juodrastis1

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Reikiamos bibliotekos:

```
library("quantmod")
library("forecast")
library("xts")
library("dplyr")
library("gridExtra")
```

Nuskaitomi duomenys:

```
data=read.csv("rawdata.csv")
data
```

```
##        Data    OMX SP350   SP500    kk   dll nedarbas Infliacija mhope
## 1   2000M01 102.10    NA 1394.46  33.8 -35.8      268        1.3 -12.1
## 2   2000M02 100.17    NA 1366.42  35.2 -35.8      266        1.1 -12.1
## 3   2000M03 102.34    NA 1498.58  42.4 -35.8      266        1.0 -12.1
## 4   2000M04 100.76    NA 1452.43  36.1 -19.8      266        0.9 -15.7
## 5   2000M05 100.31    NA 1420.60  38.3 -19.8      267        0.9 -15.7
## 6   2000M06  92.66    NA 1454.60  41.5 -19.8      270        0.8 -15.7
## 7   2000M07  90.46 39.03 1430.83  41.1 -19.8      280        0.9 -20.7
## 8   2000M08  91.99 39.53 1517.68  43.3 -19.8      282        0.9 -20.7
## 9   2000M09  92.26 38.13 1436.51  46.3 -19.8      279        0.8 -20.7
## 10  2000M10  89.54 36.41 1429.40  40.8 -23.8      275        0.9 -22.4
## 11  2000M11  94.93 36.22 1314.95  43.1 -23.8      278        1.0 -22.4
## 12  2000M12  92.70 38.34 1320.28  42.5 -23.8      285        1.1 -22.4
## 13  2001M01  96.11 38.25 1366.01  41.1 -30.8      296        1.0 -12.1
## 14  2001M02  92.54 34.31 1239.94  38.7 -30.8      299        0.9 -12.1
## 15  2001M03  87.39 32.24 1160.33  40.6 -30.8      297        0.9 -12.1
## 16  2001M04  86.25 34.22 1249.46  39.2 -18.8      287        0.9 -12.1
## 17  2001M05  84.35 33.45 1255.82  48.2 -18.8      276        1.1 -12.1
## 18  2001M06  82.13 31.60 1224.38  44.6 -18.8      270        1.1 -12.1
## 19  2001M07  74.74 31.40 1211.23  43.4 -24.8      268        1.1 -15.1
## 20  2001M08  68.55 30.50 1133.58  43.0 -24.8      269        1.2 -15.1
## 21  2001M09  68.81 27.18 1040.94  42.5 -24.8      274        1.4 -15.1
## 22  2001M10  73.01 27.78 1059.78  46.4  -4.8      283        1.5  -7.4
## 23  2001M11  75.93 28.85 1139.45  41.7  -4.8      291        1.5  -7.4
## 24  2001M12  75.56 29.54 1148.08  39.1  -4.8      296        1.5  -7.4
## 25  2002M01  77.64 28.28 1130.20  36.1   0.2      294        1.8  -6.7
## 26  2002M02  84.26 28.12 1106.73  35.3   0.2      282        2.1  -6.7
## 27  2002M03  89.78 29.50 1147.39  44.3   0.2      264        2.1  -6.7
## 28  2002M04  94.41 29.54 1076.92  43.2  -2.8      233        2.2   3.3
## 29  2002M05  85.87 29.16 1067.14  47.9   4.6      210        2.0   5.0
## 30  2002M06  83.52 28.25  989.82  45.2  -3.6      197        1.8   3.4
## 31  2002M07  85.91 25.82  911.62  43.7   3.8      193        1.7   2.6
## 32  2002M08  88.73 25.03  916.07  44.7   1.6      194        1.4   3.7
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## 33  2002M09  87.21 22.05  815.28  46.9   4.5      196        1.1   7.3
## 34  2002M10  85.57 23.92  885.76  47.4  -3.2      203        0.8   2.9
## 35  2002M11  88.05 25.18  936.31  44.8  -4.3      211        0.6   3.6
## 36  2002M12  84.78 23.74  879.82  46.1  27.5      215        0.3   3.5
## 37  2003M01  87.79 22.84  855.70  43.6  23.2      216       -0.1   1.1
## 38  2003M02  92.32 21.66  841.15  47.9   2.0      218       -0.5   3.4
## 39  2003M03  96.70 21.46  848.18  46.0   3.2      222       -0.7   2.1
## 40  2003M04 107.91 24.50  916.92  42.3   5.3      225       -0.9   1.1
## 41  2003M05 121.73 26.18  963.59  44.8   6.4      221       -1.0   0.6
## 42  2003M06 134.97 26.39  974.50  45.7   8.6      209       -1.0   4.4
## 43  2003M07 154.33 26.67  990.31  50.5   5.8      198       -1.1  -0.7
## 44  2003M08 166.98 26.51 1008.01  52.6   7.0      192       -1.1   1.8
## 45  2003M09 176.21 27.14  995.97  52.6   8.2      182       -1.0   4.2
## 46  2003M10 163.07 29.05 1050.71  55.5   9.3      180       -1.0  -1.4
## 47  2003M11 166.43 30.22 1058.20  52.8   8.3      188       -1.0   2.2
## 48  2003M12 174.48 32.08 1111.92  53.1   5.2      195       -1.1   0.3
## 49  2004M01 191.65 32.62 1131.13  45.5  13.2      198       -1.0  -0.3
## 50  2004M02 204.01 33.70 1144.94  49.9  14.3      198       -1.0   6.5
## 51  2004M03 217.80 32.51 1126.21  54.1  53.8      193       -1.0  31.3
## 52  2004M04 221.26 31.90 1107.30  56.5  54.8      180       -0.9  30.5
## 53  2004M05 208.55 32.53 1120.68  53.2  54.9      170       -0.8  27.2
## 54  2004M06 206.31 33.26 1140.84  58.9  57.5      163       -0.7  30.0
## 55  2004M07 206.80 32.00 1101.72  58.9  55.0      162       -0.5   7.5
## 56  2004M08 211.30 32.34 1104.24  60.7  12.8      161       -0.2   4.7
## 57  2004M09 223.71 33.34 1114.58  65.2  16.8      159        0.1   8.9
## 58  2004M10 238.90 34.74 1130.20  68.5  21.5      165        0.5   9.6
## 59  2004M11 262.72 36.88 1173.82  62.5  10.2      166        0.8   7.7
## 60  2004M12 293.44 37.62 1211.92  64.4  55.2      166        1.2   6.8
## 61  2005M01 322.36 37.02 1181.27  60.9  42.1      159        1.5   0.9
## 62  2005M02 336.43 38.65 1203.60  57.9  59.3      154        1.9   8.4
## 63  2005M03 346.39 37.70 1180.59  72.2  54.6      152        2.2  -2.8
## 64  2005M04 398.75 37.08 1156.85  70.1  53.7      149        2.5   3.8
## 65  2005M05 392.40 36.86 1191.50  75.7  48.2      140        2.6   8.0
## 66  2005M06 413.37 37.25 1191.33  74.2  44.9      130        2.7  13.1
## 67  2005M07 422.38 38.48 1234.18  72.3  55.0      121        2.7  12.9
## 68  2005M08 438.69 39.65 1220.33  80.2  55.9      114        2.7  11.3
## 69  2005M09 523.04 40.28 1228.81  89.9  57.3      109        2.7  12.8
## 70  2005M10 485.14 39.05 1207.01  80.1  62.6      111        2.7  11.5
## 71  2005M11 447.31 39.65 1249.48  85.8  56.6      111        2.7  16.9
## 72  2005M12 448.76 40.38 1248.29  85.6  58.3      113        2.7  13.4
## 73  2006M01 435.99 42.73 1280.08  78.1  60.1      108        2.7  11.8
## 74  2006M02 400.99 42.82 1280.66  76.2  28.3      102        2.7  12.9
## 75  2006M03 439.12 44.42 1294.87  91.1  27.8       97        2.7  13.8
## 76  2006M04 420.29 46.74 1310.61  84.7  63.6       89        2.7  22.2
## 77  2006M05 402.94 45.35 1270.09  99.5  56.0       83        2.9  16.1
## 78  2006M06 385.48 45.68 1270.20  94.9  54.1       82        3.0  29.6
## 79  2006M07 389.31 46.58 1276.66  89.3  60.6       87        3.2  38.7
## 80  2006M08 389.71 47.98 1303.82  88.6  55.8       90        3.4  39.7
## 81  2006M09 420.17 48.30 1335.85  93.2  63.5       86        3.5  35.7
## 82  2006M10 417.69 50.18 1377.94  86.6  66.1       78        3.5  34.4
## 83  2006M11 459.04 51.98 1400.63  85.2  66.2       74        3.6  39.6
## 84  2006M12 492.65 52.48 1418.30  81.2  48.8       77        3.8  34.0
## 85  2007M01 517.27 53.08 1438.24  78.6  43.5       79        3.8  34.1
## 86  2007M02 491.83 52.40 1406.82  76.1  49.7       78        3.9  32.1
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## 87  2007M03 493.53 54.17 1420.86  88.9  50.2       75        4.0  33.1
## 88  2007M04 492.28 57.45 1482.37  92.0  60.8       68        4.2  42.1
## 89  2007M05 492.22 58.70 1530.62 100.4  56.9       61        4.3  24.2
## 90  2007M06 532.90 58.46 1503.35 103.0  49.9       57        4.4  28.8
## 91  2007M07 561.02 56.96 1455.27 106.5  50.7       59        4.4  37.1
## 92  2007M08 546.15 56.68 1473.99 106.7  50.4       59        4.6  25.8
## 93  2007M09 569.04 59.60 1526.75  98.9  63.9       57        4.9  28.7
## 94  2007M10 565.42 62.30 1549.38  99.8  61.5       55        5.2  30.9
## 95  2007M11 509.83 60.22 1481.14  98.6  61.4       58        5.5  39.2
## 96  2007M12 514.23 57.17 1468.36 103.3  46.4       65        5.8  22.5
## 97  2008M01 457.16 52.14 1378.55 102.1  61.3       73        6.3  21.0
## 98  2008M02 500.46 51.90 1330.63 107.9  44.3       75        6.9  20.3
## 99  2008M03 466.88 52.50 1322.70 117.8  44.4       74        7.4  17.5
## 100 2008M04 441.78 54.83 1385.59 129.2  47.5       68        8.0  16.7
## 101 2008M05 431.64 55.06 1400.38 130.5  34.1       67        8.6  19.2
## 102 2008M06 424.34 48.61 1280.00 136.9  32.1       71        9.3  10.2
## 103 2008M07 401.04 47.36 1267.38 139.1  39.3       83        9.9  13.5
## 104 2008M08 424.30 45.48 1282.83 128.6  31.7       93       10.4  11.6
## 105 2008M09 320.76 39.86 1166.36 130.7  11.2       96       10.8   4.0
## 106 2008M10 225.83 31.39  968.75 112.1  12.2      105       11.0 -11.6
## 107 2008M11 187.49 29.28  896.24  97.0  -6.2      119       11.1 -24.3
## 108 2008M12 179.25 31.14  903.25  87.6 -22.1      137       11.1 -37.7
## 109 2009M01 191.26 26.55  825.88  76.4 -46.4      162       11.0 -55.5
## 110 2009M02 161.86 23.72  735.09  74.7 -77.3      185       10.8 -58.3
## 111 2009M03 159.86 25.58  797.87  76.1 -76.5      203       10.5 -53.1
## 112 2009M04 162.12 28.84  872.81  77.3 -55.9      210       10.0 -54.4
## 113 2009M05 178.14 32.70  919.14  82.3 -52.5      212        9.3 -30.1
## 114 2009M06 180.42 31.38  919.32  90.3 -39.6      211        8.6 -27.9
## 115 2009M07 193.72 34.81  987.48  89.2 -39.7      211        7.8 -28.9
## 116 2009M08 277.88 36.69 1020.62  86.8 -56.5      212        6.9 -31.7
## 117 2009M09 310.54 38.54 1057.08  86.5 -55.2      213        6.2 -37.7
## 118 2009M10 284.31 37.66 1036.19  83.6 -56.2      223        5.4 -29.3
## 119 2009M11 263.66 39.33 1095.63  82.7 -60.9      236        4.8 -35.2
## 120 2009M12 261.77 38.96 1115.10  83.6 -63.0      251        4.2 -42.2
## 121 2010M01 315.16 36.39 1073.87  73.2 -62.8      272        3.4 -33.2
## 122 2010M02 301.75 36.02 1104.49  79.1 -63.1      273        2.6 -29.1
## 123 2010M03 314.39 38.34 1169.43  87.0 -56.1      272        2.0 -26.5
## 124 2010M04 317.26 36.83 1186.69  94.0 -25.6      278        1.5 -16.0
## 125 2010M05 309.46 32.64 1089.41  98.0 -22.5      273        1.1  -9.4
## 126 2010M06 305.49 31.35 1030.71 106.5 -12.2      271        0.9   1.3
## 127 2010M07 313.08 35.68 1101.60 105.3 -16.7      277        0.8   7.7
## 128 2010M08 326.36 33.99 1049.33 107.7  -4.8      270        0.8  11.5
## 129 2010M09 359.77 37.85 1141.20 107.0  -5.0      265        0.8  11.1
## 130 2010M10 385.93 39.62 1183.26 112.6  22.6      266        0.9   7.5
## 131 2010M11 411.94 36.38 1180.55 112.8  26.5      262        1.0   6.0
## 132 2010M12 409.65 39.28 1257.64 116.7  27.1      267        1.2   4.5
## 133 2011M01 407.11 41.01 1286.12 111.2   5.2      260        1.5 -19.7
## 134 2011M02 411.38 42.27 1327.22 110.3  -1.5      255        1.8 -12.8
## 135 2011M03 400.13 41.82 1325.83 117.9  33.2      250        2.1  -9.8
## 136 2011M04 385.37 45.34 1363.61 114.8  33.3      243        2.5  -1.5
## 137 2011M05 397.92 43.84 1345.20 131.6  35.1      231        2.8  10.4
## 138 2011M06 396.35 42.08 1320.64 133.5  36.0      225        3.2  13.5
## 139 2011M07 398.39 40.09 1292.28 129.7  34.8      229        3.4  11.2
## 140 2011M08 373.47 36.17 1218.89 133.6  33.8      223        3.6   9.4
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## 141 2011M09 332.79 31.87 1131.42 135.0  31.1      213        3.8   4.0
## 142 2011M10 355.95 35.82 1253.30 129.8  32.5      204        4.0  -0.8
## 143 2011M11 299.38 34.72 1246.96 129.8  33.3      199        4.1  -6.7
## 144 2011M12 298.78 33.74 1257.60 126.3  30.6      205        4.1 -11.6
## 145 2012M01 310.99 35.58 1312.41 123.6 -25.2      211        4.2 -27.0
## 146 2012M02 314.75 37.38 1365.68 118.6   0.0      213        4.2 -13.0
## 147 2012M03 314.85 37.35 1408.47 132.2  22.6      214        4.2 -11.0
## 148 2012M04 330.72 36.44 1397.91 132.7   1.8      206        4.1   3.4
## 149 2012M05 335.15 32.13 1310.33 106.1  27.4      194        3.9  -6.9
## 150 2012M06 339.89 33.70 1362.16 131.4  27.2      190        3.7   7.8
## 151 2012M07 346.99 33.90 1379.32 137.7   7.5      187        3.6  -8.7
## 152 2012M08 347.38 35.41 1406.58 154.1  15.1      184        3.5  -9.8
## 153 2012M09 343.80 36.52 1440.67 148.8  20.4      185        3.4  -3.9
## 154 2012M10 346.19 37.13 1412.16 154.6  30.1      189        3.3  -8.7
## 155 2012M11 350.20 37.98 1416.18 145.5  25.1      195        3.2 -13.4
## 156 2012M12 355.08 39.30 1426.19 135.4  28.7      194        3.2 -14.1
## 157 2013M01 373.73 41.10 1498.11 135.0 -25.2      194        3.1 -17.7
## 158 2013M02 368.69 39.68 1514.68 131.4   1.0      189        3.0 -17.2
## 159 2013M03 393.63 39.71 1569.19 144.0   4.5      191        2.8  -4.7
## 160 2013M04 396.11 41.50 1597.57 135.2   7.8      180        2.7   6.4
## 161 2013M05 399.71 41.56 1630.74 134.4  24.5      167        2.6   5.6
## 162 2013M06 403.99 38.75 1606.28 136.4  25.9      168        2.5  13.3
## 163 2013M07 411.45 41.77 1685.73 142.1  30.3      159        2.3   3.0
## 164 2013M08 412.87 41.13 1632.97 145.6  29.6      162        2.0   8.7
## 165 2013M09 421.98 44.12 1681.55 145.4  13.3      158        1.8  -2.4
## 166 2013M10 416.65 45.92 1756.54 149.2  32.2      156        1.6  -0.9
## 167 2013M11 413.20 46.34 1805.81 136.5  22.4      167        1.4  -3.8
## 168 2013M12 421.60 47.45 1848.36 130.2  15.7      179        1.2 -11.3
## 169 2014M01 453.61 45.27 1782.59 118.7  -4.9      184        1.0  -6.1
## 170 2014M02 457.99 48.53 1859.45 121.6  18.6      185        0.8  -3.0
## 171 2014M03 451.48 48.28 1872.34 123.9  26.1      181        0.7   2.0
## 172 2014M04 450.22 49.60 1883.95 137.9  20.7      171        0.6   9.8
## 173 2014M05 461.20 49.98 1923.57 141.8  25.4      166        0.5  10.0
## 174 2014M06 471.95 48.57 1960.23 134.4  29.4      160        0.4   8.8
## 175 2014M07 471.33 46.52 1930.67 142.5  12.5      141        0.4   4.6
## 176 2014M08 455.93 46.80 2003.37 131.6  22.4      136        0.4  11.7
## 177 2014M09 458.10 45.08 1972.29 143.1  11.6      129        0.3   3.7
## 178 2014M10 451.35 44.09 2018.05 146.9  12.8      136        0.3   0.5
## 179 2014M11 458.92 44.98 2067.56 135.9   8.2      148        0.3  -1.5
## 180 2014M12 452.42 42.53 2058.90 123.3  -6.1      160        0.2  -6.6
## 181 2015M01 464.11 42.73 1994.99 107.3  -5.9      150        0.1  -6.6
## 182 2015M02 481.52 45.29 2104.50 117.6  -3.3      146        0.0  -5.9
## 183 2015M03 493.21 44.27 2067.89 129.7  -2.4      141       -0.2  -4.5
## 184 2015M04 494.49 46.08 2085.51 131.2  -1.1      140       -0.2  -4.8
## 185 2015M05 501.62 46.20 2107.39 139.3  19.9      136       -0.3   3.6
## 186 2015M06 497.46 43.73 2063.11 143.4  14.5      139       -0.3   7.0
## 187 2015M07 500.58 44.79 2103.84 141.2  -7.2      126       -0.4   7.6
## 188 2015M08 490.92 41.62 1972.18 129.0   4.9      122       -0.5   9.5
## 189 2015M09 479.82 39.80 1920.03 129.9  11.9      119       -0.5   4.2
## 190 2015M10 478.59 42.23 2079.36 139.2  15.0      123       -0.6   2.5
## 191 2015M11 482.78 41.64 2080.41 134.0   9.4      127       -0.7   3.1
## 192 2015M12 485.99 40.11 2043.94 121.9   6.0      139       -0.7  10.4
## 193 2016M01 487.87 37.96 1940.24 107.2   4.8      127       -0.5   6.9
## 194 2016M02 488.12 36.78 1932.23 116.0   3.3      122       -0.3   8.2
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## 195 2016M03 508.34 39.11 2059.74 123.6  10.6      119       -0.2  10.9
## 196 2016M04 503.17 40.31 2065.30 118.8   6.8      117       -0.1  13.7
## 197 2016M05 515.27 39.97 2096.95 132.5  11.4      119        0.0  15.5
## 198 2016M06 515.04 37.79 2098.86 132.9  15.7      121        0.0  15.4
## 199 2016M07 540.35 38.95 2173.60 127.8   8.6      128        0.0   8.8
## 200 2016M08 542.38 39.14 2170.95    NA  -6.2        :        0.1   5.7
##     phope pramhope shope    ta    ul vhope    vp    mp euribor
## 1       :    -20.5 -61.4 -13.0 -13.0     : -34.0  58.0  3.3431
## 2       :    -12.5 -61.4 -13.0 -13.0     : -34.0  59.6      NA
## 3       :    -10.9 -61.4 -13.0 -13.0     : -34.0  63.6  3.7470
## 4       :    -14.5 -61.4   1.0 -13.0     : -30.0  66.4  3.9253
## 5       :    -14.2 -61.4   1.0 -13.0     : -30.0  70.5  4.3620
## 6       :    -13.9 -61.4   1.0 -13.0     : -30.0  67.8  4.5017
## 7       :    -18.2 -66.4   8.0 -13.0     : -25.0  69.6  4.5829
## 8       :    -13.9 -66.4   8.0 -13.0     : -25.0  71.1  4.7771
## 9       :     -9.9 -66.4   8.0 -13.0     : -25.0  70.9  4.8528
## 10      :    -19.2 -74.9  10.0 -11.0     : -27.0  71.1  5.0413
## 11      :    -17.2 -74.9  10.0 -11.0     : -27.0  67.9  5.0920
## 12      :    -20.2 -74.9  10.0 -11.0     : -27.0  80.1  4.9392
## 13      :    -16.2 -73.4 -11.0 -13.0     : -28.0  63.4  4.7707
## 14      :     -8.5 -73.4 -11.0 -13.0     : -28.0  61.2  4.7558
## 15      :     -0.2 -73.4 -11.0 -13.0     : -28.0  68.0  4.7086
## 16      :      2.1 -47.4  11.0   4.0     : -25.0  66.9  4.6820
## 17      :     -1.9 -47.4  11.0   4.0 -32.7 -25.0  69.3  4.6367
## 18      :     -7.2 -47.4  11.0   4.0 -29.7 -25.0  68.5  4.4536
## 19      :     -9.9 -37.4   8.0  -8.0 -24.4 -29.0  71.3  4.4671
## 20      :     -4.5 -37.4   8.0  -8.0 -23.8 -29.0  72.9  4.3535
## 21      :     -8.9 -37.4   8.0  -8.0 -25.5 -29.0  68.0  3.9829
## 22      :    -13.4 -56.4   9.0   7.0 -29.9 -14.0  70.9  3.5999
## 23      :    -13.5 -56.4   9.0   7.0 -28.1 -14.0  68.4  3.3857
## 24      :    -13.5 -56.4   9.0   7.0 -26.0 -14.0  84.3  3.3449
## 25      :    -12.0 -53.9   4.0   1.0 -22.4 -16.0  68.4  3.3388
## 26      :     -4.2 -53.9   4.0   1.0 -24.7 -16.0  65.4  3.3571
## 27      :     -0.4 -53.9   4.0   1.0 -24.3 -16.0  76.2  3.3908
## 28      :     -3.4 -19.9   5.0   7.0 -22.2  -5.0  71.6  3.4069
## 29   19.0     -7.3 -10.4  -2.0  30.3 -20.9  -1.7  77.7  3.4671
## 30   11.3    -11.4 -15.9   0.2   0.9 -21.2   7.5  75.4  3.4640
## 31   10.7    -14.3 -16.4   1.1   4.1 -21.8   6.1  80.6  3.4100
## 32   10.2     -7.1 -19.0   0.1   9.0 -19.9   5.7  80.9  3.3519
## 33   20.9     -7.9 -33.6  -0.6  15.6 -18.4   7.1  76.5  3.3101
## 34   15.5    -10.0 -16.4  -0.1   6.0 -18.0   3.7  79.2  3.2613
## 35   18.0    -11.2 -44.2  -0.6   7.1 -17.2  -1.4  75.0  3.1241
## 36   17.8    -13.8 -42.8  -1.8 -21.6 -15.0   1.5  91.4  2.9410
## 37   17.0    -12.3 -37.3  -1.1 -32.1  -6.3   4.4  72.8  2.8318
## 38   22.5     -4.4 -22.2   2.9   2.5  -8.9   6.8  69.9  2.6875
## 39   38.3     -6.2 -18.7   2.1   9.6  -8.9   1.7  76.8  2.5300
## 40   40.4     -8.5  -6.8   7.9   3.3 -10.7   3.6  80.4  2.5333
## 41   21.9     -7.7  -9.3   8.7   1.3  -8.5   4.5  84.2  2.4005
## 42   20.1    -16.5  -2.8   0.1   4.0 -10.2   9.8  82.5  2.1519
## 43    6.7    -16.6  -6.7   9.3  -0.5 -11.1   9.0  91.2  2.1300
## 44    9.6    -12.1 -13.0   4.4   4.2  -9.0   7.2  91.2  2.1404
## 45    9.9     -7.6 -19.2  -0.5   8.9 -12.9   5.4  85.9  2.1473
## 46   21.8    -10.3 -22.3   8.0   8.4 -10.9   2.6  89.9  2.1436
## 47   10.6     -5.0 -22.6  -1.1   5.0 -13.2   0.8  83.6  2.1590
```

```
## 48    4.9    -4.9 -39.0  -2.2  -2.6 -12.4  -0.2 107.9  2.1463
## 49   14.5   -10.4 -37.7   1.7  -6.4 -11.2   5.1  80.1  2.0895
## 50    8.9    -3.1 -29.4   2.1  14.2 -13.5  11.5  77.7  2.0706
## 51   18.8     1.1 -15.4  -0.4  54.7  -9.9  40.3  87.1  2.0288
## 52   30.3     0.8  -4.0   0.6  46.3 -11.8  39.2  92.2  2.0488
## 53   22.9    -0.1  -0.4   8.4  41.6 -12.9  38.7  90.3  2.0859
## 54   14.9    -6.4  -3.6   2.1  40.4  -6.7  49.9  90.1  2.1127
## 55   14.2    -2.3 -10.2   1.2  51.4  -5.9   9.8  95.2  2.1160
## 56   14.5    -4.6 -13.6   1.2  11.4  -4.9   5.7  96.6  2.1143
## 57   23.4    -2.7  -9.1  -0.8  18.3  -1.8  12.1  93.6  2.1186
## 58   19.7    -3.8 -12.6  -0.4  20.1  -1.2  12.1  96.1  2.1473
## 59    4.9    -5.3 -19.6  -0.2  24.5  -3.3   9.9  90.9  2.1703
## 60   15.6   -18.0 -26.8   1.4   4.9  -3.7  11.7 114.5  2.1732
## 61   13.5   -13.8 -22.6   0.7  -1.0  -2.3   4.3  86.6  2.1454
## 62    7.7    -3.9 -12.3   0.6  20.6  -3.8  11.3  83.7  2.1384
## 63   19.7     3.9  -5.6  12.8  10.4  -5.6  -4.9  94.2  2.1372
## 64   23.6     1.0 -14.2  -0.1  21.1  -1.8   2.4  96.2  2.1372
## 65   20.9    -4.7   3.8   0.9   9.9  -5.3  14.9 101.6  2.1256
## 66   16.0    -3.7   9.8  -5.1   7.5  -2.5  16.2 101.5  2.1110
## 67   19.8     2.9  12.4  -5.6  20.4  -4.3  16.2 108.1  2.1194
## 68   11.6    -2.2   8.4   0.2  25.7  -3.9  16.1 109.8  2.1325
## 69   25.7     6.6   4.1  -1.0  26.9  -8.2  19.6 107.8  2.1391
## 70   32.0     4.0   0.2   0.8  31.0  -5.3  17.8 109.8  2.1966
## 71   28.8    -1.1  -3.0   0.0  56.1  -2.2   9.4 105.7  2.3609
## 72   20.5    -1.3 -10.4   0.1  33.7  -3.0   6.0 132.2  2.4729
## 73   28.9    -1.2 -17.3   0.8  11.9   0.0   9.0  99.3  2.5117
## 74   22.6     6.8 -17.9  -0.5   5.8  -1.0   7.0  94.0  2.6004
## 75   21.8    12.7   6.3  -0.7  15.8  -1.2   0.8 105.1  2.7226
## 76   21.7    10.0   7.4  -0.7  61.1   0.8  -2.5 105.7  2.7938
## 77   17.3     9.4  16.4   4.6  28.3  -0.7  -0.9 112.0  2.8890
## 78   22.9     5.5  16.9   4.7  22.0   0.8  44.5 115.2  2.9857
## 79   32.6     4.9  16.9 -13.9  27.8   0.5  47.3 119.9  3.1022
## 80   19.3     4.3  11.1 -13.2  30.4  -0.8  52.6 123.0  3.2265
## 81   21.3     7.4  -0.6  -1.1  20.9   2.2  55.1 120.1  3.3354
## 82   21.4     7.3   0.1  -2.3  58.6   0.9  48.9 122.4  3.5020
## 83   15.9    -0.2  -9.5  -2.0  62.8   2.6  53.9 117.3  3.5972
## 84   20.0    -7.6  -7.4  -0.6  48.0   2.5  46.4 144.2  3.6842
## 85   16.7    -5.3  -1.7   0.1  -0.7   7.9  71.0 114.9  3.7519
## 86   27.0     4.6   2.4  13.6  18.6   7.8  65.0 108.1  3.8182
## 87   24.3     9.9  12.5   1.3  57.8   8.8  39.2 124.9  3.8909
## 88   25.8    13.9  15.3  -2.2  31.4   8.9  61.2 124.3  3.9753
## 89   24.6     8.6  19.4   0.1  14.5   8.0  61.1 134.9  4.0714
## 90   21.1     9.1  14.8  -1.8  20.1   9.0  60.8 136.6  4.1478
## 91   22.7     9.4  11.3  -0.6  16.5   5.8  63.0 138.8  4.2162
## 92   17.7     9.6   6.1  -1.6  21.0   4.8  23.2 145.4  4.5436
## 93   25.1     7.7   6.0  -1.1  53.2   1.4  33.5 137.1  4.7417
## 94   10.4     3.2  -4.8  -1.8  48.0  -3.6  62.7 141.3  4.6874
## 95   16.3     7.9  -7.0  -1.1  46.5  -8.0  67.5 132.4  4.6385
## 96    9.2    -3.9  -9.8   0.2   3.8  -5.7  34.3 161.0  4.8484
## 97   12.6    -2.2  -0.8  -0.5 -21.0  -4.1  42.1 125.7  4.4815
## 98   17.1    -1.8  -1.0   4.3  -1.8  -4.2  35.4 124.9  4.3621
## 99   14.8    -0.4  -2.8   3.1  18.7  -6.2  16.9 132.2  4.5964
## 100  16.6    -5.9  -4.5   1.3  13.2 -10.3  16.0 135.5  4.7835
## 101  13.9    -1.5 -10.6   5.3   6.1 -16.0  22.2 139.0  4.8574
```

```
## 102   4.1     -3.5 -15.8   5.6  -1.0 -21.3  13.7 136.3  4.9405
## 103  -1.2     -7.2 -20.0   5.4   1.2 -24.3  24.5 143.1  4.9610
## 104  -2.3     -6.9 -32.9   5.2   9.4 -26.7  20.0 141.6  4.9652
## 105  -1.1     -9.2 -32.9   4.7   7.1 -26.3  17.0 135.3  5.0192
## 106  -4.4    -15.2 -47.4   8.0  28.6 -34.7 -16.4 138.7  5.1131
## 107 -12.1    -29.5 -58.2   6.5  12.7 -41.3 -28.3 128.5  4.2383
## 108 -40.6    -37.6 -68.9  16.9 -43.2 -51.0 -41.5 154.2  3.2926
## 109 -40.2    -36.4 -74.1  54.8 -71.1 -55.6 -45.6 104.9  2.4565
## 110 -44.2    -32.4 -75.7  51.3 -64.1 -51.4 -53.9  98.9  1.9431
## 111 -47.0    -32.1 -82.4  47.6 -69.4 -50.8 -61.5 104.3  1.6355
## 112 -40.3    -37.8 -84.4  50.5 -73.8 -50.1 -52.3 110.5  1.4223
## 113 -39.4    -32.2 -81.9  17.8 -58.0 -47.6 -30.6 111.3  1.2817
## 114 -35.9    -30.6 -79.6  16.5 -44.1 -41.6 -32.6 110.3  1.2279
## 115 -34.3    -30.1 -72.2  19.2 -54.8 -43.5 -17.1 116.1  0.9750
## 116 -32.5    -26.1 -76.9  20.5 -53.9 -47.3 -21.7 115.4  0.8605
## 117 -20.9    -31.5 -74.5  14.1 -52.6 -39.7 -50.3 101.8  0.7721
## 118 -22.9    -27.4 -79.0  12.9 -53.3 -47.3 -46.8 104.4  0.7375
## 119 -19.5    -30.6 -78.7  11.8 -59.1 -51.0 -45.8  94.5  0.7162
## 120 -25.1    -32.3 -78.8   9.6 -65.1 -50.4 -53.0 114.0  0.7120
## 121 -13.9    -19.3 -68.8   8.8 -77.8 -45.4 -48.8  87.8  0.6798
## 122 -20.2    -16.3 -64.9   8.4 -39.9 -40.0 -47.9  83.2  0.6617
## 123 -15.7    -10.5 -52.1   7.6 -32.3 -37.3 -48.0  95.5  0.6450
## 124  -5.6    -10.6 -41.0   6.1 -29.2 -37.3 -27.2  96.3  0.6447
## 125  -0.5    -11.6 -30.2   6.8 -20.3 -37.1 -21.1 100.9  0.6865
## 126   2.8    -17.3 -24.6   6.3  -4.8 -35.5  -0.8 101.8  0.7276
## 127  -0.3    -16.8 -23.7   5.9   1.3 -29.9  15.5 106.0  0.8488
## 128   0.9    -12.3 -27.1   6.1   0.2 -25.0  18.7 108.1  0.8955
## 129  10.6    -12.5 -29.1   6.2   0.4 -25.9  21.6 101.6  0.8805
## 130   8.8    -10.0 -37.6   6.5  24.4 -25.7  30.1 103.9  0.9977
## 131  11.5    -10.7 -46.5   5.2  34.0 -25.8  17.8  98.2  1.0420
## 132  13.7    -13.3 -56.1   5.3  19.4 -26.3  22.5 116.7  1.0217
## 133  11.8    -11.4 -48.7  12.2 -43.5 -24.1 -16.7  90.5  1.0172
## 134   9.6     -8.2 -40.1   6.7 -17.8 -23.5   0.2  88.0  1.0867
## 135  11.7     -1.4 -24.0   6.4  -1.0 -20.9  -7.4  98.5  1.1755
## 136  10.0      2.4 -20.0   5.4  36.9 -18.2   2.1 101.8  1.3212
## 137  15.9      1.5 -14.0   6.3  11.2 -15.9  27.0 105.3  1.4251
## 138  16.8      4.2 -10.5   6.3  12.1 -16.1  34.7 107.2  1.4886
## 139  14.4      5.5 -17.3   6.3  13.2 -14.9  27.4 111.0  1.5976
## 140  16.7     -4.3 -21.5   6.1  -4.0 -16.7  26.7 116.3  1.5521
## 141  12.7    -13.1 -29.4   7.0  11.1 -18.1  19.7 109.7  1.5365
## 142  13.1    -19.6 -38.0   7.6   8.3 -23.3  10.3 110.8  1.5759
## 143  10.9    -19.4 -46.3   6.9  21.6 -22.6 -21.4 107.8  1.4847
## 144   2.1    -16.4 -47.8   8.2  15.1 -30.0 -22.0 126.9  1.4261
## 145   2.8    -16.5 -44.1  12.8 -50.2 -22.5 -20.6  99.1  1.2222
## 146  -0.7    -10.3 -43.8   9.4 -12.6 -22.7 -16.6  93.5  1.0483
## 147   3.8    -10.7 -36.7   9.1  24.7 -20.6 -18.1 103.7  0.8585
## 148   7.7    -10.3 -26.7   8.6  24.2 -21.0 -14.0 103.1  0.7443
## 149   6.3     -6.2 -24.7   9.2  27.5 -18.5 -21.3 110.8  0.6849
## 150   4.8     -7.3 -21.3   9.7  37.1 -15.5   8.5 111.1  0.6589
## 151   6.4     -6.8 -24.5  12.3   3.8 -17.6  -3.3 115.5  0.4970
## 152   5.7    -14.0 -23.6  12.8  -3.6 -16.8   0.9 119.1  0.3324
## 153  11.6    -12.6 -26.2   9.4 -18.7 -19.6   2.9 109.8  0.2463
## 154  11.5    -15.5 -40.7  13.6  22.0 -19.5 -10.6 116.4  0.2079
## 155  10.6    -21.0 -41.1   9.6  26.7 -14.7 -22.2 110.2  0.1920
```

```
## 156   0.4    -17.1 -45.7  14.8  17.8 -16.2 -12.6 128.1  0.1855
## 157   2.8    -10.9 -32.8  18.2 -43.0 -14.6  -6.0 101.5  0.2049
## 158   1.0     -4.4 -30.4  15.4 -21.0 -14.3 -23.6  94.9  0.2234
## 159   1.3     -1.4 -19.1  13.8  33.8 -10.4 -22.5 108.5  0.2061
## 160   5.8     -1.4  -9.4  13.4  31.1 -11.4  11.7 106.2  0.2089
## 161  -0.1     -1.0  -9.8  12.9  34.2  -8.9   1.6 118.8  0.2012
## 162   1.5      2.9 -13.4  13.1  34.8  -8.2   6.0 116.1  0.2103
## 163   0.0     -2.7  -9.3  12.9  14.5  -9.3   9.7 124.7  0.2214
## 164   2.5      2.3 -13.0   9.7  10.2  -6.6  32.9 125.6  0.2259
## 165   0.3     -2.0 -22.0   9.2 -13.6  -8.9  14.4 115.3  0.2232
## 166  -1.8    -12.1 -27.4   9.8   3.3 -11.0  12.1 119.5  0.2258
## 167  -1.6    -16.4 -36.3   5.5  25.6 -11.7   4.3 113.6  0.2234
## 168  -7.1    -15.6 -38.9   1.1 -23.8  -9.0 -18.8 133.5  0.2735
## 169  -2.1     -8.0 -30.2   1.4 -21.5  -8.6  -4.9 107.8  0.2920
## 170  -1.3     -4.1 -23.9   1.4  20.1 -10.0 -13.6  99.8  0.2881
## 171   0.1      1.2 -11.8   0.8  39.4 -10.9  -9.3 112.4  0.3053
## 172   3.8     -1.0  -5.7   0.5  25.7 -12.0   3.3 117.8  0.3297
## 173  -0.6     -2.5  -1.8   0.7  36.8 -12.1  10.6 123.7  0.3246
## 174  -0.6     -4.3  -3.4   3.6  18.5 -10.9   9.0 120.8  0.2414
## 175  -7.5     -6.8 -10.3   4.2  19.9 -13.7  -0.4 131.6  0.2050
## 176  -2.7     -6.4 -10.9   4.3   6.2 -20.1  23.6 130.2  0.1916
## 177  -6.7    -10.6 -12.5   4.3  -5.1 -19.9  21.3 122.0  0.0971
## 178   4.2     -9.1 -17.7   3.7  -0.9 -18.5   6.6 126.6  0.0826
## 179  13.5    -14.3 -30.1   4.4  -5.5 -16.6   8.1 119.7  0.0809
## 180  -9.3    -16.2 -31.0   4.3 -10.2 -15.8  -5.2 144.4  0.0809
## 181 -10.0    -14.3 -27.0   2.0  -9.8  -8.8  -2.3 108.8  0.0627
## 182  -3.2     -9.9 -19.7   3.0  -4.9  -7.7  -8.5 104.5  0.0482
## 183  -5.8      0.6 -16.5   6.2  -5.1  -2.5 -21.3 119.9  0.0272
## 184  -2.7      2.3 -14.7   7.1  -6.1  -4.6 -20.3 123.4  0.0047
## 185  -1.9     -6.6 -11.2   6.4   9.1  -4.8   3.1 128.3 -0.0104
## 186   4.6     -8.4 -13.4   1.9  18.1  -7.2   9.6 130.6 -0.0139
## 187  13.5    -11.3 -11.4   2.8  22.2  -8.0  13.8 138.4 -0.0187
## 188  11.0    -12.1 -21.4   0.6  12.4  -7.7  23.1 139.2 -0.0277
## 189   6.1     -7.4 -25.2   2.5  -3.8 -11.8  15.3 129.8 -0.0370
## 190   3.6     -7.2 -32.6   2.6  16.6 -10.0  11.3 133.7 -0.0536
## 191   5.2     -9.0 -42.1   1.7  21.3  -8.8  18.3 126.3 -0.0876
## 192   0.7    -15.9 -43.1   2.4 -27.8  -7.2  35.2 152.1 -0.1263
## 193   5.8    -11.3 -35.8   1.9 -24.1  -5.9  33.9 116.3 -0.1461
## 194   2.4     -7.3 -31.3   2.4   6.8  -8.9  24.1 113.9 -0.1836
## 195   9.7     -3.9 -21.0   2.3  17.4  -6.9  21.7 127.6 -0.2285
## 196  13.7     -7.0 -21.5   2.5  34.0  -8.3  32.7 130.3 -0.2492
## 197  11.5     -7.3 -18.1   4.1  31.2 -11.8  35.7 138.2 -0.2572
## 198  10.8     -9.3 -17.4   2.2  31.5  -7.3  31.9 139.3 -0.2679
## 199   9.0     -8.8 -26.6   3.6  23.3  -8.8  17.9 144.0 -0.2945
## 200  11.9     -3.8 -20.7   2.7  11.2  -9.6  16.0     : -0.2982
```

```
data[ data == ":" ] = NA
data=data[complete.cases(data),]
rownames(data)<-NULL
```