss: 0.0343
11540/11540 [=============================
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Epoch 500/500

========] - 2s 134us/sample - loss: 0.0342 11540/11540 [===============

- accuracy: 0.9938

class_weight_Fold_3: {0: 0.40247624029993895, 1: 97.52112676056338}

pos_weight: 0.6
thresholdNum: 0.5

Average of train loss Fold_3: 0.0463

Average of yPredProbability Fold_3: 0.0133

classification_report_Fold_3:

precision recall f1-score support

Normal 0 0.99 1.00 1.00 Anomaly 1 0.00 0.00 0.00

2871 16

2887 0.99 accuracy

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2887	2887
0.50	66.0
0.50	0.99
0.50	66.0
	d avg
macro	weighted

confusion_matrix_Fold_3:

True Negatives: 2871

False Positives: 0 False Negatives: 16

True Positives: 0

End running time Fold_3: 210508_011724 ,

Start running time Fold_4: 210508_011724 ,---

Shape of Actual yXtrainRolled After Rolling Fold_4: (23094, 60)

Shape of Actual yXvalidShifted dataset: (2881, 60) Shape of Actual yXvalidRolled After Rolling Fold_4: (5760, 60)

---*** Train modelEvaluateVal without adding Augmented data

after Transform ToOneRow to give Cross Validation Model Shape of data

```
fold_4:
File - finalTest_CV
```

```
xtrain: (11547, 118), ytrain: (11547,)
xvalid: (2880, 118), yvalid: (2880,)
```

Number of final label 0 in yXtrain_Fold_4: 11483

Number of final label 1 in yXtrain_Before_AddingAugedData_Fold_4: 64 Number of final label 1 in yXtrain_After_AddingAugedData_Fold_4: 64

11547/11547 [===========================] - 3s 234us/sample - loss: 3.1467 Train on 11547 samples - accuracy: 0.9919 Epoch 1/500

11547/11547 [==========================] - 1s 122us/sample - loss: 1.5704 - accuracy: 0.9945 Epoch 2/500

11547/11547 [===========================] - 1s 125us/sample - loss: 0.7340 - accuracy: 0.9945 Epoch 3/500

11547/11547 [==========================] - 1s 124us/sample - loss: 0.3369 Epoch 4/500

130us/sample - loss: 0.1623 **2**s I - accuracy: 0.9945 Epoch 5/500

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0.0405
                  11547/11547 [==========================] - 1s 121us/sample - loss: 0.0899
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Epoch 6/500
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========] - 2s 134us/sample - loss: 0.0393
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Epoch 14/500
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========] - 1s 126us/sample - loss: 0.0372
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 1s 121us/sample - loss: 0.0381
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Epoch 27/500
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11547/11547 [==========================] - 1s 129us/sample - loss: 0.0360
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Epoch 36/500
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                Epoch 31/500
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11547/11547 [===========================] - 2s 134us/sample - loss: 0.0356
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Epoch 39/500
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1s 125us/sample - loss: 0.0350
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11547/11547 [==========================] - 1s 129us/sample - loss: 0.0348
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Epoch 56/500
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11547/11547 [===========================] - 1s 127us/sample - loss: 0.0344
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Epoch 64/500
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- 2s 134us/sample - loss: 0.0343
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11547/11547 [==========================] - 1s 123us/sample - loss: 0.0339
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11547/11547 [==========================] - 1s 125us/sample - loss: 0.0339
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- 1s 126us/sample - loss: 0.0336
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11547/11547 [===========================] - 1s 128us/sample - loss: 0.0336
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- 2s 132us/sample - loss: 0.0335
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11547/11547 [==========================] - 2s 136us/sample - loss: 0.0333
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Epoch 131/500
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1s 120us/sample - loss: 0.0332
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11547/11547 [===========================] - 1s 129us/sample - loss: 0.0332
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Epoch 157/500
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Epoch 156/500
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11547/11547 [===========================] - 1s 122us/sample - loss: 0.0333
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Epoch 164/500
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1s 125us/sample - loss: 0.0332
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11547/11547 [==========================] - 1s 129us/sample - loss: 0.0332
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11547/11547 [==========================] - 1s 121us/sample - loss: 0.0330
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Epoch 189/500
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11547/11547 [===========================] - 2s 133us/sample - loss: 0.0328
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Epoch 214/500
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- 2s 133us/sample - loss: 0.0329
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Epoch 231/500
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11547/11547 [===========================] - 1s 120us/sample - loss: 0.0326
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Epoch 239/500
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11547/11547 [==========================] - 1s 108us/sample - loss: 0.0328
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11547/11547 [==========================] - 1s 111us/sample - loss: 0.0326
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1s 111us/sample - loss: 0.0326
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Epoch 264/500
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- 1s 110us/sample - loss: 0.0327
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Epoch 277/500
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Epoch 275/500
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- 1s 102us/sample - loss: 0.0323
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                      11547/11547 [===========================] - 1s 105us/sample - loss: 0.0327
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11547/11547 [===========================] - 2s 131us/sample - loss: 0.0326
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Epoch 289/500
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- 2s 130us/sample - loss: 0.0325
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11547/11547 [==========================] - 1s 129us/sample - loss: 0.0323
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11547/11547 [==========================] - 1s 126us/sample - loss: 0.0324
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Epoch 314/500
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1s 130us/sample - loss: 0.0328
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11547/11547 [==========================] - 1s 127us/sample - loss: 0.0322
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11547/11547 [==========================] - 2s 130us/sample - loss: 0.0323
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- 2s 131us/sample - loss: 0.0323
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11547/11547 [==========================] - 1s 129us/sample - loss: 0.0320
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- 2s 131us/sample - loss: 0.0323
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11547/11547 [==========================] - 1s 127us/sample - loss: 0.0320
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Epoch 389/500
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========] - 1s 122us/sample - loss: 0.0322
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 - 2s 140us/sample - loss: 0.0321
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11547/11547 [===========================] - 1s 130us/sample - loss: 0.0320
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11547/11547 [==========================] - 1s 120us/sample - loss: 0.0320
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Epoch 414/500
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- 1s 120us/sample - loss: 0.0319
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11547/11547 [===========================] - 2s 137us/sample - loss: 0.0319
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11547/11547 [===========================] - 1s 126us/sample - loss: 0.0317
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Epoch 439/500
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- 1s 124us/sample - loss: 0.0318
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11547/11547 [==========================] - 2s 136us/sample - loss: 0.0319
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Epoch 456/500
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11547/11547 [===========================] - 2s 133us/sample - loss: 0.0319
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11547/11547 [======
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Epoch 470/500
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- 1s 124us/sample - loss: 0.0318
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Epoch 479/500
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11547/11547 [==========================] - 2s 133us/sample - loss: 0.0317
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11547/11547 [==================================
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Epoch 486/500
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Epoch 481/500
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11547/11547 [===========================] - 2s 130us/sample - loss: 0.0319
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Epoch 489/500
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File - finalTest_CV
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11547/11547 [==========================] - 1s 121us/sample - loss: 0.0319
 - 2s 133us/sample - loss: 0.0318
                                                                                                                11547/11547 [===========================] - 2s 133us/sample - loss: 0.0318
                                                                                                                                                                                                                          11547/11547 [==========================] - 2s 134us/sample - loss: 0.0318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   class_weight_Fold_4: {0: 0.40222938256553165, 1: 108.253125}
                                                                                                                                                                                                                                                                                                                                                                                                                         2880/2880 [========================= ] - 0s 98us/sample
- accuracy: 0.9945
Epoch 500/500
                                       - accuracy: 0.9945
                                                                                                                                                   - accuracy: 0.9945
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                                                                                                                                                                                          Epoch 499/500
                                                                           Epoch 498/500
```

pos_weight: 0.6
thresholdNum: 0.5

Average of train loss Fold_4: 0.0449 Average of yPredProbability Fold_4: 0.0099

classification_report_Fold_4:

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support	2857	2880 2880 2880	
f1-score	1.00	0.99	
recall	1.00	0.50	
precision	0.09	0.50	<pre>Lx_Fold_4:</pre>
	Normal O Anomaly 1	accuracy macro avg weighted avg	confusion_matrix_Fold_4 True Negatives: 2857 False Positives: 0 False Negatives: 23 True Positives: 0

End running time Fold_4: 210508_012938

Start running time Fold_5: 210508_012938

Shape of Actual yXtrainRolled After Rolling Fold_5: (23068, 60)

Shape of Actual yXvalidShifted dataset: (2894, 60) Shape of Actual yXvalidRolled After Rolling Fold_5: (5786, 60) Shape

Shape of data after Transform ToOneRow to give Cross Validation Model

```
xtrain: (11534, 118), ytrain: (11534,)
xvalid: (2893, 118), yvalid: (2893,)
```

Number of final label 0 in yXtrain_Fold_5: 11457

Number of final label 1 in yXtrain_Before_AddingAugedData_Fold_5: 77 Number of final label 1 in yXtrain_After_AddingAugedData_Fold_5: 77

```
Train on 11534 samples
```

- accuracy: 0.9927

Epoch 2/500

11534/11534 [===========================] - 2s 133us/sample - loss: 1.4195

- accuracy: 0.9933

133us/sample - loss: 0.6244 Epoch 3/500

```
11534/11534 [===========================] - 2s 132us/sample - loss: 0.2732
                                                                                                        11534/11534 [===========================] - 1s 119us/sample - loss: 0.1315
                                                                                                                                                                         135us/sample - loss: 0.0782
                                                                                                                                                                                                                                        2s 134us/sample - loss: 0.0590
                                                                                                                                                                                                                                                                                                   11534/11534 [===========================] - 1s 119us/sample - loss: 0.0490
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11534/11534 [===================================
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  accuracy: 0.9933
                                                              - accuracy: 0.9933
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11534/11534 [===========================] - 2s 132us/sample - loss: 0.0467
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Epoch 12/500
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1s 130us/sample - loss: 0.0436
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 - 1s 126us/sample - loss: 0.0441
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0.0419
                                      11534/11534 [==========================] - 2s 131us/sample - loss: 0.0425
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                    Epoch 29/500
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11534/11534 [===========================] - 2s 130us/sample - loss: 0.0412
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Epoch 37/500
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2s 133us/sample - loss: 0.0405
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Epoch 52/500
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11534/11534 [==========================] - 2s 135us/sample - loss: 0.0406
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Epoch 57/500
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Epoch 55/500
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                    Epoch 54/500
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1s 124us/sample - loss: 0.0402
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Epoch 62/500
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2s 136us/sample - loss: 0.0397
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11534/11534 [===========================] - 1s 128us/sample - loss: 0.0396
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11534/11534 [===================================
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Epoch 84/500
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11534/11534 [===========================] - 1s 120us/sample - loss: 0.0392
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Epoch 87/500
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2s 131us/sample - loss: 0.0399
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                  11534/11534 [=========================== ] - 1s 125us/sample - loss: 0.0393
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Epoch 104/500
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11534/11534 [===========================] - 2s 133us/sample - loss: 0.0392
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Epoch 112/500
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2s 132us/sample - loss: 0.0393
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11534/11534 [============================] - 1s 129us/sample - loss: 0.0393
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135us/sample - loss: 0.0392
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1s 126us/sample - loss: 0.0388
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11534/11534 [===========================] - 2s 131us/sample - loss: 0.0389
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2s 132us/sample - loss: 0.0387
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11534/11534 [===========================] - 1s 122us/sample - loss: 0.0388
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11534/11534 [==========================] - 2s 133us/sample - loss: 0.0388
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Epoch 237/500
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2s 139us/sample - loss: 0.0384
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11534/11534 [==========================] - 1s 122us/sample - loss: 0.0385
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11534/11534 [===========================] - 1s 119us/sample - loss: 0.0383
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1s 121us/sample - loss: 0.0385
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11534/11534 [==========================] - 2s 133us/sample - loss: 0.0384
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11534/11534 [===========================] - 2s 134us/sample - loss: 0.0384
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1s 127us/sample - loss: 0.0382
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11534/11534 [==========================] - 2s 138us/sample - loss: 0.0382
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11534/11534 [===========================] - 2s 137us/sample - loss: 0.0386
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2s 137us/sample - loss: 0.0382
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11534/11534 [==========================] - 1s 126us/sample - loss: 0.0379
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11534/11534 [===========================] - 1s 129us/sample - loss: 0.0382
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Epoch 337/500
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1s 129us/sample - loss: 0.0379
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11534/11534 [==========================] - 2s 134us/sample - loss: 0.0382
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Epoch 354/500
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11534/11534 [===========================] - 2s 138us/sample - loss: 0.0380
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Epoch 362/500
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1s 122us/sample - loss: 0.0380
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Epoch 373/500
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11534/11534 [==========================] - 1s 121us/sample - loss: 0.0379
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11534/11534 [===========================] - 1s 121us/sample - loss: 0.0378
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1s 122us/sample - loss: 0.0379
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11534/11534 [==========================] - 1s 129us/sample - loss: 0.0378
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Epoch 407/500
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Epoch 409/500
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Epoch 404/500
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11534/11534 [==========================] - 1s 128us/sample - loss: 0.0379
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Epoch 414/500
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1s 124us/sample - loss: 0.0377
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11534/11534 [==========================] - 2s 143us/sample - loss: 0.0378
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1s 121us/sample - loss: 0.0380
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- 2s 135us/sample - loss: 0.0376
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11534/11534 [==========================] - 1s 121us/sample - loss: 0.0378
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11534/11534 [===========================] - 1s 123us/sample - loss: 0.0376
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1s 125us/sample - loss: 0.0377
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11534/11534 [==========================] - 1s 123us/sample - loss: 0.0376
                                                                                                                                                                     1s 123us/sample - loss: 0.0375
                                                                                                                                                                                                                                         11534/11534 [==========================] - 1s 126us/sample - loss: 0.0376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0.0377
                                                                                              11534/11534 [===========================] - 2s 135us/sample - loss: 0.0377
                                                                                                                                                                                                                                                                                                                                                                                        11534/11534 [===========================] - 2s 141us/sample - loss: 0.0377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       loss:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      126us/sample –
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1s
                                                                                                                                                                          ı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Epoch 481/500
11534/11534 [==================================
                                                                                                                                                                                                                                                                                                                                        - accuracy: 0.9933
Epoch 484/500
                                               - accuracy: 0.9933
                                                                                                                    - accuracy: 0.9933
                                                                                                                                                                                            - accuracy: 0.9933
                                                                                                                                                                                                                                                                  - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                                                                                              - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           accuracy: 0.9933
                                                                     Epoch 480/500
Epoch 479/500
                                                                                                                                                                                                                  Epoch 482/500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Epoch 486/500
```

```
11534/11534 [===========================] - 2s 137us/sample - loss: 0.0376
                       11534/11534 [===========================] - 1s 123us/sample - loss: 0.0376
                                                                                              135us/sample - loss: 0.0375
                                                                                                                                                                     ========] - 1s 122us/sample - loss: 0.0376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  =====] - 2s 131us/sample - loss: 0.0376
                                                                                                                                                                                                                                                                                                               11534/11534 [===========================] - 1s 124us/sample - loss: 0.0377
                                                                                                                                                                                                                                                                                                                                                                                                                                                             120us/sample - loss: 0.0377
                                                                                              1s
                                                                                                   ı
                                                                                                                                                                                                                                                                                                                                                                                                                                                          11534/11534 [================
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Epoch 494/500
11534/11534 [======
                                              - accuracy: 0.9933
                                                                                                                     - accuracy: 0.9933
                                                                                                                                                                                           - accuracy: 0.9933
                                                                                                                                                                                                                                                                 - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                      - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                                                                                             - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         - accuracy: 0.9933
                                                                                                                                                                                                                                                                                       Epoch 491/500
                                                                                                                                                                                                                                                                                                                                                              Epoch 492/500
                                                                       Epoch 488/500
                                                                                                                                            Epoch 489/500
                                                                                                                                                                                                                                                                                                                                                                                                                                    Epoch 493/500
Epoch 487/500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Epoch 495/500
```

```
File - finalTest_CV
```

```
- 1s 123us/sample - loss: 0.0377
                                                                         :========] - 2s 149us/sample - loss: 0.0375
                                                                                                                                                                                                                        11534/11534 [===========================] - 2s 133us/sample - loss: 0.0378
                                                                                                                                                                                                                                                                                                                                                                         11534/11534 [=========================== ] - 2s 135us/sample - loss:
                                                                                                                                                                                                                                                                                                                                                                                                                          2893/2893 [========================= ] - 0s 83us/sample
11534/11534 [================
                                                                                                                                                                                                                                                                                                                        - accuracy: 0.9933
Epoch 500/500
                        - accuracy: 0.9933
                                                                                                - accuracy: 0.9933
                                                                                                                                                                         - accuracy: 0.9933
                                                                                                                                                                                                                                                - accuracy: 0.9933
                                                                                                                                                                                                                                                                                                                                                                                               - accuracy: 0.9933
                                                                                                                                                                                             Epoch 498/500
                                                 Epoch 496/500
```

pos_weight: 0.6
thresholdNum: 0.5

class_weight_Fold_5: {0: 0.4026883128218557, 1: 89.87532467532468}

Average of train loss rota_ɔ: ʊ.ʊᠴːʊ Average of yPredProbability Fold_5: 0.014

classification_report_Fold_5:

support
f1-score
recall
precision

_	<u>د</u> 0	ឆ្ន
Suppoi. L	2883	2893 2893 2893
ו.פנפרר וד-אנחו.פ	1.00	1.00 0.50 0.99
ופנפרר	1.00	0.50
IIOTSTOB.Id	1.00	0.50
	Normal 0 Anomaly 1	accuracy macro avg weighted avg

confusion_matrix_Fold_5:

2883 True Negatives:

False Negatives: False Positives:

True Positives:

End running time Fold_5: 210508_014207 ,-----

Average's Results of All Folds is such as below:

Approach class_weight did not use

thresholdNum: 0.5

Average's train loss of All Folds : 0.0465 Average of yPredProbability fold_All: 0.0097

support f1-score recall classification_report_AllFolds: precision

14423 14423 14337 86 14423 1.00 0.99 0.50 0.99 1.00 00.00 0.500.99 00.0 0.500.99 weighted avg macro avg Anomaly 1 accuracy Normal

confusion_matrix_AllFolds:

True Negatives: 14337

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File - finalTest_CV

False Positives:

False Negatives: True Positives:

Average threshold_rt AllFolds: 0.04 Average precision_rt AllFolds: 0.02 Average recall_rt AllFolds: 0.2

Main End running time: 210508_014218, **************************

Process finished with exit code 0