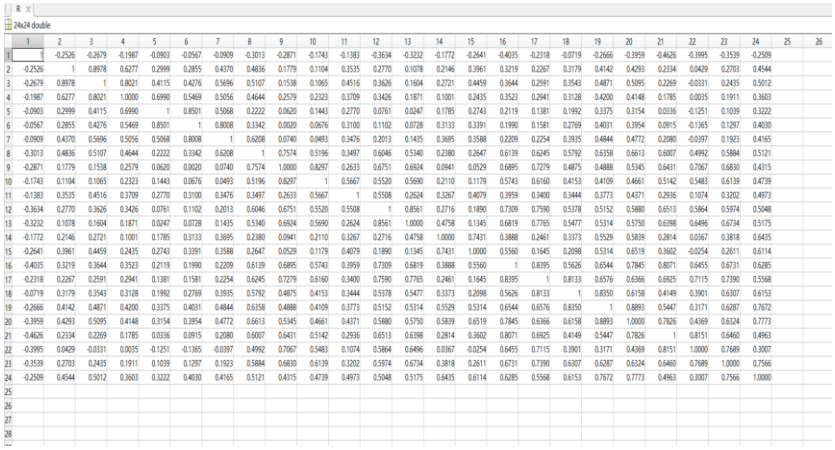
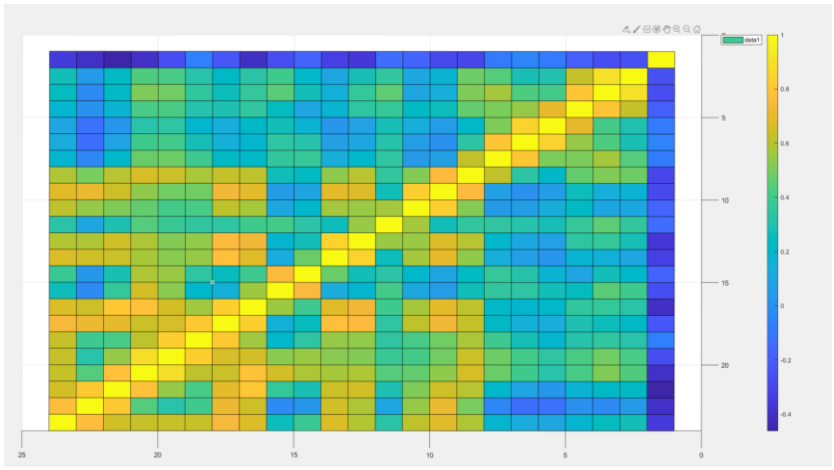
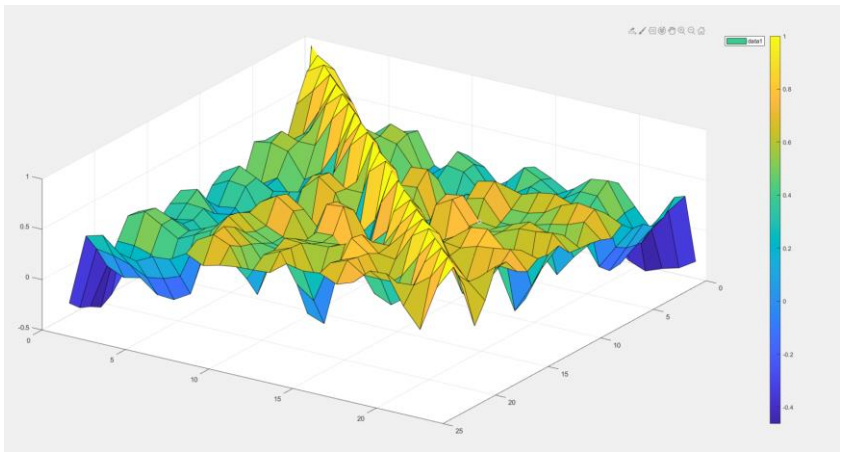
Task1.2

Graph



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	1	-0.2526	-0.2679	-0.1987	-0.0903	-0.0567	-0.0909	-0.3013	-0.2871	-0.1743	-0.1383	-0.3634	-0.3232	-0.1772	-0.2641	-0.4035	-0.2318	-0.0719	-0.2666	-0.3959	-0.4626	-0.3995	-0.3539	-0.2509		
2	-0.2526	1	0.8978	0.6277	0.2999	0.2855	0.4370	0.4836	0.1779	0.1104	0.3535	0.2770	0.1078	0.2146	0.3961	0.3219	0.2267	0.3179	0.4142	0.4293	0.2334	0.0429	0.2703	0.4544		
3	-0.2679	0.8978	1	0.8021	0.4115	0.4276	0.5696	0.5107	0.1538	0.1065	0.4516	0.3626	0.1604	0.2721	0.4459	0.3644	0.2591	0.3543	0.4871	0.5095	0.2269	-0.0331	0.2435	0.5012		
4	-0.1987	0.6277	0.8021	1.0000	0.6990	0.5469	0.5056	0.4644	0.2579	0.2323	0.3709	0.3426	0.1871	0.1001	0.2435	0.3523	0.2941	0.3128	0.4200	0.4148	0.1785	0.0035	0.1911	0.3603		
5	-0.0903	0.2999	0.4115	0.6990	1	0.8501	0.5068	0.2222	0.0620	0.1443	0.2770	0.0761	0.0247	0.1785	0.2743	0.2119	0.1381	0.1992	0.3375	0.3154	0.0336	-0.1251	0.1039	0.3222		
6	-0.0567	0.2855	0.4276	0.5469	0.8501	1	0.8008	0.3342	0.0020	0.0676	0.3100	0.1102	0.0728	0.3133	0.3391	0.1990	0.1581	0.2769	0.4031	0.3954	0.0915	-0.1365	0.1297	0.4030		
7	-0.0909	0.4370	0.5696	0.5056	0.5068	0.8008	1	0.6208	0.0740	0.0493	0.3476	0.2013	0.1435	0.3695	0.3588	0.2209	0.2254	0.3935	0.4844	0.4772	0.2080	-0.0397	0.1923	0.4165		
8	-0.3013	0.4836	0.5107	0.4644	0.2222	0.3342	0.6208	1	0.7574	0.5196	0.3497	0.6046	0.5340	0.2380	0.2647	0.6139	0.6245	0.5792	0.6358	0.6613	0.6007	0.4992	0.5884	0.5121		
9	-0.2871	0.1779	0.1538	0.2579	0.0620	0.0020	0.0740	0.7574	1.0000	0.8297	0.2633	0.6751	0.6924	0.0941	0.0529	0.6895	0.7279	0.4875	0.4888	0.5345	0.6431	0.7067	0.6830	0.4315		
10	-0.1743	0.1104	0.1065	0.2323	0.1443	0.0676	0.0493	0.5196	0.8297	1	0.5667	0.5520	0.5690	0.2110	0.1179	0.5743	0.6160	0.4153	0.4109	0.4661	0.5142	0.5483	0.6139	0.4739		
11	-0.1383	0.3535	0.4516	0.3709	0.2770	0.3100	0.3476	0.3497	0.2633	0.5667	1	0.5508	0.2624	0.3267	0.4079	0.3959	0.3400	0.3444	0.3773	0.4371	0.2936	0.1074	0.3202	0.4973		
12	-0.3634	0.2770	0.3626	0.3426	0.0761	0.1102	0.2013	0.6046	0.6751	0.5520	0.5508	1	0.8561	0.2716	0.1890	0.7309	0.7590	0.5378	0.5152	0.5880	0.6513	0.5864	0.5974	0.5048		
13	-0.3232	0.1078	0.1604	0.1871	0.0247	0.0728	0.1435	0.5340	0.6924	0.5690	0.2624	0.8561	1.0000	0.4758	0.1345	0.6819	0.7765	0.5477	0.5314	0.5750	0.6398	0.6496	0.6734	0.5175		
14	-0.1772	0.2146	0.2721	0.1001	0.1785	0.3133	0.3695	0.2380	0.0941	0.2110	0.3267	0.2716	0.4758	1.0000	0.7431	0.3888	0.2461	0.3373	0.5529	0.5839	0.2814	0.0367	0.3818	0.6435		
15	-0.2641	0.3961	0.4459	0.2435	0.2743	0.3391	0.3588	0.2647	0.0529	0.1179	0.4079	0.1890	0.1345	0.7431	1.0000	0.5560	0.1645	0.2098	0.5314	0.6519	0.3602	-0.0254	0.2611	0.6114		
16	-0.4035	0.3219	0.3644	0.3523	0.2119	0.1990	0.2209	0.6139	0.6895	0.5743	0.3959	0.7309	0.6819	0.3888	0.5560	1	0.8395	0.5626	0.6544	0.7845	0.8071	0.6455	0.6731	0.6285		
17	-0.2318	0.2267	0.2591	0.2941	0.1381	0.1581	0.2254	0.6245	0.7279	0.6160	0.3400	0.7590	0.7765	0.2461	0.1645	0.8395	1	0.8133	0.6576	0.6366	0.6925	0.7115	0.7390	0.5568		
18	-0.0719	0.3179	0.3543	0.3128	0.1992	0.2769	0.3935	0.5792	0.4875	0.4153	0.3444	0.5378	0.5477	0.3373	0.2098	0.5626	0.8133	1	0.8350	0.6158	0.4149	0.3901	0.6307	0.6153		
19	-0.2666	0.4142	0.4871	0.4200	0.3375	0.4031	0.4844	0.6358	0.4888	0.4109	0.3773	0.5152	0.5314	0.5529	0.5314	0.6544	0.6576	0.8350	1	0.8893	0.5447	0.3171	0.6287	0.7672		
20	-0.3959	0.4293	0.5095	0.4148	0.3154	0.3954	0.4772	0.6613	0.5345	0.4661	0.4371	0.5880	0.5750	0.5839	0.6519	0.7845	0.6366	0.6158	0.8893	1.0000	0.7826	0.4369	0.6324	0.7773		
21	-0.4626	0.2334	0.2269	0.1785	0.0336	0.0915	0.2080	0.6007	0.6431	0.5142	0.2936	0.6513	0.6398	0.2814	0.3602	0.8071	0.6925	0.4149	0.5447	0.7826	1	0.8151	0.6460	0.4963		
22	-0.3995	0.0429	-0.0331	0.0035	-0.1251	-0.1365	-0.0397	0.4992	0.7067	0.5483	0.1074	0.5864	0.6496	0.0367	-0.0254	0.6455	0.7115	0.3901	0.3171	0.4369	0.8151	1.0000	0.7689	0.3007		
23	-0.3539	0.2703	0.2435	0.1911	0.1039	0.1297	0.1923	0.5884	0.6830	0.6139	0.3202	0.5974	0.6734	0.3818	0.2611	0.6731	0.7390	0.6307	0.6287	0.6324	0.6460	0.7689	1.0000	0.7566		
24	-0.2509	0.4544	0.5012	0.3603	0.3222	0.4030	0.4165	0.5121	0.4315	0.4739	0.4973	0.5048	0.5175	0.6435	0.6114	0.6285	0.5568	0.6153	0.7672	0.7773	0.4963	0.3007	0.7566	1.0000		
25																										
26																										
27																										
28																										





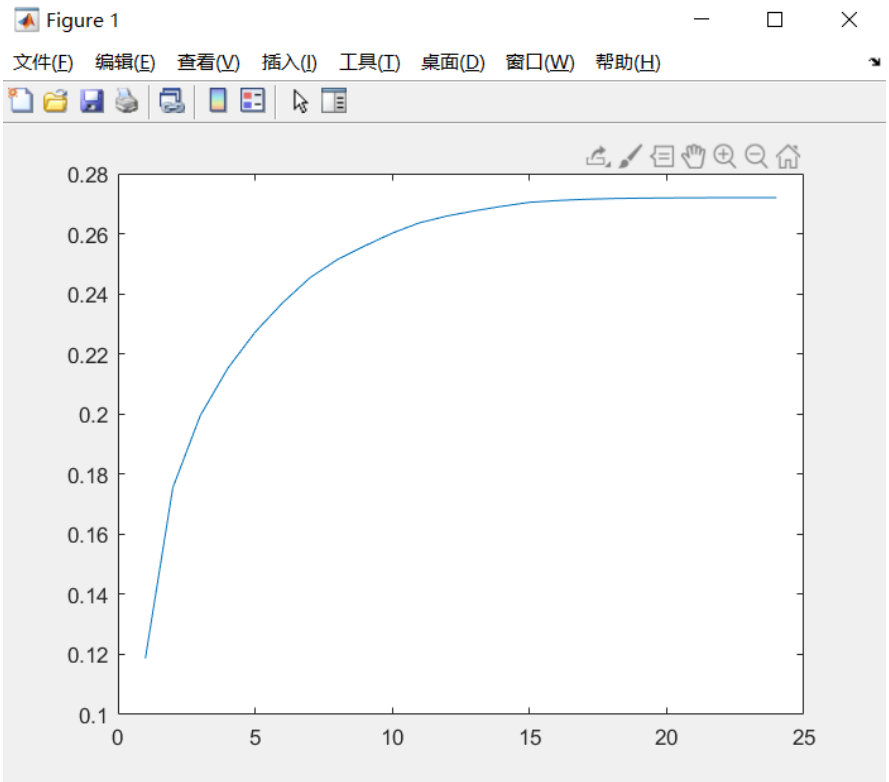
This is a stationary 1-dependence matrix. The value in (i, i) is always equal to 1, where the range of i is from 1 to 24. All the values in row 1 is equal to the values in column 1, and it is the same situation for the rest of the columns and rows.

The matrix is symmetry and the elements on diagonal is 1. All the value is in the range between -1 and 1. The positive values illustrate the corresponding variables are in positive related and negative values means negative related.

Value 1 means corresponding variables are linear related.

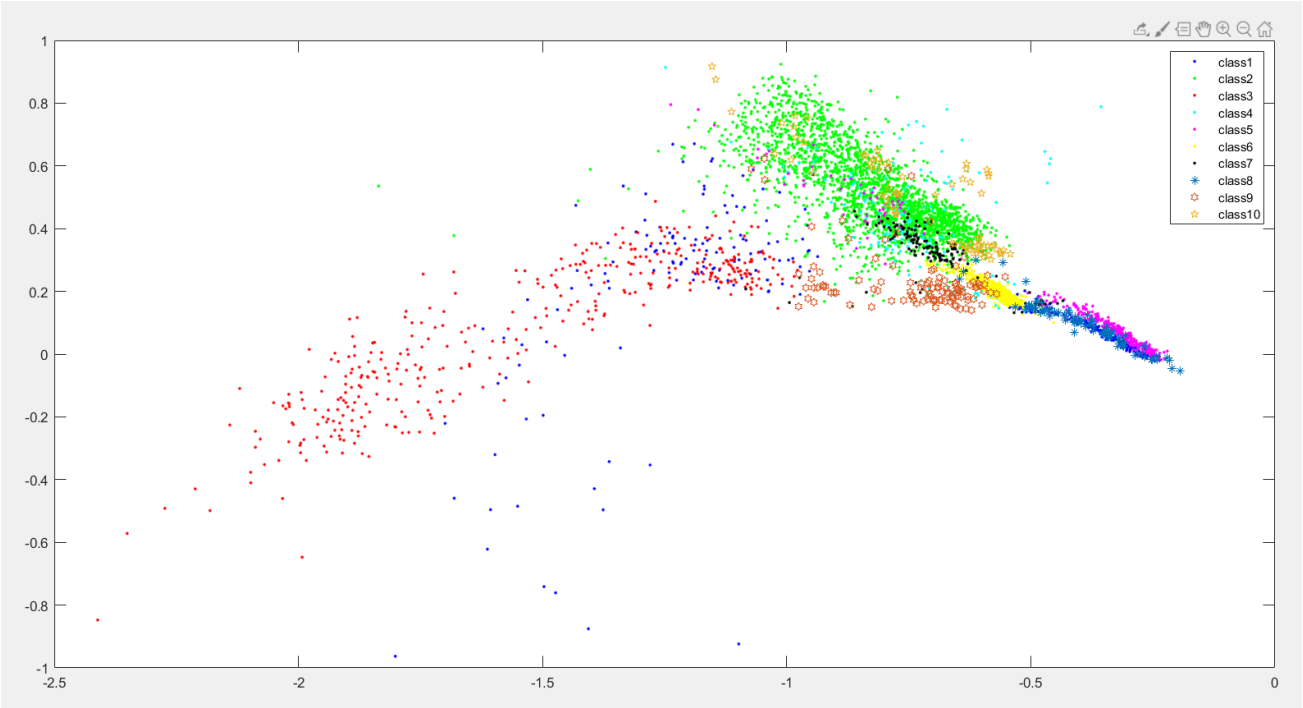
Task 1.3

(b)



(c)

The 2-D PCA plane plot:



Task 1.4

Question: Run the function with epsilon=0.01 and Kfolds=5 for each CovKind=1,2,3, and report the accuracy (correct classification rate) in your report.

When epsilon = 0.01, Kfolds =5 and CovKind = 1

The file 't1_mgc_5cv6_ck1_CM.mat' and calculate the sum of CM, then I get the result which is 0.9071 which means the accuracy is 90.71%

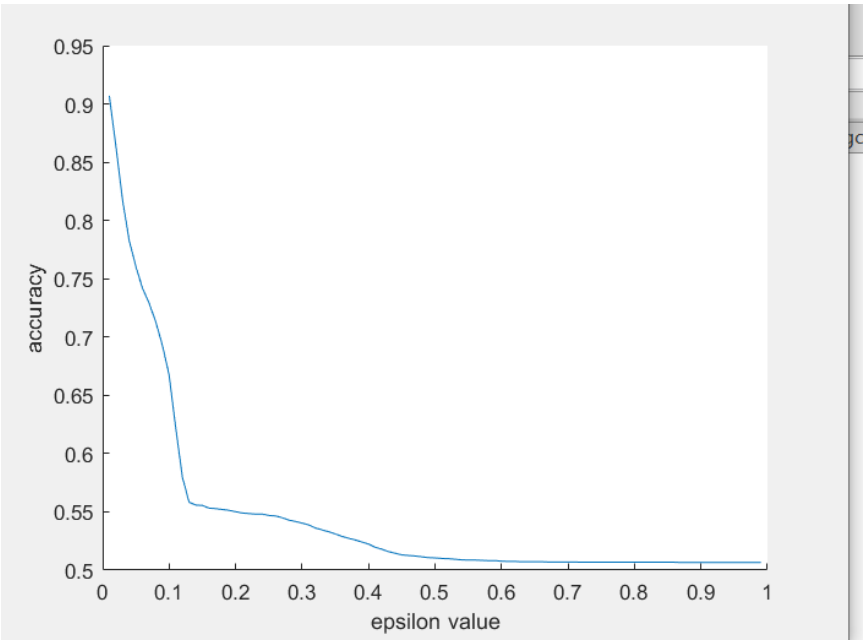
When epsilon = 0.01, Kfolds =5 and CovKind = 2

The file 't1_mgc_5cv6_ck2_CM.mat' and calculate the sum of CM, then I get the result which is 0.8214 which means the accuracy is 82.14%

When epsilon = 0.01, Kfolds =5 and CovKind = 3

The file 't1_mgc_5cv6_ck3_CM.mat' and calculate the sum of CM, then I get the result which is 0.8824 which means the accuracy is 88.24%

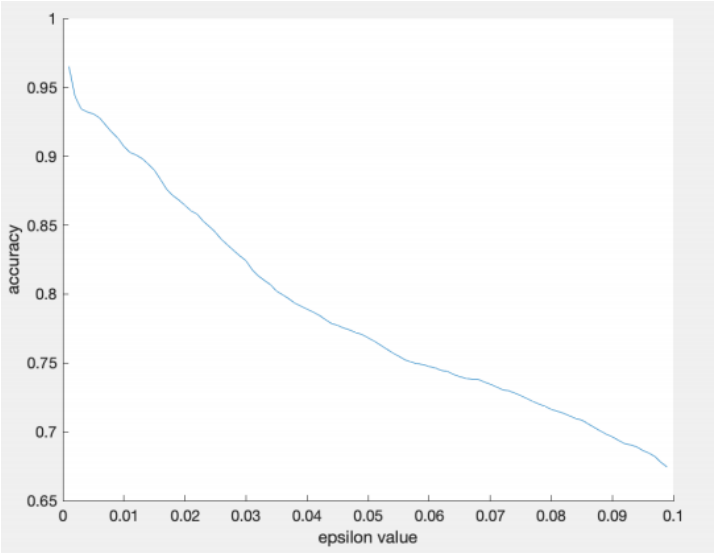
Task1.5



In this diagram, x-axis represents the value of epsilon and y-axis represents the value of accuracy. As the increasing of epsilon value, the accuracy is decrease. And the accuracy is over 0.9 when the epsilon value is less than 0.5, and then it decreases step by step to about 0.55 when the epsilon value is about 0.12. The turning point is when epsilon value is 0.12 and the accuracy is about 0.55, because after this point the accuracy decrease slightly and end on 0.5 when epsilon value is close to 1. Hence the value of epsilon will dramatically influence the accuracy value.

Also, I want to check this theory in the range of 0-0.1 in epsilon value.

Here is the graph:



Hence, we found that the accuracy value is still decreasing linearly when the epsilon value is increasing.