DMW C2 Assignment-1

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Algorithm:

- Minimization of volume of data-enclosing hypersphere with R>0 using neural network transformation.
- Optimization of the network weight W such that most of the data falls within the hypersphere center.
- Mapping of normal points to the hypersphere center, Mapping of anomalies further away or outside the sphere.
- Then,using the One-class SS-DSVDD,we impose a quadratic loss on the distances of the mapped points to the fixed center c, for both the unlabeled samples and the labeled normal points.
- For the labeled anomalies, we penalize the inverse such that anomalies must be mapped further away from the center.

Results:

ROC scores for each class :

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ROC scores for class  0  is:  95.24544097017966

ROC scores for class  1  is:  98.62677310911842

ROC scores for class  2  is:  87.09789198805053

ROC scores for class  3  is:  88.26553155871761

ROC scores for class  4  is:  92.78068664662078

ROC scores for class  5  is:  80.90931985087767

ROC scores for class  6  is:  96.5064793893863

ROC scores for class  7  is:  93.87657190290241

ROC scores for class  8  is:  84.99050882438186

ROC scores for class  9  is:  91.0064783426748
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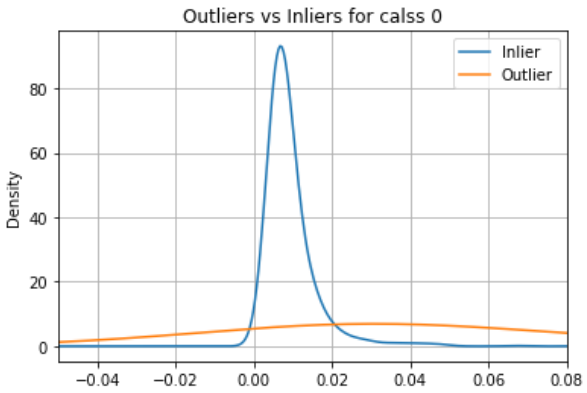
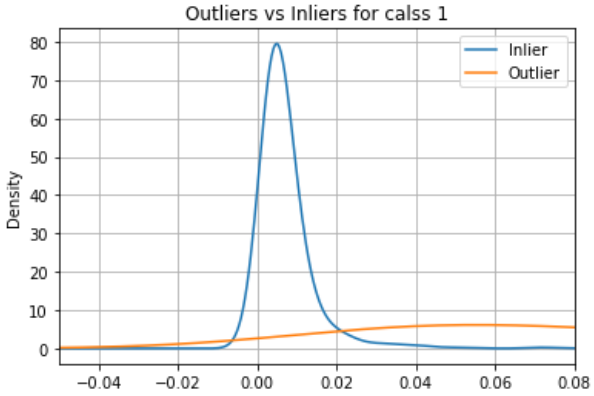
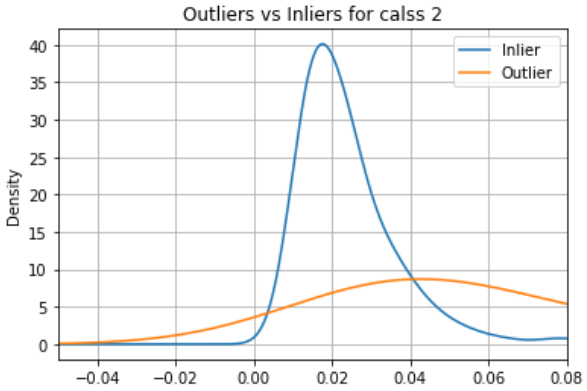
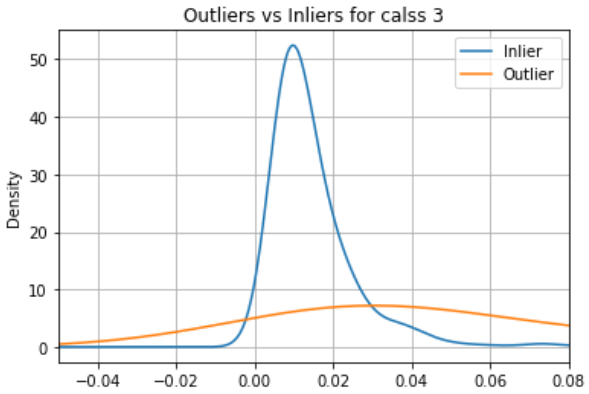
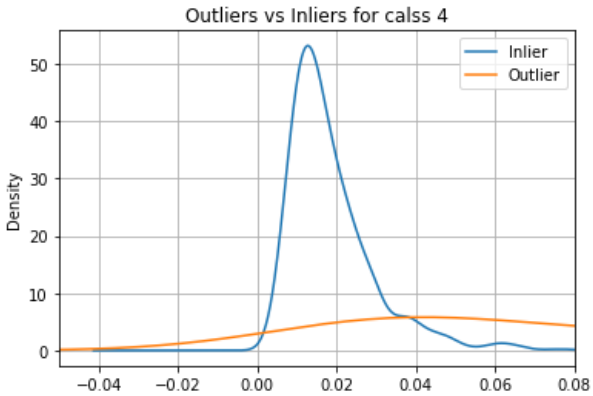
Outliers vs Inliers for each class :

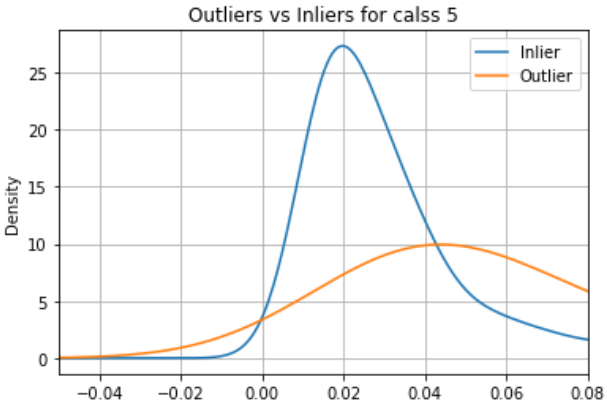


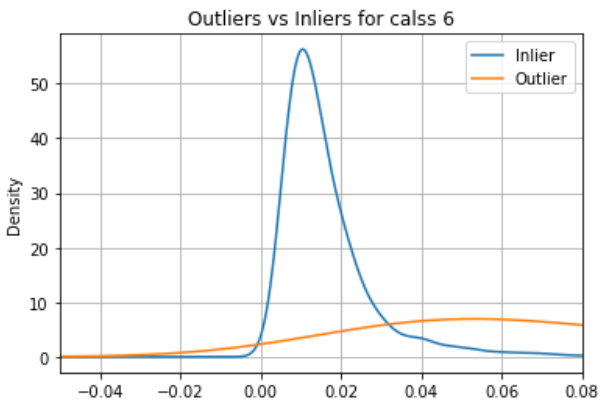


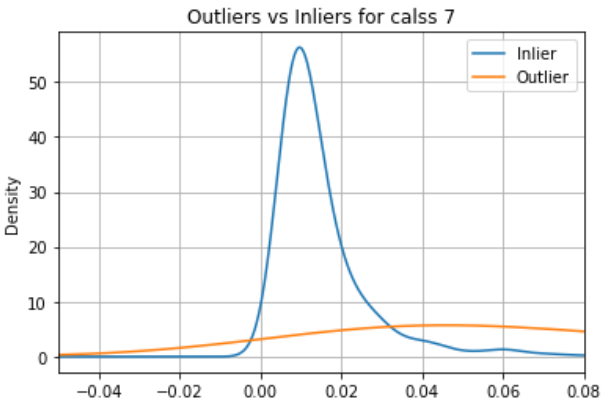


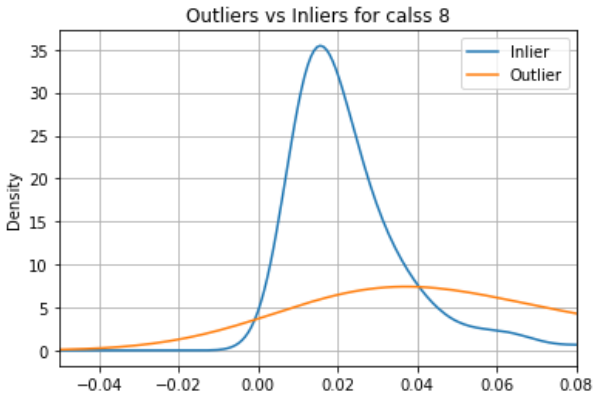


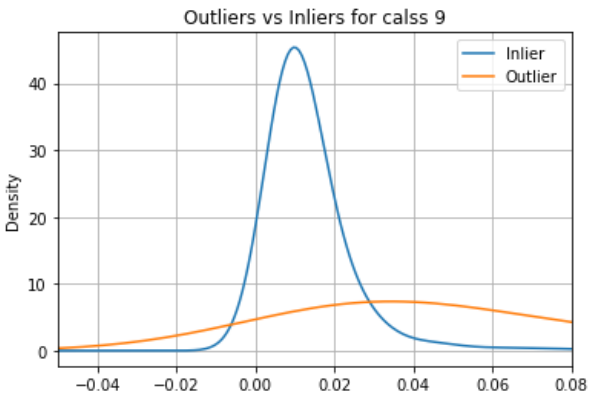





Outliers vs Inliers for calss 6
Inlier
Outlier
Density
50
40
30
20
10
0
−0.04
−0.02
0.00
0.02
0.04
0.06
0.08


Outliers vs Inliers for calss 7
Inlier
Outlier
Density
50
40
30
20
10
0
−0.04
−0.02
0.00
0.02
0.04
0.06
0.08


Outliers vs Inliers for calss 8
Inlier
Outlier
Density
35
30
25
20
15
10
5
0
−0.04
−0.02
0.00
0.02
0.04
0.06
0.08


Outliers vs Inliers for calss 9
Inlier
Outlier
Density
40
30
20
10
0
−0.04
−0.02
0.00
0.02
0.04
0.06
0.08