

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

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

**Description:**

Data from Di Cook's "Xgobi Book" page

<http://www.public.iastate.edu/~dicook/xgobi-book/>

In one restaurant, a foodserver recorded the following data on all customers he had served during an interval of two and a half months in early 1990. The restaurant, located in a suburban shopping mall, was one of a national chain and served a varied menu.

TOTBILL Total bill, including tax, in dollars

TIP Tip in dollars

SEX Sex of person paying the bill (0=male, 1=female)

SMOKER Smoker in the party? (0=no, 1=yes)

DAY 3=Thursday, 4=Friday, 5=Saturday, 6=Sunday

TIME 0=day, 1=night

SIZE Size of the party

**Descriptive statistics:**

Dataset= tips\_DvsN : n= 244 , d= 6

Class1: n= 176

**Covariance matrix:**

|      | [,1]    | [,2]    | [,3]    | [,4]    | [,5]    | [,6]    |
|------|---------|---------|---------|---------|---------|---------|
| [1,] | 83.5767 | 8.3097  | -0.4707 | 0.4249  | 0.3669  | 4.6352  |
| [2,] | 8.3097  | 2.0628  | -0.0299 | -0.0147 | 0.0785  | 0.5602  |
| [3,] | -0.4707 | -0.0299 | 0.2094  | 0.0132  | -0.0418 | -0.0503 |
| [4,] | 0.4249  | -0.0147 | 0.0132  | 0.2409  | -0.0838 | -0.0637 |
| [5,] | 0.3669  | 0.0785  | -0.0418 | -0.0838 | 0.4009  | 0.1308  |
| [6,] | 4.6352  | 0.5602  | -0.0503 | -0.0637 | 0.1308  | 0.8285  |

**Correlation matrix:**

|      | [,1]    | [,2]    | [,3]    | [,4]    | [,5]    | [,6]    |
|------|---------|---------|---------|---------|---------|---------|
| [1,] | 1.0000  | 0.6329  | -0.1125 | 0.0947  | 0.0634  | 0.5570  |
| [2,] | 0.6329  | 1.0000  | -0.0455 | -0.0208 | 0.0864  | 0.4285  |
| [3,] | -0.1125 | -0.0455 | 1.0000  | 0.0590  | -0.1443 | -0.1207 |
| [4,] | 0.0947  | -0.0208 | 0.0590  | 1.0000  | -0.2695 | -0.1426 |
| [5,] | 0.0634  | 0.0864  | -0.1443 | -0.2695 | 1.0000  | 0.2270  |
| [6,] | 0.5570  | 0.4285  | -0.1207 | -0.1426 | 0.2270  | 1.0000  |

Median: 18.8347 2.9694 0.2811 0.3067 5.3465 2.5333

Mean: 20.7972 3.1027 0.2955 0.3977 5.3523 2.6307

**MCD-estimated:**

MDC-0.975-Mean: 21.8872 3.2203 0 0.2586 6 2.8103

MDC-0.750-Mean: 21.8872 3.2203 0 0.2586 6 2.8103

MDC-0.500-Mean: 21.8872 3.2203 0 0.2586 6 2.8103

Class2: n= 68

Covariance matrix:

|      | [,1]    | [,2]    | [,3]    | [,4]    | [,5]    | [,6]    |
|------|---------|---------|---------|---------|---------|---------|
| [1,] | 59.5040 | 7.4887  | -0.4333 | 0.0791  | -0.4517 | 5.6853  |
| [2,] | 7.4887  | 1.4529  | -0.0759 | 0.0365  | -0.0361 | 0.8121  |
| [3,] | -0.4333 | -0.0759 | 0.2535  | -0.0274 | 0.0059  | 0.0237  |
| [4,] | 0.0791  | 0.0365  | -0.0274 | 0.2272  | 0.0542  | -0.0667 |
| [5,] | -0.4517 | -0.0361 | 0.0059  | 0.0542  | 0.0937  | -0.0430 |
| [6,] | 5.6853  | 0.8121  | 0.0237  | -0.0667 | -0.0430 | 1.0817  |

Correlation matrix:

|      | [,1]    | [,2]    | [,3]    | [,4]    | [,5]    | [,6]    |
|------|---------|---------|---------|---------|---------|---------|
| [1,] | 1.0000  | 0.8054  | -0.1116 | 0.0215  | -0.1913 | 0.7087  |
| [2,] | 0.8054  | 1.0000  | -0.1250 | 0.0635  | -0.0977 | 0.6479  |
| [3,] | -0.1116 | -0.1250 | 1.0000  | -0.1143 | 0.0384  | 0.0453  |
| [4,] | 0.0215  | 0.0635  | -0.1143 | 1.0000  | 0.3715  | -0.1346 |
| [5,] | -0.1913 | -0.0977 | 0.0384  | 0.3715  | 1.0000  | -0.1351 |
| [6,] | 0.7087  | 0.6479  | 0.0453  | -0.1346 | -0.1351 | 1.0000  |

Median: 15.3934 2.442 0.5175 0.3778 3.1178 2.1454

Mean: 17.1687 2.7281 0.5147 0.3382 3.1029 2.4118

MCD-estimated:

MDC-0.975-Mean: 17.0509 2.6738 0.5556 0 3.0222 2.5111

MDC-0.750-Mean: 17.0509 2.6738 0.5556 0 3.0222 2.5111

MDC-0.500-Mean: 17.0509 2.6738 0.5556 0 3.0222 2.5111

Measures:

Mah.Dist: 4.1285

Mah.Dist-MCD-0.975: 27.3108

Mah.Dist-MCD-0.750: 27.3108

Mah.Dist-MCD-0.500: 27.3108

