

Cpts570-hw2

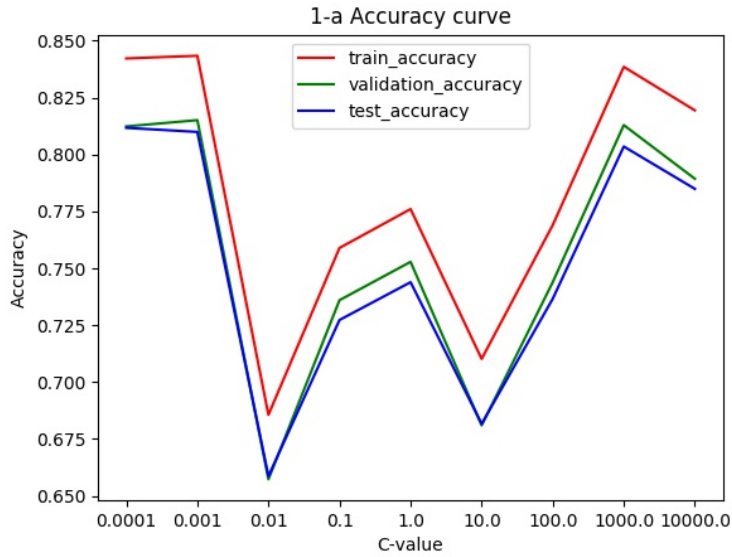
Mengxiao Zhang-11651502

October 23, 2019

1 Programming and Empirical Analysis Part

1.1 Problem 1

1.1.1 a



Since I use LinearSVC, I cannot plot the number of support vectors. And finally I find the best C is 0.001.

1.1.2 b

The testing accuracy: 77.69%.

The corresponding confusion matrix:

699	9	2	56	16	0	204	1	12	1
2	943	1	31	6	0	14	1	1	1
17	6	256	10	258	0	444	0	8	1
21	17	3	818	57	1	77	2	2	2
0	2	8	31	760	1	195	0	3	0
0	1	0	1	0	830	2	98	12	56
90	4	21	44	140	0	675	0	26	0
0	0	0	0	0	11	0	970	0	19
4	5	2	8	12	10	34	13	911	1
0	0	0	0	0	7	3	83	0	907

1.1.3 c

```
'train accuracy' : array([0.76897917, 1., 1., 1.]),  
'validation accuracy' : array([0.74391667, 0.88141667, 0.87016667, 0.8565]),  
'test accuracy' : array([0.7366, 0.8755, 0.8671, 0.8477]),  
'Number of Support Vectors' : [0,  
array([1841, 216, 2075, 1563, 2119, 959, 2810, 947, 498, 520], dtype = int32),  
array([1539, 169, 1720, 1301, 1815, 941, 2491, 857, 374, 463], dtype = int32),  
array([1362, 149, 1460, 1148, 1556, 993, 2245, 766, 321, 399], dtype = int32)]  
The best degree : 2
```

1.2 Problem 2

```
train accuracy : 90.12083333333332%  
validation accuracy : 89.51666666666667%  
test accuracy : 90.0%
```

1.3 Problem 3

1.3.1 b

```
training Accuracy : 100%  
validation Accuracy : 65.00%  
testing Accuracy : 74.28571428571429%
```

1.3.2 d