Report

1. The algorithm for DBSCAN is can be found in the folder. I am attaching both the python file and Jupyter file containing the algorithm.
   The code is slightly explained in the comments mentioned for each line.

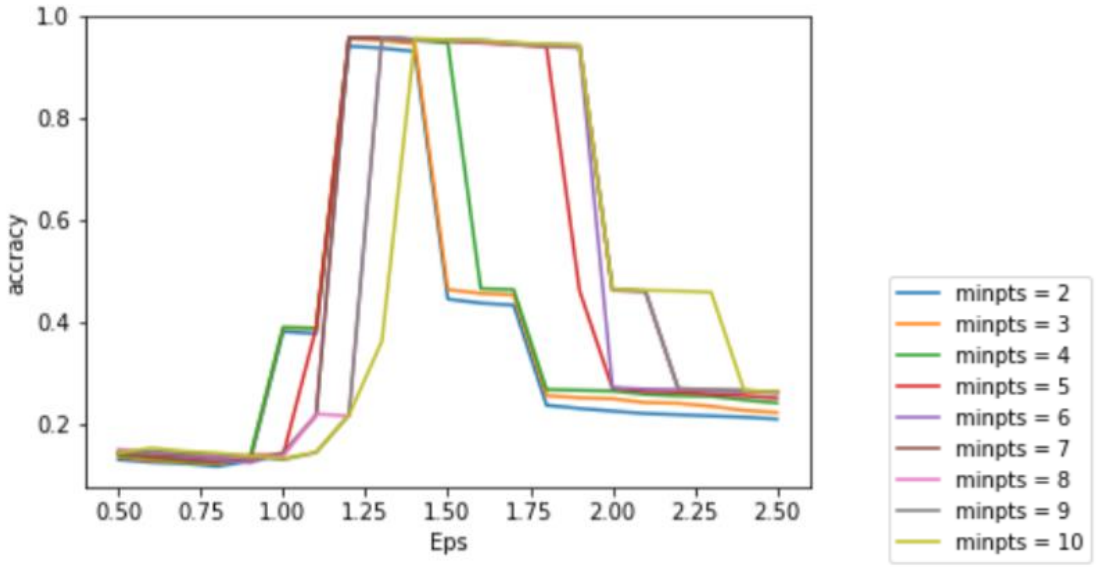
2. The following show the accuracy values and the number of clusters formed for different combinations of (minpts, epsilon)

```
3. (2, 0.5): (0.1295238095238095, 206),
4.  (2, 1.0): (0.38095238095238093, 13),
5.  (2, 1.5): (0.44476190476190475, 20),
6.  (2, 2.0): (0.22476190476190477, 22),
7.  (2, 2.5): (0.20904761904761904, 15),
8.  (2, 3.0): (0.19904761904761906, 6),
9.  (2, 3.5): (0.19523809523809524, 4),
10.   (3, 0.5): (0.13428571428571429, 154),
11.   (3, 1.0): (0.38857142857142857, 7),
12.   (3, 1.5): (0.4633333333333333, 9),
13.   (3, 2.0): (0.24904761904761905, 12),
14.   (3, 2.5): (0.2219047619047619, 13),
15.   (3, 3.0): (0.2057142857142857, 7),
16.   (3, 3.5): (0.1976190476190476, 3),
17.   (4, 0.5): (0.13857142857142857, 105),
18.   (4, 1.0): (0.38904761904761903, 7),
19.   (4, 1.5): (0.9471428571428572, 6),
20.   (4, 2.0): (0.2642857142857143, 5),
21.   (4, 2.5): (0.24047619047619048, 7),
22.   (4, 3.0): (0.21857142857142858, 3),
23.   (4, 3.5): (0.2057142857142857, 2),
24.   (5, 0.5): (0.14238095238095239, 58),
25.   (5, 1.0): (0.13857142857142857, 11),
26.   (5, 1.5): (0.9514285714285714, 5),
27.   (5, 2.0): (0.27, 3),
28.   (5, 2.5): (0.25, 6),
29.   (5, 3.0): (0.2257142857142857, 3),
30.   (5, 3.5): (0.20952380952380953, 1),
31.   (6, 0.5): (0.14238095238095239, 31),
32.   (6, 1.0): (0.14142857142857143, 15),
33.   (6, 1.5): (0.9514285714285714, 5),
34.   (6, 2.0): (0.27095238095238094, 3),
35.   (6, 2.5): (0.259047619047619, 2),
36.   (6, 3.0): (0.2342857142857143, 4),
37.   (6, 3.5): (0.21761904761904763, 3),
38.   (7, 0.5): (0.14285714285714285, 14),
39.   (7, 1.0): (0.14285714285714285, 14),
40.   (7, 1.5): (0.9519047619047619, 5),
41.   (7, 2.0): (0.46190476190476193, 4),
42.   (7, 2.5): (0.26142857142857145, 1),
43.   (7, 3.0): (0.24142857142857144, 3),
44.   (7, 3.5): (0.22380952380952382, 2)
```

   The number of classes formed by the algorithm varied with the values of Eps and Minpts. The high accuracies happened mostly for the classification with 5 classes, which is the same number of classes in the ground truth.

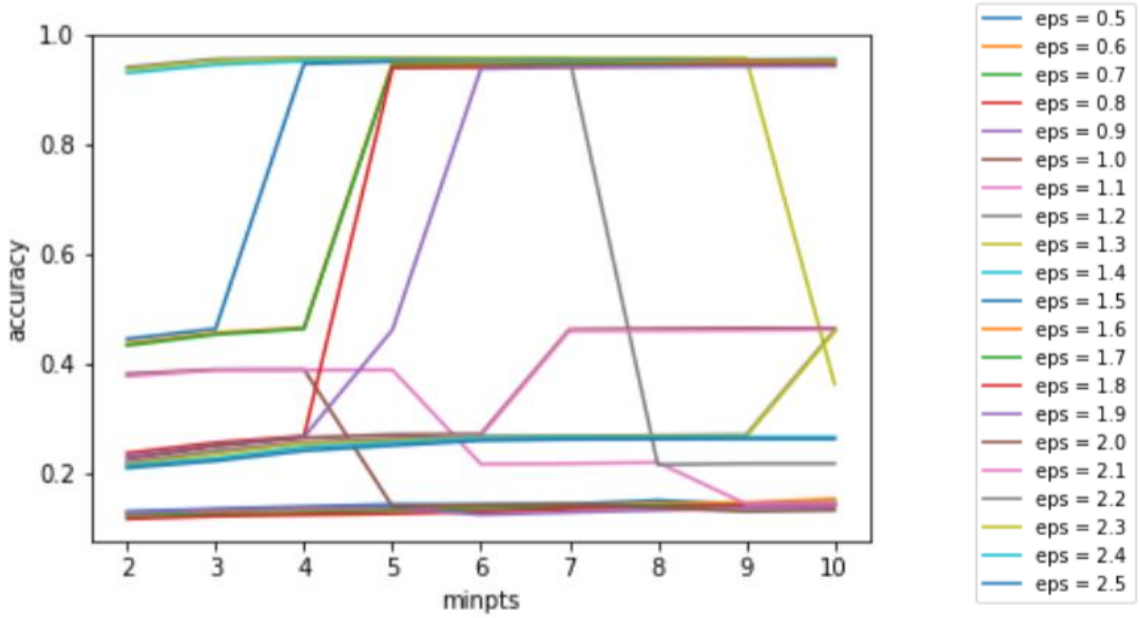
But in case of 4 minimum points and epsilon = 1.5, there are actually classes but accuracy is around 0.94 which means the 6th class is of very small size.

3. **Variation with Epsilon:**



The variation of accuracy with epsilon has a fixed trend that they are very low at the beginning and there is an increase to around 95% accuracy and then again decrease. For all values of minpts, the peak is almost always covering a value between 1.25 and 1.5.

Variation with Mints:



But when the variation of accuracy with minpts is considered it is not in particuar trend.