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

Description:

```
1. Title of Database: Wine recognition data
Updated Sept 21, 1998 by C.Blake : Added attribute information

2. Sources:
   (a) Forina, M. et al, PARVUS - An Extendible Package for Data
       Exploration, Classification and Correlation. Institute of Pharmaceutical
       and Food Analysis and Technologies, Via Brigata Salerno,
       16147 Genoa, Italy.

   (b) Stefan Aeberhard, email: stefan@coral.cs.jcu.edu.au
   (c) July 1991
3. Past Usage:

   (1)
   S. Aeberhard, D. Coomans and O. de Vel,
   Comparison of Classifiers in High Dimensional Settings,
   Tech. Rep. no. 92-02, (1992), Dept. of Computer Science and Dept. of
   Mathematics and Statistics, James Cook University of North Queensland.
   (Also submitted to Technometrics).

   The data was used with many others for comparing various
   classifiers. The classes are separable, though only RDA
   has achieved 100% correct classification.
   (RDA : 100%, QDA 99.4%, LDA 98.9%, 1NN 96.1% (z-transformed data))
   (All results using the leave-one-out technique)

   In a classification context, this is a well posed problem
   with "well behaved" class structures. A good data set
   for first testing of a new classifier, but not very
   challenging.
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(2)
S. Aeberhard, D. Coomans and O. de Vel,
"THE CLASSIFICATION PERFORMANCE OF RDA"
Tech. Rep. no. 92-01, (1992), Dept. of Computer Science and Dept. of
Mathematics and Statistics, James Cook University of North Queensland.
(Also submitted to Journal of Chemometrics).

Here, the data was used to illustrate the superior performance of
the use of a new appreciation function with RDA.

4. Relevant Information:

   -- These data are the results of a chemical analysis of
      wines grown in the same region in Italy but derived from three
      different cultivars.
      The analysis determined the quantities of 13 constituents
      found in each of the three types of wines.

   -- I think that the initial data set had around 30 variables, but
      for some reason I only have the 13 dimensional version.
      I had a list of what the 30 or so variables were, but a.)
      I lost it, and b.), I would not know which 13 variables
      are included in the set.

   -- The attributes are (dontated by Riccardo Leardi, riclea@anchem.unige.it)
   1) Alcohol
   2) Malic acid
   3) Ash
   4) Alcalinity of ash
   5) Magnesium
   6) Total phenols
   7) Flavanoids
   8) Nonflavanoid phenols
   9) Proanthocyanins
   10)Color intensity
   11)Hue
   12)OD280/OD315 of diluted wines
   13)Proline

5. Number of Instances

class 1 59
class 2 71
class 3 48

6. Number of Attributes

13

7. For Each Attribute:

All attributes are continuous

No statistics available, but suggest to standardise
variables for certain uses (e.g. for us with classifiers
which are NOT scale invariant)

NOTE: 1st attribute is class identifier (1-3)

8. Missing Attribute Values:

None

9. Class Distribution: number of instances per class

class 1 59
class 2 71
class 3 48

Descriptive statistics:

Dataset= wine_2vs3 : n= 119 , d= 13

Class1: n= 71

```
Covariance matrix:
          [,1]     [,2]     [,3]     [,4]      [,5]     [,6]      [,7]     [,8]     [,9]     [,10]    [,11]    [,12]       [,13]
 [1,]    0.2894  -0.0117  -0.0365  -0.1014   -0.2696  -0.0136   -0.0145  -0.0045  -0.0614   0.1342  -0.0002  -0.0348      3.6514
 [2,]   -0.0117   1.0314   0.0476   0.8094   -1.3065   0.0218    0.0802   0.0161   0.1287  -0.1909  -0.0841   0.0796    -35.7978
 [3,]   -0.0365   0.0476   0.0995   0.7347    0.6825   0.0193    0.0701   0.0117   0.0082   0.0176  -0.0020   0.0252      2.0810
 [4,]   -0.1014   0.8094   0.7347  11.2210    0.1831   0.2337    0.7360   0.0758   0.2195  -0.2660  -0.0522   0.6356     -7.6396
 [5,]   -0.2696  -1.3065   0.6825   0.1831  280.6797   0.6403    0.0200  -0.4032   3.0037   0.6807   0.4244  -0.6338   1315.8461
 [6,]   -0.0136   0.0218   0.0193   0.2337    0.6403   0.2974    0.2967  -0.0287   0.1256   0.0853   0.0044   0.1313      1.4513
 [7,]   -0.0145   0.0802   0.0701   0.7360    0.0200   0.2967    0.4980  -0.0206   0.2121   0.2471  -0.0042   0.2031    -13.6026
 [8,]   -0.0045   0.0161   0.0117   0.0758   -0.4032  -0.0287   -0.0206   0.0154  -0.0240   0.0021  -0.0008  -0.0254     -2.9756
 [9,]   -0.0614   0.1287   0.0082   0.2195    3.0037   0.1256    0.2121  -0.0240   0.3625  -0.0411  -0.0066   0.1153     11.7763
[10,]    0.1342  -0.1909   0.0176  -0.2660    0.6807   0.0853    0.2471   0.0021  -0.0411   0.8555  -0.0049  -0.0538     14.8850
[11,]   -0.0002  -0.0841  -0.0020  -0.0522    0.4244   0.0044   -0.0042  -0.0008  -0.0066  -0.0049   0.0412  -0.0053      3.6517
[12,]   -0.0348   0.0796   0.0252   0.6356   -0.6338   0.1313    0.2031  -0.0254   0.1153  -0.0538  -0.0053   0.2466     -8.6508
[13,]    3.6514 -35.7978   2.0810  -7.6396 1315.8461   1.4513  -13.6026  -2.9756  11.7763  14.8850   3.6517  -8.6508  24715.3678

Correlation matrix:
          [,1]     [,2]     [,3]     [,4]     [,5]     [,6]     [,7]     [,8]     [,9]     [,10]    [,11]    [,12]    [,13]
 [1,]    1.0000  -0.0214  -0.2149  -0.0563  -0.0299  -0.0463  -0.0382  -0.0682  -0.1896   0.2698  -0.0020  -0.1303   0.0432
 [2,]   -0.0214   1.0000   0.1487   0.2379  -0.0768   0.0394   0.1119   0.1276   0.2105  -0.2033  -0.4080   0.1578  -0.2242
 [3,]   -0.2149   0.1487   1.0000   0.6953   0.1291   0.1121   0.3149   0.2998   0.0430   0.0602  -0.0312   0.1606   0.0420
 [4,]   -0.0563   0.2379   0.6953   1.0000   0.0033   0.1279   0.3114   0.1826   0.1088  -0.0859  -0.0768   0.3821  -0.0145
 [5,]   -0.0299  -0.0768   0.1291   0.0033   1.0000   0.0701   0.0017  -0.1941   0.2978   0.0439   0.1248  -0.0762   0.4996
 [6,]   -0.0463   0.0394   0.1121   0.1279   0.0701   1.0000   0.7710  -0.4247   0.3826   0.1691   0.0397   0.4847   0.0169
 [7,]   -0.0382   0.1119   0.3149   0.3114   0.0017   0.7710   1.0000  -0.2353   0.4993   0.3786  -0.0294   0.5796  -0.1226
 [8,]   -0.0682   0.1276   0.2998   0.1826  -0.1941  -0.4247  -0.2353   1.0000  -0.3216   0.0185  -0.0337  -0.4131  -0.1527
 [9,]   -0.1896   0.2105   0.0430   0.1088   0.2978   0.3826   0.4993  -0.3216   1.0000  -0.0738  -0.0544   0.3858   0.1244
[10,]    0.2698  -0.2033   0.0602  -0.0859   0.0439   0.1691   0.3786   0.0185  -0.0738   1.0000  -0.0261  -0.1171   0.1024
[11,]   -0.0020  -0.4080  -0.0312  -0.0768   0.1248   0.0397  -0.0294  -0.0337  -0.0544  -0.0261   1.0000  -0.0524   0.1145
[12,]   -0.1303   0.1578   0.1606   0.3821  -0.0762   0.4847   0.5796  -0.4131   0.3858  -0.1171  -0.0524   1.0000  -0.1108
[13,]    0.0432  -0.2242   0.0420  -0.0145   0.4996   0.0169  -0.1226  -0.1527   0.1244   0.1024   0.1145  -0.1108   1.0000

Median:              12.3121 1.8089 2.2183 20.7242 88.7897 1.9897 1.9028 0.3976 1.5782 3.0512 1.0454 2.6943 490.7916

Mean:                12.2787 1.9327 2.2448 20.238  94.5493 2.2589 2.0808 0.3637 1.6303 3.0866 1.0563 2.7854 519.507
MCD-estimated:
MDC-0.975-Mean:      12.2455 1.7611 2.2181 20.2553 88.9149 2.1877 2.0621 0.3694 1.5043 3.0557 1.0636 2.8343 484.8723
MDC-0.750-Mean:      12.2232 1.8191 2.2245 20.3085 88.6809 2.2098 2.0757 0.3602 1.5432 3.0096 1.0479 2.8394 482
MDC-0.500-Mean:      12.2226 1.6376 2.2317 20.1739 89.3261 2.2072 2.0915 0.3596 1.5387 3.0841 1.0639 2.8343 495.7391
```

Class2: n= 48

Covariance matrix:
```
          [,1]     [,2]     [,3]      [,4]      [,5]     [,6]     [,7]     [,8]     [,9]    [,10]    [,11]    [,12]       [,13]
 [1,]   0.2812   0.0637   0.0240    0.2514   -0.4859   0.0398   0.0118   0.0025   0.0816   0.4293  -0.0021   0.0191     -5.4347
 [2,]   0.0637   1.1835   0.0036    0.2089   -2.0731  -0.0624  -0.0899   0.0193  -0.0994  -0.4078   0.0099   0.0021      0.3642
 [3,]   0.0240   0.0036   0.0341    0.3163    0.4250   0.0310   0.0150  -0.0005   0.0146   0.0534   0.0038   0.0113     -3.1312
 [4,]   0.2514   0.2089   0.3163    5.0993    3.9202   0.2938   0.1799  -0.0048   0.2432   0.8382   0.0071   0.0256    -25.6472
 [5,]  -0.4859  -2.0731   0.4250    3.9202  118.6024  -0.1541   1.8180  -0.6837   0.6836   2.6223   0.0057  -0.6609    238.0120
 [6,]   0.0398  -0.0624   0.0310    0.2938   -0.1541   0.1274   0.0250   0.0145   0.0905   0.2771  -0.0011   0.0195      1.7637
 [7,]   0.0118  -0.0899   0.0150    0.1799    1.8180   0.0250   0.0861  -0.0231   0.0490   0.2489  -0.0098  -0.0343     -8.3254
 [8,]   0.0025   0.0193  -0.0005   -0.0048   -0.6837   0.0145  -0.0231   0.0154   0.0087   0.0075   0.0022   0.0104      2.8891
 [9,]   0.0816  -0.0994   0.0146    0.2432    0.6836   0.0905   0.0490   0.0087   0.1671   0.6471  -0.0197  -0.0143      9.1982
[10,]   0.4293  -0.4078   0.0534    0.8382    2.6223   0.2771   0.2489   0.0075   0.6471   5.3405  -0.1504  -0.0648     32.0230
[11,]  -0.0021   0.0099   0.0038    0.0071    0.0057  -0.0011  -0.0098   0.0022  -0.0197  -0.1504   0.0131   0.0113      0.0311
[12,]   0.0191   0.0021   0.0113    0.0256   -0.6609   0.0195  -0.0343   0.0104  -0.0143  -0.0648   0.0113   0.0740      6.1259
[13,]  -5.4347   0.3642  -3.1312  -25.6472  238.0120   1.7637  -8.3254   2.8891   9.1982  32.0230   0.0311   6.1259  13247.3293
```
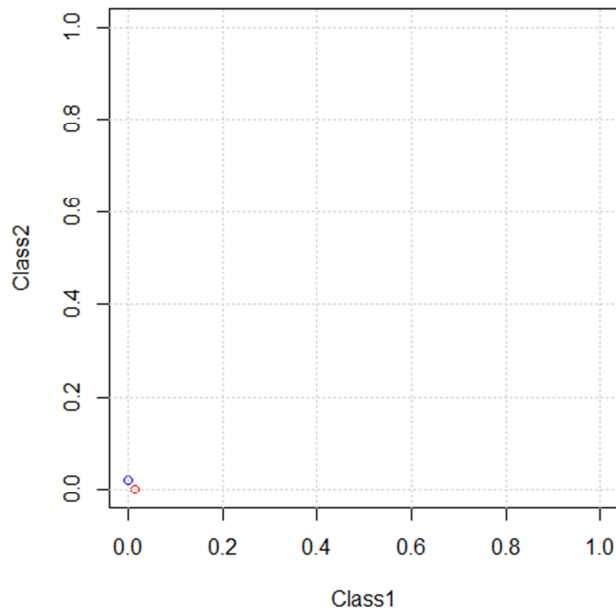
Correlation matrix:
```
          [,1]     [,2]     [,3]     [,4]     [,5]     [,6]     [,7]     [,8]     [,9]    [,10]    [,11]    [,12]    [,13]
 [1,]   1.0000   0.1105   0.2451   0.2099  -0.0841   0.2104   0.0761   0.0382   0.3766   0.3504  -0.0341   0.1322  -0.0891
 [2,]   0.1105   1.0000   0.0181   0.0850  -0.1750  -0.1607  -0.2816   0.1428  -0.2234  -0.1622   0.0797   0.0072   0.0029
 [3,]   0.2451   0.0181   1.0000   0.7585   0.2113   0.4704   0.2771  -0.0204   0.1938   0.1252   0.1805   0.2254  -0.1473
 [4,]   0.2099   0.0850   0.7585   1.0000   0.1594   0.3645   0.2714  -0.0171   0.2634   0.1606   0.0276   0.0417  -0.0987
 [5,]  -0.0841  -0.1750   0.2113   0.1594   1.0000  -0.0396   0.5688  -0.5057   0.1535   0.1042   0.0046  -0.2230   0.1899
 [6,]   0.2104  -0.1607   0.4704   0.3645  -0.0396   1.0000   0.2389   0.3263   0.6200   0.3359  -0.0261   0.2004   0.0429
 [7,]   0.0761  -0.2816   0.2771   0.2714   0.5688   0.2389   1.0000  -0.6345   0.4080   0.3669  -0.2931  -0.4297  -0.2464
 [8,]   0.0382   0.1428  -0.0204  -0.0171  -0.5057   0.3263  -0.6345   1.0000   0.1718   0.0263   0.1531   0.3066   0.2022
 [9,]   0.3766  -0.2234   0.1938   0.2634   0.1535   0.6200   0.4080   0.1718   1.0000   0.6849  -0.4218  -0.1286   0.1955
[10,]   0.3504  -0.1622   0.1252   0.1606   0.1042   0.3359   0.3669   0.0263   0.6849   1.0000  -0.5686  -0.1030   0.1204
[11,]  -0.0341   0.0797   0.1805   0.0276   0.0046  -0.0261  -0.2931   0.1531  -0.4218  -0.5686   1.0000   0.3643   0.0024
[12,]   0.1322   0.0072   0.2254   0.0417  -0.2230   0.2004  -0.4297   0.3066  -0.1286  -0.1030   0.3643   1.0000   0.1956
[13,]  -0.0891   0.0029  -0.1473  -0.0987   0.1899   0.0429  -0.2464   0.2022   0.1955   0.1204   0.0024   0.1956   1.0000
```

```
Median:            13.187 3.0508  2.4547 21.4506  97.5229 1.7777 0.8029 0.448  1.2204 7.7863 0.6726 1.7161 625.3559

Mean:              13.1538 3.3338 2.4371 21.4167  99.3125 1.6788 0.7815 0.4475 1.1535 7.3962 0.6827 1.6835 629.8958
MCD-estimated:
MDC-0.975-Mean:  13.2423 3.559  2.4335 21.2742  97.2903 1.6545 0.6816 0.4742 1.2032 7.7955 0.6632 1.7413 647.2581
MDC-0.750-Mean:  13.1514 3.2863 2.4311 21.3286 100.7429 1.6531 0.8006 0.446  1.1263 7.5031 0.6906 1.6626 637.8571
MDC-0.500-Mean:  13.2097 3.4285 2.4439 21.4848 100      1.6703 0.7639 0.4518 1.1221 7.417  0.6936 1.6903 647.7273


Measures:
Mah.Dist:                        5.2863
Mah.Dist-MCD-0.975:              6.0036
Mah.Dist-MCD-0.750:              6.3792
Mah.Dist-MCD-0.500:              6.4272
```


DD-Plot (zonoid): wine_2vs3

DD-Plot (random Tukey): wine_2vs3