Exercise 1:
a-b.) Learned parameter values

a_1i (i being the row in the table below) =

par{1, 1}

	1
1	0.0095
2	0.9202
3	0.0025
4	-8.1099e-05
5	-6.7662e-04
6	-0.0555
7	0.0041
8	1.0784e-04
9	-0.0127
10	-7.7042e-05
11	-5.4360e-06
12	0.0372
13	-9.9196e-05
14	3.5064e-07
15	0.0038
16	9.9353e-07
17	2.3947e-07
18	-0.0059
19	1.7885e-07

a_2i=

par{1, 2}

	1
1	-0.0029
2	-0.0014
3	-0.0117
4	0.4731
5	3.8215e-04
6	-0.0113
7	-4.4264e-04
8	4.3103e-05
9	0.0184
10	-0.0010
11	-6.6349e-06
12	0.0097
13	8.7618e-06
14	1.9423e-07
15	-0.0043
16	2.4695e-06
17	-8.1994e-09
18	-7.5783e-04
19	-5.4324e-08

a_3i=

par{1, 3}

	1
1	-8.1977e-04
2	-5.9606e-05
3	0.9974
4	9.1341e-04
5	2.9136e-04
6	-0.0025
7	1.0690e-05
8	-9.2312e-07
9	0.0016
10	-2.5655e-05
11	-6.0623e-06
12	0.0022
13	-1.8420e-06
14	-3.4973e-08
15	-3.0059e-04
16	9.0592e-08
17	2.2107e-08
18	-2.2396e-04
19	2.5239e-09

$k=2$:
Optimal value for p1: 5
Optimal value for p2: all from 1 to 6
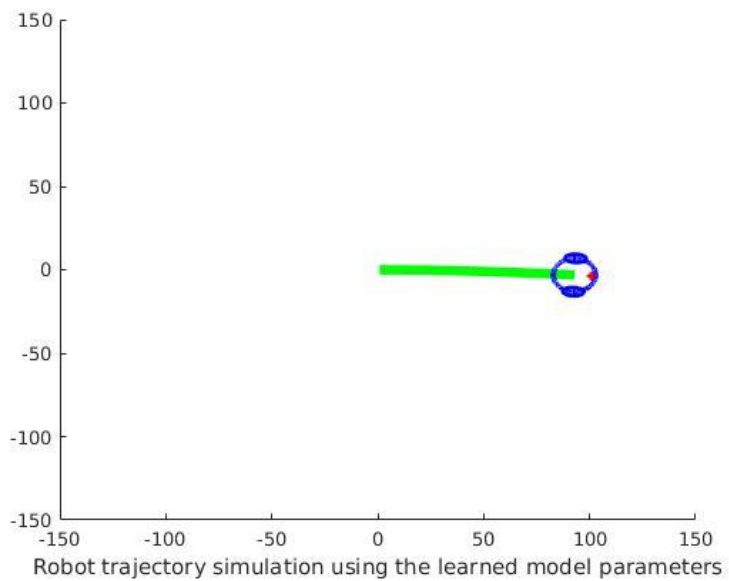
$k=5$:
Optimal value for p1: 4
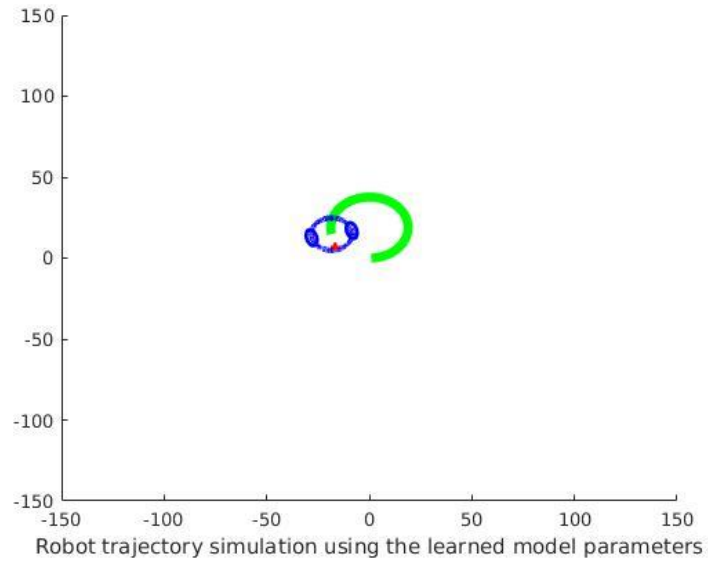Optimal value for p2: all from 1 to 6

c.) Plots

1.) (v,w) = (0, 0.05):

Robot trajectory simulation using the learned model parameters

2.) (v,w) = (1,0):

Robot trajectory simulation using the learned model parameters

3.) (v,w) = (1,0.05):

Robot trajectory simulation using the learned model parameters

4.) (v,w) = (-1,-0.05):

Robot trajectory simulation using the learned model parameters
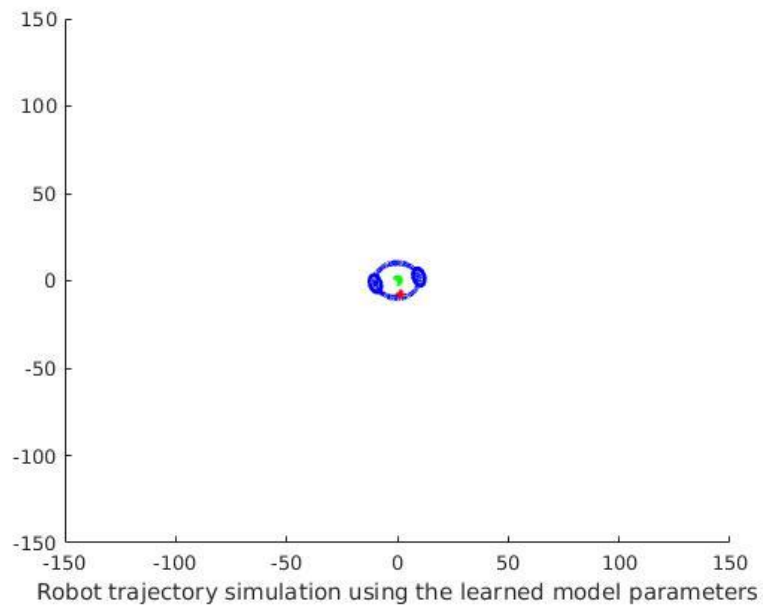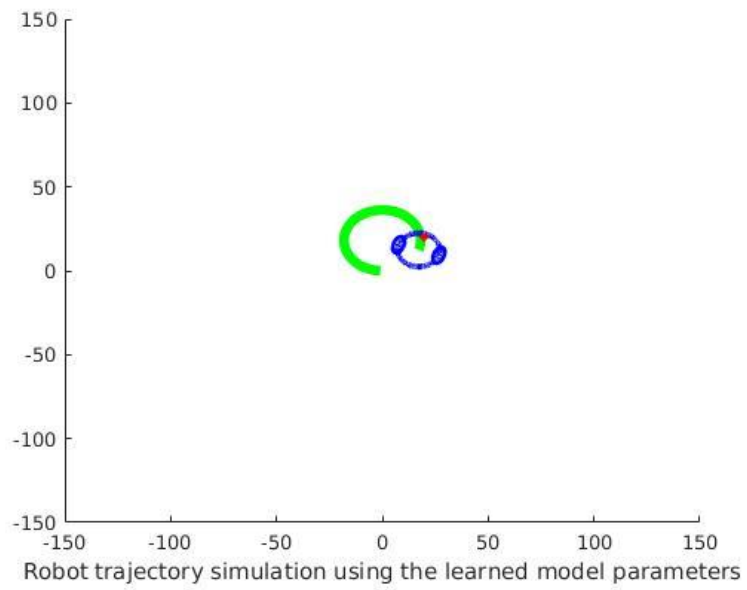
Exercise 2:
1.) The optimal value for d is 48. The classification error is 3.6200. There is also a d=49 with the same classification error.
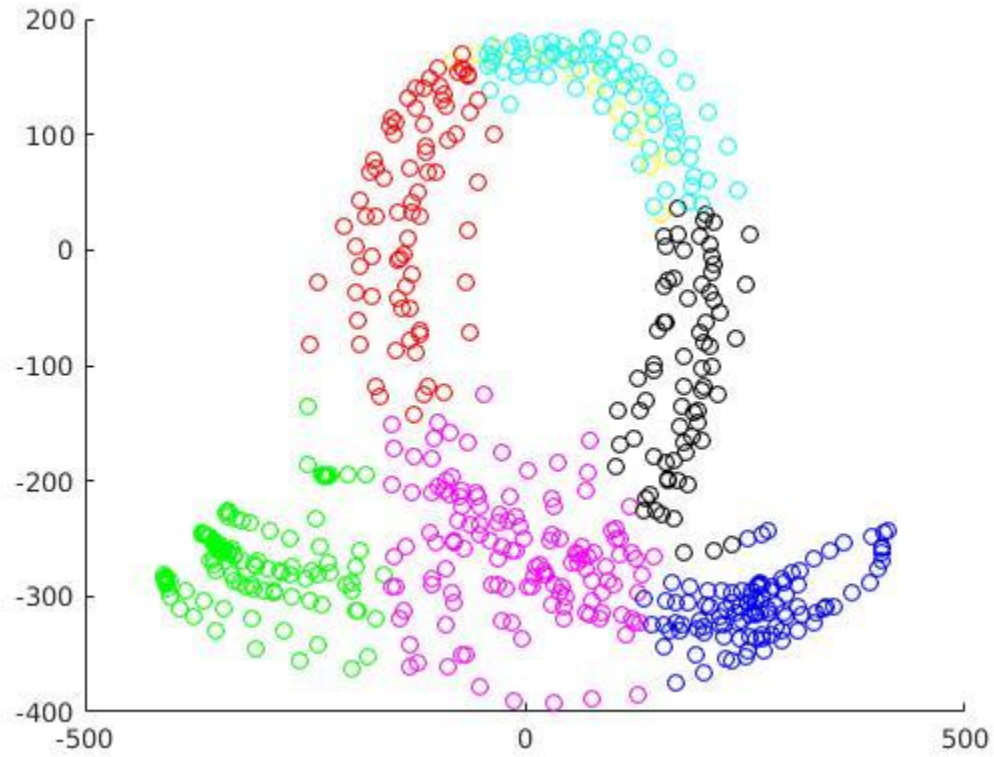
2.) Confusion Matrix:

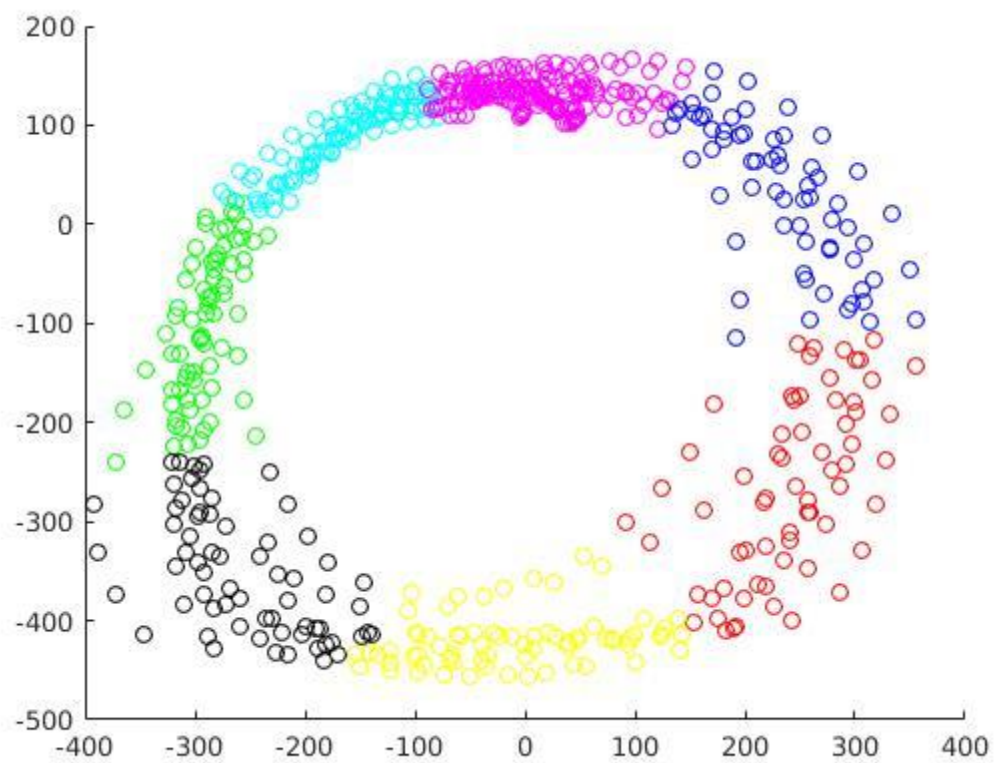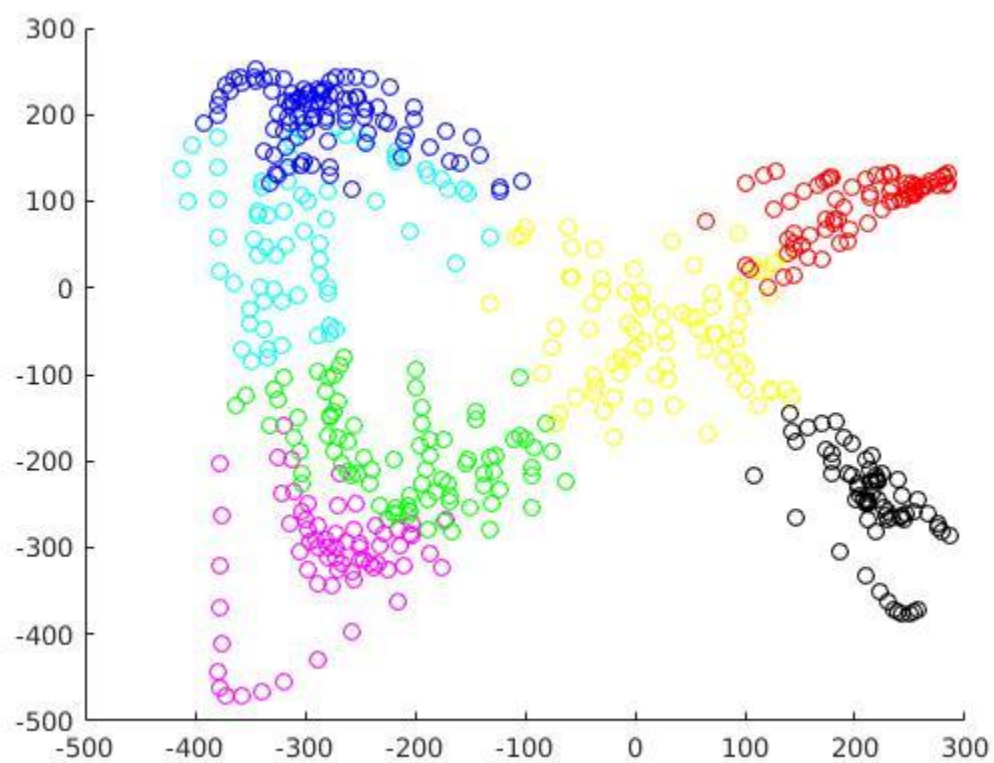| digit	0	1	2	3	4	5	6	7	8	9
0	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
1	0.00	0.97	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00
2	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.02	0.00
3	0.00	0.00	0.01	0.96	0.00	0.00	0.00	0.00	0.02	0.00
4	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.01
5	0.00	0.00	0.00	0.02	0.00	0.96	0.00	0.00	0.01	0.00
6	0.01	0.00	0.00	0.00	0.00	0.01	0.96	0.00	0.01	0.00
7	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.93	0.01	0.02
8	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.97	0.01
9	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.94

3.) d vs Classification error:
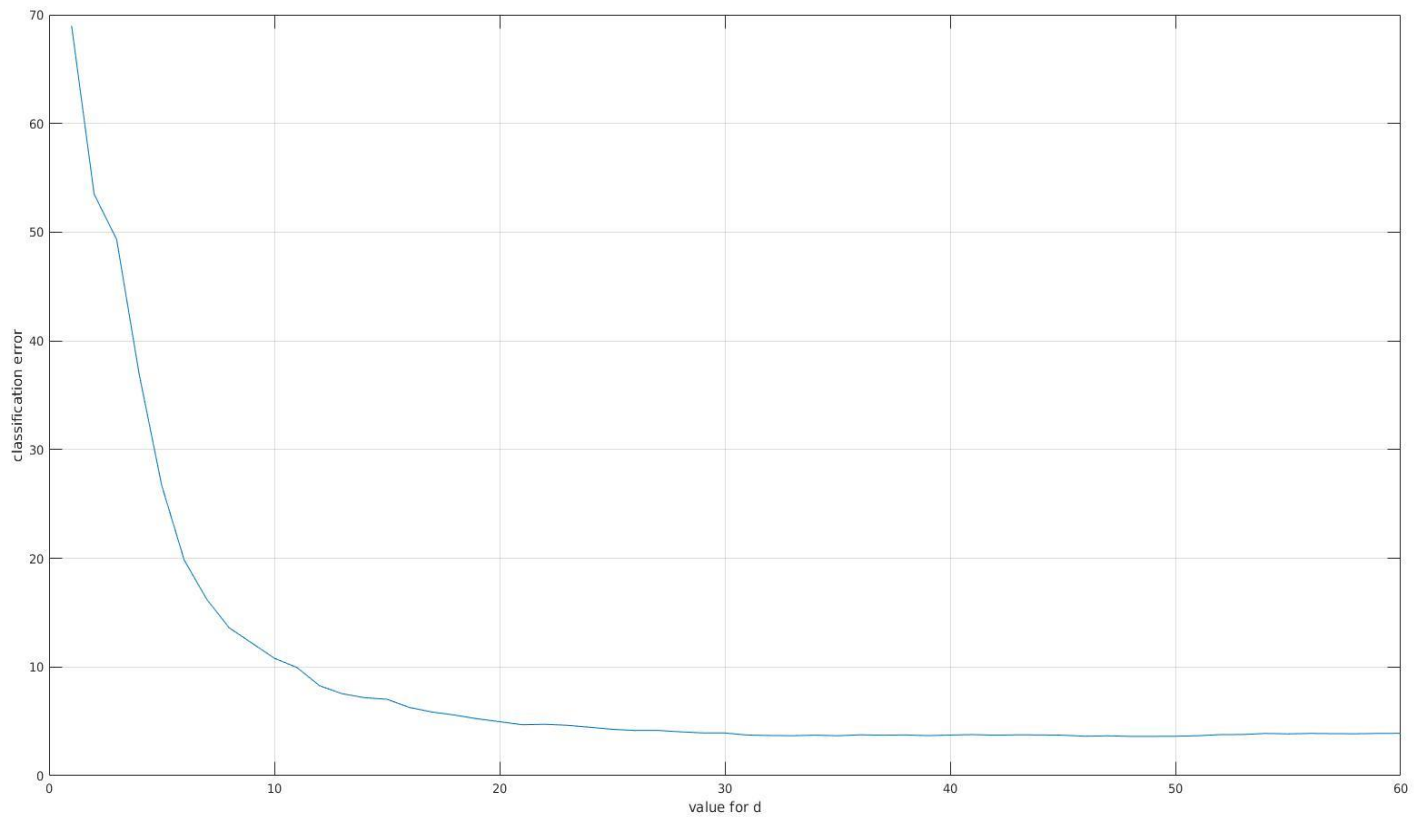
a.)   For 7 clusters (k-means)

b.) For 7 clusters (nubs)