

Python 2.7.12 |Anaconda 4.2.0 (64-bit)| (default, Jun 29 2016, 11:07:13) [MSC v.1500 64 bit (AMD64)]  
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IPython 5.1.0 -- An enhanced Interactive Python.

? -> Introduction and overview of IPython's features.

%quickref -> Quick reference.

help -> Python's own help system.

object? -> Details about 'object', use 'object??' for extra details.

In [1]: import pandas as pd

...: import numpy as np

...:

...:

...: X = pd.read\_csv('C:\Users\Dev\Downloads\parkinsons.data')

...: X.drop('name', axis = 1, inplace = True)

...: print X.head()

...: print X.info

...: print X.describe()

...: print X.isnull().sum() # No NaNs!

...: print X.dtypes # All object types are correct!

...:

	MDVP:F0(Hz)	MDVP:F1(Hz)	MDVP:F2(Hz)	MDVP:Jitter(%)	MDVP:Jitter(Abs)	\
0	119.992	157.302	74.997	0.00784	0.00007	
1	122.400	148.650	113.819	0.00968	0.00008	
2	116.682	131.111	111.555	0.01050	0.00009	
3	116.676	137.871	111.366	0.00997	0.00009	
4	116.014	141.781	110.655	0.01284	0.00011	

	MDVP:RAP	MDVP:PPQ	Jitter:DDP	MDVP:Shimmer	MDVP:Shimmer(dB)	...	\
0	0.00370	0.00554	0.01109	0.04374	0.426	...	
1	0.00465	0.00696	0.01394	0.06134	0.626	...	
2	0.00544	0.00781	0.01633	0.05233	0.482	...	
3	0.00502	0.00698	0.01505	0.05492	0.517	...	
4	0.00655	0.00908	0.01966	0.06425	0.584	...	

	Shimmer:DDA	NHR	HNR	status	RPDE	DFA	spread1	\
0	0.06545	0.02211	21.033	1	0.414783	0.815285	-4.813031	
1	0.09403	0.01929	19.085	1	0.458359	0.819521	-4.075192	
2	0.08270	0.01309	20.651	1	0.429895	0.825288	-4.443179	
3	0.08771	0.01353	20.644	1	0.434969	0.819235	-4.117501	
4	0.10470	0.01767	19.649	1	0.417356	0.823484	-3.747787	

	spread2	D2	PPE
0	0.266482	2.301442	0.284654
1	0.335590	2.486855	0.368674
2	0.311173	2.342259	0.332634
3	0.334147	2.405554	0.368975
4	0.234513	2.332180	0.410335

[5 rows x 23 columns]

	<bound method DataFrame.info of	MDVP:F0(Hz)	MDVP:F1(Hz)	MDVP:F2(Hz)	MDVP:Jitter(%)	\
0		119.992	157.302	74.997	0.00784	
1		122.400	148.650	113.819	0.00968	
2		116.682	131.111	111.555	0.01050	
3		116.676	137.871	111.366	0.00997	
4		116.014	141.781	110.655	0.01284	
5		120.552	131.162	113.787	0.00968	
6		120.267	137.244	114.820	0.00333	
7		107.332	113.840	104.315	0.00290	
8		95.730	132.068	91.754	0.00551	
9		95.056	120.103	91.226	0.00532	
10		88.333	112.240	84.072	0.00505	
11		91.904	115.871	86.292	0.00540	
12		136.926	159.866	131.276	0.00293	
13		139.173	179.139	76.556	0.00390	
14		152.845	163.305	75.836	0.00294	
15		142.167	217.455	83.159	0.00369	
16		144.188	349.259	82.764	0.00544	

17	168.778	232.181	75.603	0.00718
18	153.046	175.829	68.623	0.00742
19	156.405	189.398	142.822	0.00768
20	153.848	165.738	65.782	0.00840
21	153.880	172.860	78.128	0.00480
22	167.930	193.221	79.068	0.00442
23	173.917	192.735	86.180	0.00476
24	163.656	200.841	76.779	0.00742
25	104.400	206.002	77.968	0.00633
26	171.041	208.313	75.501	0.00455
27	146.845	208.701	81.737	0.00496
28	155.358	227.383	80.055	0.00310
29	162.568	198.346	77.630	0.00502
..	...	...	...	
165	236.200	244.663	102.137	0.00277
166	237.323	243.709	229.256	0.00303
167	260.105	264.919	237.303	0.00339
168	197.569	217.627	90.794	0.00803
169	240.301	245.135	219.783	0.00517
170	244.990	272.210	239.170	0.00451
171	112.547	133.374	105.715	0.00355
172	110.739	113.597	100.139	0.00356
173	113.715	116.443	96.913	0.00349
174	117.004	144.466	99.923	0.00353
175	115.380	123.109	108.634	0.00332
176	116.388	129.038	108.970	0.00346
177	151.737	190.204	129.859	0.00314
178	148.790	158.359	138.990	0.00309
179	148.143	155.982	135.041	0.00392
180	150.440	163.441	144.736	0.00396
181	148.462	161.078	141.998	0.00397
182	149.818	163.417	144.786	0.00336
183	117.226	123.925	106.656	0.00417
184	116.848	217.552	99.503	0.00531
185	116.286	177.291	96.983	0.00314
186	116.556	592.030	86.228	0.00496
187	116.342	581.289	94.246	0.00267
188	114.563	119.167	86.647	0.00327
189	201.774	262.707	78.228	0.00694
190	174.188	230.978	94.261	0.00459
191	209.516	253.017	89.488	0.00564
192	174.688	240.005	74.287	0.01360
193	198.764	396.961	74.904	0.00740
194	214.289	260.277	77.973	0.00567

	MDVP:Jitter(Abs)	MDVP:RAP	MDVP:PPQ	Jitter:DDP	MDVP:Shimmer \
0	0.00007	0.00370	0.00554	0.01109	0.04374
1	0.00008	0.00465	0.00696	0.01394	0.06134
2	0.00009	0.00544	0.00781	0.01633	0.05233
3	0.00009	0.00502	0.00698	0.01505	0.05492
4	0.00011	0.00655	0.00908	0.01966	0.06425
5	0.00008	0.00463	0.00750	0.01388	0.04701
6	0.00003	0.00155	0.00202	0.00466	0.01608
7	0.00003	0.00144	0.00182	0.00431	0.01567
8	0.00006	0.00293	0.00332	0.00880	0.02093
9	0.00006	0.00268	0.00332	0.00803	0.02838
10	0.00006	0.00254	0.00330	0.00763	0.02143
11	0.00006	0.00281	0.00336	0.00844	0.02752
12	0.00002	0.00118	0.00153	0.00355	0.01259
13	0.00003	0.00165	0.00208	0.00496	0.01642
14	0.00002	0.00121	0.00149	0.00364	0.01828
15	0.00003	0.00157	0.00203	0.00471	0.01503
16	0.00004	0.00211	0.00292	0.00632	0.02047
17	0.00004	0.00284	0.00387	0.00853	0.03327
18	0.00005	0.00364	0.00432	0.01092	0.05517
19	0.00005	0.00372	0.00399	0.01116	0.03995
20	0.00005	0.00428	0.00450	0.01285	0.03810
21	0.00003	0.00232	0.00267	0.00696	0.04137

22	0.00003	0.00220	0.00247	0.00661	0.04351
23	0.00003	0.00221	0.00258	0.00663	0.04192
24	0.00005	0.00380	0.00390	0.01140	0.01659
25	0.00006	0.00316	0.00375	0.00948	0.03767
26	0.00003	0.00250	0.00234	0.00750	0.01966
27	0.00003	0.00250	0.00275	0.00749	0.01919
28	0.00002	0.00159	0.00176	0.00476	0.01718
29	0.00003	0.00280	0.00253	0.00841	0.01791
..	...	...	...	...	...
165	0.00001	0.00154	0.00153	0.00462	0.02448
166	0.00001	0.00173	0.00159	0.00519	0.01242
167	0.00001	0.00205	0.00186	0.00616	0.02030
168	0.00004	0.00490	0.00448	0.01470	0.02177
169	0.00002	0.00316	0.00283	0.00949	0.02018
170	0.00002	0.00279	0.00237	0.00837	0.01897
171	0.00003	0.00166	0.00190	0.00499	0.01358
172	0.00003	0.00170	0.00200	0.00510	0.01484
173	0.00003	0.00171	0.00203	0.00514	0.01472
174	0.00003	0.00176	0.00218	0.00528	0.01657
175	0.00003	0.00160	0.00199	0.00480	0.01503
176	0.00003	0.00169	0.00213	0.00507	0.01725
177	0.00002	0.00135	0.00162	0.00406	0.01469
178	0.00002	0.00152	0.00186	0.00456	0.01574
179	0.00003	0.00204	0.00231	0.00612	0.01450
180	0.00003	0.00206	0.00233	0.00619	0.02551
181	0.00003	0.00202	0.00235	0.00605	0.01831
182	0.00002	0.00174	0.00198	0.00521	0.02145
183	0.00004	0.00186	0.00270	0.00558	0.01909
184	0.00005	0.00260	0.00346	0.00780	0.01795
185	0.00003	0.00134	0.00192	0.00403	0.01564
186	0.00004	0.00254	0.00263	0.00762	0.01660
187	0.00002	0.00115	0.00148	0.00345	0.01300
188	0.00003	0.00146	0.00184	0.00439	0.01185
189	0.00003	0.00412	0.00396	0.01235	0.02574
190	0.00003	0.00263	0.00259	0.00790	0.04087
191	0.00003	0.00331	0.00292	0.00994	0.02751
192	0.00008	0.00624	0.00564	0.01873	0.02308
193	0.00004	0.00370	0.00390	0.01109	0.02296
194	0.00003	0.00295	0.00317	0.00885	0.01884

	MDVP:Shimmer(dB)	...	Shimmer:DDA	NHR	HNR	status \
0	0.426	...	0.06545	0.02211	21.033	1
1	0.626	...	0.09403	0.01929	19.085	1
2	0.482	...	0.08270	0.01309	20.651	1
3	0.517	...	0.08771	0.01353	20.644	1
4	0.584	...	0.10470	0.01767	19.649	1
5	0.456	...	0.06985	0.01222	21.378	1
6	0.140	...	0.02337	0.00607	24.886	1
7	0.134	...	0.02487	0.00344	26.892	1
8	0.191	...	0.03218	0.01070	21.812	1
9	0.255	...	0.04324	0.01022	21.862	1
10	0.197	...	0.03237	0.01166	21.118	1
11	0.249	...	0.04272	0.01141	21.414	1
12	0.112	...	0.01968	0.00581	25.703	1
13	0.154	...	0.02184	0.01041	24.889	1
14	0.158	...	0.03191	0.00609	24.922	1
15	0.126	...	0.02316	0.00839	25.175	1
16	0.192	...	0.02908	0.01859	22.333	1
17	0.348	...	0.04322	0.02919	20.376	1
18	0.542	...	0.07413	0.03160	17.280	1
19	0.348	...	0.05164	0.03365	17.153	1
20	0.328	...	0.05000	0.03871	17.536	1
21	0.370	...	0.06062	0.01849	19.493	1
22	0.377	...	0.06685	0.01280	22.468	1
23	0.364	...	0.06562	0.01840	20.422	1
24	0.164	...	0.02214	0.01778	23.831	1
25	0.381	...	0.05197	0.02887	22.066	1
26	0.186	...	0.02666	0.01095	25.908	1

27	0.198	...	0.02650	0.01328	25.119	1
28	0.161	...	0.02307	0.00677	25.970	1
29	0.168	...	0.02380	0.01170	25.678	1
..	...	...	...	...	...	...
165	0.217	...	0.04231	0.00620	24.078	0
166	0.116	...	0.02089	0.00533	24.679	0
167	0.197	...	0.03557	0.00910	21.083	0
168	0.189	...	0.03836	0.01337	19.269	0
169	0.212	...	0.03529	0.00965	21.020	0
170	0.181	...	0.03253	0.01049	21.528	0
171	0.129	...	0.01992	0.00435	26.436	0
172	0.133	...	0.02261	0.00430	26.550	0
173	0.133	...	0.02245	0.00478	26.547	0
174	0.145	...	0.02643	0.00590	25.445	0
175	0.137	...	0.02436	0.00401	26.005	0
176	0.155	...	0.02623	0.00415	26.143	0
177	0.132	...	0.02184	0.00570	24.151	1
178	0.142	...	0.02518	0.00488	24.412	1
179	0.131	...	0.02175	0.00540	23.683	1
180	0.237	...	0.03964	0.00611	23.133	1
181	0.163	...	0.02849	0.00639	22.866	1
182	0.198	...	0.03464	0.00595	23.008	1
183	0.171	...	0.02592	0.00955	23.079	0
184	0.163	...	0.02429	0.01179	22.085	0
185	0.136	...	0.02001	0.00737	24.199	0
186	0.154	...	0.02460	0.01397	23.958	0
187	0.117	...	0.01892	0.00680	25.023	0
188	0.106	...	0.01672	0.00703	24.775	0
189	0.255	...	0.04363	0.04441	19.368	0
190	0.405	...	0.07008	0.02764	19.517	0
191	0.263	...	0.04812	0.01810	19.147	0
192	0.256	...	0.03804	0.10715	17.883	0
193	0.241	...	0.03794	0.07223	19.020	0
194	0.190	...	0.03078	0.04398	21.209	0

	RPDE	DFA	spread1	spread2	D2	PPE
0	0.414783	0.815285	-4.813031	0.266482	2.301442	0.284654
1	0.458359	0.819521	-4.075192	0.335590	2.486855	0.368674
2	0.429895	0.825288	-4.443179	0.311173	2.342259	0.332634
3	0.434969	0.819235	-4.117501	0.334147	2.405554	0.368975
4	0.417356	0.823484	-3.747787	0.234513	2.332180	0.410335
5	0.415564	0.825069	-4.242867	0.299111	2.187560	0.357775
6	0.596040	0.764112	-5.634322	0.257682	1.854785	0.211756
7	0.637420	0.763262	-6.167603	0.183721	2.064693	0.163755
8	0.615551	0.773587	-5.498678	0.327769	2.322511	0.231571
9	0.547037	0.798463	-5.011879	0.325996	2.432792	0.271362
10	0.611137	0.776156	-5.249770	0.391002	2.407313	0.249740
11	0.583390	0.792520	-4.960234	0.363566	2.642476	0.275931
12	0.460600	0.646846	-6.547148	0.152813	2.041277	0.138512
13	0.430166	0.665833	-5.660217	0.254989	2.519422	0.199889
14	0.474791	0.654027	-6.105098	0.203653	2.125618	0.170100
15	0.565924	0.658245	-5.340115	0.210185	2.205546	0.234589
16	0.567380	0.644692	-5.440040	0.239764	2.264501	0.218164
17	0.631099	0.605417	-2.931070	0.434326	3.007463	0.430788
18	0.665318	0.719467	-3.949079	0.357870	3.109010	0.377429
19	0.649554	0.686080	-4.554466	0.340176	2.856676	0.322111
20	0.660125	0.704087	-4.095442	0.262564	2.739710	0.365391
21	0.629017	0.698951	-5.186960	0.237622	2.557536	0.259765
22	0.619060	0.679834	-4.330956	0.262384	2.916777	0.285695
23	0.537264	0.686894	-5.248776	0.210279	2.547508	0.253556
24	0.397937	0.732479	-5.557447	0.220890	2.692176	0.215961
25	0.522746	0.737948	-5.571843	0.236853	2.846369	0.219514
26	0.418622	0.720916	-6.183590	0.226278	2.589702	0.147403
27	0.358773	0.726652	-6.271690	0.196102	2.314209	0.162999
28	0.470478	0.676258	-7.120925	0.279789	2.241742	0.108514
29	0.427785	0.723797	-6.635729	0.209866	1.957961	0.135242
..	...	...	...	...	...	...
165	0.469928	0.628232	-6.816086	0.172270	2.235197	0.119652

166	0.384868	0.626710	-7.018057	0.176316	1.852402	0.091604
167	0.440988	0.628058	-7.517934	0.160414	1.881767	0.075587
168	0.372222	0.725216	-5.736781	0.164529	2.882450	0.202879
169	0.371837	0.646167	-7.169701	0.073298	2.266432	0.100881
170	0.522812	0.646818	-7.304500	0.171088	2.095237	0.096220
171	0.413295	0.756700	-6.323531	0.218885	2.193412	0.160376
172	0.369090	0.776158	-6.085567	0.192375	1.889002	0.174152
173	0.380253	0.766700	-5.943501	0.192150	1.852542	0.179677
174	0.387482	0.756482	-6.012559	0.229298	1.872946	0.163118
175	0.405991	0.761255	-5.966779	0.197938	1.974857	0.184067
176	0.361232	0.763242	-6.016891	0.109256	2.004719	0.174429
177	0.396610	0.745957	-6.486822	0.197919	2.449763	0.132703
178	0.402591	0.762508	-6.311987	0.182459	2.251553	0.160306
179	0.398499	0.778349	-5.711205	0.240875	2.845109	0.192730
180	0.352396	0.759320	-6.261446	0.183218	2.264226	0.144105
181	0.408598	0.768845	-5.704053	0.216204	2.679185	0.197710
182	0.329577	0.757180	-6.277170	0.109397	2.209021	0.156368
183	0.603515	0.669565	-5.619070	0.191576	2.027228	0.215724
184	0.663842	0.656516	-5.198864	0.206768	2.120412	0.252404
185	0.598515	0.654331	-5.592584	0.133917	2.058658	0.214346
186	0.566424	0.667654	-6.431119	0.153310	2.161936	0.120605
187	0.528485	0.663884	-6.359018	0.116636	2.152083	0.138868
188	0.555303	0.659132	-6.710219	0.149694	1.913990	0.121777
189	0.508479	0.683761	-6.934474	0.159890	2.316346	0.112838
190	0.448439	0.657899	-6.538586	0.121952	2.657476	0.133050
191	0.431674	0.683244	-6.195325	0.129303	2.784312	0.168895
192	0.407567	0.655683	-6.787197	0.158453	2.679772	0.131728
193	0.451221	0.643956	-6.744577	0.207454	2.138608	0.123306
194	0.462803	0.664357	-5.724056	0.190667	2.555477	0.148569

[195 rows x 23 columns]>

	MDVP:F0(Hz)	MDVP:F1(Hz)	MDVP:F2(Hz)	MDVP:Jitter(%) \
count	195.000000	195.000000	195.000000	195.000000
mean	154.228641	197.104918	116.324631	0.006220
std	41.390065	91.491548	43.521413	0.004848
min	88.333000	102.145000	65.476000	0.001680
25%	117.572000	134.862500	84.291000	0.003460
50%	148.790000	175.829000	104.315000	0.004940
75%	182.769000	224.205500	140.018500	0.007365
max	260.105000	592.030000	239.170000	0.033160

	MDVP:Jitter(Abs)	MDVP:RAP	MDVP:PPQ	Jitter:DDP	MDVP:Shimmer \
count	195.000000	195.000000	195.000000	195.000000	195.000000
mean	0.000044	0.003306	0.003446	0.009920	0.029709
std	0.000035	0.002968	0.002759	0.008903	0.018857
min	0.000007	0.000680	0.000920	0.002040	0.009540
25%	0.000020	0.001660	0.001860	0.004985	0.016505
50%	0.000030	0.002500	0.002690	0.007490	0.022970
75%	0.000060	0.003835	0.003955	0.011505	0.037885
max	0.000260	0.021440	0.019580	0.064330	0.119080

	MDVP:Shimmer(dB)	...	Shimmer:DDA	NHR	HNR \
count	195.000000	...	195.000000	195.000000	195.000000
mean	0.282251	...	0.046993	0.024847	21.885974
std	0.194877	...	0.030459	0.040418	4.425764
min	0.085000	...	0.013640	0.000650	8.441000
25%	0.148500	...	0.024735	0.005925	19.198000
50%	0.221000	...	0.038360	0.011660	22.085000
75%	0.350000	...	0.060795	0.025640	25.075500
max	1.302000	...	0.169420	0.314820	33.047000

	status	RPDE	DFA	spread1	spread2	D2 \
count	195.000000	195.000000	195.000000	195.000000	195.000000	195.000000
mean	0.753846	0.498536	0.718099	-5.684397	0.226510	2.381826
std	0.431878	0.103942	0.055336	1.090208	0.083406	0.382799
min	0.000000	0.256570	0.574282	-7.964984	0.006274	1.423287
25%	1.000000	0.421306	0.674758	-6.450096	0.174351	2.099125
50%	1.000000	0.495954	0.722254	-5.720868	0.218885	2.361532

75%	1.000000	0.587562	0.761881	-5.046192	0.279234	2.636456
max	1.000000	0.685151	0.825288	-2.434031	0.450493	3.671155

```

PPE
count 195.000000
mean 0.206552
std 0.090119
min 0.044539
25% 0.137451
50% 0.194052
75% 0.252980
max 0.527367

```

```

[8 rows x 23 columns]
MDVP:Fo(Hz)    0
MDVP:Fhi(Hz)   0
MDVP:Flo(Hz)   0
MDVP:Jitter(%) 0
MDVP:Jitter(Abs) 0
MDVP:RAP       0
MDVP:PPQ       0
Jitter:DDP     0
MDVP:Shimmer   0
MDVP:Shimmer(dB) 0
Shimmer:APQ3   0
Shimmer:APQ5   0
MDVP:APQ       0
Shimmer:DDA    0
NHR            0
HNR            0
status         0
RPDE           0
DFA            0
spread1        0
spread2        0
D2             0
PPE            0
dtype: int64
MDVP:Fo(Hz)    float64
MDVP:Fhi(Hz)   float64
MDVP:Flo(Hz)   float64
MDVP:Jitter(%) float64
MDVP:Jitter(Abs) float64
MDVP:RAP       float64
MDVP:PPQ       float64
Jitter:DDP     float64
MDVP:Shimmer   float64
MDVP:Shimmer(dB) float64
Shimmer:APQ3   float64
Shimmer:APQ5   float64
MDVP:APQ       float64
Shimmer:DDA    float64
NHR            float64
HNR            float64
status         int64
RPDE           float64
DFA            float64
spread1        float64
spread2        float64
D2             float64
PPE            float64
dtype: object

```

```

In [2]: y = X.status
...: X.drop('status', axis = 1, inplace = True)
...: print X.columns # 'status' has been dropped from X
...:
Index([u'MDVP:Fo(Hz)', u'MDVP:Fhi(Hz)', u'MDVP:Flo(Hz)', u'MDVP:Jitter(%)',

```

```
u'MDVP:Jitter(Abs)', u'MDVP:RAP', u'MDVP:PPQ', u'Jitter:DDP',  
u'MDVP:Shimmer', u'MDVP:Shimmer(dB)', u'Shimmer:APQ3', u'Shimmer:APQ5',  
u'MDVP:APQ', u'Shimmer:DDA', u'NHR', u'HNR', u'RPDE', u'DFA',  
u'spread1', u'spread2', u'D2', u'PPE'],  
dtype='object')
```

In [3]: from sklearn import preprocessing

In [4]: T = preprocessing.scale(X)

In [5]: from sklearn.decomposition import PCA

```
...: pca = PCA(n_components = 14)  
...: X_pca = pca.fit_transform(T)  
...:
```

In [6]: from sklearn.manifold import Isomap

```
In [7]: best_score = 0  
...: for k in range(2, 6):  
...:     for l in range(4, 7):  
...:         iso = Isomap(n_neighbors = k, n_components = 1)  
...:         X_iso = iso.fit_transform(T)  
...:
```

In [8]: from sklearn.cross\_validation import train\_test\_split

C:\Users\Dev\Anaconda2\lib\site-packages\sklearn\cross\_validation.py:44: DeprecationWarning: This module was deprecated in version 0.18 in favor of the model\_selection module into which all the refactored classes and functions are moved. Also note that the interface of the new CV iterators are different from that of this module. This module will be removed in 0.20.  
"This module will be removed in 0.20.", DeprecationWarning)

In [9]: X\_train, X\_test, y\_train, y\_test = train\_test\_split(X\_iso, y, test\_size = 0.3, random\_state = 7)

In [10]: from sklearn.svm import SVC

In [11]: model = SVC()

In [12]: model.fit(X\_train, y\_train)

Out[12]:

```
SVC(C=1.0, cache_size=200, class_weight=None, coef0=0.0,  
decision_function_shape=None, degree=3, gamma='auto', kernel='rbf',  
max_iter=-1, probability=False, random_state=None, shrinking=True,  
tol=0.001, verbose=False)
```

In [13]: score = model.score(X\_test, y\_test)

In [14]: print score

0.881355932203

In [15]: for i in np.arange(start = 0.05, stop = 2.05, step = 0.05):

```
...:     for j in np.arange(start = 0.001, stop = 0.101, step = 0.001):  
...:         model = SVC(C = i, gamma = j)  
...:         model.fit(X_train, y_train)  
...:         score = model.score(X_test, y_test)  
...:         if score > best_score:  
...:             best_score = score  
...:             best_C = model.C  
...:             best_gamma = model.gamma  
...:             best_n_neighbors = iso.n_neighbors  
...:             best_n_components = iso.n_components  
...: print "The highest score obtained:", best_score  
...: print "C value:", best_C  
...: print "gamma value:", best_gamma  
...: print "isomap n_neighbors:", best_n_neighbors  
...: print "isomap n_components:", best_n_components  
...:
```

The highest score obtained: 0.932203389831

C value: 1.75

gamma value: 0.037

```
isomap n_neighbors: 5  
isomap n_components: 6
```

In [16]: