

The data set (and description) can be downloaded here:

<http://stat.ethz.ch/Teaching/Datasets/TENNIS.dat>

Description:

VARIABLE	PERIOD*	VARIABLE NAME
1		ID
2		AGE
3		SEX 1 = MALE 2 = FEMALE 9 = MISSING
4		DRUG ORDER 1 = MOTRIN-PLACEBO 2 = PLACEBO-MOTRIN
5	2	DURING STUDY PERIOD, PAIN DURING MAXIMUM ACTIVITY VS BASELINE 1 = WORSE 2 = UNCHANGED 3 = SLIGHTLY IMPROVED (25%) 4 = MODERATELY IMPROVED (50%) 5 = MOSTLY IMPROVED (75%) 6 = COMPLETELY IMPROVED 9 = MISSING
6	2	WITHIN 12 HOURS FOLLOWING MAXIMAL ACTIVITY, COMPARED TO SAME PERIOD AT BASELINE (SAME CODE AS VARIABLE 5)
7	2	DURING THE AVERAGE DAY OF STUDY PERIOD PAIN VS BASELINE (SAME CODE AS VARIABLE 5)
8	2	OVERALL IMPRESSION OF DRUG EFFICACY VS BASELINE (SAME CODE AS VARIABLE 5)
9	3	DURING STUDY PERIOD, PAIN DURING MAXIMUM ACTIVITY VS BASELINE

		(SAME CODE AS VARIABLE 5)
10	3	WITHIN 12 HOURS FOLLOWING MAXIMAL ACTIVITY, COMPARED TO SAME PERIOD AT BASELINE (SAME CODE AS VARIABLE 5)
11	3	DURING THE AVERAGE DAY OF STUDY PERIOD PAIN VS BASELINE (SAME CODE AS VARIABLE 5)
12	3	OVERALL IMPRESSION OF DRUG EFFICACY VS BASELINE (SAME CODE AS VARIABLE 5)
13	4	DURING STUDY PERIOD, PAIN DURING MAXIMUM ACTIVITY VS BASELINE (SAME CODE AS VARIABLE 5)
14	4	WITHIN 12 HOURS FOLLOWING MAXIMAL ACTIVITY, COMPARED TO SAME PERIOD AT BASELINE (SAME CODE AS VARIABLE 5)
15	4	DURING THE AVERAGE DAY OF STUDY PERIOD PAIN VS BASELINE (SAME CODE AS VARIABLE 5)
16	4	OVERALL IMPRESSION OF DRUG EFFICACY VS BASELINE (SAME CODE AS VARIABLE 5)

 * PERIOD 2 = PAIN SCORES AFTER THE FIRST ACTIVE DRUG PERIOD
 COMPARED WITH BASELINE

PERIOD 3 = PAIN SCORES AFTER THE WASHOUT PERIOD COMPARED
 WITH BASELINE

PERIOD 4 = PAIN SCORES AFTER THE SECOND ACTIVE DRUG PERIOD
 COMPARED WITH BASELINE

Descriptive statistics:

Dataset= tennis_MvsF : n= 87 , d= 15

Class1: n= 42

Covariance matrix:

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]
[1,]	1767.9419	-28.2021	-2.2381	-9.5819	-10.8374	-8.7120	-7.5482	-11.9791	-12.1533
[2,]	-28.2021	59.1411	-0.0627	2.1429	0.7805	2.1429	2.4791	2.7474	3.6411
[3,]	-2.2381	-0.0627	0.2555	-0.3589	-0.2846	-0.3508	-0.3647	-0.1045	0.0105
[4,]	-9.5819	2.1429	-0.3589	2.6481	2.0488	2.1603	2.2544	1.5958	0.9477
[5,]	-10.8374	0.7805	-0.2846	2.0488	2.5203	2.0081	2.1057	1.1951	0.6341
[6,]	-8.7120	2.1429	-0.3508	2.1603	2.0081	2.1928	2.2381	1.6446	0.8746
[7,]	-7.5482	2.4791	-0.3647	2.2544	2.1057	2.2381	2.3513	1.7091	0.9059
[8,]	-11.9791	2.7474	-0.1045	1.5958	1.1951	1.6446	1.7091	3.7822	3.0523
[9,]	-12.1533	3.6411	0.0105	0.9477	0.6341	0.8746	0.9059	3.0523	3.5192
[10,]	-3.6748	1.2317	-0.1057	1.4146	1.1626	1.5285	1.6138	3.4756	2.9268
[11,]	-15.5761	4.2265	-0.0790	1.3624	1.1789	1.3217	1.4019	3.3449	3.2997
[12,]	-16.0256	4.0296	0.1684	0.9791	1.1301	0.9141	0.9193	1.0331	0.5540
[13,]	-16.7271	3.4669	0.2288	0.9373	1.2358	0.9048	0.9082	0.9652	0.4669
[14,]	-15.5738	3.7648	0.1940	0.9164	1.2846	0.9326	0.9413	1.1202	0.5575
[15,]	-15.5796	4.0836	0.1580	1.0314	1.2520	1.0151	1.0256	1.1394	0.5958

	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]
[1,]	-3.6748	-15.5761	-16.0256	-16.7271	-15.5738	-15.5796
[2,]	1.2317	4.2265	4.0296	3.4669	3.7648	4.0836
[3,]	-0.1057	-0.0790	0.1684	0.2288	0.1940	0.1580
[4,]	1.4146	1.3624	0.9791	0.9373	0.9164	1.0314
[5,]	1.1626	1.1789	1.1301	1.2358	1.2846	1.2520
[6,]	1.5285	1.3217	0.9141	0.9048	0.9326	1.0151
[7,]	1.6138	1.4019	0.9193	0.9082	0.9413	1.0256
[8,]	3.4756	3.3449	1.0331	0.9652	1.1202	1.1394
[9,]	2.9268	3.2997	0.5540	0.4669	0.5575	0.5958
[10,]	3.6545	3.3821	0.8577	0.8130	0.9472	0.9675
[11,]	3.3821	3.9907	1.0012	0.9222	1.0616	1.0918
[12,]	0.8577	1.0012	3.8566	3.9396	4.0319	3.9001
[13,]	0.8130	0.9222	3.9396	4.1440	4.1893	4.0093
[14,]	0.9472	1.0616	4.0319	4.1893	4.3513	4.1452
[15,]	0.9675	1.0918	3.9001	4.0093	4.1452	4.0116

Correlation matrix:

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]
[1,]	1.0000	-0.0872	-0.1053	-0.1400	-0.1624	-0.1399	-0.1171	-0.1465	-0.1541
[2,]	-0.0872	1.0000	-0.0161	0.1712	0.0639	0.1882	0.2102	0.1837	0.2524
[3,]	-0.1053	-0.0161	1.0000	-0.4363	-0.3546	-0.4686	-0.4705	-0.1063	0.0110
[4,]	-0.1400	0.1712	-0.4363	1.0000	0.7931	0.8965	0.9034	0.5042	0.3105
[5,]	-0.1624	0.0639	-0.3546	0.7931	1.0000	0.8542	0.8650	0.3871	0.2129
[6,]	-0.1399	0.1882	-0.4686	0.8965	0.8542	1.0000	0.9856	0.5711	0.3148
[7,]	-0.1171	0.2102	-0.4705	0.9034	0.8650	0.9856	1.0000	0.5731	0.3149
[8,]	-0.1465	0.1837	-0.1063	0.5042	0.3871	0.5711	0.5731	1.0000	0.8366
[9,]	-0.1541	0.2524	0.0110	0.3105	0.2129	0.3148	0.3149	0.8366	1.0000
[10,]	-0.0457	0.0838	-0.1094	0.4547	0.3831	0.5399	0.5505	0.9349	0.8161
[11,]	-0.1854	0.2751	-0.0782	0.4191	0.3717	0.4468	0.4576	0.8610	0.8805
[12,]	-0.1941	0.2668	0.1697	0.3064	0.3625	0.3143	0.3053	0.2705	0.1504
[13,]	-0.1954	0.2215	0.2224	0.2829	0.3824	0.3001	0.2910	0.2438	0.1223
[14,]	-0.1776	0.2347	0.1839	0.2700	0.3879	0.3019	0.2943	0.2761	0.1425
[15,]	-0.1850	0.2651	0.1560	0.3164	0.3938	0.3423	0.3339	0.2925	0.1586

	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]
[1,]	-0.0457	-0.1854	-0.1941	-0.1954	-0.1776	-0.1850
[2,]	0.0838	0.2751	0.2668	0.2215	0.2347	0.2651
[3,]	-0.1094	-0.0782	0.1697	0.2224	0.1839	0.1560
[4,]	0.4547	0.4191	0.3064	0.2829	0.2700	0.3164
[5,]	0.3831	0.3717	0.3625	0.3824	0.3879	0.3938
[6,]	0.5399	0.4468	0.3143	0.3001	0.3019	0.3423
[7,]	0.5505	0.4576	0.3053	0.2910	0.2943	0.3339
[8,]	0.9349	0.8610	0.2705	0.2438	0.2761	0.2925
[9,]	0.8161	0.8805	0.1504	0.1223	0.1425	0.1586
[10,]	1.0000	0.8856	0.2285	0.2089	0.2375	0.2527
[11,]	0.8856	1.0000	0.2552	0.2268	0.2547	0.2729
[12,]	0.2285	0.2552	1.0000	0.9855	0.9842	0.9916
[13,]	0.2089	0.2268	0.9855	1.0000	0.9866	0.9833
[14,]	0.2375	0.2547	0.9842	0.9866	1.0000	0.9921
[15,]	0.2527	0.2729	0.9916	0.9833	0.9921	1.0000

Median: 761.4407 42.9018 1.5103 3.0493 3.3858 3.5691 3.4978 3.2187 2.3745 3.1911 2.6345 4.5344 4.5996 4.6483 4.65

Mean: 768.2381 42.9286 1.4762 3.2857 3.3333 3.619 3.5476 3.2143 2.4286 3.1667 2.7619 4.4048 4.381 4.4524 4.4762

MCD-estimated:

0.975-Mean: 767.4194 42.7419 1.5161 2.9032 3.0968 3.2903 3.1935 2.8065 2.3871 2.8065 2.4194 4.2903 4.2581 4.3548 4.3548
 0.750-Mean: 769.4615 43.2821 1.4615 3.3846 3.4359 3.6667 3.6667 3.2821 2.4615 3.2564 2.8462 4.4103 4.3846 4.4615 4.4872
 0.500-Mean: 763.2333 43.6 1.5 3.3667 3.6333 3.6 3.6 3.0333 2.3333 2.9667 2.8 4.6 4.6333 4.7 4.6667

Class2: n= 45

Covariance matrix:

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]
[1,]	1859.4818	-0.2682	3.9273	13.1455	5.1909	5.0273	4.0045	7.1727	-0.2045
[2,]	-0.2682	81.7798	-0.2015	-3.0288	-0.6298	-0.6697	-1.6066	-4.8146	-1.3131
[3,]	3.9273	-0.2015	0.2545	-0.1455	-0.2212	-0.2545	-0.2015	0.0697	0.1970
[4,]	13.1455	-3.0288	-0.1455	1.4727	1.2152	1.1455	1.1530	0.9061	0.0152
[5,]	5.1909	-0.6298	-0.2212	1.2152	1.7253	1.2970	1.3702	0.8328	-0.1187
[6,]	5.0273	-0.6697	-0.2545	1.1455	1.2970	1.5273	1.4439	0.7333	0.1288
[7,]	4.0045	-1.6066	-0.2015	1.1530	1.3702	1.4439	1.5525	1.0944	0.0960
[8,]	7.1727	-4.8146	0.0697	0.9061	0.8328	0.7333	1.0944	2.2859	0.5480
[9,]	-0.2045	-1.3131	0.1970	0.0152	-0.1187	0.1288	0.0960	0.5480	1.0101
[10,]	3.1909	-3.1449	0.0515	0.7606	0.5813	0.6606	0.8096	1.5525	0.6692
[11,]	1.8273	-1.1879	0.1955	0.0636	-0.0576	0.1455	0.1530	0.7015	0.9470
[12,]	14.5318	-2.4328	0.1652	-0.0121	0.1192	0.3424	0.4308	0.8404	0.5480
[13,]	16.9909	0.9303	0.1682	-0.1091	-0.0030	0.0818	0.2485	0.6924	0.4470
[14,]	21.3273	0.1126	0.1197	0.0788	0.0056	0.1833	0.3399	0.9086	0.4798
[15,]	13.0818	-0.0343	0.0924	-0.0258	-0.0157	0.0970	0.2157	0.7556	0.4722

Covariance matrix:

	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]
[1,]	3.1909	1.8273	14.5318	16.9909	21.3273	13.0818
[2,]	-3.1449	-1.1879	-2.4328	0.9303	0.1126	-0.0343
[3,]	0.0515	0.1955	0.1652	0.1682	0.1197	0.0924
[4,]	0.7606	0.0636	-0.0121	-0.1091	0.0788	-0.0258
[5,]	0.5813	-0.0576	0.1192	-0.0030	0.0056	-0.0157
[6,]	0.6606	0.1455	0.3424	0.0818	0.1833	0.0970
[7,]	0.8096	0.1530	0.4308	0.2485	0.3399	0.2157
[8,]	1.5525	0.7015	0.8404	0.6924	0.9086	0.7556
[9,]	0.6692	0.9470	0.5480	0.4470	0.4798	0.4722
[10,]	1.4828	0.7152	0.9071	0.6333	0.8616	0.7040
[11,]	0.7152	0.9727	0.5106	0.4364	0.4652	0.4515
[12,]	0.9071	0.5106	3.2859	2.5197	2.6040	2.4465
[13,]	0.6333	0.4364	2.5197	2.9273	2.6788	2.4197
[14,]	0.8616	0.4652	2.6040	2.6788	2.7859	2.4919
[15,]	0.7040	0.4515	2.4465	2.4197	2.4919	2.4071

Correlation matrix:

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]
[1,]	1.0000	-0.0007	0.1805	0.2512	0.0916	0.0943	0.0745	0.1100	-0.0047
[2,]	-0.0007	1.0000	-0.0442	-0.2760	-0.0530	-0.0599	-0.1426	-0.3521	-0.1445
[3,]	0.1805	-0.0442	1.0000	-0.2376	-0.3338	-0.4082	-0.3206	0.0914	0.3884
[4,]	0.2512	-0.2760	-0.2376	1.0000	0.7623	0.7638	0.7625	0.4938	0.0124
[5,]	0.0916	-0.0530	-0.3338	0.7623	1.0000	0.7990	0.8372	0.4194	-0.0899
[6,]	0.0943	-0.0599	-0.4082	0.7638	0.7990	1.0000	0.9377	0.3925	0.1037
[7,]	0.0745	-0.1426	-0.3206	0.7625	0.8372	0.9377	1.0000	0.5810	0.0766
[8,]	0.1100	-0.3521	0.0914	0.4938	0.4194	0.3925	0.5810	1.0000	0.3606
[9,]	-0.0047	-0.1445	0.3884	0.0124	-0.0899	0.1037	0.0766	0.3606	1.0000
[10,]	0.0608	-0.2856	0.0839	0.5147	0.3634	0.4390	0.5336	0.8433	0.5468
[11,]	0.0430	-0.1332	0.3928	0.0532	-0.0444	0.1193	0.1245	0.4705	0.9553
[12,]	0.1859	-0.1484	0.1806	-0.0055	0.0501	0.1529	0.1907	0.3066	0.3008
[13,]	0.2303	0.0601	0.1948	-0.0525	-0.0013	0.0387	0.1166	0.2677	0.2599
[14,]	0.2963	0.0075	0.1421	0.0389	0.0025	0.0889	0.1634	0.3600	0.2860
[15,]	0.1955	-0.0024	0.1181	-0.0137	-0.0077	0.0506	0.1116	0.3221	0.3028

	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]
[1,]	0.0608	0.0430	0.1859	0.2303	0.2963	0.1955
[2,]	-0.2856	-0.1332	-0.1484	0.0601	0.0075	-0.0024
[3,]	0.0839	0.3928	0.1806	0.1948	0.1421	0.1181
[4,]	0.5147	0.0532	-0.0055	-0.0525	0.0389	-0.0137
[5,]	0.3634	-0.0444	0.0501	-0.0013	0.0025	-0.0077
[6,]	0.4390	0.1193	0.1529	0.0387	0.0889	0.0506
[7,]	0.5336	0.1245	0.1907	0.1166	0.1634	0.1116
[8,]	0.8433	0.4705	0.3066	0.2677	0.3600	0.3221
[9,]	0.5468	0.9553	0.3008	0.2599	0.2860	0.3028
[10,]	1.0000	0.5955	0.4109	0.3040	0.4239	0.3727
[11,]	0.5955	1.0000	0.2856	0.2586	0.2826	0.2951
[12,]	0.4109	0.2856	1.0000	0.8124	0.8607	0.8699
[13,]	0.3040	0.2586	0.8124	1.0000	0.9381	0.9116
[14,]	0.4239	0.2826	0.8607	0.9381	1.0000	0.9623
[15,]	0.3727	0.2951	0.8699	0.9116	0.9623	1.0000

Median: 787.5896 43.2293 1.5444 3.1075 3.3705 3.2655 3.3418 2.5057 1.7874 2.4344 1.8069 4.134 3.9815 4.0418 4.1199

Mean: 780.8 44.2444 1.5333 2.9333 3.1556 3.1333 3.2444 2.6222 1.8889 2.4889 1.9333 3.8222 3.7333 3.8222 3.9556

MCD-estimated:

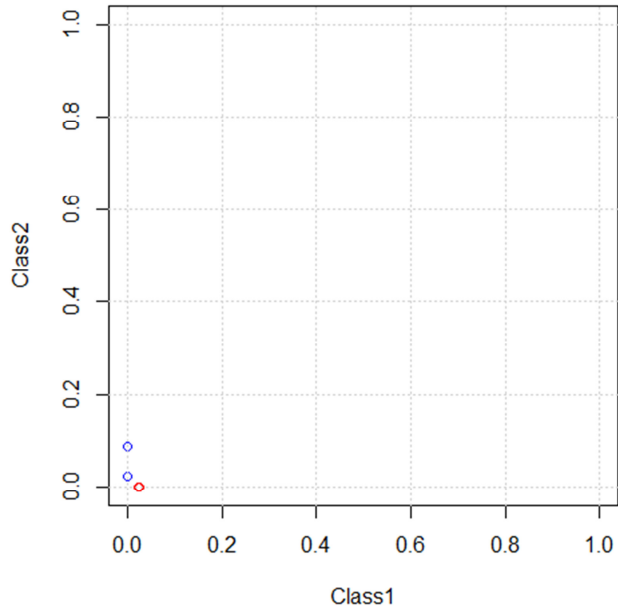
0.975-Mean: 780.8 44.2444 1.5333 2.9333 3.1556 3.1333 3.2444 2.6222 1.8889 2.4889 1.9333 3.8222 3.7333 3.8222 3.9556

0.750-Mean: 789.6842 44.6053 1.5526 2.9211 3.1053 3.1579 3.2632 2.6579 1.8947 2.5263 1.9474 3.9474 3.8684 4 4

0.500-Mean: 778.7073 43.4878 1.5122 2.878 3.0488 3.0732 3.1463 2.5366 1.9512 2.5122 1.9512 3.8049 3.6829 3.7805 3.9268

Measures:
Mah. Dist: 1.0996
Mah. Dist-MCD-0.975: 0.908
Mah. Dist-MCD-0.750: 0.7205
Mah. Dist-MCD-0.500: 0.7671

DD-Plot (zonoid): tennis_MvsF



DD-Plot (random Tukey): tennis_MvsF

