Lab 5

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11:59PM March 16, 2019

Load the Boston housing data frame and create the vector y (the median value) and matrix X (all other features) from the data frame. Name the columns the same as Boston except for the first name it "(Intercept)".

```
data(Boston, package = "MASS")
summary(Boston)
```

```
##       crim                zn             indus            chas
##  Min.   : 0.00632   Min.   :  0.00   Min.   : 0.46   Min.   :0.00000
##  1st Qu.: 0.08204   1st Qu.:  0.00   1st Qu.: 5.19   1st Qu.:0.00000
##  Median : 0.25651   Median :  0.00   Median : 9.69   Median :0.00000
##  Mean   : 3.61352   Mean   : 11.36   Mean   :11.14   Mean   :0.06917
##  3rd Qu.: 3.67708   3rd Qu.: 12.50   3rd Qu.:18.10   3rd Qu.:0.00000
##  Max.   :88.97620   Max.   :100.00   Max.   :27.74   Max.   :1.00000
##       nox               rm             age              dis
##  Min.   :0.3850   Min.   :3.561   Min.   :  2.90   Min.   : 1.130
##  1st Qu.:0.4490   1st Qu.:5.886   1st Qu.: 45.02   1st Qu.: 2.100
##  Median :0.5380   Median :6.208   Median : 77.50   Median : 3.207
##  Mean   :0.5547   Mean   :6.285   Mean   : 68.57   Mean   : 3.795
##  3rd Qu.:0.6240   3rd Qu.:6.623   3rd Qu.: 94.08   3rd Qu.: 5.188
##  Max.   :0.8710   Max.   :8.780   Max.   :100.00   Max.   :12.127
##       rad              tax           ptratio          black
##  Min.   : 1.000   Min.   :187.0   Min.   :12.60   Min.   :  0.32
##  1st Qu.: 4.000   1st Qu.:279.0   1st Qu.:17.40   1st Qu.:375.38
##  Median : 5.000   Median :330.0   Median :19.05   Median :391.44
##  Mean   : 9.549   Mean   :408.2   Mean   :18.46   Mean   :356.67
##  3rd Qu.:24.000   3rd Qu.:666.0   3rd Qu.:20.20   3rd Qu.:396.23
##  Max.   :24.000   Max.   :711.0   Max.   :22.00   Max.   :396.90
##      lstat            medv
##  Min.   : 1.73   Min.   : 5.00
##  1st Qu.: 6.95   1st Qu.:17.02
##  Median :11.36   Median :21.20
##  Mean   :12.65   Mean   :22.53
##  3rd Qu.:16.95   3rd Qu.:25.00
##  Max.   :37.97   Max.   :50.00
```

```
str(Boston)
```

```
## 'data.frame':    506 obs. of  14 variables:
##  $ crim   : num  0.00632 0.02731 0.02729 0.03237 0.06905 ...
##  $ zn     : num  18 0 0 0 0 0 12.5 12.5 12.5 12.5 ...
##  $ indus  : num  2.31 7.07 7.07 2.18 2.18 2.18 7.87 7.87 7.87 7.87 ...
##  $ chas   : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ nox    : num  0.538 0.469 0.469 0.458 0.458 0.458 0.524 0.524 0.524 0.524 ...
##  $ rm     : num  6.58 6.42 7.18 7 7.15 ...
##  $ age    : num  65.2 78.9 61.1 45.8 54.2 58.7 66.6 96.1 100 85.9 ...
##  $ dis    : num  4.09 4.97 4.97 6.06 6.06 ...
##  $ rad    : int  1 2 2 3 3 3 5 5 5 5 ...
##  $ tax    : num  296 242 242 222 222 222 311 311 311 311 ...
```

```
##  $ ptratio: num  15.3 17.8 17.8 18.7 18.7 18.7 15.2 15.2 15.2 15.2 ...
##  $ black  : num  397 397 393 395 397 ...
##  $ lstat  : num  4.98 9.14 4.03 2.94 5.33 ...
##  $ medv   : num  24 21.6 34.7 33.4 36.2 28.7 22.9 27.1 16.5 18.9 ...
```

```
y = Boston$medv
X = as.matrix(cbind(1, Boston[, 1 : 13]))
X
```

```
##     1    crim   zn indus chas   nox    rm   age    dis rad tax ptratio
## 1   1 0.00632 18.0  2.31    0 0.5380 6.575  65.2 4.0900   1 296    15.3
## 2   1 0.02731  0.0  7.07    0 0.4690 6.421  78.9 4.9671   2 242    17.8
## 3   1 0.02729  0.0  7.07    0 0.4690 7.185  61.1 4.9671   2 242    17.8
## 4   1 0.03237  0.0  2.18    0 0.4580 6.998  45.8 6.0622   3 222    18.7
## 5   1 0.06905  0.0  2.18    0 0.4580 7.147  54.2 6.0622   3 222    18.7
## 6   1 0.02985  0.0  2.18    0 0.4580 6.430  58.7 6.0622   3 222    18.7
## 7   1 0.08829 12.5  7.87    0 0.5240 6.012  66.6 5.5605   5 311    15.2
## 8   1 0.14455 12.5  7.87    0 0.5240 6.172  96.1 5.9505   5 311    15.2
## 9   1 0.21124 12.5  7.87    0 0.5240 5.631 100.0 6.0821   5 311    15.2
## 10  1 0.17004 12.5  7.87    0 0.5240 6.004  85.9 6.5921   5 311    15.2
## 11  1 0.22489 12.5  7.87    0 0.5240 6.377  94.3 6.3467   5 311    15.2
## 12  1 0.11747 12.5  7.87    0 0.5240 6.009  82.9 6.2267   5 311    15.2
## 13  1 0.09378 12.5  7.87    0 0.5240 5.889  39.0 5.4509   5 311    15.2
## 14  1 0.62976  0.0  8.14    0 0.5380 5.949  61.8 4.7075   4 307    21.0
## 15  1 0.63796  0.0  8.14    0 0.5380 6.096  84.5 4.4619   4 307    21.0
## 16  1 0.62739  0.0  8.14    0 0.5380 5.834  56.5 4.4986   4 307    21.0
## 17  1 1.05393  0.0  8.14    0 0.5380 5.935  29.3 4.4986   4 307    21.0
## 18  1 0.78420  0.0  8.14    0 0.5380 5.990  81.7 4.2579   4 307    21.0
## 19  1 0.80271  0.0  8.14    0 0.5380 5.456  36.6 3.7965   4 307    21.0
## 20  1 0.72580  0.0  8.14    0 0.5380 5.727  69.5 3.7965   4 307    21.0
## 21  1 1.25179  0.0  8.14    0 0.5380 5.570  98.1 3.7979   4 307    21.0
## 22  1 0.85204  0.0  8.14    0 0.5380 5.965  89.2 4.0123   4 307    21.0
## 23  1 1.23247  0.0  8.14    0 0.5380 6.142  91.7 3.9769   4 307    21.0
## 24  1 0.98843  0.0  8.14    0 0.5380 5.813 100.0 4.0952   4 307    21.0
## 25  1 0.75026  0.0  8.14    0 0.5380 5.924  94.1 4.3996   4 307    21.0
## 26  1 0.84054  0.0  8.14    0 0.5380 5.599  85.7 4.4546   4 307    21.0
## 27  1 0.67191  0.0  8.14    0 0.5380 5.813  90.3 4.6820   4 307    21.0
## 28  1 0.95577  0.0  8.14    0 0.5380 6.047  88.8 4.4534   4 307    21.0
## 29  1 0.77299  0.0  8.14    0 0.5380 6.495  94.4 4.4547   4 307    21.0
## 30  1 1.00245  0.0  8.14    0 0.5380 6.674  87.3 4.2390   4 307    21.0
## 31  1 1.13081  0.0  8.14    0 0.5380 5.713  94.1 4.2330   4 307    21.0
## 32  1 1.35472  0.0  8.14    0 0.5380 6.072 100.0 4.1750   4 307    21.0
## 33  1 1.38799  0.0  8.14    0 0.5380 5.950  82.0 3.9900   4 307    21.0
## 34  1 1.15172  0.0  8.14    0 0.5380 5.701  95.0 3.7872   4 307    21.0
## 35  1 1.61282  0.0  8.14    0 0.5380 6.096  96.9 3.7598   4 307    21.0
## 36  1 0.06417  0.0  5.96    0 0.4990 5.933  68.2 3.3603   5 279    19.2
## 37  1 0.09744  0.0  5.96    0 0.4990 5.841  61.4 3.3779   5 279    19.2
## 38  1 0.08014  0.0  5.96    0 0.4990 5.850  41.5 3.9342   5 279    19.2
## 39  1 0.17505  0.0  5.96    0 0.4990 5.966  30.2 3.8473   5 279    19.2
## 40  1 0.02763 75.0  2.95    0 0.4280 6.595  21.8 5.4011   3 252    18.3
## 41  1 0.03359 75.0  2.95    0 0.4280 7.024  15.8 5.4011   3 252    18.3
## 42  1 0.12744  0.0  6.91    0 0.4480 6.770   2.9 5.7209   3 233    17.9
## 43  1 0.14150  0.0  6.91    0 0.4480 6.169   6.6 5.7209   3 233    17.9
## 44  1 0.15936  0.0  6.91    0 0.4480 6.211   6.5 5.7209   3 233    17.9
## 45  1 0.12269  0.0  6.91    0 0.4480 6.069  40.0 5.7209   3 233    17.9
```

```
## 46  1 0.17142   0.0  6.91  0 0.4480 5.682 33.8 5.1004  3 233   17.9
## 47  1 0.18836   0.0  6.91  0 0.4480 5.786 33.3 5.1004  3 233   17.9
## 48  1 0.22927   0.0  6.91  0 0.4480 6.030 85.5 5.6894  3 233   17.9
## 49  1 0.25387   0.0  6.91  0 0.4480 5.399 95.3 5.8700  3 233   17.9
## 50  1 0.21977   0.0  6.91  0 0.4480 5.602 62.0 6.0877  3 233   17.9
## 51  1 0.08873  21.0  5.64  0 0.4390 5.963 45.7 6.8147  4 243   16.8
## 52  1 0.04337  21.0  5.64  0 0.4390 6.115 63.0 6.8147  4 243   16.8
## 53  1 0.05360  21.0  5.64  0 0.4390 6.511 21.1 6.8147  4 243   16.8
## 54  1 0.04981  21.0  5.64  0 0.4390 5.998 21.4 6.8147  4 243   16.8
## 55  1 0.01360  75.0  4.00  0 0.4100 5.888 47.6 7.3197  3 469   21.1
## 56  1 0.01311  90.0  1.22  0 0.4030 7.249 21.9 8.6966  5 226   17.9
## 57  1 0.02055  85.0  0.74  0 0.4100 6.383 35.7 9.1876  2 313   17.3
## 58  1 0.01432 100.0  1.32  0 0.4110 6.816 40.5 8.3248  5 256   15.1
## 59  1 0.15445  25.0  5.13  0 0.4530 6.145 29.2 7.8148  8 284   19.7
## 60  1 0.10328  25.0  5.13  0 0.4530 5.927 47.2 6.9320  8 284   19.7
## 61  1 0.14932  25.0  5.13  0 0.4530 5.741 66.2 7.2254  8 284   19.7
## 62  1 0.17171  25.0  5.13  0 0.4530 5.966 93.4 6.8185  8 284   19.7
## 63  1 0.11027  25.0  5.13  0 0.4530 6.456 67.8 7.2255  8 284   19.7
## 64  1 0.12650  25.0  5.13  0 0.4530 6.762 43.4 7.9809  8 284   19.7
## 65  1 0.01951  17.5  1.38  0 0.4161 7.104 59.5 9.2229  3 216   18.6
## 66  1 0.03584  80.0  3.37  0 0.3980 6.290 17.8 6.6115  4 337   16.1
## 67  1 0.04379  80.0  3.37  0 0.3980 5.787 31.1 6.6115  4 337   16.1
## 68  1 0.05789  12.5  6.07  0 0.4090 5.878 21.4 6.4980  4 345   18.9
## 69  1 0.13554  12.5  6.07  0 0.4090 5.594 36.8 6.4980  4 345   18.9
## 70  1 0.12816  12.5  6.07  0 0.4090 5.885 33.0 6.4980  4 345   18.9
## 71  1 0.08826   0.0 10.81  0 0.4130 6.417  6.6 5.2873  4 305   19.2
## 72  1 0.15876   0.0 10.81  0 0.4130 5.961 17.5 5.2873  4 305   19.2
## 73  1 0.09164   0.0 10.81  0 0.4130 6.065  7.8 5.2873  4 305   19.2
## 74  1 0.19539   0.0 10.81  0 0.4130 6.245  6.2 5.2873  4 305   19.2
## 75  1 0.07896   0.0 12.83  0 0.4370 6.273  6.0 4.2515  5 398   18.7
## 76  1 0.09512   0.0 12.83  0 0.4370 6.286 45.0 4.5026  5 398   18.7
## 77  1 0.10153   0.0 12.83  0 0.4370 6.279 74.5 4.0522  5 398   18.7
## 78  1 0.08707   0.0 12.83  0 0.4370 6.140 45.8 4.0905  5 398   18.7
## 79  1 0.05646   0.0 12.83  0 0.4370 6.232 53.7 5.0141  5 398   18.7
## 80  1 0.08387   0.0 12.83  0 0.4370 5.874 36.6 4.5026  5 398   18.7
## 81  1 0.04113  25.0  4.86  0 0.4260 6.727 33.5 5.4007  4 281   19.0
## 82  1 0.04462  25.0  4.86  0 0.4260 6.619 70.4 5.4007  4 281   19.0
## 83  1 0.03659  25.0  4.86  0 0.4260 6.302 32.2 5.4007  4 281   19.0
## 84  1 0.03551  25.0  4.86  0 0.4260 6.167 46.7 5.4007  4 281   19.0
## 85  1 0.05059   0.0  4.49  0 0.4490 6.389 48.0 4.7794  3 247   18.5
## 86  1 0.05735   0.0  4.49  0 0.4490 6.630 56.1 4.4377  3 247   18.5
## 87  1 0.05188   0.0  4.49  0 0.4490 6.015 45.1 4.4272  3 247   18.5
## 88  1 0.07151   0.0  4.49  0 0.4490 6.121 56.8 3.7476  3 247   18.5
## 89  1 0.05660   0.0  3.41  0 0.4890 7.007 86.3 3.4217  2 270   17.8
## 90  1 0.05302   0.0  3.41  0 0.4890 7.079 63.1 3.4145  2 270   17.8
## 91  1 0.04684   0.0  3.41  0 0.4890 6.417 66.1 3.0923  2 270   17.8
## 92  1 0.03932   0.0  3.41  0 0.4890 6.405 73.9 3.0921  2 270   17.8
## 93  1 0.04203  28.0 15.04  0 0.4640 6.442 53.6 3.6659  4 270   18.2
## 94  1 0.02875  28.0 15.04  0 0.4640 6.211 28.9 3.6659  4 270   18.2
## 95  1 0.04294  28.0 15.04  0 0.4640 6.249 77.3 3.6150  4 270   18.2
## 96  1 0.12204   0.0  2.89  0 0.4450 6.625 57.8 3.4952  2 276   18.0
## 97  1 0.11504   0.0  2.89  0 0.4450 6.163 69.6 3.4952  2 276   18.0
## 98  1 0.12083   0.0  2.89  0 0.4450 8.069 76.0 3.4952  2 276   18.0
## 99  1 0.08187   0.0  2.89  0 0.4450 7.820 36.9 3.4952  2 276   18.0
```

```
## 100 1  0.06860  0.0   2.89   0 0.4450 7.416  62.5  3.4952  2 276   18.0
## 101 1  0.14866  0.0   8.56   0 0.5200 6.727  79.9  2.7778  5 384   20.9
## 102 1  0.11432  0.0   8.56   0 0.5200 6.781  71.3  2.8561  5 384   20.9
## 103 1  0.22876  0.0   8.56   0 0.5200 6.405  85.4  2.7147  5 384   20.9
## 104 1  0.21161  0.0   8.56   0 0.5200 6.137  87.4  2.7147  5 384   20.9
## 105 1  0.13960  0.0   8.56   0 0.5200 6.167  90.0  2.4210  5 384   20.9
## 106 1  0.13262  0.0   8.56   0 0.5200 5.851  96.7  2.1069  5 384   20.9
## 107 1  0.17120  0.0   8.56   0 0.5200 5.836  91.9  2.2110  5 384   20.9
## 108 1  0.13117  0.0   8.56   0 0.5200 6.127  85.2  2.1224  5 384   20.9
## 109 1  0.12802  0.0   8.56   0 0.5200 6.474  97.1  2.4329  5 384   20.9
## 110 1  0.26363  0.0   8.56   0 0.5200 6.229  91.2  2.5451  5 384   20.9
## 111 1  0.10793  0.0   8.56   0 0.5200 6.195  54.4  2.7778  5 384   20.9
## 112 1  0.10084  0.0  10.01   0 0.5470 6.715  81.6  2.6775  6 432   17.8
## 113 1  0.12329  0.0  10.01   0 0.5470 5.913  92.9  2.3534  6 432   17.8
## 114 1  0.22212  0.0  10.01   0 0.5470 6.092  95.4  2.5480  6 432   17.8
## 115 1  0.14231  0.0  10.01   0 0.5470 6.254  84.2  2.2565  6 432   17.8
## 116 1  0.17134  0.0  10.01   0 0.5470 5.928  88.2  2.4631  6 432   17.8
## 117 1  0.13158  0.0  10.01   0 0.5470 6.176  72.5  2.7301  6 432   17.8
## 118 1  0.15098  0.0  10.01   0 0.5470 6.021  82.6  2.7474  6 432   17.8
## 119 1  0.13058  0.0  10.01   0 0.5470 5.872  73.1  2.4775  6 432   17.8
## 120 1  0.14476  0.0  10.01   0 0.5470 5.731  65.2  2.7592  6 432   17.8
## 121 1  0.06899  0.0  25.65   0 0.5810 5.870  69.7  2.2577  2 188   19.1
## 122 1  0.07165  0.0  25.65   0 0.5810 6.004  84.1  2.1974  2 188   19.1
## 123 1  0.09299  0.0  25.65   0 0.5810 5.961  92.9  2.0869  2 188   19.1
## 124 1  0.15038  0.0  25.65   0 0.5810 5.856  97.0  1.9444  2 188   19.1
## 125 1  0.09849  0.0  25.65   0 0.5810 5.879  95.8  2.0063  2 188   19.1
## 126 1  0.16902  0.0  25.65   0 0.5810 5.986  88.4  1.9929  2 188   19.1
## 127 1  0.38735  0.0  25.65   0 0.5810 5.613  95.6  1.7572  2 188   19.1
## 128 1  0.25915  0.0  21.89   0 0.6240 5.693  96.0  1.7883  4 437   21.2
## 129 1  0.32543  0.0  21.89   0 0.6240 6.431  98.8  1.8125  4 437   21.2
## 130 1  0.88125  0.0  21.89   0 0.6240 5.637  94.7  1.9799  4 437   21.2
## 131 1  0.34006  0.0  21.89   0 0.6240 6.458  98.9  2.1185  4 437   21.2
## 132 1  1.19294  0.0  21.89   0 0.6240 6.326  97.7  2.2710  4 437   21.2
## 133 1  0.59005  0.0  21.89   0 0.6240 6.372  97.9  2.3274  4 437   21.2
## 134 1  0.32982  0.0  21.89   0 0.6240 5.822  95.4  2.4699  4 437   21.2
## 135 1  0.97617  0.0  21.89   0 0.6240 5.757  98.4  2.3460  4 437   21.2
## 136 1  0.55778  0.0  21.89   0 0.6240 6.335  98.2  2.1107  4 437   21.2
## 137 1  0.32264  0.0  21.89   0 0.6240 5.942  93.5  1.9669  4 437   21.2
## 138 1  0.35233  0.0  21.89   0 0.6240 6.454  98.4  1.8498  4 437   21.2
## 139 1  0.24980  0.0  21.89   0 0.6240 5.857  98.2  1.6686  4 437   21.2
## 140 1  0.54452  0.0  21.89   0 0.6240 6.151  97.9  1.6687  4 437   21.2
## 141 1  0.29090  0.0  21.89   0 0.6240 6.174  93.6  1.6119  4 437   21.2
## 142 1  1.62864  0.0  21.89   0 0.6240 5.019 100.0  1.4394  4 437   21.2
## 143 1  3.32105  0.0  19.58   1 0.8710 5.403 100.0  1.3216  5 403   14.7
## 144 1  4.09740  0.0  19.58   0 0.8710 5.468 100.0  1.4118  5 403   14.7
## 145 1  2.77974  0.0  19.58   0 0.8710 4.903  97.8  1.3459  5 403   14.7
## 146 1  2.37934  0.0  19.58   0 0.8710 6.130 100.0  1.4191  5 403   14.7
## 147 1  2.15505  0.0  19.58   0 0.8710 5.628 100.0  1.5166  5 403   14.7
## 148 1  2.36862  0.0  19.58   0 0.8710 4.926  95.7  1.4608  5 403   14.7
## 149 1  2.33099  0.0  19.58   0 0.8710 5.186  93.8  1.5296  5 403   14.7
## 150 1  2.73397  0.0  19.58   0 0.8710 5.597  94.9  1.5257  5 403   14.7
## 151 1  1.65660  0.0  19.58   0 0.8710 6.122  97.3  1.6180  5 403   14.7
## 152 1  1.49632  0.0  19.58   0 0.8710 5.404 100.0  1.5916  5 403   14.7
## 153 1  1.12658  0.0  19.58   1 0.8710 5.012  88.0  1.6102  5 403   14.7
```

```
## 154 1  2.14918   0.0 19.58   0 0.8710 5.709  98.5  1.6232   5 403   14.7
## 155 1  1.41385   0.0 19.58   1 0.8710 6.129  96.0  1.7494   5 403   14.7
## 156 1  3.53501   0.0 19.58   1 0.8710 6.152  82.6  1.7455   5 403   14.7
## 157 1  2.44668   0.0 19.58   0 0.8710 5.272  94.0  1.7364   5 403   14.7
## 158 1  1.22358   0.0 19.58   0 0.6050 6.943  97.4  1.8773   5 403   14.7
## 159 1  1.34284   0.0 19.58   0 0.6050 6.066 100.0  1.7573   5 403   14.7
## 160 1  1.42502   0.0 19.58   0 0.8710 6.510 100.0  1.7659   5 403   14.7
## 161 1  1.27346   0.0 19.58   1 0.6050 6.250  92.6  1.7984   5 403   14.7
## 162 1  1.46336   0.0 19.58   0 0.6050 7.489  90.8  1.9709   5 403   14.7
## 163 1  1.83377   0.0 19.58   1 0.6050 7.802  98.2  2.0407   5 403   14.7
## 164 1  1.51902   0.0 19.58   1 0.6050 8.375  93.9  2.1620   5 403   14.7
## 165 1  2.24236   0.0 19.58   0 0.6050 5.854  91.8  2.4220   5 403   14.7
## 166 1  2.92400   0.0 19.58   0 0.6050 6.101  93.0  2.2834   5 403   14.7
## 167 1  2.01019   0.0 19.58   0 0.6050 7.929  96.2  2.0459   5 403   14.7
## 168 1  1.80028   0.0 19.58   0 0.6050 5.877  79.2  2.4259   5 403   14.7
## 169 1  2.30040   0.0 19.58   0 0.6050 6.319  96.1  2.1000   5 403   14.7
## 170 1  2.44953   0.0 19.58   0 0.6050 6.402  95.2  2.2625   5 403   14.7
## 171 1  1.20742   0.0 19.58   0 0.6050 5.875  94.6  2.4259   5 403   14.7
## 172 1  2.31390   0.0 19.58   0 0.6050 5.880  97.3  2.3887   5 403   14.7
## 173 1  0.13914   0.0  4.05   0 0.5100 5.572  88.5  2.5961   5 296   16.6
## 174 1  0.09178   0.0  4.05   0 0.5100 6.416  84.1  2.6463   5 296   16.6
## 175 1  0.08447   0.0  4.05   0 0.5100 5.859  68.7  2.7019   5 296   16.6
## 176 1  0.06664   0.0  4.05   0 0.5100 6.546  33.1  3.1323   5 296   16.6
## 177 1  0.07022   0.0  4.05   0 0.5100 6.020  47.2  3.5549   5 296   16.6
## 178 1  0.05425   0.0  4.05   0 0.5100 6.315  73.4  3.3175   5 296   16.6
## 179 1  0.06642   0.0  4.05   0 0.5100 6.860  74.4  2.9153   5 296   16.6
## 180 1  0.05780   0.0  2.46   0 0.4880 6.980  58.4  2.8290   3 193   17.8
## 181 1  0.06588   0.0  2.46   0 0.4880 7.765  83.3  2.7410   3 193   17.8
## 182 1  0.06888   0.0  2.46   0 0.4880 6.144  62.2  2.5979   3 193   17.8
## 183 1  0.09103   0.0  2.46   0 0.4880 7.155  92.2  2.7006   3 193   17.8
## 184 1  0.10008   0.0  2.46   0 0.4880 6.563  95.6  2.8470   3 193   17.8
## 185 1  0.08308   0.0  2.46   0 0.4880 5.604  89.8  2.9879   3 193   17.8
## 186 1  0.06047   0.0  2.46   0 0.4880 6.153  68.8  3.2797   3 193   17.8
## 187 1  0.05602   0.0  2.46   0 0.4880 7.831  53.6  3.1992   3 193   17.8
## 188 1  0.07875  45.0  3.44   0 0.4370 6.782  41.1  3.7886   5 398   15.2
## 189 1  0.12579  45.0  3.44   0 0.4370 6.556  29.1  4.5667   5 398   15.2
## 190 1  0.08370  45.0  3.44   0 0.4370 7.185  38.9  4.5667   5 398   15.2
## 191 1  0.09068  45.0  3.44   0 0.4370 6.951  21.5  6.4798   5 398   15.2
## 192 1  0.06911  45.0  3.44   0 0.4370 6.739  30.8  6.4798   5 398   15.2
## 193 1  0.08664  45.0  3.44   0 0.4370 7.178  26.3  6.4798   5 398   15.2
## 194 1  0.02187  60.0  2.93   0 0.4010 6.800   9.9  6.2196   1 265   15.6
## 195 1  0.01439  60.0  2.93   0 0.4010 6.604  18.8  6.2196   1 265   15.6
## 196 1  0.01381  80.0  0.46   0 0.4220 7.875  32.0  5.6484   4 255   14.4
## 197 1  0.04011  80.0  1.52   0 0.4040 7.287  34.1  7.3090   2 329   12.6
## 198 1  0.04666  80.0  1.52   0 0.4040 7.107  36.6  7.3090   2 329   12.6
## 199 1  0.03768  80.0  1.52   0 0.4040 7.274  38.3  7.3090   2 329   12.6
## 200 1  0.03150  95.0  1.47   0 0.4030 6.975  15.3  7.6534   3 402   17.0
## 201 1  0.01778  95.0  1.47   0 0.4030 7.135  13.9  7.6534   3 402   17.0
## 202 1  0.03445  82.5  2.03   0 0.4150 6.162  38.4  6.2700   2 348   14.7
## 203 1  0.02177  82.5  2.03   0 0.4150 7.610  15.7  6.2700   2 348   14.7
## 204 1  0.03510  95.0  2.68   0 0.4161 7.853  33.2  5.1180   4 224   14.7
## 205 1  0.02009  95.0  2.68   0 0.4161 8.034  31.9  5.1180   4 224   14.7
## 206 1  0.13642   0.0 10.59   0 0.4890 5.891  22.3  3.9454   4 277   18.6
## 207 1  0.22969   0.0 10.59   0 0.4890 6.326  52.5  4.3549   4 277   18.6
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## 208 1  0.25199   0.0 10.59   0 0.4890 5.783  72.7  4.3549   4 277   18.6
## 209 1  0.13587   0.0 10.59   1 0.4890 6.064  59.1  4.2392   4 277   18.6
## 210 1  0.43571   0.0 10.59   1 0.4890 5.344 100.0  3.8750   4 277   18.6
## 211 1  0.17446   0.0 10.59   1 0.4890 5.960  92.1  3.8771   4 277   18.6
## 212 1  0.37578   0.0 10.59   1 0.4890 5.404  88.6  3.6650   4 277   18.6
## 213 1  0.21719   0.0 10.59   1 0.4890 5.807  53.8  3.6526   4 277   18.6
## 214 1  0.14052   0.0 10.59   0 0.4890 6.375  32.3  3.9454   4 277   18.6
## 215 1  0.28955   0.0 10.59   0 0.4890 5.412   9.8  3.5875   4 277   18.6
## 216 1  0.19802   0.0 10.59   0 0.4890 6.182  42.4  3.9454   4 277   18.6
## 217 1  0.04560   0.0 13.89   1 0.5500 5.888  56.0  3.1121   5 276   16.4
## 218 1  0.07013   0.0 13.89   0 0.5500 6.642  85.1  3.4211   5 276   16.4
## 219 1  0.11069   0.0 13.89   1 0.5500 5.951  93.8  2.8893   5 276   16.4
## 220 1  0.11425   0.0 13.89   1 0.5500 6.373  92.4  3.3633   5 276   16.4
## 221 1  0.35809   0.0  6.20   1 0.5070 6.951  88.5  2.8617   8 307   17.4
## 222 1  0.40771   0.0  6.20   1 0.5070 6.164  91.3  3.0480   8 307   17.4
## 223 1  0.62356   0.0  6.20   1 0.5070 6.879  77.7  3.2721   8 307   17.4
## 224 1  0.61470   0.0  6.20   0 0.5070 6.618  80.8  3.2721   8 307   17.4
## 225 1  0.31533   0.0  6.20   0 0.5040 8.266  78.3  2.8944   8 307   17.4
## 226 1  0.52693   0.0  6.20   0 0.5040 8.725  83.0  2.8944   8 307   17.4
## 227 1  0.38214   0.0  6.20   0 0.5040 8.040  86.5  3.2157   8 307   17.4
## 228 1  0.41238   0.0  6.20   0 0.5040 7.163  79.9  3.2157   8 307   17.4
## 229 1  0.29819   0.0  6.20   0 0.5040 7.686  17.0  3.3751   8 307   17.4
## 230 1  0.44178   0.0  6.20   0 0.5040 6.552  21.4  3.3751   8 307   17.4
## 231 1  0.53700   0.0  6.20   0 0.5040 5.981  68.1  3.6715   8 307   17.4
## 232 1  0.46296   0.0  6.20   0 0.5040 7.412  76.9  3.6715   8 307   17.4
## 233 1  0.57529   0.0  6.20   0 0.5070 8.337  73.3  3.8384   8 307   17.4
## 234 1  0.33147   0.0  6.20   0 0.5070 8.247  70.4  3.6519   8 307   17.4
## 235 1  0.44791   0.0  6.20   1 0.5070 6.726  66.5  3.6519   8 307   17.4
## 236 1  0.33045   0.0  6.20   0 0.5070 6.086  61.5  3.6519   8 307   17.4
## 237 1  0.52058   0.0  6.20   1 0.5070 6.631  76.5  4.1480   8 307   17.4
## 238 1  0.51183   0.0  6.20   0 0.5070 7.358  71.6  4.1480   8 307   17.4
## 239 1  0.08244  30.0  4.93   0 0.4280 6.481  18.5  6.1899   6 300   16.6
## 240 1  0.09252  30.0  4.93   0 0.4280 6.606  42.2  6.1899   6 300   16.6
## 241 1  0.11329  30.0  4.93   0 0.4280 6.897  54.3  6.3361   6 300   16.6
## 242 1  0.10612  30.0  4.93   0 0.4280 6.095  65.1  6.3361   6 300   16.6
## 243 1  0.10290  30.0  4.93   0 0.4280 6.358  52.9  7.0355   6 300   16.6
## 244 1  0.12757  30.0  4.93   0 0.4280 6.393   7.8  7.0355   6 300   16.6
## 245 1  0.20608  22.0  5.86   0 0.4310 5.593  76.5  7.9549   7 330   19.1
## 246 1  0.19133  22.0  5.86   0 0.4310 5.605  70.2  7.9549   7 330   19.1
## 247 1  0.33983  22.0  5.86   0 0.4310 6.108  34.9  8.0555   7 330   19.1
## 248 1  0.19657  22.0  5.86   0 0.4310 6.226  79.2  8.0555   7 330   19.1
## 249 1  0.16439  22.0  5.86   0 0.4310 6.433  49.1  7.8265   7 330   19.1
## 250 1  0.19073  22.0  5.86   0 0.4310 6.718  17.5  7.8265   7 330   19.1
## 251 1  0.14030  22.0  5.86   0 0.4310 6.487  13.0  7.3967   7 330   19.1
## 252 1  0.21409  22.0  5.86   0 0.4310 6.438   8.9  7.3967   7 330   19.1
## 253 1  0.08221  22.0  5.86   0 0.4310 6.957   6.8  8.9067   7 330   19.1
## 254 1  0.36894  22.0  5.86   0 0.4310 8.259   8.4  8.9067   7 330   19.1
## 255 1  0.04819  80.0  3.64   0 0.3920 6.108  32.0  9.2203   1 315   16.4
## 256 1  0.03548  80.0  3.64   0 0.3920 5.876  19.1  9.2203   1 315   16.4
## 257 1  0.01538  90.0  3.75   0 0.3940 7.454  34.2  6.3361   3 244   15.9
## 258 1  0.61154  20.0  3.97   0 0.6470 8.704  86.9  1.8010   5 264   13.0
## 259 1  0.66351  20.0  3.97   0 0.6470 7.333 100.0  1.8946   5 264   13.0
## 260 1  0.65665  20.0  3.97   0 0.6470 6.842 100.0  2.0107   5 264   13.0
## 261 1  0.54011  20.0  3.97   0 0.6470 7.203  81.8  2.1121   5 264   13.0
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## 262 1  0.53412  20.0   3.97    0 0.6470 7.520  89.4  2.1398   5 264    13.0
## 263 1  0.52014  20.0   3.97    0 0.6470 8.398  91.5  2.2885   5 264    13.0
## 264 1  0.82526  20.0   3.97    0 0.6470 7.327  94.5  2.0788   5 264    13.0
## 265 1  0.55007  20.0   3.97    0 0.6470 7.206  91.6  1.9301   5 264    13.0
## 266 1  0.76162  20.0   3.97    0 0.6470 5.560  62.8  1.9865   5 264    13.0
## 267 1  0.78570  20.0   3.97    0 0.6470 7.014  84.6  2.1329   5 264    13.0
## 268 1  0.57834  20.0   3.97    0 0.5750 8.297  67.0  2.4216   5 264    13.0
## 269 1  0.54050  20.0   3.97    0 0.5750 7.470  52.6  2.8720   5 264    13.0
## 270 1  0.09065  20.0   6.96    1 0.4640 5.920  61.5  3.9175   3 223    18.6
## 271 1  0.29916  20.0   6.96    0 0.4640 5.856  42.1  4.4290   3 223    18.6
## 272 1  0.16211  20.0   6.96    0 0.4640 6.240  16.3  4.4290   3 223    18.6
## 273 1  0.11460  20.0   6.96    0 0.4640 6.538  58.7  3.9175   3 223    18.6
## 274 1  0.22188  20.0   6.96    1 0.4640 7.691  51.8  4.3665   3 223    18.6
## 275 1  0.05644  40.0   6.41    1 0.4470 6.758  32.9  4.0776   4 254    17.6
## 276 1  0.09604  40.0   6.41    0 0.4470 6.854  42.8  4.2673   4 254    17.6
## 277 1  0.10469  40.0   6.41    1 0.4470 7.267  49.0  4.7872   4 254    17.6
## 278 1  0.06127  40.0   6.41    1 0.4470 6.826  27.6  4.8628   4 254    17.6
## 279 1  0.07978  40.0   6.41    0 0.4470 6.482  32.1  4.1403   4 254    17.6
## 280 1  0.21038  20.0   3.33    0 0.4429 6.812  32.2  4.1007   5 216    14.9
## 281 1  0.03578  20.0   3.33    0 0.4429 7.820  64.5  4.6947   5 216    14.9
## 282 1  0.03705  20.0   3.33    0 0.4429 6.968  37.2  5.2447   5 216    14.9
## 283 1  0.06129  20.0   3.33    1 0.4429 7.645  49.7  5.2119   5 216    14.9
## 284 1  0.01501  90.0   1.21    1 0.4010 7.923  24.8  5.8850   1 198    13.6
## 285 1  0.00906  90.0   2.97    0 0.4000 7.088  20.8  7.3073   1 285    15.3
## 286 1  0.01096  55.0   2.25    0 0.3890 6.453  31.9  7.3073   1 300    15.3
## 287 1  0.01965  80.0   1.76    0 0.3850 6.230  31.5  9.0892   1 241    18.2
## 288 1  0.03871  52.5   5.32    0 0.4050 6.209  31.3  7.3172   6 293    16.6
## 289 1  0.04590  52.5   5.32    0 0.4050 6.315  45.6  7.3172   6 293    16.6
## 290 1  0.04297  52.5   5.32    0 0.4050 6.565  22.9  7.3172   6 293    16.6
## 291 1  0.03502  80.0   4.95    0 0.4110 6.861  27.9  5.1167   4 245    19.2
## 292 1  0.07886  80.0   4.95    0 0.4110 7.148  27.7  5.1167   4 245    19.2
## 293 1  0.03615  80.0   4.95    0 0.4110 6.630  23.4  5.1167   4 245    19.2
## 294 1  0.08265   0.0  13.92    0 0.4370 6.127  18.4  5.5027   4 289    16.0
## 295 1  0.08199   0.0  13.92    0 0.4370 6.009  42.3  5.5027   4 289    16.0
## 296 1  0.12932   0.0  13.92    0 0.4370 6.678  31.1  5.9604   4 289    16.0
## 297 1  0.05372   0.0  13.92    0 0.4370 6.549  51.0  5.9604   4 289    16.0
## 298 1  0.14103   0.0  13.92    0 0.4370 5.790  58.0  6.3200   4 289    16.0
## 299 1  0.06466  70.0   2.24    0 0.4000 6.345  20.1  7.8278   5 358    14.8
## 300 1  0.05561  70.0   2.24    0 0.4000 7.041  10.0  7.8278   5 358    14.8
## 301 1  0.04417  70.0   2.24    0 0.4000 6.871  47.4  7.8278   5 358    14.8
## 302 1  0.03537  34.0   6.09    0 0.4330 6.590  40.4  5.4917   7 329    16.1
## 303 1  0.09266  34.0   6.09    0 0.4330 6.495  18.4  5.4917   7 329    16.1
## 304 1  0.10000  34.0   6.09    0 0.4330 6.982  17.7  5.4917   7 329    16.1
## 305 1  0.05515  33.0   2.18    0 0.4720 7.236  41.1  4.0220   7 222    18.4
## 306 1  0.05479  33.0   2.18    0 0.4720 6.616  58.1  3.3700   7 222    18.4
## 307 1  0.07503  33.0   2.18    0 0.4720 7.420  71.9  3.0992   7 222    18.4
## 308 1  0.04932  33.0   2.18    0 0.4720 6.849  70.3  3.1827   7 222    18.4
## 309 1  0.49298   0.0   9.90    0 0.5440 6.635  82.5  3.3175   4 304    18.4
## 310 1  0.34940   0.0   9.90    0 0.5440 5.972  76.7  3.1025   4 304    18.4
## 311 1  2.63548   0.0   9.90    0 0.5440 4.973  37.8  2.5194   4 304    18.4
## 312 1  0.79041   0.0   9.90    0 0.5440 6.122  52.8  2.6403   4 304    18.4
## 313 1  0.26169   0.0   9.90    0 0.5440 6.023  90.4  2.8340   4 304    18.4
## 314 1  0.26938   0.0   9.90    0 0.5440 6.266  82.8  3.2628   4 304    18.4
## 315 1  0.36920   0.0   9.90    0 0.5440 6.567  87.3  3.6023   4 304    18.4
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## 316 1  0.25356   0.0  9.90   0 0.5440 5.705  77.7  3.9450   4 304   18.4
## 317 1  0.31827   0.0  9.90   0 0.5440 5.914  83.2  3.9986   4 304   18.4
## 318 1  0.24522   0.0  9.90   0 0.5440 5.782  71.7  4.0317   4 304   18.4
## 319 1  0.40202   0.0  9.90   0 0.5440 6.382  67.2  3.5325   4 304   18.4
## 320 1  0.47547   0.0  9.90   0 0.5440 6.113  58.8  4.0019   4 304   18.4
## 321 1  0.16760   0.0  7.38   0 0.4930 6.426  52.3  4.5404   5 287   19.6
## 322 1  0.18159   0.0  7.38   0 0.4930 6.376  54.3  4.5404   5 287   19.6
## 323 1  0.35114   0.0  7.38   0 0.4930 6.041  49.9  4.7211   5 287   19.6
## 324 1  0.28392   0.0  7.38   0 0.4930 5.708  74.3  4.7211   5 287   19.6
## 325 1  0.34109   0.0  7.38   0 0.4930 6.415  40.1  4.7211   5 287   19.6
## 326 1  0.19186   0.0  7.38   0 0.4930 6.431  14.7  5.4159   5 287   19.6
## 327 1  0.30347   0.0  7.38   0 0.4930 6.312  28.9  5.4159   5 287   19.6
## 328 1  0.24103   0.0  7.38   0 0.4930 6.083  43.7  5.4159   5 287   19.6
## 329 1  0.06617   0.0  3.24   0 0.4600 5.868  25.8  5.2146   4 430   16.9
## 330 1  0.06724   0.0  3.24   0 0.4600 6.333  17.2  5.2146   4 430   16.9
## 331 1  0.04544   0.0  3.24   0 0.4600 6.144  32.2  5.8736   4 430   16.9
## 332 1  0.05023  35.0  6.06   0 0.4379 5.706  28.4  6.6407   1 304   16.9
## 333 1  0.03466  35.0  6.06   0 0.4379 6.031  23.3  6.6407   1 304   16.9
## 334 1  0.05083   0.0  5.19   0 0.5150 6.316  38.1  6.4584   5 224   20.2
## 335 1  0.03738   0.0  5.19   0 0.5150 6.310  38.5  6.4584   5 224   20.2
## 336 1  0.03961   0.0  5.19   0 0.5150 6.037  34.5  5.9853   5 224   20.2
## 337 1  0.03427   0.0  5.19   0 0.5150 5.869  46.3  5.2311   5 224   20.2
## 338 1  0.03041   0.0  5.19   0 0.5150 5.895  59.6  5.6150   5 224   20.2
## 339 1  0.03306   0.0  5.19   0 0.5150 6.059  37.3  4.8122   5 224   20.2
## 340 1  0.05497   0.0  5.19   0 0.5150 5.985  45.4  4.8122   5 224   20.2
## 341 1  0.06151   0.0  5.19   0 0.5150 5.968  58.5  4.8122   5 224   20.2
## 342 1  0.01301  35.0  1.52   0 0.4420 7.241  49.3  7.0379   1 284   15.5
## 343 1  0.02498   0.0  1.89   0 0.5180 6.540  59.7  6.2669   1 422   15.9
## 344 1  0.02543  55.0  3.78   0 0.4840 6.696  56.4  5.7321   5 370   17.6
## 345 1  0.03049  55.0  3.78   0 0.4840 6.874  28.1  6.4654   5 370   17.6
## 346 1  0.03113   0.0  4.39   0 0.4420 6.014  48.5  8.0136   3 352   18.8
## 347 1  0.06162   0.0  4.39   0 0.4420 5.898  52.3  8.0136   3 352   18.8
## 348 1  0.01870  85.0  4.15   0 0.4290 6.516  27.7  8.5353   4 351   17.9
## 349 1  0.01501  80.0  2.01   0 0.4350 6.635  29.7  8.3440   4 280   17.0
## 350 1  0.02899  40.0  1.25   0 0.4290 6.939  34.5  8.7921   1 335   19.7
## 351 1  0.06211  40.0  1.25   0 0.4290 6.490  44.4  8.7921   1 335   19.7
## 352 1  0.07950  60.0  1.69   0 0.4110 6.579  35.9 10.7103   4 411   18.3
## 353 1  0.07244  60.0  1.69   0 0.4110 5.884  18.5 10.7103   4 411   18.3
## 354 1  0.01709  90.0  2.02   0 0.4100 6.728  36.1 12.1265   5 187   17.0
## 355 1  0.04301  80.0  1.91   0 0.4130 5.663  21.9 10.5857   4 334   22.0
## 356 1  0.10659  80.0  1.91   0 0.4130 5.936  19.5 10.5857   4 334   22.0
## 357 1  8.98296   0.0 18.10   1 0.7700 6.212  97.4  2.1222  24 666   20.2
## 358 1  3.84970   0.0 18.10   1 0.7700 6.395  91.0  2.5052  24 666   20.2
## 359 1  5.20177   0.0 18.10   1 0.7700 6.127  83.4  2.7227  24 666   20.2
## 360 1  4.26131   0.0 18.10   0 0.7700 6.112  81.3  2.5091  24 666   20.2
## 361 1  4.54192   0.0 18.10   0 0.7700 6.398  88.0  2.5182  24 666   20.2
## 362 1  3.83684   0.0 18.10   0 0.7700 6.251  91.1  2.2955  24 666   20.2
## 363 1  3.67822   0.0 18.10   0 0.7700 5.362  96.2  2.1036  24 666   20.2
## 364 1  4.22239   0.0 18.10   1 0.7700 5.803  89.0  1.9047  24 666   20.2
## 365 1  3.47428   0.0 18.10   1 0.7180 8.780  82.9  1.9047  24 666   20.2
## 366 1  4.55587   0.0 18.10   0 0.7180 3.561  87.9  1.6132  24 666   20.2
## 367 1  3.69695   0.0 18.10   0 0.7180 4.963  91.4  1.7523  24 666   20.2
## 368 1 13.52220   0.0 18.10   0 0.6310 3.863 100.0  1.5106  24 666   20.2
## 369 1  4.89822   0.0 18.10   0 0.6310 4.970 100.0  1.3325  24 666   20.2
```

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## 370 1  5.66998  0.0 18.10   1 0.6310 6.683   96.8  1.3567  24 666    20.2
## 371 1  6.53876  0.0 18.10   1 0.6310 7.016   97.5  1.2024  24 666    20.2
## 372 1  9.23230  0.0 18.10   0 0.6310 6.216  100.0  1.1691  24 666    20.2
## 373 1  8.26725  0.0 18.10   1 0.6680 5.875   89.6  1.1296  24 666    20.2
## 374 1 11.10810  0.0 18.10   0 0.6680 4.906  100.0  1.1742  24 666    20.2
## 375 1 18.49820  0.0 18.10   0 0.6680 4.138  100.0  1.1370  24 666    20.2
## 376 1 19.60910  0.0 18.10   0 0.6710 7.313   97.9  1.3163  24 666    20.2
## 377 1 15.28800  0.0 18.10   0 0.6710 6.649   93.3  1.3449  24 666    20.2
## 378 1  9.82349  0.0 18.10   0 0.6710 6.794   98.8  1.3580  24 666    20.2
## 379 1 23.64820  0.0 18.10   0 0.6710 6.380   96.2  1.3861  24 666    20.2
## 380 1 17.86670  0.0 18.10   0 0.6710 6.223  100.0  1.3861  24 666    20.2
## 381 1 88.97620  0.0 18.10   0 0.6710 6.968   91.9  1.4165  24 666    20.2
## 382 1 15.87440  0.0 18.10   0 0.6710 6.545   99.1  1.5192  24 666    20.2
## 383 1  9.18702  0.0 18.10   0 0.7000 5.536  100.0  1.5804  24 666    20.2
## 384 1  7.99248  0.0 18.10   0 0.7000 5.520  100.0  1.5331  24 666    20.2
## 385 1 20.08490  0.0 18.10   0 0.7000 4.368   91.2  1.4395  24 666    20.2
## 386 1 16.81180  0.0 18.10   0 0.7000 5.277   98.1  1.4261  24 666    20.2
## 387 1 24.39380  0.0 18.10   0 0.7000 4.652  100.0  1.4672  24 666    20.2
## 388 1 22.59710  0.0 18.10   0 0.7000 5.000   89.5  1.5184  24 666    20.2
## 389 1 14.33370  0.0 18.10   0 0.7000 4.880  100.0  1.5895  24 666    20.2
## 390 1  8.15174  0.0 18.10   0 0.7000 5.390   98.9  1.7281  24 666    20.2
## 391 1  6.96215  0.0 18.10   0 0.7000 5.713   97.0  1.9265  24 666    20.2
## 392 1  5.29305  0.0 18.10   0 0.7000 6.051   82.5  2.1678  24 666    20.2
## 393 1 11.57790  0.0 18.10   0 0.7000 5.036   97.0  1.7700  24 666    20.2
## 394 1  8.64476  0.0 18.10   0 0.6930 6.193   92.6  1.7912  24 666    20.2
## 395 1 13.35980  0.0 18.10   0 0.6930 5.887   94.7  1.7821  24 666    20.2
## 396 1  8.71675  0.0 18.10   0 0.6930 6.471   98.8  1.7257  24 666    20.2
## 397 1  5.87205  0.0 18.10   0 0.6930 6.405   96.0  1.6768  24 666    20.2
## 398 1  7.67202  0.0 18.10   0 0.6930 5.747   98.9  1.6334  24 666    20.2
## 399 1 38.35180  0.0 18.10   0 0.6930 5.453  100.0  1.4896  24 666    20.2
## 400 1  9.91655  0.0 18.10   0 0.6930 5.852   77.8  1.5004  24 666    20.2
## 401 1 25.04610  0.0 18.10   0 0.6930 5.987  100.0  1.5888  24 666    20.2
## 402 1 14.23620  0.0 18.10   0 0.6930 6.343  100.0  1.5741  24 666    20.2
## 403 1  9.59571  0.0 18.10   0 0.6930 6.404  100.0  1.6390  24 666    20.2
## 404 1 24.80170  0.0 18.10   0 0.6930 5.349   96.0  1.7028  24 666    20.2
## 405 1 41.52920  0.0 18.10   0 0.6930 5.531   85.4  1.6074  24 666    20.2
## 406 1 67.92080  0.0 18.10   0 0.6930 5.683  100.0  1.4254  24 666    20.2
## 407 1 20.71620  0.0 18.10   0 0.6590 4.138  100.0  1.1781  24 666    20.2
## 408 1 11.95110  0.0 18.10   0 0.6590 5.608  100.0  1.2852  24 666    20.2
## 409 1  7.40389  0.0 18.10   0 0.5970 5.617   97.9  1.4547  24 666    20.2
## 410 1 14.43830  0.0 18.10   0 0.5970 6.852  100.0  1.4655  24 666    20.2
## 411 1 51.13580  0.0 18.10   0 0.5970 5.757  100.0  1.4130  24 666    20.2
## 412 1 14.05070  0.0 18.10   0 0.5970 6.657  100.0  1.5275  24 666    20.2
## 413 1 18.81100  0.0 18.10   0 0.5970 4.628  100.0  1.5539  24 666    20.2
## 414 1 28.65580  0.0 18.10   0 0.5970 5.155  100.0  1.5894  24 666    20.2
## 415 1 45.74610  0.0 18.10   0 0.6930 4.519  100.0  1.6582  24 666    20.2
## 416 1 18.08460  0.0 18.10   0 0.6790 6.434  100.0  1.8347  24 666    20.2
## 417 1 10.83420  0.0 18.10   0 0.6790 6.782   90.8  1.8195  24 666    20.2
## 418 1 25.94060  0.0 18.10   0 0.6790 5.304   89.1  1.6475  24 666    20.2
## 419 1 73.53410  0.0 18.10   0 0.6790 5.957  100.0  1.8026  24 666    20.2
## 420 1 11.81230  0.0 18.10   0 0.7180 6.824   76.5  1.7940  24 666    20.2
## 421 1 11.08740  0.0 18.10   0 0.7180 6.411  100.0  1.8589  24 666    20.2
## 422 1  7.02259  0.0 18.10   0 0.7180 6.006   95.3  1.8746  24 666    20.2
## 423 1 12.04820  0.0 18.10   0 0.6140 5.648   87.6  1.9512  24 666    20.2
```

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## 424 1  7.05042   0.0 18.10   0 0.6140 6.103  85.1  2.0218  24 666    20.2
## 425 1  8.79212   0.0 18.10   0 0.5840 5.565  70.6  2.0635  24 666    20.2
## 426 1 15.86030   0.0 18.10   0 0.6790 5.896  95.4  1.9096  24 666    20.2
## 427 1 12.24720   0.0 18.10   0 0.5840 5.837  59.7  1.9976  24 666    20.2
## 428 1 37.66190   0.0 18.10   0 0.6790 6.202  78.7  1.8629  24 666    20.2
## 429 1  7.36711   0.0 18.10   0 0.6790 6.193  78.1  1.9356  24 666    20.2
## 430 1  9.33889   0.0 18.10   0 0.6790 6.380  95.6  1.9682  24 666    20.2
## 431 1  8.49213   0.0 18.10   0 0.5840 6.348  86.1  2.0527  24 666    20.2
## 432 1 10.06230   0.0 18.10   0 0.5840 6.833  94.3  2.0882  24 666    20.2
## 433 1  6.44405   0.0 18.10   0 0.5840 6.425  74.8  2.2004  24 666    20.2
## 434 1  5.58107   0.0 18.10   0 0.7130 6.436  87.9  2.3158  24 666    20.2
## 435 1 13.91340   0.0 18.10   0 0.7130 6.208  95.0  2.2222  24 666    20.2
## 436 1 11.16040   0.0 18.10   0 0.7400 6.629  94.6  2.1247  24 666    20.2
## 437 1 14.42080   0.0 18.10   0 0.7400 6.461  93.3  2.0026  24 666    20.2
## 438 1 15.17720   0.0 18.10   0 0.7400 6.152 100.0  1.9142  24 666    20.2
## 439 1 13.67810   0.0 18.10   0 0.7400 5.935  87.9  1.8206  24 666    20.2
## 440 1  9.39063   0.0 18.10   0 0.7400 5.627  93.9  1.8172  24 666    20.2
## 441 1 22.05110   0.0 18.10   0 0.7400 5.818  92.4  1.8662  24 666    20.2
## 442 1  9.72418   0.0 18.10   0 0.7400 6.406  97.2  2.0651  24 666    20.2
## 443 1  5.66637   0.0 18.10   0 0.7400 6.219 100.0  2.0048  24 666    20.2
## 444 1  9.96654   0.0 18.10   0 0.7400 6.485 100.0  1.9784  24 666    20.2
## 445 1 12.80230   0.0 18.10   0 0.7400 5.854  96.6  1.8956  24 666    20.2
## 446 1 10.67180   0.0 18.10   0 0.7400 6.459  94.8  1.9879  24 666    20.2
## 447 1  6.28807   0.0 18.10   0 0.7400 6.341  96.4  2.0720  24 666    20.2
## 448 1  9.92485   0.0 18.10   0 0.7400 6.251  96.6  2.1980  24 666    20.2
## 449 1  9.32909   0.0 18.10   0 0.7130 6.185  98.7  2.2616  24 666    20.2
## 450 1  7.52601   0.0 18.10   0 0.7130 6.417  98.3  2.1850  24 666    20.2
## 451 1  6.71772   0.0 18.10   0 0.7130 6.749  92.6  2.3236  24 666    20.2
## 452 1  5.44114   0.0 18.10   0 0.7130 6.655  98.2  2.3552  24 666    20.2
## 453 1  5.09017   0.0 18.10   0 0.7130 6.297  91.8  2.3682  24 666    20.2
## 454 1  8.24809   0.0 18.10   0 0.7130 7.393  99.3  2.4527  24 666    20.2
## 455 1  9.51363   0.0 18.10   0 0.7130 6.728  94.1  2.4961  24 666    20.2
## 456 1  4.75237   0.0 18.10   0 0.7130 6.525  86.5  2.4358  24 666    20.2
## 457 1  4.66883   0.0 18.10   0 0.7130 5.976  87.9  2.5806  24 666    20.2
## 458 1  8.20058   0.0 18.10   0 0.7130 5.936  80.3  2.7792  24 666    20.2
## 459 1  7.75223   0.0 18.10   0 0.7130 6.301  83.7  2.7831  24 666    20.2
## 460 1  6.80117   0.0 18.10   0 0.7130 6.081  84.4  2.7175  24 666    20.2
## 461 1  4.81213   0.0 18.10   0 0.7130 6.701  90.0  2.5975  24 666    20.2
## 462 1  3.69311   0.0 18.10   0 0.7130 6.376  88.4  2.5671  24 666    20.2
## 463 1  6.65492   0.0 18.10   0 0.7130 6.317  83.0  2.7344  24 666    20.2
## 464 1  5.82115   0.0 18.10   0 0.7130 6.513  89.9  2.8016  24 666    20.2
## 465 1  7.83932   0.0 18.10   0 0.6550 6.209  65.4  2.9634  24 666    20.2
## 466 1  3.16360   0.0 18.10   0 0.6550 5.759  48.2  3.0665  24 666    20.2
## 467 1  3.77498   0.0 18.10   0 0.6550 5.952  84.7  2.8715  24 666    20.2
## 468 1  4.42228   0.0 18.10   0 0.5840 6.003  94.5  2.5403  24 666    20.2
## 469 1 15.57570   0.0 18.10   0 0.5800 5.926  71.0  2.9084  24 666    20.2
## 470 1 13.07510   0.0 18.10   0 0.5800 5.713  56.7  2.8237  24 666    20.2
## 471 1  4.34879   0.0 18.10   0 0.5800 6.167  84.0  3.0334  24 666    20.2
## 472 1  4.03841   0.0 18.10   0 0.5320 6.229  90.7  3.0993  24 666    20.2
## 473 1  3.56868   0.0 18.10   0 0.5800 6.437  75.0  2.8965  24 666    20.2
## 474 1  4.64689   0.0 18.10   0 0.6140 6.980  67.6  2.5329  24 666    20.2
## 475 1  8.05579   0.0 18.10   0 0.5840 5.427  95.4  2.4298  24 666    20.2
## 476 1  6.39312   0.0 18.10   0 0.5840 6.162  97.4  2.2060  24 666    20.2
## 477 1  4.87141   0.0 18.10   0 0.6140 6.484  93.6  2.3053  24 666    20.2
```

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## 478 1 15.02340    0.0 18.10    0 0.6140 5.304 97.3 2.1007 24 666    20.2
## 479 1 10.23300    0.0 18.10    0 0.6140 6.185 96.7 2.1705 24 666    20.2
## 480 1 14.33370    0.0 18.10    0 0.6140 6.229 88.0 1.9512 24 666    20.2
## 481 1  5.82401    0.0 18.10    0 0.5320 6.242 64.7 3.4242 24 666    20.2
## 482 1  5.70818    0.0 18.10    0 0.5320 6.750 74.9 3.3317 24 666    20.2
## 483 1  5.73116    0.0 18.10    0 0.5320 7.061 77.0 3.4106 24 666    20.2
## 484 1  2.81838    0.0 18.10    0 0.5320 5.762 40.3 4.0983 24 666    20.2
## 485 1  2.37857    0.0 18.10    0 0.5830 5.871 41.9 3.7240 24 666    20.2
## 486 1  3.67367    0.0 18.10    0 0.5830 6.312 51.9 3.9917 24 666    20.2
## 487 1  5.69175    0.0 18.10    0 0.5830 6.114 79.8 3.5459 24 666    20.2
## 488 1  4.83567    0.0 18.10    0 0.5830 5.905 53.2 3.1523 24 666    20.2
## 489 1  0.15086    0.0 27.74    0 0.6090 5.454 92.7 1.8209  4 711    20.1
## 490 1  0.18337    0.0 27.74    0 0.6090 5.414 98.3 1.7554  4 711    20.1
## 491 1  0.20746    0.0 27.74    0 0.6090 5.093 98.0 1.8226  4 711    20.1
## 492 1  0.10574    0.0 27.74    0 0.6090 5.983 98.8 1.8681  4 711    20.1
## 493 1  0.11132    0.0 27.74    0 0.6090 5.983 83.5 2.1099  4 711    20.1
## 494 1  0.17331    0.0  9.69    0 0.5850 5.707 54.0 2.3817  6 391    19.2
## 495 1  0.27957    0.0  9.69    0 0.5850 5.926 42.6 2.3817  6 391    19.2
## 496 1  0.17899    0.0  9.69    0 0.5850 5.670 28.8 2.7986  6 391    19.2
## 497 1  0.28960    0.0  9.69    0 0.5850 5.390 72.9 2.7986  6 391    19.2
## 498 1  0.26838    0.0  9.69    0 0.5850 5.794 70.6 2.8927  6 391    19.2
## 499 1  0.23912    0.0  9.69    0 0.5850 6.019 65.3 2.4091  6 391    19.2
## 500 1  0.17783    0.0  9.69    0 0.5850 5.569 73.5 2.3999  6 391    19.2
## 501 1  0.22438    0.0  9.69    0 0.5850 6.027 79.7 2.4982  6 391    19.2
## 502 1  0.06263    0.0 11.93    0 0.5730 6.593 69.1 2.4786  1 273    21.0
## 503 1  0.04527    0.0 11.93    0 0.5730 6.120 76.7 2.2875  1 273    21.0
## 504 1  0.06076    0.0 11.93    0 0.5730 6.976 91.0 2.1675  1 273    21.0
## 505 1  0.10959    0.0 11.93    0 0.5730 6.794 89.3 2.3889  1 273    21.0
## 506 1  0.04741    0.0 11.93    0 0.5730 6.030 80.8 2.5050  1 273    21.0
##      black lstat
## 1   396.90  4.98
## 2   396.90  9.14
## 3   392.83  4.03
## 4   394.63  2.94
## 5   396.90  5.33
## 6   394.12  5.21
## 7   395.60 12.43
## 8   396.90 19.15
## 9   386.63 29.93
## 10  386.71 17.10
## 11  392.52 20.45
## 12  396.90 13.27
## 13  390.50 15.71
## 14  396.90  8.26
## 15  380.02 10.26
## 16  395.62  8.47
## 17  386.85  6.58
## 18  386.75 14.67
## 19  288.99 11.69
## 20  390.95 11.28
## 21  376.57 21.02
## 22  392.53 13.83
## 23  396.90 18.72
## 24  394.54 19.88
```

```
## 25   394.33 16.30
## 26   303.42 16.51
## 27   376.88 14.81
## 28   306.38 17.28
## 29   387.94 12.80
## 30   380.23 11.98
## 31   360.17 22.60
## 32   376.73 13.04
## 33   232.60 27.71
## 34   358.77 18.35
## 35   248.31 20.34
## 36   396.90  9.68
## 37   377.56 11.41
## 38   396.90  8.77
## 39   393.43 10.13
## 40   395.63  4.32
## 41   395.62  1.98
## 42   385.41  4.84
## 43   383.37  5.81
## 44   394.46  7.44
## 45   389.39  9.55
## 46   396.90 10.21
## 47   396.90 14.15
## 48   392.74 18.80
## 49   396.90 30.81
## 50   396.90 16.20
## 51   395.56 13.45
## 52   393.97  9.43
## 53   396.90  5.28
## 54   396.90  8.43
## 55   396.90 14.80
## 56   395.93  4.81
## 57   396.90  5.77
## 58   392.90  3.95
## 59   390.68  6.86
## 60   396.90  9.22
## 61   395.11 13.15
## 62   378.08 14.44
## 63   396.90  6.73
## 64   395.58  9.50
## 65   393.24  8.05
## 66   396.90  4.67
## 67   396.90 10.24
## 68   396.21  8.10
## 69   396.90 13.09
## 70   396.90  8.79
## 71   383.73  6.72
## 72   376.94  9.88
## 73   390.91  5.52
## 74   377.17  7.54
## 75   394.92  6.78
## 76   383.23  8.94
## 77   373.66 11.97
## 78   386.96 10.27
```

```
## 79   386.40 12.34
## 80   396.06  9.10
## 81   396.90  5.29
## 82   395.63  7.22
## 83   396.90  6.72
## 84   390.64  7.51
## 85   396.90  9.62
## 86   392.30  6.53
## 87   395.99 12.86
## 88   395.15  8.44
## 89   396.90  5.50
## 90   396.06  5.70
## 91   392.18  8.81
## 92   393.55  8.20
## 93   395.01  8.16
## 94   396.33  6.21
## 95   396.90 10.59
## 96   357.98  6.65
## 97   391.83 11.34
## 98   396.90  4.21
## 99   393.53  3.57
## 100 396.90  6.19
## 101 394.76  9.42
## 102 395.58  7.67
## 103   70.80 10.63
## 104 394.47 13.44
## 105 392.69 12.33
## 106 394.05 16.47
## 107 395.67 18.66
## 108 387.69 14.09
## 109 395.24 12.27
## 110 391.23 15.55
## 111 393.49 13.00
## 112 395.59 10.16
## 113 394.95 16.21
## 114 396.90 17.09
## 115 388.74 10.45
## 116 344.91 15.76
## 117 393.30 12.04
## 118 394.51 10.30
## 119 338.63 15.37
## 120 391.50 13.61
## 121 389.15 14.37
## 122 377.67 14.27
## 123 378.09 17.93
## 124 370.31 25.41
## 125 379.38 17.58
## 126 385.02 14.81
## 127 359.29 27.26
## 128 392.11 17.19
## 129 396.90 15.39
## 130 396.90 18.34
## 131 395.04 12.60
## 132 396.90 12.26
```

```
## 133 385.76 11.12
## 134 388.69 15.03
## 135 262.76 17.31
## 136 394.67 16.96
## 137 378.25 16.90
## 138 394.08 14.59
## 139 392.04 21.32
## 140 396.90 18.46
## 141 388.08 24.16
## 142 396.90 34.41
## 143 396.90 26.82
## 144 396.90 26.42
## 145 396.90 29.29
## 146 172.91 27.80
## 147 169.27 16.65
## 148 391.71 29.53
## 149 356.99 28.32
## 150 351.85 21.45
## 151 372.80 14.10
## 152 341.60 13.28
## 153 343.28 12.12
## 154 261.95 15.79
## 155 321.02 15.12
## 156  88.01 15.02
## 157  88.63 16.14
## 158 363.43  4.59
## 159 353.89  6.43
## 160 364.31  7.39
## 161 338.92  5.50
## 162 374.43  1.73
## 163 389.61  1.92
## 164 388.45  3.32
## 165 395.11 11.64
## 166 240.16  9.81
## 167 369.30  3.70
## 168 227.61 12.14
## 169 297.09 11.10
## 170 330.04 11.32
## 171 292.29 14.43
## 172 348.13 12.03
## 173 396.90 14.69
## 174 395.50  9.04
## 175 393.23  9.64
## 176 390.96  5.33
## 177 393.23 10.11
## 178 395.60  6.29
## 179 391.27  6.92
## 180 396.90  5.04
## 181 395.56  7.56
## 182 396.90  9.45
## 183 394.12  4.82
## 184 396.90  5.68
## 185 391.00 13.98
## 186 387.11 13.15
```

```
## 187 392.63  4.45
## 188 393.87  6.68
## 189 382.84  4.56
## 190 396.90  5.39
## 191 377.68  5.10
## 192 389.71  4.69
## 193 390.49  2.87
## 194 393.37  5.03
## 195 376.70  4.38
## 196 394.23  2.97
## 197 396.90  4.08
## 198 354.31  8.61
## 199 392.20  6.62
## 200 396.90  4.56
## 201 384.30  4.45
## 202 393.77  7.43
## 203 395.38  3.11
## 204 392.78  3.81
## 205 390.55  2.88
## 206 396.90 10.87
## 207 394.87 10.97
## 208 389.43 18.06
## 209 381.32 14.66
## 210 396.90 23.09
## 211 393.25 17.27
## 212 395.24 23.98
## 213 390.94 16.03
## 214 385.81  9.38
## 215 348.93 29.55
## 216 393.63  9.47
## 217 392.80 13.51
## 218 392.78  9.69
## 219 396.90 17.92
## 220 393.74 10.50
## 221 391.70  9.71
## 222 395.24 21.46
## 223 390.39  9.93
## 224 396.90  7.60
## 225 385.05  4.14
## 226 382.00  4.63
## 227 387.38  3.13
## 228 372.08  6.36
## 229 377.51  3.92
## 230 380.34  3.76
## 231 378.35 11.65
## 232 376.14  5.25
## 233 385.91  2.47
## 234 378.95  3.95
## 235 360.20  8.05
## 236 376.75 10.88
## 237 388.45  9.54
## 238 390.07  4.73
## 239 379.41  6.36
## 240 383.78  7.37
```

```
## 241 391.25 11.38
## 242 394.62 12.40
## 243 372.75 11.22
## 244 374.71  5.19
## 245 372.49 12.50
## 246 389.13 18.46
## 247 390.18  9.16
## 248 376.14 10.15
## 249 374.71  9.52
## 250 393.74  6.56
## 251 396.28  5.90
## 252 377.07  3.59
## 253 386.09  3.53
## 254 396.90  3.54
## 255 392.89  6.57
## 256 395.18  9.25
## 257 386.34  3.11
## 258 389.70  5.12
## 259 383.29  7.79
## 260 391.93  6.90
## 261 392.80  9.59
## 262 388.37  7.26
## 263 386.86  5.91
## 264 393.42 11.25
## 265 387.89  8.10
## 266 392.40 10.45
## 267 384.07 14.79
## 268 384.54  7.44
## 269 390.30  3.16
## 270 391.34 13.65
## 271 388.65 13.00
## 272 396.90  6.59
## 273 394.96  7.73
## 274 390.77  6.58
## 275 396.90  3.53
## 276 396.90  2.98
## 277 389.25  6.05
## 278 393.45  4.16
## 279 396.90  7.19
## 280 396.90  4.85
## 281 387.31  3.76
## 282 392.23  4.59
## 283 377.07  3.01
## 284 395.52  3.16
## 285 394.72  7.85
## 286 394.72  8.23
## 287 341.60 12.93
## 288 396.90  7.14
## 289 396.90  7.60
## 290 371.72  9.51
## 291 396.90  3.33
## 292 396.90  3.56
## 293 396.90  4.70
## 294 396.90  8.58
```

```
## 295 396.90 10.40
## 296 396.90  6.27
## 297 392.85  7.39
## 298 396.90 15.84
## 299 368.24  4.97
## 300 371.58  4.74
## 301 390.86  6.07
## 302 395.75  9.50
## 303 383.61  8.67
## 304 390.43  4.86
## 305 393.68  6.93
## 306 393.36  8.93
## 307 396.90  6.47
## 308 396.90  7.53
## 309 396.90  4.54
## 310 396.24  9.97
## 311 350.45 12.64
## 312 396.90  5.98
## 313 396.30 11.72
## 314 393.39  7.90
## 315 395.69  9.28
## 316 396.42 11.50
## 317 390.70 18.33
## 318 396.90 15.94
## 319 395.21 10.36
## 320 396.23 12.73
## 321 396.90  7.20
## 322 396.90  6.87
## 323 396.90  7.70
## 324 391.13 11.74
## 325 396.90  6.12
## 326 393.68  5.08
## 327 396.90  6.15
## 328 396.90 12.79
## 329 382.44  9.97
## 330 375.21  7.34
## 331 368.57  9.09
## 332 394.02 12.43
## 333 362.25  7.83
## 334 389.71  5.68
## 335 389.40  6.75
## 336 396.90  8.01
## 337 396.90  9.80
## 338 394.81 10.56
## 339 396.14  8.51
## 340 396.90  9.74
## 341 396.90  9.29
## 342 394.74  5.49
## 343 389.96  8.65
## 344 396.90  7.18
## 345 387.97  4.61
## 346 385.64 10.53
## 347 364.61 12.67
## 348 392.43  6.36
```

```
## 349 390.94  5.99
## 350 389.85  5.89
## 351 396.90  5.98
## 352 370.78  5.49
## 353 392.33  7.79
## 354 384.46  4.50
## 355 382.80  8.05
## 356 376.04  5.57
## 357 377.73 17.60
## 358 391.34 13.27
## 359 395.43 11.48
## 360 390.74 12.67
## 361 374.56  7.79
## 362 350.65 14.19
## 363 380.79 10.19
## 364 353.04 14.64
## 365 354.55  5.29
## 366 354.70  7.12
## 367 316.03 14.00
## 368 131.42 13.33
## 369 375.52  3.26
## 370 375.33  3.73
## 371 392.05  2.96
## 372 366.15  9.53
## 373 347.88  8.88
## 374 396.90 34.77
## 375 396.90 37.97
## 376 396.90 13.44
## 377 363.02 23.24
## 378 396.90 21.24
## 379 396.90 23.69
## 380 393.74 21.78
## 381 396.90 17.21
## 382 396.90 21.08
## 383 396.90 23.60
## 384 396.90 24.56
## 385 285.83 30.63
## 386 396.90 30.81
## 387 396.90 28.28
## 388 396.90 31.99
## 389 372.92 30.62
## 390 396.90 20.85
## 391 394.43 17.11
## 392 378.38 18.76
## 393 396.90 25.68
## 394 396.90 15.17
## 395 396.90 16.35
## 396 391.98 17.12
## 397 396.90 19.37
## 398 393.10 19.92
## 399 396.90 30.59
## 400 338.16 29.97
## 401 396.90 26.77
## 402 396.90 20.32
```

```
## 403 376.11 20.31
## 404 396.90 19.77
## 405 329.46 27.38
## 406 384.97 22.98
## 407 370.22 23.34
## 408 332.09 12.13
## 409 314.64 26.40
## 410 179.36 19.78
## 411   2.60 10.11
## 412  35.05 21.22
## 413  28.79 34.37
## 414 210.97 20.08
## 415  88.27 36.98
## 416  27.25 29.05
## 417  21.57 25.79
## 418 127.36 26.64
## 419  16.45 20.62
## 420  48.45 22.74
## 421 318.75 15.02
## 422 319.98 15.70
## 423 291.55 14.10
## 424   2.52 23.29
## 425   3.65 17.16
## 426   7.68 24.39
## 427  24.65 15.69
## 428  18.82 14.52
## 429  96.73 21.52
## 430  60.72 24.08
## 431  83.45 17.64
## 432  81.33 19.69
## 433  97.95 12.03
## 434 100.19 16.22
## 435 100.63 15.17
## 436 109.85 23.27
## 437  27.49 18.05
## 438   9.32 26.45
## 439  68.95 34.02
## 440 396.90 22.88
## 441 391.45 22.11
## 442 385.96 19.52
## 443 395.69 16.59
## 444 386.73 18.85
## 445 240.52 23.79
## 446  43.06 23.98
## 447 318.01 17.79
## 448 388.52 16.44
## 449 396.90 18.13
## 450 304.21 19.31
## 451   0.32 17.44
## 452 355.29 17.73
## 453 385.09 17.27
## 454 375.87 16.74
## 455   6.68 18.71
## 456  50.92 18.13
```

```
## 457  10.48 19.01
## 458   3.50 16.94
## 459 272.21 16.23
## 460 396.90 14.70
## 461 255.23 16.42
## 462 391.43 14.65
## 463 396.90 13.99
## 464 393.82 10.29
## 465 396.90 13.22
## 466 334.40 14.13
## 467  22.01 17.15
## 468 331.29 21.32
## 469 368.74 18.13
## 470 396.90 14.76
## 471 396.90 16.29
## 472 395.33 12.87
## 473 393.37 14.36
## 474 374.68 11.66
## 475 352.58 18.14
## 476 302.76 24.10
## 477 396.21 18.68
## 478 349.48 24.91
## 479 379.70 18.03
## 480 383.32 13.11
## 481 396.90 10.74
## 482 393.07  7.74
## 483 395.28  7.01
## 484 392.92 10.42
## 485 370.73 13.34
## 486 388.62 10.58
## 487 392.68 14.98
## 488 388.22 11.45
## 489 395.09 18.06
## 490 344.05 23.97
## 491 318.43 29.68
## 492 390.11 18.07
## 493 396.90 13.35
## 494 396.90 12.01
## 495 396.90 13.59
## 496 393.29 17.60
## 497 396.90 21.14
## 498 396.90 14.10
## 499 396.90 12.92
## 500 395.77 15.10
## 501 396.90 14.33
## 502 391.99  9.67
## 503 396.90  9.08
## 504 396.90  5.64
## 505 393.45  6.48
## 506 396.90  7.88
```

```r
colnames(X)[1] = "Intercept"
```

Run the OLS linear model to get b, the vector of coefficients. Do not use `lm`.

```
#bvector = (Xtranspose * X)inverseXtranspose * yvector
b = solve(t(X) %*% X ) %*% t(X) %*% y
```

Find the hat matrix for this regression H and find its rank. Is this rank expected?

We expect it to be 14 because H is a projection on to Y in the X col space.

```
H = X %*% solve(t(X) %*% X) %*% t(X)
dim(H)
```

```
## [1] 506 506
```

```
pacman :: p_load(Matrix)
rankMatrix(H)
```

```
## [1] 14
## attr(,"method")
## [1] "tolNorm2"
## attr(,"useGrad")
## [1] FALSE
## attr(,"tol")
## [1] 1.123546e-13
```

Verify this is a projection matrix by verifying the two sufficient conditions. Use the testthat library's expect_equal(matrix1, matrix2, tolerance = 1e-2).

```
pacman ::p_load(testthat)
expect_equal(H, t(H), tolerance = 1e-2)
expect_equal(H %*% H, H, tolerance = 1e-2)
```

Find the matrix that projects onto the space of residuals H_comp and find its rank. Is this rank expected?

```
I = diag(nrow(H))
H_comp = (I - H)
rankMatrix(H_comp)#numerical error
```

```
## [1] 497
## attr(,"method")
## [1] "tolNorm2"
## attr(,"useGrad")
## [1] FALSE
## attr(,"tol")
## [1] 1.123546e-13
```

Verify this is a projection matrix by verifying the two sufficient conditions. Use the testthat library.

```
expect_equal(H_comp, t(H_comp), tolerance = 1e-2)
expect_equal(H_comp %*% H_comp, H_comp, tolerance = 1e-2)
```

Calculate $\hat{y}$.

```
yhat = H %*% y
head(yhat)
```

```
##        [,1]
## 1 30.00384
## 2 25.02556
## 3 30.56760
## 4 28.60704
## 5 27.94352
```

```
## 6 25.25628
```

Calculate e as the difference of y and $\hat{y}$ and the projection onto the space of the residuals. Verify the two means of calculating the residuals provide the same results.

```
e = y - yhat
e_2 = H_comp %*% y # projecting y on to the space of residuals orthogonal to col space of X
expect_equal(e, e_2)
```

Calculate R^2 and RMSE.

```
#1 - SSE / SST
sse = sum(e^2)
sst = sum((y - mean(y))^2)

rsquared = 1 - sse / sst
rsquared
```

```
## [1] 0.7406427
```

```
mse = sse / nrow(X) - ncol(X)
rmse = sqrt(mse) #rmse is standard deviation of errors
rmse #std deviation of errors on 95%
```

```
## [1] 2.809774
```

Verify $\hat{y}$ and e are orthogonal.

```
t(e) %*% yhat #= numerically 0; its an orthogonal projection is forced to make a right angle
```

```
##              [,1]
## [1,] -4.991142e-08
```

Verify $\hat{y} - \bar{y}$ and e are orthogonal.

```
t(e) %*% (yhat - mean(y))  # project y - ybar got back yhat - ybar
```

```
##              [,1]
## [1,] 2.832162e-09
```

Find the cosine-squared of $y - \bar{y}$ and $\hat{y} - \bar{y}$ and verify it is the same as R^2.

```
#theta
y_minus_y_bar = y - mean(y)
yhat_minus_y_bar = yhat - mean(y)
length_y_minus_y_bar = sqrt ( sum( y_minus_y_bar^2))
length_yhat_minus_y_bar = sqrt ( sum( yhat_minus_y_bar^2))

theta = acos(( t(y_minus_y_bar) %*% yhat_minus_y_bar) / (length_y_minus_y_bar * length_yhat_minus_y_bar
theta * (180 / pi)
```

```
##          [,1]
## [1,] 30.61531
```

```
cos_theta_squared = cos(theta)^2
cos_theta_squared
```

```
##          [,1]
## [1,] 0.7406427
```

Verify the sum of squares identity which we learned was due to the Pythagorean Theorem (applies since the projection is specifically orthogonal).

```
length_y_minus_y_bar^2 - length_yhat_minus_y_bar^2 - sse
```

```
## [1] 5.666152e-09
```

Create a matrix that is $(p+1) \times (p+1)$ full of NA's. Label the columns the same columns as X. Do not label the rows. For the first row, find the OLS estimate of the y regressed on the first column only and put that in the first entry. For the second row, find the OLS estimates of the y regressed on the first and second columns of X only and put them in the first and second entries. For the third row, find the OLS estimates of the y regressed on the first, second and third columns of X only and put them in the first, second and third entries, etc. For the last row, fill it with the full OLS estimates.

```
M = matrix(NA, nrow = ncol(X), ncol = ncol(X))
colnames(M) = colnames(X)
head(M)
```

```
##      Intercept crim zn indus chas nox rm age dis rad tax ptratio black
## [1,]        NA   NA NA    NA   NA  NA NA  NA  NA  NA  NA      NA    NA
## [2,]        NA   NA NA    NA   NA  NA NA  NA  NA  NA  NA      NA    NA
## [3,]        NA   NA NA    NA   NA  NA NA  NA  NA  NA  NA      NA    NA
## [4,]        NA   NA NA    NA   NA  NA NA  NA  NA  NA  NA      NA    NA
## [5,]        NA   NA NA    NA   NA  NA NA  NA  NA  NA  NA      NA    NA
## [6,]        NA   NA NA    NA   NA  NA NA  NA  NA  NA  NA      NA    NA
##      lstat
## [1,]    NA
## [2,]    NA
## [3,]    NA
## [4,]    NA
## [5,]    NA
## [6,]    NA
```

```
X_j = X[, 1, drop = FALSE]
b = solve(t(X_j) %*% X_j) %*% t(X_j) %*% y #mean(y) = intercept; intercept = null model
M[1, 1] = b
X_j_2 = X[ , 1:2]
b = solve(t(X_j_2) %*% X_j_2) %*% t(X_j_2) %*% y
b #OLS estimates your weights so however big based on cols
```

```
##                  [,1]
## Intercept 24.0331062
## crim      -0.4151903
```

```
for(j in 1: ncol(M)){
  X_j = X[, 1 : j, drop = FALSE] #1 then 1,2 then 1,2,3
  b = solve(t(X_j) %*% X_j) %*% t(X_j) %*% y #X is stretching and so will be
  M[j, 1:j] = b # youre filling in the rows iteratively
}
round(M, 2)
```

```
##      Intercept  crim   zn indus chas   nox   rm   age dis rad tax
## [1,]     22.53    NA   NA    NA   NA    NA   NA    NA  NA  NA  NA
## [2,]     24.03 -0.42   NA    NA   NA    NA   NA    NA  NA  NA  NA
## [3,]     22.49 -0.35 0.12    NA   NA    NA   NA    NA  NA  NA  NA
## [4,]     27.39 -0.25 0.06 -0.42   NA    NA   NA    NA  NA  NA  NA
## [5,]     27.11 -0.23 0.06 -0.44 6.89    NA   NA    NA  NA  NA  NA
## [6,]     29.49 -0.22 0.06 -0.38 7.03 -5.42   NA    NA  NA  NA  NA
## [7,]    -17.95 -0.18 0.02 -0.14 4.78 -7.18 7.34    NA  NA  NA  NA
## [8,]    -18.26 -0.17 0.01 -0.13 4.84 -4.36 7.39 -0.02  NA  NA  NA
```

```
## [9,]      0.83 -0.20 0.06 -0.23 4.58 -14.45 6.75 -0.06 -1.76    NA    NA
## [10,]     0.16 -0.18 0.06 -0.21 4.54 -13.34 6.79 -0.06 -1.75 -0.05    NA
## [11,]     2.99 -0.18 0.07 -0.10 4.11 -12.59 6.66 -0.05 -1.73  0.16 -0.01
## [12,]    27.15 -0.18 0.04 -0.04 3.49 -22.18 6.08 -0.05 -1.58  0.25 -0.01
## [13,]    20.65 -0.16 0.04 -0.03 3.22 -20.48 6.12 -0.05 -1.55  0.28 -0.01
## [14,]    36.46 -0.11 0.05  0.02 2.69 -17.77 3.81  0.00 -1.48  0.31 -0.01
##        ptratio black lstat
## [1,]       NA    NA    NA
## [2,]       NA    NA    NA
## [3,]       NA    NA    NA
## [4,]       NA    NA    NA
## [5,]       NA    NA    NA
## [6,]       NA    NA    NA
## [7,]       NA    NA    NA
## [8,]       NA    NA    NA
## [9,]       NA    NA    NA
## [10,]      NA    NA    NA
## [11,]      NA    NA    NA
## [12,]   -1.00    NA    NA
## [13,]   -1.01  0.01    NA
## [14,]   -0.95  0.01 -0.52
```
`#ran OLS regressions with more and more features where b is the wieghts, the y hat ... as you add more`

Examine this matrix. Why are the estimates changing from row to row as you add in more predictors? The weights change therefore changing the estimates because as you add more predictors you explain more and reduce your residual

Clear the workspace and load the diamonds dataset.

```
pacman::p_load(ggplot2)
data(diamonds, package = "ggplot2")
summary(diamonds)
```

```
##      carat                cut          color        clarity
##  Min.   :0.2000   Fair     : 1610   D: 6775   SI1    :13065
##  1st Qu.:0.4000   Good     : 4906   E: 9797   VS2    :12258
##  Median :0.7000   Very Good:12082   F: 9542   SI2    : 9194
##  Mean   :0.7979   Premium  :13791   G:11292   VS1    : 8171
##  3rd Qu.:1.0400   Ideal    :21551   H: 8304   VVS2   : 5066
##  Max.   :5.0100                     I: 5422   VVS1   : 3655
##                                     J: 2808   (Other): 2531
##      depth           table           price             x
##  Min.   :43.00   Min.   :43.00   Min.   :  326   Min.   : 0.000
##  1st Qu.:61.00   1st Qu.:56.00   1st Qu.:  950   1st Qu.: 4.710
##  Median :61.80   Median :57.00   Median : 2401   Median : 5.700
##  Mean   :61.75   Mean   :57.46   Mean   : 3933   Mean   : 5.731
##  3rd Qu.:62.50   3rd Qu.:59.00   3rd Qu.: 5324   3rd Qu.: 6.540
##  Max.   :79.00   Max.   :95.00   Max.   :18823   Max.   :10.740
##
##        y               z
##  Min.   : 0.000   Min.   : 0.000
##  1st Qu.: 4.720   1st Qu.: 2.910
##  Median : 5.710   Median : 3.530
##  Mean   : 5.735   Mean   : 3.539
##  3rd Qu.: 6.540   3rd Qu.: 4.040
```

```
##  Max.   :58.900   Max.   :31.800
##
```

Extract y, the price variable and "c", the nominal variable "color" as vectors.

```
y = diamonds$price
c = diamonds$color
table(c) #nominal so convert to binary
```

```
## c
##    D    E    F    G    H    I    J
## 6775 9797 9542 11292 8304 5422 2808
```

Convert the "c" vector to X which contains an intercept and an appropriate number of dummies. Let the color G be the refernce category as it is the modal color. Name the columns of X appropriately. The first should be "(Intercept)". Delete c.

```
X = rep(1, nrow(diamonds))
X = cbind(X, diamonds$color == 'D')#want a dummy
X = cbind(X, diamonds$color == 'E')
X = cbind(X, diamonds$color == 'F')
X = cbind(X, diamonds$color == 'H')
X = cbind(X, diamonds$color == 'I')
X = cbind(X, diamonds$color == 'J')
colnames(X) = c("Intercept", "is_D", "is_E", "is_F", "is_H", "is_I", "is_J")
head(X)
```

```
##      Intercept is_D is_E is_F is_H is_I is_J
## [1,]         1    0    1    0    0    0    0
## [2,]         1    0    1    0    0    0    0
## [3,]         1    0    1    0    0    0    0
## [4,]         1    0    0    0    0    1    0
## [5,]         1    0    0    0    0    0    1
## [6,]         1    0    0    0    0    0    1
```

Repeat the iterative exercise above we did for Boston here.

```
M = matrix(NA, nrow = ncol(X), ncol = ncol(X))
colnames(M) = colnames(X)
X_j = X[, 1, drop = FALSE]
b = solve(t(X_j) %*% X_j) %*% t(X_j) %*% y
M[1, 1] = b
X_j_2 = X[ , 1:2]
b = solve(t(X_j_2) %*% X_j_2) %*% t(X_j_2) %*% y
b
```

```
##              [,1]
## Intercept 4042.3784
## is_D      -872.4243
```

```
for(j in 1 : ncol(M)){
  X_j = X[, 1 : j, drop = FALSE]
  b = solve(t(X_j) %*% X_j) %*% t(X_j) %*% y
  M[j, 1:j] = b
}
round(M, 2)
```

```
##      Intercept    is_D    is_E    is_F    is_H    is_I    is_J
## [1,]   3932.80      NA      NA      NA      NA      NA      NA
```

```
## [2,]   4042.38  -872.42        NA      NA      NA      NA      NA
## [3,]   4295.54 -1125.59 -1218.79      NA      NA      NA      NA
## [4,]   4491.23 -1321.28 -1414.48 -766.34      NA      NA      NA
## [5,]   4493.17 -1323.22 -1416.42 -768.28  -6.50      NA      NA
## [6,]   4262.94 -1092.99 -1186.19 -538.06 223.72  828.93      NA
## [7,]   3999.14  -829.18  -922.38 -274.25 487.53 1092.74 1324.68
```

Why didn't the estimates change as we added more and more features?

The estimates did change.

Create a vector y by simulating $n = 100$ standard iid normals. Create a matrix of size 100 x 2 and populate the first column by all ones (for the intercept) and the second column by 100 standard iid normals. Find the R^2 of an OLS regression of y ~ X. Use matrix algebra.

```r
y <- c(rnorm(100))
#y
X <- as.matrix(cbind(1, y ), nrow = 100, ncol =  2)
colnames(X) <- c("intercept", "y")
#X


b = solve( t(X) %*% X) %*% t(X) %*%y
H = X%*% solve(t(X) %*% X) %*% t(X)
yhat = X %*% b

e <- y - yhat
sse <- sum(e^2)
sst = sum((y-mean(y))^2)
Rsquared = 1- sse/sst
Rsquared
```

```
## [1] 1
```

from the last problem. Find the R^2 of an OLS regression of y ~ X. You can use the `summary` function of an `lm` model.

Write a for loop to each time bind a new column of 100 standard iid normals to the matrix X and find the R^2 each time until the number of columns is 100. Create a vector to save all R^2's. What happened??

```r
ols1.2 <- lm(y~X)
summary(ols1.2)
```

```
## Warning in summary.lm(ols1.2): essentially perfect fit: summary may be
## unreliable

##
## Call:
## lm(formula = y ~ X)
##
## Residuals:
##        Min         1Q     Median         3Q        Max
## -3.723e-16 -1.974e-17  1.277e-17  3.136e-17  1.553e-16
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error  t value Pr(>|t|)
## (Intercept) 0.000e+00  7.666e-18 0.000e+00        1
```

```
## Xintercept          NA          NA       NA       NA
## Xy          1.000e+00   7.686e-18 1.301e+17   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 7.599e-17 on 98 degrees of freedom
## Multiple R-squared:      1,  Adjusted R-squared:      1
## F-statistic: 1.693e+34 on 1 and 98 DF,  p-value: < 2.2e-16
```

```r
y=rnorm(100)
X=matrix(data=c(rep(1,100),rnorm(100)),ncol=2,nrow=100)
rsquared=c()


while(ncol(X)<100){

  b=solve(t(X)%*%X)%*%t(X)%*%y
  yhat=X%*%b
  e=y-yhat
  sse=sum(e^2)
  sst=sum(y-mean(y)^2)
  rsquared=c(1-(sse/sst),rsquared)
  X=cbind(X,rnorm(100))
}
rsquared
```

```
##  [1]    4.198422  15.818744  16.351078  29.893565  29.893570  33.762151
##  [7]   33.772956  63.820598  65.944337  93.165409 115.808009 122.243044
## [13]  125.114702 127.081540 136.607174 171.396146 180.397104 203.734912
## [19]  204.569166 238.736195 240.317969 240.624343 243.744347 277.239647
## [25]  278.836654 283.087619 290.244791 290.269332 310.482128 311.621434
## [31]  321.811211 322.822142 323.395544 340.332171 344.419657 344.420054
## [37]  347.785998 354.939812 356.867370 358.510015 370.867321 373.765967
## [43]  374.077417 380.866713 393.138587 401.308143 402.836991 404.604467
## [49]  404.637620 448.386194 488.891369 491.388367 491.925200 511.854539
## [55]  541.007194 550.127084 566.359786 578.969588 581.750393 587.348177
## [61]  587.551914 593.561747 593.813595 594.657813 595.912117 596.538331
## [67]  605.079097 633.206909 638.460678 643.447904 650.945296 651.138144
## [73]  652.703218 663.990150 665.591088 665.609901 666.411604 673.144646
## [79]  689.131164 710.264638 712.890863 713.032318 715.150793 725.180083
## [85]  726.600907 726.675530 726.685960 741.539985 753.305974 766.256101
## [91]  768.503909 782.204820 782.219231 782.253158 785.154995 844.201640
## [97]  848.029746 849.346862
```

```r
X
```

```
##        [,1]         [,2]          [,3]          [,4]           [,5]
## [1,]   1  0.244105027 -0.992787873  0.606509842  2.125336613
## [2,]   1 -1.247164597  0.512141594 -0.276171349 -0.165839273
## [3,]   1 -0.401203706 -0.305188191  0.120959862 -0.889893884
## [4,]   1  0.501479642 -0.672177968 -0.877708103  0.369700377
## [5,]   1 -1.629535418  0.569867314 -0.288543019 -0.198887569
## [6,]   1 -1.898699545 -1.080080687 -0.510470439 -0.795827312
## [7,]   1 -1.738488450 -0.345477590  1.037186266 -1.079896458
## [8,]   1  1.264611246  1.121316297 -1.632591660  0.901578669
```

```
##    [9,]    1 -0.651284765  1.561450308 -0.311459991  0.195526517
##   [10,]    1 -0.452317359  0.192865156  1.038822439 -1.348415452
##   [11,]    1  0.108804428  0.821388223 -0.183442301 -1.658643253
##   [12,]    1 -0.285675879 -0.386397814 -0.279275239 -0.485257574
##   [13,]    1 -1.152800949  2.868052196 -1.605128317 -0.233086488
##   [14,]    1 -0.058332950 -0.773888448 -0.176066070 -1.062030883
##   [15,]    1 -0.369716347  0.867447924  0.073531354 -1.486920069
##   [16,]    1  1.242302808 -0.142445905  0.662174532 -1.244713902
##   [17,]    1 -0.894654636 -0.902953251  1.714850049  0.914119564
##   [18,]    1  0.126054190  0.560633835  0.965243964 -0.258265052
##   [19,]    1  0.009273322 -0.586355247  0.255202763  0.834826919
##   [20,]    1 -0.910136724  0.947599038  0.187455076 -1.048205961
##   [21,]    1  0.782223294  0.947520802  0.343746417  0.291621272
##   [22,]    1  1.175522679  0.772515044  0.003364871  1.155747154
##   [23,]    1 -0.953155951 -1.376274186 -0.387542647  0.310830703
##   [24,]    1  0.883677013  0.414072093 -3.156451315 -3.166298377
##   [25,]    1  0.714311170 -0.486336429 -0.698870700  0.268237929
##   [26,]    1 -1.441378968  0.257567794  0.946067035 -0.470708995
##   [27,]    1 -0.336457526 -0.774225793 -1.027160126  1.314925711
##   [28,]    1 -0.007215555  0.214646676  1.889699221  0.721300420
##   [29,]    1 -0.693804733 -1.421620565  0.144316186 -0.742224706
##   [30,]    1  0.840930333 -0.513775575  0.142553034  0.640195956
##   [31,]    1 -0.716250360  1.074377031  0.945507565 -0.315881186
##   [32,]    1 -0.637140160 -0.514839472  0.526643883 -1.121330523
##   [33,]    1 -0.246374488  1.081402991  0.344274368 -0.291711762
##   [34,]    1  0.161042953  0.695770315 -0.173814304  0.897651795
##   [35,]    1 -0.471178051 -1.959869329 -2.006681531 -1.039808357
##   [36,]    1  0.005523703 -0.083117181 -0.987671878 -0.219759290
##   [37,]    1 -2.127199922  1.441399327  0.357482807  0.294766327
##   [38,]    1  1.959278126 -0.487437156  0.599601756 -1.401439149
##   [39,]    1 -1.050738815  0.082968525  0.547498024 -0.709604388
##   [40,]    1 -0.992936334 -0.287854937 -0.163328768  1.378762484
##   [41,]    1 -0.034610691 -2.504826582 -0.570829257  0.848685374
##   [42,]    1 -2.447520082 -0.622745481 -1.234552088  0.110472518
##   [43,]    1 -0.723057363 -1.092741235  0.816714644 -0.901740398
##   [44,]    1  0.198066303 -0.316530779  1.782658920 -0.145190802
##   [45,]    1  0.207612131  0.815221513  0.055918732 -1.674025632
##   [46,]    1  0.162510545 -0.355133925  0.686215724 -1.216944798
##   [47,]    1  0.423710856  0.137645366  1.432864824  0.021211725
##   [48,]    1  0.065558548  0.397505981  0.774223249 -1.299432313
##   [49,]    1  0.987213909  1.678458874  0.697926013 -1.979685041
##   [50,]    1  0.399211091 -0.991111673  1.284976517 -0.638101921
##   [51,]    1 -0.607427763 -1.446022414  1.129780933  0.630662709
##   [52,]    1 -0.847817471 -0.333820419 -0.886733709  1.087631373
##   [53,]    1 -0.280712120  0.502650070 -0.220185281  0.832249291
##   [54,]    1 -0.231469535  0.001773399 -0.002273068 -1.319904856
##   [55,]    1 -0.031092596  1.371407679  1.283828502  0.664041371
##   [56,]    1 -0.492154672 -0.101682540  2.595007401 -0.896412601
##   [57,]    1 -0.530545095 -2.610047966 -1.335902389 -0.936536247
##   [58,]    1  0.341131173  1.182353884  1.723896321 -0.154923642
##   [59,]    1  1.187389218  1.261710576  1.979534474 -0.539828682
##   [60,]    1 -1.502018721 -0.020734531 -1.442099351  1.710134023
##   [61,]    1 -1.204774428 -1.206443633  0.065718080 -1.064150950
##   [62,]    1 -0.670429376  0.893897210  0.381074723 -0.669507975
```

```
## [63,]    1  1.219587775  0.573079926  0.262692453  0.133347847
## [64,]    1 -1.460736463  0.883790104 -1.148498192 -1.223651050
## [65,]    1  0.619598412  0.599911439 -1.193836487  0.707646142
## [66,]    1 -0.247922007  0.139210190 -0.485712219  0.003793644
## [67,]    1  0.173288126 -0.890240429 -0.741293449 -1.578847524
## [68,]    1  0.236497177 -0.439316366  0.228954093  0.490361073
## [69,]    1 -1.615279108  0.596893699  0.452365274  0.516266267
## [70,]    1 -0.506071981 -0.798410419  0.010815944 -1.267131485
## [71,]    1 -1.620532236  1.892115969 -0.075820636  0.258187048
## [72,]    1 -0.475048371  0.364623069  1.048122738  0.135855401
## [73,]    1  0.023928860  2.237702515 -0.269862391  1.315114239
## [74,]    1 -0.153301591 -0.152506729  0.302492049 -1.542160059
## [75,]    1 -1.275222910 -1.851883859  0.641501038 -0.060297526
## [76,]    1 -0.513148082  0.526533569  0.179659190  0.688366734
## [77,]    1 -0.445852338  0.110456979 -1.476531724 -1.388333106
## [78,]    1  0.316757363  2.742297978 -0.660474608 -0.567220693
## [79,]    1 -0.726731129  0.871621543 -0.107420637  0.878906122
## [80,]    1  1.356396307  0.640942226 -0.105800972 -1.942765495
## [81,]    1  2.555407651  1.213738037  0.233997217  0.001132816
## [82,]    1  1.557714354  0.627227976 -0.966484483  0.306956726
## [83,]    1  1.683528750  1.716831336 -0.543224477  0.358344413
## [84,]    1 -1.452483733  0.462537870 -1.052936285  0.789922510
## [85,]    1 -0.436016027 -0.419536586  0.421452031 -0.320117326
## [86,]    1  0.262081475  0.016071453 -1.100951562 -0.269006135
## [87,]    1 -0.792882797  1.708778001 -0.171731747 -1.422642079
## [88,]    1  0.111672372  0.686778465 -1.480403404 -0.907955660
## [89,]    1  1.343699996  1.223630074  1.236359676  0.886880345
## [90,]    1  0.909746853 -0.326148175 -1.143823106 -0.875403447
## [91,]    1  0.968199655 -1.270469430 -1.268706917 -0.061952792
## [92,]    1  0.319076190  0.489129639  0.900440803  0.759159928
## [93,]    1 -1.304233660  1.524537489  1.194565090  0.078029939
## [94,]    1 -0.154220731 -0.444723237  0.055133436 -0.365984400
## [95,]    1  0.673618876  0.252963901  0.870883399 -1.043325052
## [96,]    1  0.287131305 -0.932915934  0.386913477 -1.681357574
## [97,]    1  0.500505148 -1.073133763 -0.195004095  1.427055257
## [98,]    1 -0.740044440  0.362517529 -0.493048811  0.238839229
## [99,]    1 -0.280318829 -0.817922568 -0.257415120 -0.209667795
## [100,]   1 -0.599850240  1.455552744  1.260630271 -1.874126372
##                [,6]        [,7]        [,8]         [,9]        [,10]
##   [1,] -0.55592413  0.22212210  0.51087560 -2.2093224393 -0.460040196
##   [2,]  1.57112255  1.17290515  0.31654572  0.5830868754  1.225684452
##   [3,] -2.02450022 -0.27559418  0.50754695  0.0817268057 -0.177311916
##   [4,]  0.85346849  1.27600888  0.74228951  0.2539444472  0.607610762
##   [5,]  0.41911228 -1.15541868 -0.36883250 -1.9641629640  0.224429912
##   [6,]  0.56343867 -0.56457317  0.35880538 -0.3047424208  0.273585347
##   [7,]  0.11266346  0.80183939 -1.59491247 -0.5551920118  0.372407962
##   [8,] -0.79562154  1.53247920 -0.80392072  0.5333635238  0.104296707
##   [9,] -0.99672555 -0.77537501  2.18761636 -1.0666461435  0.325196947
##  [10,] -0.17525887  0.95306755 -0.52964249  1.7723769244 -2.284348518
##  [11,] -0.02030755 -0.61298756 -1.13827483  0.0451087847 -0.360463586
##  [12,] -0.01857266 -0.27669317  0.92840120 -0.4213988885 -0.444359617
##  [13,] -1.19853576  0.61576366 -0.33834191  0.0816067174 -0.571103451
##  [14,]  0.17520458 -1.44973585  0.09737896 -0.3373594276 -1.865435302
##  [15,]  0.28527208 -0.33777510  0.77249376 -0.2956284676 -0.143245676
```

```
## [16,] -1.38629839 -0.28792855  1.40877587  0.2285880835 -1.244081419
## [17,] -1.73684994 -0.90687539 -0.10615813 -0.3715985892  0.251841350
## [18,]  0.32025298  0.49568484  1.59240437  0.4188940315  0.606913106
## [19,]  0.38950118 -0.75367600  0.91369110 -0.4453275895  1.186377379
## [20,]  1.08931344  0.33191333  0.92712588  2.4272839205 -1.776922646
## [21,] -1.62620652  1.10344651  1.22255656 -1.1110393955 -0.212053539
## [22,] -0.17302725 -2.22116772 -1.11496252  1.5256425140  0.005031776
## [23,]  0.10563424  0.35834245 -0.13933118 -3.0776856258 -0.221412048
## [24,] -0.29281916  0.14249035 -0.17261704 -0.4058788952  0.312548673
## [25,]  1.22739229  1.37555285  0.56116197  1.0915770193 -0.568943930
## [26,] -1.62065480  0.88667792  0.92457488 -0.5705227685  1.304265328
## [27,]  1.40299233  2.13737000  0.07438096  0.4654804403 -1.238196136
## [28,] -0.08773104  1.81084704  1.49729904 -0.5873409923  0.239572101
## [29,]  0.45210814  1.23316735 -1.09468881 -0.5330408238  0.215615245
## [30,] -1.16346021 -0.98492464  0.56154545 -0.6490036523  0.117120080
## [31,]  0.19025387  0.31847964  0.63349616 -1.0110914999 -1.394541146
## [32,]  1.42228810  0.16010745  1.55593490  0.1130383561 -1.105304695
## [33,] -0.06938864  1.47058131  0.68077911  0.2424695304  1.445073050
## [34,]  0.18518939  0.28827607 -0.08421409 -0.2689947042  1.260134351
## [35,]  1.04395999  0.41264640 -1.39575812  1.0047684753 -1.160467621
## [36,] -0.37390135 -1.39423037 -0.55673905 -1.1184233160 -1.015813492
## [37,]  0.57194254  0.06826086 -0.60745243  0.6089622044  1.971945855
## [38,]  1.93119516  0.06491117 -0.23546252  0.0155679455  1.740335607
## [39,]  0.08135308 -1.02363269 -0.14028935  0.1509506365 -0.928821584
## [40,]  0.90591490  2.05353039  0.36988924  0.8847769219 -0.466088660
## [41,] -1.25720833 -1.38591236 -0.39447900 -0.4153462599 -0.753365593
## [42,]  0.76155374 -0.20140197 -1.59775066  0.3520772098  0.612907644
## [43,] -0.45632390  1.40709041 -1.36481315  0.3151521145  0.606962450
## [44,] -2.22771874 -0.94179151 -0.23326262  0.0330416470  1.340122965
## [45,]  0.82661728  0.47315476  0.32373229 -2.1165158909 -0.124935313
## [46,] -1.10012190  1.20773136  1.13006548  1.4728436125  1.044394790
## [47,]  0.36246131 -0.92521195 -0.31958441  1.0038269784  0.022907973
## [48,] -0.18878089  0.78661893  0.34137593  1.7281758751  0.353562587
## [49,]  0.42629262  1.27800731  0.19028148  1.3391972656 -0.184647286
## [50,]  1.57538761 -0.44998243  0.33351887  0.6316956808  0.731493731
## [51,]  1.17067197  0.88552701 -0.11468132 -2.3418737239 -0.459216905
## [52,] -1.62623979  0.71166567  0.31947209  0.0001903259  1.120522505
## [53,]  1.79575527 -0.53568958  0.04908304  1.2304386390 -1.142466892
## [54,]  0.96379547 -0.31585716 -0.03303898 -0.1839846518 -0.048512656
## [55,] -1.15565111 -0.37801001  1.09270280 -1.3316720143  1.241354663
## [56,]  0.45546695  0.07926853 -1.21995825  0.5609080030  0.829118465
## [57,]  0.86981479  0.04766679  0.40487596  0.9857731878  0.634753367
## [58,]  0.40775513  0.52777624  1.35522458 -0.1764093866  2.202813741
## [59,] -0.47997593  0.69467519 -0.41560044 -0.5570806753 -0.244986719
## [60,]  1.36234071  0.10953825  1.21579267  0.9728475951 -1.087287953
## [61,]  1.68317307 -0.22230431 -0.76606691  0.3362097420 -0.196673485
## [62,] -0.60015801  0.76977629  1.36851729 -0.7877871977 -1.325411668
## [63,]  0.19232281  1.57199307  1.54328451  0.4875744776  1.255503687
## [64,] -1.62575101 -0.83706978  0.42232958  1.4156441287 -0.166978234
## [65,]  0.17742898  0.29619018 -0.70815579 -0.1340353287 -0.759529282
## [66,]  1.28591660  1.40576484 -0.39349372  0.9870498440  0.709636355
## [67,]  1.73327157 -0.59699315  0.25865877  0.2271674787  1.283429949
## [68,]  0.18308185 -0.83165046 -0.38374278  1.1789447635  0.235229683
## [69,] -0.65057005 -0.52256174 -0.03749619  1.8832592531 -1.225069714
```

```
## [70,]    0.75603948   0.55082975   0.63023107   0.0702534638  -0.030030963
## [71,]    0.18194746  -0.44610422   0.28715133  -0.7706947668  -0.867579565
## [72,]    1.16759609   2.17972145  -0.97011042  -1.6035628808   2.008600113
## [73,]    1.24325271   0.12882955   2.51199074   1.2634653857   0.777836107
## [74,]    0.08135062  -1.65800382   0.17921843  -0.2961358837   0.858743408
## [75,]    0.21193145   0.02337813   1.87751033   0.4093636388   0.701519503
## [76,]    1.56482668   1.02504359   0.25941951   0.5448075408   0.939523643
## [77,]   -0.26960996   0.45464409   0.48075875   0.1735512460  -1.576298647
## [78,]    0.13852416   0.65296730  -0.42939399   0.5423777792   0.242984169
## [79,]    0.51972225  -0.29869697   0.50763851  -1.6864680854   0.828042817
## [80,]   -0.07247829  -0.51065888   0.22080694   0.7053335013  -1.543339400
## [81,]   -0.55449655  -1.14875946  -0.29544269   1.1050754137   1.059359660
## [82,]   -0.94824539   0.56393750   1.48241935  -2.0048529542  -0.946628967
## [83,]   -0.36597137   0.64077889   0.73597267   0.2549289657  -0.875801214
## [84,]   -0.40683822   1.02774973   1.02101355  -0.2179085268  -0.467750419
## [85,]    0.15775510  -0.58902476   1.33015663  -0.5378900386  -1.078992137
## [86,]   -0.64379046  -1.89069095   0.95203221   1.3461249127   0.410620538
## [87,]   -0.20511124  -1.93146228  -0.83540137  -0.2693855295   0.402999987
## [88,]    0.56509752   1.14807102   0.75641027   0.6517590019   1.004926452
## [89,]   -0.60323205  -0.30883838   1.01779833  -0.6208743953  -0.875440341
## [90,]    0.32274924   0.34089682  -1.40333529   0.8226552025   0.653402056
## [91,]   -0.16863955  -0.05242506  -0.51781129   0.0506805128   0.433575628
## [92,]   -1.39940579   0.57809421  -1.11674042  -0.5742804803   0.412660255
## [93,]   -0.92105012  -0.80627950  -1.19877095   0.4368785560  -0.727818940
## [94,]   -0.09277503  -0.75042498   0.33521320  -0.3684940082  -2.054608622
## [95,]    0.85202278  -0.60864314   0.13648672  -2.2375273704  -1.036236213
## [96,]    1.47993293   0.81590314   0.96953923   0.5775815429  -1.066195693
## [97,]    0.50070652   1.17237539  -0.27714727  -0.6462560748  -0.487022068
## [98,]   -0.35250021   0.19508169   0.84690804  -0.8425168144  -1.209775212
## [99,]   -0.07330527  -0.60806382   1.47963913   0.1470844381  -0.030703636
## [100,]  -0.45488936  -1.18353048   0.44197377   0.0976650492   1.172371043
##               [,11]        [,12]        [,13]         [,14]         [,15]
##   [1,]    0.07435194   0.919608801  -2.37904752  -0.46588280   0.201306169
##   [2,]    0.13220962   0.424141241  -0.26043704  -0.46200706   0.377185941
##   [3,]    1.15484741   1.522248690   0.27899066  -1.62774608   0.766487702
##   [4,]    1.66402023   0.627362796   0.10152093   0.85756320  -0.331067291
##   [5,]   -0.40478980  -1.580072239  -0.04226172  -0.06676696  -1.912781276
##   [6,]   -2.05344974  -1.376610633  -0.35945505   1.84981133   0.835503536
##   [7,]   -0.42887115  -0.735031192   0.08066691   1.52243581   1.278742369
##   [8,]    1.98967959  -0.961919394   0.76011137   0.76122335   0.454627141
##   [9,]    0.98665423   0.371368699   0.71014916   0.82679893   0.679562953
##  [10,]    1.00917631  -0.285543540   0.60557769  -0.91618128  -1.907022263
##  [11,]   -0.61579603   0.986617851  -0.37933395   1.17757853   0.860659973
##  [12,]    1.09287981  -1.217177003   0.43940002  -0.58818888  -0.565113358
##  [13,]    1.36249092   0.837386754   0.33941278  -0.18856245  -0.375570142
##  [14,]    0.62013304  -0.893432336  -0.14141271   0.39688654   0.153724015
##  [15,]   -0.40222596  -0.671430832   1.04334174   0.13376052   2.247016233
##  [16,]    0.81370081  -0.673594188  -0.04774418   0.02527600   0.393924032
##  [17,]    0.07945110   0.951909057   0.46793653   0.76725448   0.555646766
##  [18,]   -0.14898249   0.392974540   0.37688703   0.33050864  -1.477327311
##  [19,]   -0.18157348   0.194400446   0.96523598  -0.25095671  -0.058716088
##  [20,]   -1.38510367  -0.114597727   0.06810265   1.53255462  -0.829875555
##  [21,]    0.22538336  -1.017430668   0.37793094   0.17756937   0.058388581
##  [22,]   -1.04663700  -0.584562107  -1.17145368  -0.08490203  -0.668325953
```

```
## [23,]  -0.61054061   0.832692882   1.31591159  -1.90774949  -1.270584031
## [24,]   0.55727754  -0.638408068   0.06274440  -2.06644669   0.487992119
## [25,]  -0.49295952   0.056096272   0.43478060  -0.70628589   0.466193777
## [26,]  -1.20905031   0.502623840  -0.26030999   0.55221346   1.444024458
## [27,]   0.86962617  -0.152014530   0.56447560   0.62166693   0.617806834
## [28,]   1.63759161  -1.304696177  -0.49144387  -0.88232510   0.479250864
## [29,]  -1.57370153  -0.860750962  -0.53106795  -0.34213534  -0.772044956
## [30,]   0.88998037   1.362508090   0.88258804  -0.52949928   0.718042727
## [31,]   0.33760223   1.754468000  -0.83042245  -0.09853462   1.210872576
## [32,]   1.41222411  -1.006681230  -1.64201922  -1.50118995  -0.659067746
## [33,]  -1.34508321   0.503479198  -1.36688055   0.27525917   0.642603201
## [34,]  -0.01363390   0.557461908  -0.03975096   0.40481743   0.490380928
## [35,]   1.02937483   0.838389681   0.33217603   0.45895688   1.651716517
## [36,]   0.23014348   0.649923626   2.13502709   0.60158820   0.793247660
## [37,]   0.68897953   0.778778689   1.24702262  -0.56881240   0.069279853
## [38,]  -1.08240718   0.234952276  -1.39868636   0.42209458   1.580786999
## [39,]   1.11363228   0.339303725  -0.83247549   0.74806074  -3.210231964
## [40,]   0.90592225   0.008947202   0.34528097   0.06226247   0.909535340
## [41,]   0.48767582   1.110815249   0.08248399  -0.65670191  -0.575341682
## [42,]   0.55578775   0.241004268   0.92471037   0.06946689  -1.908057425
## [43,]  -0.82572241   0.153361973  -1.40390641   0.49535556  -1.681561043
## [44,]   0.56900918  -1.780210050   0.73621449  -1.85174444  -1.973590164
## [45,]  -0.09549953   1.673068975  -0.61624385  -0.63056647  -0.753818639
## [46,]  -1.51620400   0.063285105   0.42699980  -0.82178786  -1.127400985
## [47,]   0.35581650  -0.715053963  -0.07741085  -0.01241235   1.336026498
## [48,]   1.41793602  -0.633038195  -0.70911372  -2.17976796  -0.095623605
## [49,]   0.99480043   1.217901060  -0.15187325   1.11050325   0.948140034
## [50,]  -0.41461751   0.107244054   1.68078119   0.20789099   0.306337886
## [51,]  -1.80006913   2.113092335   0.56084887  -0.85271753   0.334758010
## [52,]   1.02163550  -0.711028801   1.53808647   0.24815293  -0.209462829
## [53,]  -1.83325850  -0.747334175  -1.74676807   1.12549911   0.602833577
## [54,]  -0.04955286   0.525304473  -0.18049379   0.62770788   1.514531817
## [55,]  -1.12058752  -0.571791602  -0.45821660  -0.63086909   0.613169840
## [56,]   0.17472707   0.842092837   2.40945274  -1.09520471   1.378460073
## [57,]   1.03109005   1.060779595   0.11944988   0.35190096  -0.416689064
## [58,]   1.55703389  -2.354055478   1.12221975   0.54729967   1.295632918
## [59,]   0.71868424   1.397338884  -2.91162316   0.56805990   0.733034022
## [60,]   0.75599047  -0.347555054  -0.35563347   0.66737545   0.040864706
## [61,]   1.87737939  -1.045612632  -0.41688582  -1.14999552   0.225015480
## [62,]  -0.72573395   0.244321403   1.74071447  -0.89613448  -0.008666661
## [63,]  -1.97706268  -0.331892406  -0.92778062   1.04988886  -0.108150391
## [64,]  -0.20919197   0.404215394  -0.78957028  -0.83064126   0.829537385
## [65,]   0.19924885  -1.077357758  -1.65856608   1.42635742  -0.870919637
## [66,]  -0.77665400  -0.353586978   2.70304755  -1.93177212  -0.074569759
## [67,]  -0.67161014   0.087403040   0.57757687  -0.86442356   0.534712727
## [68,]  -1.25488953   0.137685727   1.11459248  -0.64861334  -0.503642292
## [69,]  -0.97897966  -1.194947017  -1.16229568  -1.31867322   1.743116105
## [70,]   2.26971184   0.986019752   0.07761861  -2.14866166   0.223728428
## [71,]   1.42276991  -0.378704481   0.73717147  -0.44281614  -0.109740590
## [72,]  -0.13978308   1.113640586  -1.51155786  -0.63027279   0.075328448
## [73,]   0.60027863  -1.166854555  -2.33587245  -0.46087556   0.069447842
## [74,]  -1.97800755   0.435303160   0.73502051   1.45237028   0.943464775
## [75,]  -0.23387556  -0.293507505   0.58554897  -0.90296929   0.950719158
## [76,]   1.43240898  -0.174170775   0.53522849  -0.73617522   1.436147742
```

```
##  [77,]   0.39042915 -0.609646260 -0.30537501 -1.60668709 -0.811440848
##  [78,]  -1.08757502  0.236640114 -1.23250688 -0.84221434  1.501227692
##  [79,]  -1.62796339  0.060366020  1.10561980 -0.55483043 -1.384692381
##  [80,]   0.37170332 -0.125999074 -0.49109132  0.28326312 -0.310853184
##  [81,]   0.79218427  0.021330584  0.01934859  1.64015476  0.963024534
##  [82,]   0.48677085 -0.912978206 -0.14886984  0.68153785 -0.678151928
##  [83,]  -0.53151412  0.382883459 -0.11230607 -0.26406260 -2.165205510
##  [84,]  -0.71985345  1.208716183  1.18272395  1.17726355  0.426176466
##  [85,]  -0.70406721 -0.448829432  1.16861924  0.60715402  0.487507485
##  [86,]  -0.55137213  1.166412453 -0.84622326 -0.23760935 -0.035825203
##  [87,]   1.49530455 -0.287064560  1.20220496 -0.75940211 -1.309390033
##  [88,]  -0.25515146 -0.093390185 -0.94074722  0.19722937  0.484721379
##  [89,]  -0.15680796 -0.187758452 -0.25441890 -0.20626724  1.011024194
##  [90,]   0.99180593  0.104923192 -0.45703976  1.35929122 -0.489680084
##  [91,]  -0.74284735  1.134858400 -0.77185858 -0.48994889 -0.461569418
##  [92,]   0.14981819 -0.215477203  0.03514759 -2.28826925 -0.496728929
##  [93,]   0.18908354 -0.451154915 -0.01267722 -1.52595742 -0.305250626
##  [94,]  -1.08780812 -1.395509116 -1.62673438  0.35205742 -0.420630134
##  [95,]   0.09860758  0.516193471  0.02912090 -0.92619575 -0.726244017
##  [96,]  -0.37533928  1.978757734  0.28034374  1.78318062  0.060792335
##  [97,]   1.91025239 -0.191650666 -0.08637830  1.53354812  1.800835926
##  [98,]   0.95461730  0.630871770 -1.18352080  0.87477551 -0.451603841
##  [99,]  -0.47506228 -0.576572776 -0.87989700 -2.13086114  0.505431195
## [100,]  -0.51181802  1.640687791 -0.03910180  0.12504769  0.329935127
##                   [,16]        [,17]       [,18]       [,19]       [,20]
##   [1,]  -0.411454711 -1.054255887  1.38219916  0.51281921 -0.05724647
##   [2,]  -0.523042761  1.148897865 -0.45133952 -1.10042815  0.06082689
##   [3,]   0.224979186  1.048927936  0.06042582 -0.35905441 -1.17415772
##   [4,]  -0.497403471 -1.396412740 -1.09740475 -0.56355308 -0.49166463
##   [5,]  -0.097923089 -0.417062505 -1.95543222  0.04684655 -0.75856708
##   [6,]  -0.331850741 -1.255365029 -0.68697368  0.95977085 -0.23910371
##   [7,]  -0.359183588  0.681702015 -0.48374797 -0.86063697  0.34846053
##   [8,]  -0.756266996 -1.785878062  0.04032160 -1.07052844  0.21621922
##   [9,]  -0.244372926  1.094356112 -0.40870075 -0.28968498  0.16485156
##  [10,]  -0.548567007 -1.993744287 -0.62927476 -1.32204578 -0.79549703
##  [11,]  -0.210587771  0.194950666 -0.30090191 -1.31473701  0.54660031
##  [12,]  -0.464679327 -0.613577913 -0.69504900  2.11551419  0.15303843
##  [13,]   0.742951032 -0.189811460  0.75089130  0.62496406  1.22008324
##  [14,]  -0.262034076  0.558256956 -0.33776536 -0.17238493 -0.91323567
##  [15,]   0.170604976 -0.673652904 -0.46710587 -1.34451492 -1.83866449
##  [16,]  -1.548414930  0.913987013 -0.49747897 -1.24501736  0.63322778
##  [17,]  -1.486341169 -0.351357623  0.47333520  0.80064474  0.07817466
##  [18,]   1.356043187  0.215050256 -1.66080943 -0.67492801 -1.00957900
##  [19,]   1.232968918  1.081190612 -0.38218174  0.51790816  1.04316017
##  [20,]  -0.514252372  0.885050843 -1.23136616 -1.40547310 -0.33022500
##  [21,]   1.215564818 -0.083846544  0.02082977 -0.94218876 -0.60239504
##  [22,]  -0.369008934  0.822429459 -2.03941521  0.61251558 -0.57467983
##  [23,]   0.315065699  0.125147995  0.45190497  0.16479576  0.69757585
##  [24,]  -0.916271262 -0.026992697  2.38383678 -0.31300386 -0.34112125
##  [25,]  -0.845948290  0.716579452  1.09296511 -0.18339052 -1.56803660
##  [26,]   0.714379341 -0.485478318 -0.41341327  0.42295586  1.12293174
##  [27,]  -1.138424379  0.041274123 -1.04290991  1.01558102  1.26224651
##  [28,]  -1.402582488  0.947120597 -0.04432434  0.14832826  0.53793898
##  [29,]   0.686258230 -0.987988692  0.49918625  0.41422469  0.40414657
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## [30,]  0.761844531 -0.869648510 -0.66438173 -0.93795654 -1.08488013
## [31,]  1.852725468 -1.236271362  0.84170791 -0.60355150 -0.40713641
## [32,] -0.498571390  0.932361087  1.07390877 -0.54308677 -1.11350780
## [33,]  1.167564082  1.304420624  1.05034457  0.81646541  0.63842980
## [34,] -0.452128702 -0.309632429 -0.64818684  0.69902744 -0.27070405
## [35,] -0.630841448  1.689860085 -0.29177303  0.38591963 -0.83612166
## [36,]  0.325188611 -0.858545023  0.66478123 -0.85402428  0.07056113
## [37,] -2.839956091 -1.851657158  0.17624868 -0.08142540  0.96855379
## [38,] -0.977710725  0.004589249  0.35299188  1.48780851  0.61348201
## [39,] -0.733784858 -0.902294199 -0.17178266  1.13903212 -0.12216435
## [40,]  1.902670918 -0.670461833 -0.11209293  0.99357722 -1.17307357
## [41,]  0.521411889 -1.747381885  1.92370470 -0.02540879 -1.81107421
## [42,] -1.909516205 -0.093645756 -1.23692017 -0.94202887  0.66965913
## [43,]  0.872776990  1.473597680 -0.66676691 -1.98930961  0.24878380
## [44,]  0.876510667  0.896157546  0.09330542  0.16670089  0.69953495
## [45,] -0.259820162 -0.619957110  0.96653432 -1.92765163  1.12158786
## [46,]  0.557168804 -0.554014110  1.82376340  0.64017896 -0.38189834
## [47,] -0.506940088  0.022732454 -0.73928909  0.39704820  0.50662613
## [48,]  0.625363800 -0.329823467  0.01503736  0.63140282  0.96979616
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##  [89,] -0.244957851 -0.677441645 -1.09956463  0.28555828  0.60914222
##  [90,] -0.676267239 -0.225655138 -1.04973091 -0.92254897  0.52998811
##  [91,] -0.688085570  1.330746752  1.04496069 -1.12372331 -0.09110064
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##  [93,]  0.455644231 -0.040419118  1.18921631  1.34317418 -0.45869359
##  [94,]  2.187527129  0.894828109 -0.20120773 -2.92184930 -0.44718955
##  [95,]  1.262680412 -1.400728928 -0.90236194  0.09129016 -0.27577862
##  [96,]  0.514972288  0.559214689  0.33629113 -1.29500935 -0.51194628
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##  [98,] -0.650723951 -0.219909522  0.29803723  0.07699907 -0.37989947
##  [99,]  1.461716708  0.503369088 -1.14027970  0.75596474  0.56188420
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##   [2,]  1.429418779 -0.8024237324  0.537098693  0.84847919  0.142172457
##   [3,]  0.415724694 -1.1027839317 -0.703231253  0.25963593  0.436682371
##   [4,] -1.152715655  0.5218578046 -0.342783955 -0.93043023 -0.705647521
##   [5,]  2.338262397  0.9914110790 -0.970191464 -1.60063756  0.749354744
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##   [7,] -0.844861138  0.1466610875 -0.748584892 -1.60253693  0.496388667
##   [8,] -0.185103197  0.5642470515  0.081515445 -1.68702573  0.900726897
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##  [10,]  2.105095898 -0.3589839726 -0.904308632 -0.44039941  0.545156901
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##  [42,] -0.363209096  0.171892756 -1.117088789 -0.6857853905  0.71931680
##  [43,]  1.163455107 -0.267609069  0.108020572  2.2772916306 -0.54606377
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##  [44,] -0.337822418  0.428514296 -1.030308833 -1.5819252424  0.28364403
##  [45,]  0.282255248 -1.737867314  0.009629276 -0.5382438023 -1.23938020
##  [46,]  0.878194422 -1.076714740  1.377196628 -0.2437745629 -1.25184391
##  [47,] -2.700746102 -0.436817549  1.327275690  0.3343793764  0.45563710
##  [48,]  1.807166771 -1.093999365 -0.799642411 -0.0953824151  0.86530247
##  [49,] -0.608927686 -2.027681396  0.648558175  0.6178819118  2.13963823
##  [50,] -0.247256647  0.309075248 -0.965392374 -0.7690744333  1.32955943
##  [51,]  1.283959346  0.498476757 -1.587231239 -0.5162435856 -0.65741607
##  [52,]  0.458992757 -2.531659475  1.825473211 -1.4871138266 -0.25250771
##  [53,]  1.152402589 -0.516198892  0.147676802  0.3596958294 -0.98944528
##  [54,] -0.459809076 -1.491445660 -1.166876061  0.4204631595  1.89152764
##  [55,]  0.903751483 -0.265392045 -0.931269889 -0.5160932600  0.85121931
##  [56,] -1.150452676 -0.020673286  0.758878691  0.9050543420  0.75720396
##  [57,]  0.528167030  0.733947857  0.229197299 -1.2179974703 -0.43314318
##  [58,] -1.611582610 -0.717924702  0.134021129 -0.8303427916 -0.63511239
##  [59,] -1.111999361  0.876897597 -1.312649498 -0.5748482188  0.90457279
##  [60,]  0.642575009  0.019844804 -0.743638323  1.5974921185  1.72484875
##  [61,]  0.111807654 -1.550822025 -1.585409206  0.8817679193 -0.41356533
##  [62,] -0.441588120  1.704524197 -0.757924717 -0.4152366354  0.26918756
##  [63,]  0.414740761  0.267370359 -0.710709850  0.2039794214 -0.92504661
##  [64,]  0.101553679  0.451881144 -0.492480644  0.3194450259 -1.27667957
##  [65,] -0.768771268  0.284486602  2.379495481 -1.0110507184 -1.44601402
##  [66,]  0.851107672 -0.128792988 -0.939193296 -1.1931212388 -1.28755972
##  [67,]  0.153493406 -0.089328524  1.302448833  1.1402100848  0.59880902
##  [68,] -0.098890111  0.874256060  0.646793509 -1.8724309030 -1.64329760
##  [69,]  0.973597928  0.719849655  1.592943970  0.6668272254 -0.02667572
##  [70,] -0.470207937  0.021073845 -2.257547292  0.6645949196  1.71833945
##  [71,] -0.736355009 -0.456495779 -0.339939779 -1.9454126924 -0.04122943
##  [72,]  1.416337610  0.801022108  1.048549428 -0.0105845146 -2.24715817
##  [73,]  0.154363533  0.557056995  0.886114353  0.5500343814  0.54455131
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##  [75,]  1.463625071  0.247697743  0.245432017 -2.1233589915 -0.27973067
##  [76,]  0.409714811  0.561401654 -2.466401134 -0.1813943658 -0.28767348
##  [77,]  0.641279831 -0.332956445 -0.757004633 -0.2919641579 -0.35776806
##  [78,]  0.147727891 -1.253583250 -0.661982844 -0.2962613738  1.25938354
##  [79,]  0.609252539  0.391916602  1.107470515 -0.4504974728 -1.10986504
##  [80,] -0.764559385 -0.325231764 -0.976565830  0.9133976699 -0.77213872
##  [81,]  0.379084529 -0.120411524 -1.776431876 -0.4696798230  0.65013501
##  [82,] -0.817297139 -1.066004499  1.764473529  0.4227220120 -0.26095290
##  [83,] -1.002702192  1.914957713  0.979426434  0.4139624290  0.02885099
##  [84,] -0.692338804  0.329324859  1.553503158 -0.5067904521 -1.02913263
##  [85,] -2.119434766 -1.126547727 -1.031741803 -0.5066789908  0.39860024
##  [86,] -1.208946815  1.119828784 -0.349418990 -0.8729564173 -0.77602222
##  [87,] -0.028720357 -2.129823414 -0.070263680  0.3442779247 -0.99421674
##  [88,] -1.400331150 -0.587954920  0.149588783 -0.2740691550 -0.72642596
##  [89,]  0.710797184  0.687366120 -0.663651815 -1.0065260838  0.32054892
##  [90,] -0.756408468  0.920230361 -0.079856275  0.8989159747  0.70450417
##  [91,]  0.293276211  1.668129786 -1.107315091  0.0005904796  0.93420073
##  [92,] -0.400282690 -0.015456210  0.449214403  0.5599762846  0.25597019
##  [93,]  0.824094750 -0.285388851  0.592773990  0.6113110833 -0.13094452
##  [94,] -0.417231856  0.547440293 -0.401663946 -0.8298472491 -0.14142980
##  [95,] -2.014346498 -0.391919121 -1.042955012  1.0778955472  0.50324056
##  [96,]  0.943260482  0.887928790  1.068159148  1.6357067591  0.63004657
##  [97,] -0.482522265  0.873410435 -0.888880461  0.1117118733 -0.12205776
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##  [98,] -1.287016323  0.985026507 -1.141513416  0.3909455546 -0.10994902
##  [99,] -2.193372775 -0.211741903  0.981943005  0.8169442893 -0.27453286
## [100,]  0.105539308  0.379439099  0.253250966 -1.2462152102  0.73881234
##               [,31]        [,32]        [,33]         [,34]        [,35]
##   [1,] -2.231923102  1.40518823  0.55241754  1.1899040134 -0.55699296
##   [2,] -0.962368160  0.10113872  1.03105983  2.2768426102 -0.97110229
##   [3,]  2.439034492  0.26715036 -0.31620821 -0.6886149614  0.34606862
##   [4,]  1.617442451 -0.10598628  1.44530868  0.1657776688 -1.73505853
##   [5,] -0.608181649 -0.17552940 -1.86210692  0.9414013888  0.91060793
##   [6,]  1.335723024  0.97773542 -0.79667529 -0.1551671268  1.35449242
##   [7,] -0.365250927 -0.68402084 -0.64426300 -0.3325038071  0.96339629
##   [8,]  1.142577012 -0.57648575 -1.06740906 -0.8336436361  1.18013587
##   [9,]  1.270516021  0.45603296 -1.33852817 -0.0872348839 -1.31892032
##  [10,] -1.258225391 -2.69430837  0.60467128  1.2068314679 -0.56626856
##  [11,]  0.617129802  0.76077872 -1.21422769  2.5642000733  1.07343374
##  [12,] -0.321778756  0.31998613 -2.00149139  0.1895915639 -0.91427901
##  [13,]  0.830563183 -0.76264805  0.14090364 -0.3923714090  0.17306503
##  [14,] -0.166931807 -1.63874162 -0.04221757  2.1831766738  1.67389754
##  [15,] -0.017210771 -1.57076859  0.59457687 -0.3902531533  0.36035063
##  [16,] -0.057424265  0.28801105  1.52189216  0.3535962877  0.57511436
##  [17,]  2.005474644  0.59128029 -1.03464804  0.2781717796 -0.10454075
##  [18,] -1.626019848 -0.99707928 -0.73271264  0.1585835297  0.17869739
##  [19,] -0.478985616  0.04535425  2.14845242 -2.0006774433 -0.29562202
##  [20,] -0.574651770  0.09080426  0.27501070  0.1295298125 -1.22418035
##  [21,] -1.515565810  1.05739451  0.15844439 -1.2892531141 -1.06565441
##  [22,]  0.331581447  0.37812206  0.69381604  1.4208580340  1.12941408
##  [23,] -0.497632520 -0.87761481  1.41734440  0.0382099218 -0.47937939
##  [24,]  0.929781721  1.70124187 -0.17508395 -0.5429510424  0.34645820
##  [25,]  1.260819911 -1.85678000 -2.75646428  0.5048220567  0.62960192
##  [26,]  0.379313135 -0.18109458 -0.92204003 -0.1459931469 -1.44377423
##  [27,]  0.086176053 -1.36923438 -0.28565503 -0.8531943835 -0.47127112
##  [28,]  1.979244768  0.38607421 -0.28288799  0.7278041449  1.55235752
##  [29,] -0.315277003 -0.16286423 -0.32883103 -1.2103919775 -0.01310944
##  [30,] -0.309893325  0.04468715 -1.11420093  0.1586934618  0.13835402
##  [31,] -1.298108743  0.33370307  0.06210234  0.9769266560  0.98349488
##  [32,] -0.684598866 -1.13027529 -0.51369768  0.0728238931  0.06050880
##  [33,] -0.879673895  1.72400259 -3.81050110  0.5450248664  0.04134137
##  [34,]  1.120075577 -0.51657600  0.71870847  0.2344996811 -1.00754114
##  [35,] -1.441066807  0.92630923 -1.91087820  0.8227203861  0.50319972
##  [36,] -0.150264718  0.03684689 -1.18977685  1.5489010446  1.46516563
##  [37,]  0.532866267  0.49791031 -0.13306511  0.0831806229 -2.50115630
##  [38,]  0.176687636 -0.80700062  0.16290983  0.0747209516  0.74978328
##  [39,] -0.522372260  1.85157801 -0.83339782  0.1593604724  2.78336175
##  [40,]  0.277292583 -0.18455138  0.84289875  0.1875945098  0.19353380
##  [41,]  0.396106432  0.96704589  0.22513138 -0.5346145923  0.64121733
##  [42,] -1.071291749  0.26902470  0.14829254  0.4374551094 -2.01560412
##  [43,] -1.567761170 -0.23773411 -0.22871413  1.3984397746  0.40684058
##  [44,] -0.858156146 -1.59763083  1.12918831  1.2324160051 -0.88234275
##  [45,]  0.177417967 -1.01610281 -0.88953574 -0.6749405786  0.01656230
##  [46,] -0.419965417  0.87947303 -0.25063929 -0.7690140942 -0.85833874
##  [47,]  0.002580789  0.63458158  1.56865161 -1.1772593518 -0.94949100
##  [48,]  1.382920979 -0.55680065  1.78130458  0.2699998524  1.26812538
##  [49,] -1.453238488 -2.45667553  0.86194746  0.0965096642  0.96515083
##  [50,]  0.921161418 -1.66019091 -1.37404027 -0.1698614483 -0.39190610
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## [51,]  -0.448951203   0.07169230   0.75638492 -1.5141597470   0.06678323
## [52,]  -1.353921650  -0.81092612   0.48734146 -1.6054677957   0.94340122
## [53,]  -0.225628343  -1.22927976  -1.03284365 -0.9805346756   0.11613759
## [54,]   2.642563088  -0.46954316  -0.77529676  0.1182806759   1.78135539
## [55,]   0.678694610   0.98601568   0.33735549  1.0181166389   0.30022397
## [56,]  -0.029166320  -0.54934600   1.01932292  1.5145863928   0.28088413
## [57,]   1.258127319  -0.16184639  -0.06386392 -0.6704017420   1.95606050
## [58,]  -0.592231527   1.74653446  -0.56231909  0.3622736907   1.00987851
## [59,]  -0.615142157   0.33979108  -1.42915126 -1.2835758012   0.89724730
## [60,]   0.834189393   0.09329722  -0.26291493 -0.0050408594   0.12085075
## [61,]  -0.649577998   0.93625188   0.04535950 -1.1521487761  -1.74129536
## [62,]   0.231775601   0.25282603   0.50991864 -0.3144022008  -0.41564235
## [63,]   0.146476319   0.15534353  -0.39473548  0.7164956840   1.61168557
## [64,]  -0.107814067   0.80251925   0.76984259 -1.0097423891  -1.38224345
## [65,]  -0.348574876   0.39067306   0.06676853  1.2512547460  -0.48871759
## [66,]   1.321726779  -1.00600271   1.61213296 -1.9048212414  -0.37047751
## [67,]   0.360024341  -0.48008474   0.05939724 -0.6675926477  -0.27196231
## [68,]  -0.331298790   1.80225114  -0.17768728 -0.8198324017  -0.22983539
## [69,]   0.716552124   0.33513189  -1.06658156 -0.4447576659  -0.63861396
## [70,]  -0.861910151  -0.36384938  -0.29936801 -0.5676592104   1.29365720
## [71,]   1.066044325   1.45623415  -0.10601684 -1.2453085198  -0.53889293
## [72,]   0.269873688  -0.06842974   0.34621917  0.3008715385  -1.10020316
## [73,]   1.389260828   0.33885628  -0.80014470 -0.7914570404   0.38870434
## [74,]  -0.657188769  -0.81580735  -1.14148261 -0.0002869956   0.07622615
## [75,]  -0.841335219   1.31907519  -0.35613771 -0.1302131340   2.23140713
## [76,]   0.782499239   1.30031603   1.92303403  1.6056672192  -0.25665453
## [77,]  -0.574874069   0.16640858   2.45918504  1.4423659506  -0.74639815
## [78,]   0.788720942  -0.32293951   0.29969544  1.0494184532   0.51217601
## [79,]  -0.139585145   0.63363022  -0.03689899  0.2147429968   1.17050184
## [80,]   0.009948105   2.81401670  -0.77599220 -0.2450047008   0.78377775
## [81,]   0.244085046   1.57310610  -0.54004841  1.9434000062  -0.17949837
## [82,]   1.226246963   0.92729271   1.20066208  2.4828051404  -1.61126254
## [83,]   1.343578157  -0.95049220  -0.82734767  0.5120467677  -0.34146024
## [84,]   0.334926133  -0.18411785  -0.24641328 -0.3898250104   1.75150108
## [85,]   0.185692580  -1.00313452   0.16369610  1.4117973572  -1.69205372
## [86,]   0.642708106   1.67817230   1.08335376  0.6817050720  -0.44440017
## [87,]   1.225622005  -0.13733784   2.51355546 -0.6877775562  -1.93330046
## [88,]   1.271143614  -1.10727844   1.43097640  0.4347588520   0.55028065
## [89,]   0.636465227   0.42144401  -0.41254854 -1.4204914154   0.62900506
## [90,]   2.188556506  -0.86085245   0.01251993  1.9527722465   0.71407476
## [91,]  -0.934087396  -1.06954147   0.98811340  0.3610535889  -0.10141971
## [92,]   0.156463384   0.01292533  -0.60619527  0.5758967700   1.38438170
## [93,]   1.164985574  -0.12977820   1.42550466  1.5166958025   0.78774317
## [94,]   0.973055295  -0.88054549   1.13266969  0.6004179055  -0.65683933
## [95,]   0.586867373  -1.42940580   0.43630697  1.1932126304   1.68564422
## [96,]  -1.622251182  -0.36750302   0.88160521 -0.5457185463  -0.69549520
## [97,]  -0.730915755  -1.80703597   0.62004354 -0.4530841516  -0.47432417
## [98,]   0.139972042  -0.19215516  -0.72825643  1.4022960939   0.52348910
## [99,]  -1.703524347   1.68055626  -1.48545593 -0.9657495394   1.53648443
## [100,]  0.014169810   0.47730208  -1.59925593 -0.7151518210  -2.48018983
##               [,36]        [,37]        [,38]         [,39]         [,40]
##   [1,]   0.14320492 -0.400441746   0.81472437  0.185189569 -2.740020152
##   [2,]  -0.73812063  2.354198962  -1.06036648  0.167502602  0.083627419
##   [3,]   0.67040380  0.392796424   0.48093828 -0.030910536 -0.708627632
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##    [4,]   1.67136032 -0.563437720 -0.27291881 -0.458465991 -0.938306488
##    [5,]   0.12337542 -0.136785667 -0.03335821 -0.789000426  0.847839355
##    [6,]  -0.61346736 -0.432630687 -0.20813939  2.253229769 -0.203780272
##    [7,]  -0.22069209  0.352494094 -1.51820326 -0.848616346 -1.207554246
##    [8,]   0.18172095  0.294682536  0.41869490  0.994266887  0.043313592
##    [9,]  -0.35524160  1.001565684  0.09480739  0.165720110 -2.311639876
##   [10,]   0.65696003 -2.391047817  1.13157082  0.180814989 -0.725538734
##   [11,]  -0.85412069 -0.403247940 -0.24153343  0.590602585 -0.361933881
##   [12,]   0.43737409 -0.817693300  0.44964211  0.390897487 -0.204134177
##   [13,]   0.24576140  1.621190808 -2.29344962  1.282933927  1.173807367
##   [14,]   0.68892022  0.225821817  0.33138345 -0.095666785 -1.017211194
##   [15,]   0.66561602  0.581117087  0.83947285 -1.570304116  0.130843118
##   [16,]  -1.19914285 -1.361397556 -2.32491017 -0.009753811 -0.724513652
##   [17,]  -1.00740154 -0.504935596  1.59253367  0.356074020  1.463416733
##   [18,]   0.08435617  0.693101545 -0.43490682  1.198657523  0.356666049
##   [19,]   1.33057002  0.507029336  0.29909486 -0.454808224 -0.083282441
##   [20,]  -1.71025141  0.243915113  0.94625383 -0.272802782  0.582300779
##   [21,]   1.03019529 -0.808675869  0.44799168  0.321435423  0.782533170
##   [22,]   0.94443417  0.364380805  0.30231270 -0.253796563  0.218754165
##   [23,]  -0.28893881 -0.051061301  1.11843607 -0.458485728 -0.484485202
##   [24,]   1.09866740 -1.559032645  0.54957890  0.186474259  0.047968425
##   [25,]   1.02885888 -0.087901243 -1.37293158  0.330612365 -1.795648165
##   [26,]   0.25401578 -1.969012845 -1.92423435 -1.463336760  1.823412623
##   [27,]   0.38743445  0.401977576 -0.29714843 -0.501538463 -0.261574883
##   [28,]  -0.09626496 -1.037468546 -0.46174736  1.411587690 -0.519476575
##   [29,]   1.46944497  2.459395748  0.50634576 -1.089252478  1.589545044
##   [30,]  -1.62352936 -0.280890993 -1.35654998 -0.259290692  0.184036000
##   [31,]   0.30770687 -1.517718753 -0.91188444  0.520078466  1.063601609
##   [32,]   0.83738642  0.625607373 -0.03180701 -2.299647623 -0.311229273
##   [33,]  -0.66169007  1.321614798 -0.80885606 -0.770736028  2.163321418
##   [34,]  -0.28727240  0.854383716  0.41323932  1.000062564 -1.030809827
##   [35,]   1.57126902  0.004012215 -0.68428435 -0.179405500  0.605532809
##   [36,]  -0.24891714  0.021689424 -0.15637971  0.794989551  0.346580284
##   [37,]   1.52149464 -0.555790338  0.95843451  0.808442506 -0.256257929
##   [38,]  -0.58448430  1.191803186  0.35420176 -0.538729603 -2.167291112
##   [39,]   0.36654694  0.027467952 -0.03914752  0.319712457  1.969328424
##   [40,]   1.02637111 -0.502772046  0.46866878  1.479549150  0.418161048
##   [41,]   1.02033539  0.288304200  1.69575394  0.116176906 -0.527156590
##   [42,]   1.20238594 -0.930060325  1.15977430 -0.138294863  0.689507984
##   [43,]  -0.54387615 -3.538447232  0.31520110  1.064874410 -2.307820776
##   [44,]   0.57090897  0.933127018  0.40654064  0.079821862 -0.972606283
##   [45,]   0.14502402 -0.738544615 -0.27425881  0.361549884  1.897705778
##   [46,]  -0.92665334 -0.109387809 -1.33442507 -2.520853883 -1.252181481
##   [47,]  -0.48545246  0.274471774  0.01034498 -0.234888196 -1.257752083
##   [48,]  -1.55012957  0.728858143 -0.29276869  0.174527619 -0.420470878
##   [49,]   1.68423067  0.034492621  0.36186125 -2.677299974  0.636099495
##   [50,]   0.23177696 -0.692315016  1.58468186 -1.652454817  1.736058838
##   [51,]  -0.79124203  0.433804844 -1.37955812 -0.969767978  0.049035878
##   [52,]   0.95120275 -1.179793528 -1.36298028 -0.547894305 -0.170660932
##   [53,]   0.07731257  0.756144033 -0.10101094 -1.125308166 -0.946236662
##   [54,]   2.07641029 -1.075566948  1.98548078  0.419629111 -0.677164115
##   [55,]  -0.51596325  0.401085660  0.30252628  1.924245316 -0.359926084
##   [56,]   0.44576646 -2.366415207 -0.16069696  0.053181186  0.534045508
##   [57,]  -1.28325242 -0.294160845 -0.93922249 -2.308369671 -0.349763909
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##  [58,] -0.85331167  1.014415161  2.04697691  0.046901518 -0.519781053
##  [59,] -0.61624522  0.020684461 -1.18284027  0.590392952 -1.451655408
##  [60,]  0.13835671 -0.592990431  0.91618287 -0.162866042 -0.628074859
##  [61,]  0.88023186  0.509211517  0.15279458  1.017571489 -1.269550400
##  [62,] -0.39404565  1.235929266 -0.88402616 -0.867854596  1.067906500
##  [63,] -0.58518965 -0.102918418  0.77321097  0.254074406 -0.862206091
##  [64,]  0.90117752  1.160975098  1.97589267 -1.731784486 -0.460924950
##  [65,]  0.51467409 -0.476399444 -1.20936771 -0.300324927  1.066889017
##  [66,]  1.03925876 -0.530226967 -1.24422626 -0.090712041 -0.816232954
##  [67,] -0.45024976 -0.761088428  0.06655033 -0.240384517 -1.966620037
##  [68,]  1.23418441 -0.402096367  0.15221176  0.984529856  2.129210115
##  [69,] -0.67064166 -0.387507007 -1.30075740 -0.431859323 -0.941423021
##  [70,] -2.73433780  1.203443720 -0.91427739  0.219587887  0.512041458
##  [71,]  0.19304188 -0.147111076 -0.52688090  0.890780728 -0.046326599
##  [72,]  0.84877137  0.377932602 -1.48914844  0.642729155 -1.459201604
##  [73,]  0.84090509  0.612498410 -0.39486488  1.001299643  0.457529409
##  [74,] -1.60209440 -0.703125473  0.50043520  0.169353428 -0.945386723
##  [75,]  0.58829104 -0.240613522 -0.71251340 -1.101479763  0.095463990
##  [76,] -0.48668341  1.304584155 -0.38090163  0.413177200  1.324343076
##  [77,] -1.90158570 -1.946690795 -0.04527455 -0.879478431 -0.194863104
##  [78,] -0.10417117  0.731844064  0.24417740 -0.091938863 -1.171475626
##  [79,] -0.24818358  0.036366032 -0.76170532  0.578157581  1.631727421
##  [80,] -0.28228700  0.801807575 -0.26125847  0.225070945  1.078140091
##  [81,] -0.71447890  0.429740974 -0.91695583 -1.173302458 -0.262568945
##  [82,] -2.10630007 -0.168677770  0.52498136  1.119539669  0.285490338
##  [83,] -1.84955461  0.304209863  1.31178682 -0.044027330  1.384459765
##  [84,] -0.49681393  1.446217437  0.20313568  0.381450334  0.760300204
##  [85,] -0.87645171 -0.709555610 -0.07693168  0.524256343  0.471976445
##  [86,]  0.62274653  1.036894974  0.08349875 -0.457824994  1.882027646
##  [87,]  0.72015484  0.022371035  0.49181724  0.121002392  1.344160394
##  [88,] -0.63549346 -0.851382710  0.75722169  0.295998925 -0.480144263
##  [89,] -0.83516607  0.079357343 -0.32562599 -0.083620251  0.406460052
##  [90,] -0.83886743 -0.486421033 -0.45732155  0.432432969 -0.327905934
##  [91,] -1.31877026 -0.179337584  1.48314130  1.470338398 -0.004744144
##  [92,] -0.32623394 -0.002692377 -0.49028371  0.596831166  0.064257541
##  [93,]  0.16954399  0.126026483  0.04033577 -0.262250082 -0.256998302
##  [94,] -0.09315430 -0.534438065  0.09812260 -0.382759412 -0.648203322
##  [95,]  0.53392198 -1.135612742 -0.87762757  0.859389512  0.514001842
##  [96,] -1.19884526 -0.549114572 -1.56752591  0.239325715 -1.303515062
##  [97,]  2.04488234  0.004498460  0.13043188  0.113843457  0.297524061
##  [98,]  1.53859083 -1.073112445  0.95528916  1.372440721  1.336885789
##  [99,]  0.32563649  0.097049639  0.59309685  1.572718137 -0.017593335
## [100,]  0.69851180 -0.643065216 -0.99225559 -1.391946743 -0.721318841
##              [,41]        [,42]        [,43]        [,44]        [,45]
##   [1,]  0.42729455  0.822993561  1.24752293  0.652816010  1.18442382
##   [2,]  0.67130644  1.737528563  1.11148325 -0.999005740  1.94904862
##   [3,]  0.99467483  0.298205415 -1.20286481 -1.573859457 -0.28044474
##   [4,]  1.51385687  1.587901586  0.51636888  1.123847157 -0.98452119
##   [5,] -0.55873290  0.321048076 -0.03039004  0.515496723  0.84178835
##   [6,]  0.08473509 -0.580245977 -0.33364271  0.790880080 -0.79019699
##   [7,]  0.50240860  0.486305653 -0.25534153 -0.657935617  1.50326207
##   [8,]  0.41975296 -0.818724518 -0.14934735  0.293741203  0.61477009
##   [9,]  0.74900558 -0.666620736  0.01862678 -1.088639995  1.41852804
##  [10,]  0.65857519  0.174246357  1.42022304  0.687006774  0.21802809
```

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## [11,]  -0.95910466   0.647382632  -1.50964839   0.280406124  -0.71226174
## [12,]  -0.57904067  -1.414536756   0.66398726  -1.259469296   0.67286886
## [13,]  -1.71934653  -0.366557085  -0.45609749  -0.103500346   0.50316102
## [14,]   0.13800814  -1.940060597   0.94533395  -0.687613596   1.08755835
## [15,]  -1.68891893  -0.414100766   1.89629602   1.130250163  -0.97038286
## [16,]  -1.30513431   1.080423074   0.51202425  -1.742349813   0.08687690
## [17,]   0.79465338   0.167792445   0.59131220   0.362034705  -1.94912618
## [18,]  -0.46823691  -0.986286802   0.53813342  -1.010038425   1.61663016
## [19,]   2.52006504   1.952398442  -1.05532485   1.048582068  -1.57868017
## [20,]  -0.81178577   0.217414228   0.18680296   0.131015415  -1.36269117
## [21,]  -0.58464894  -0.144201833  -0.54562300   0.714916804  -0.84245898
## [22,]   0.36920252  -1.026789984  -1.32531124   0.944087356  -1.61216592
## [23,]   1.76511903  -2.062483100   2.30446956   0.000350976  -0.17572740
## [24,]  -0.54430830   0.439342546  -1.61034257   0.276905345   0.93154767
## [25,]  -1.04534733  -0.306286094  -0.97635653   1.162389131   0.62447660
## [26,]   0.38859592   1.909150463  -0.13911654  -0.357255213   0.97841770
## [27,]  -0.91533345   2.737760839   0.21276633  -0.396581185  -0.51472914
## [28,]  -1.66256924  -0.090137250   0.07301886  -1.669205839  -0.22738043
## [29,]  -0.44674917  -0.914044628   2.15215481   0.109106270  -0.86652067
## [30,]   0.80820277  -0.998730959   0.89060260   0.813374948   0.54860682
## [31,]   0.75659300   0.634069955   0.13827011  -0.924416020   0.03386926
## [32,]  -1.62902739  -1.312776123  -0.08225089  -0.467372012   0.65632608
## [33,]   0.76268048  -0.014134349   0.13030174  -0.669815292   0.14022959
## [34,]   0.18908247   0.716419639   2.62585457  -2.489703616   0.04451549
## [35,]   0.84303105   0.867441451  -0.20753165   0.383064111   0.19440098
## [36,]   0.63694281  -1.172821028  -1.34779892   2.072182241  -1.28005763
## [37,]   0.52400474   1.012513721   0.19856653   0.173983582  -0.04360924
## [38,]  -0.57848612  -2.027173345   0.85155099   0.344229006   1.11255754
## [39,]  -0.67357263  -0.019338593  -0.50916976  -1.164474667  -0.34754729
## [40,]  -1.49778411  -0.107543888  -0.32053619   0.984769675  -0.68126357
## [41,]   1.94665717   0.865167246   0.27404756  -1.853479409  -0.34822489
## [42,]   1.16760410   0.084604591  -0.36844915   0.797463324   0.93236829
## [43,]  -0.62797889   1.915785129  -0.02438251   2.425950536  -0.52666848
## [44,]  -0.72470762   0.614354691  -1.26141541  -0.379772586   0.34472708
## [45,]   0.63830077  -0.194662106  -0.88111657   1.142340351   0.16958871
## [46,]  -0.96749358   0.152642583  -1.30570144   1.448158294   0.74446694
## [47,]  -0.46646183   0.028031771  -1.22982567   0.336509614  -1.69933133
## [48,]   0.63571219   0.346030157  -0.58236522   0.778085643  -0.02502248
## [49,]  -1.21169512  -0.008717727  -1.66397029   0.133143151   2.21279728
## [50,]   0.01520945   0.380617968  -0.25821773   1.010358599  -0.45346367
## [51,]   1.29976985   0.557451043  -1.49459008   0.370720431  -0.42510979
## [52,]   0.59515972   0.356241471  -0.03569452  -0.407100689  -0.46043818
## [53,]  -0.42671029  -1.287116686  -1.55481658  -1.569859494   0.10759310
## [54,]   0.48844020   0.248883173  -0.49299726   0.069602082  -0.99657155
## [55,]  -0.01066551  -0.352832826   0.07825768  -0.366444615   0.07091057
## [56,]   1.61378579   0.567658274  -1.35989237   0.212248952   2.15710615
## [57,]   0.06627046  -0.188936600  -0.52969708  -0.931355963  -0.28815084
## [58,]   1.71403156  -1.104780251   0.29832056  -1.235935840  -0.24904337
## [59,]  -0.16752383  -0.202681113  -0.50278243   0.816856375  -1.15493468
## [60,]   0.54006490  -0.295579047  -0.30080871   0.947793849  -1.41787969
## [61,]  -0.33345388   2.016821415   0.70450108   0.667643155  -0.23431676
## [62,]   0.79122392   0.599420584   0.68643110  -2.508643145   1.61428580
## [63,]   0.35327105  -0.270319555  -1.44888873   0.586569441   1.30401790
## [64,]  -0.78107164  -1.020454481  -0.63770777  -1.089804196  -0.63926192
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## [65,]  -0.02412029  0.093812649  0.03856060  1.461346636  1.76312643
## [66,]   0.30401684  1.002702337 -1.26127914  0.019216570 -0.75803737
## [67,]   1.50819469  1.186347542 -1.21046539 -0.726037115 -1.33835262
## [68,]   0.21392458 -1.536256006 -0.62148634 -1.005815086 -0.29797016
## [69,]  -1.00945560 -0.607841855 -1.35736211  0.516245483  0.28096052
## [70,]  -0.48841857 -1.859337861  1.12264341  0.234661788 -0.99275627
## [71,]  -0.15916131 -0.180956582  0.35234402 -1.002828251  0.54874891
## [72,]   1.29903957  0.387491058  1.72087981 -0.051290168 -0.28988928
## [73,]  -0.86108936  1.017692348  0.13490023 -0.282474773  0.09690304
## [74,]   0.23961718  1.849294587  0.35320395  0.413013670 -0.47773276
## [75,]  -0.40541064 -1.396525177 -0.35470619 -0.602285319 -1.55772534
## [76,]   0.91064441  0.157204900  0.98749806  0.745238330  0.38022402
## [77,]   0.72435843 -0.677398273 -0.19911238  0.964357216 -0.58667547
## [78,]   0.17936373  0.423494794 -0.25984655  0.940277680 -0.13681541
## [79,]   0.91707802 -1.168063533  0.22917649  0.594284018 -1.24317933
## [80,]   0.87417649 -0.475585021 -1.26582676  1.561602550 -0.24434669
## [81,]  -0.81062770 -1.015410291  1.38831412  1.868497326  0.62882936
## [82,]   0.03754786 -0.440343273 -0.60577417  0.069883502 -0.32022877
## [83,]  -0.82677325 -0.508411161  0.91594011 -1.383610039 -1.88411471
## [84,]  -0.28612457  0.296198802 -0.12404305  0.398865770 -0.78933997
## [85,]   0.39432667 -0.443209072 -0.25893873  0.795897532 -0.65254849
## [86,]   0.54546579 -0.428825241  0.21167531 -0.952975796  0.23269429
## [87,]  -0.48545131  0.134272583 -0.09504157 -1.791924564  0.32451030
## [88,]  -0.07606592 -0.451440214 -0.10127334 -0.177052343 -0.26688009
## [89,]  -1.62702732 -0.342354489  0.83318053  0.300380543 -0.80256980
## [90,]   1.11229297 -1.604112519 -0.16278131 -0.154208405  0.28506262
## [91,]   0.24187062 -1.328253208 -0.24799367  0.795414343  1.31015359
## [92,]  -0.30538875  0.004627850  0.16817262  0.238233851  1.48739512
## [93,]   1.14727895 -0.690651735  0.57976239  0.638765904  1.25289105
## [94,]   0.41107381 -1.643806133  1.50945186  0.311459391  0.26966463
## [95,]   1.15249695  1.202418230  0.69600699 -0.893564370  2.45112730
## [96,]  -0.04417171 -1.829867166 -0.87599532  0.240399439  0.20705325
## [97,]  -2.90664545  0.800176073  1.39963427  0.042198110  1.27503432
## [98,]   0.59284028  0.792793791 -0.54593282 -0.819062178  1.58352737
## [99,]   0.40612715  0.837584550  0.09698804  0.308542937 -0.92805082
## [100,]  0.06053438  0.195414362  0.80017287 -0.684589280  0.41162630
##              [,46]        [,47]        [,48]        [,49]        [,50]
##   [1,]   0.620046086 -0.905362758  0.4661662294  0.555252979 -0.08233971
##   [2,]   2.366528822 -2.183436265 -0.0778726244  0.238040139  0.09840594
##   [3,]   0.070613390 -0.285622591  2.4809687014 -0.511065483  0.22695521
##   [4,]   0.851844989 -0.768101954 -0.2568782116  0.065828408 -1.73802270
##   [5,]   1.243866977 -0.346709167 -1.1641869523 -1.048615498  0.35155713
##   [6,]   0.884429090  1.497954176 -0.6462414652  0.770909152 -0.05670992
##   [7,]   0.552875818 -0.344291794  0.4089862842 -0.342673106 -0.41737632
##   [8,]  -0.747852605 -0.237114990 -0.1905044249  1.332878504 -0.45444696
##   [9,]   0.236657382 -0.742030664 -0.2127643581 -0.168060064 -0.51543266
##  [10,]  -0.250187840  0.778452103  2.3032508801  2.294858767  0.35040369
##  [11,]  -0.115478771  0.779613998 -0.7036865267  0.403904485  1.24567966
##  [12,]  -0.306491416 -0.977003508 -0.8617318637 -1.230090064 -0.42109524
##  [13,]  -0.167557109 -0.984052390  0.9434537420  0.004948872 -0.02758531
##  [14,]  -0.236975114 -1.200961803 -0.9258932235  0.072259731  2.97862100
##  [15,]   0.835882853  2.075910418 -1.0638663447  0.833311126  1.92645674
##  [16,]   0.048871012 -1.152690910  1.2960777989 -0.982130667 -0.10367918
##  [17,]  -0.301566389 -0.023143877  0.2397514098  0.022690994  0.71089371
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##  [18,] -1.028501816  0.847056981 -0.5341901183  0.881216710  0.15188141
##  [19,]  0.769464609  0.294178482 -0.1045835537  0.463338615 -0.04209345
##  [20,]  1.041307745 -0.533291966 -0.5926457824  0.835195434  0.89647058
##  [21,]  0.314870090  0.005193754 -1.5772564893 -0.394307503  1.05052156
##  [22,] -1.241337521  1.243469731  0.3186206176 -0.745004728  0.13308703
##  [23,] -0.536441078 -0.562977351  2.4530230270 -0.735733946  0.35584862
##  [24,] -0.967519173  0.903312593 -1.0694495419 -0.113126441 -0.65206887
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##  [97,]  -1.032701078  0.279368542  0.47301590  1.436471756 -0.38340382
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##  [17,]  -0.15598392  0.006174181 -1.08471851  0.375305878 -0.70844289
##  [18,]   1.26808386 -0.729457176  0.67753912 -0.915620486 -0.43313223
##  [19,]   0.22504810  0.378824793  0.76340840 -0.454104935  2.38887343
##  [20,]   1.62393275 -0.368319486  0.10067515 -0.318512795 -1.39672215
##  [21,]  -1.11484549  1.697303535 -0.43474324  0.697462538  0.45876947
##  [22,]   0.71804679  0.120820492  0.71309510  1.864076758  0.17107774
##  [23,]  -0.58022061 -2.354705849 -1.26109929 -0.579718668 -0.45192569
##  [24,]  -0.29959382  0.977568567 -1.12033372  0.501684770 -0.58674673
##  [25,]   1.43824709 -0.760677516 -0.49011088  1.913336123 -0.51989299
##  [26,]  -0.34634358  0.707636078 -0.35990439  0.648112584 -1.49218567
##  [27,]   0.76280559  0.821874203 -0.03596826  1.548743476  0.97799142
##  [28,]   1.91872370  0.360165471  0.10036951 -0.805721970 -0.81292490
##  [29,]  -0.15552641  0.382511123  1.42376334 -0.622105144  0.89035374
##  [30,]   0.40287491 -1.226601233 -2.02830971  0.816331583  1.43815661
##  [31,]  -1.72901207 -0.261950362  1.09606604  0.268182826 -0.20923691
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## [32,] -1.10552564  1.565451649  0.21664865  0.110232242 -0.40742437
## [33,] -0.58818543  0.201048522  1.45551591 -0.578517575  0.46773048
## [34,] -0.26842910  0.253614066 -0.35517761 -0.686162302 -1.43020709
## [35,]  0.34597224  0.276012519  0.24114579 -1.104424314  1.53575969
## [36,]  1.30617892 -0.053495482 -0.21018348  0.796029591 -0.49919068
## [37,] -0.58011576 -0.658180242 -1.58081685 -0.459761547  0.53420298
## [38,] -0.86301677 -0.200030201  1.76390393  0.716485161  1.52809730
## [39,]  0.40089222  0.771626491 -0.13662243 -0.196605277  0.81257629
## [40,]  1.10689317  0.578322295 -0.91541170 -1.209381404 -0.55392159
## [41,]  1.35576649 -0.164289538 -0.36971641  0.459850205 -0.47647337
## [42,] -1.36294432 -0.836249907  1.01545781  0.999633597  0.01258759
## [43,]  1.32506673 -0.569433575 -1.83926249 -0.339728448 -1.11553139
## [44,] -0.26841398  0.065663585  0.76802308  0.328761237 -0.92239355
## [45,]  1.59480752 -0.346010461 -0.78962538  0.031493035  0.72956448
## [46,]  1.16688747  0.523155198  1.80756497  1.197389552 -0.66112242
## [47,]  0.83262690 -1.804118893 -0.26185572 -1.065655982 -2.15173002
## [48,]  1.19781368  0.494242435  1.03144785 -0.909978732 -1.22064365
## [49,] -0.75884214  0.403646010  1.60729664  1.058494708  0.82680248
## [50,]  1.18370742  0.686402512 -1.04534214  0.953573797  0.03069773
## [51,] -1.59789118  2.377903647  0.45838577  1.819095875 -1.70462668
## [52,]  0.44284008 -0.715141419 -0.53893002  0.851436130  0.78782001
## [53,] -0.71348413 -0.848956133 -0.43327479  0.768874165  0.45745207
## [54,]  1.63589515 -0.293764442 -1.26464126  0.030432366 -0.37296345
## [55,] -0.92568755 -0.252777379 -1.32858642  0.103070211 -0.41307593
## [56,] -0.96238389 -0.807404242 -2.32542931 -0.822931780 -0.59727186
## [57,]  0.68977697  0.374382942  0.04748559  0.366899550 -0.15251179
## [58,]  0.27405096 -2.136929114  0.85482028  0.188503749 -0.78314723
## [59,]  0.18039584  0.444670871 -0.14461991 -0.858371907 -0.25573941
## [60,]  0.98665819 -0.307200270 -0.27313286  0.457289718  3.10715207
## [61,]  1.61233098  0.367799146  0.29115007  0.001548294 -0.94431131
## [62,] -0.13845651  0.770686651 -1.16023464  0.990603002 -1.20241121
## [63,]  1.23994326  1.289926434 -0.88212006 -0.348159754 -0.10833661
## [64,] -1.57407958 -1.748607627  1.58609205  1.625894352 -0.63895317
## [65,] -1.55881150  0.565723720  2.07434921  0.118986288 -0.32120601
## [66,] -0.03872956 -0.308936747 -1.43452262  0.092303343 -1.93241214
## [67,] -0.73913933  0.569498092 -0.61087352  1.294213762 -1.65069475
## [68,] -0.30112487  1.530216330 -0.80138130  0.374154721 -0.50765524
## [69,] -0.20281344 -0.847248483 -1.00047345 -0.077284799 -1.24784484
## [70,] -1.40417017 -0.598230541  0.13482824 -1.186395970  0.36940453
## [71,]  0.15057838  0.570160134 -1.14494017  1.147538367  0.39807515
## [72,] -0.71010506  1.238762256 -0.57164052 -0.281422367 -0.98083038
## [73,]  2.08157773 -0.504173321 -0.85627216 -0.560616459 -1.60252815
## [74,] -2.06742693  0.018949045  0.47759808 -0.357646816  1.33309181
## [75,] -0.07224454  1.155110055  0.71335823 -0.401367014 -0.04468779
## [76,] -0.28111238  0.232578413  1.52239204  0.580818970 -0.68772212
## [77,] -0.17477540  0.522981868 -0.58773919 -1.377584934  1.94723044
## [78,] -1.14230919 -2.454835031  0.75582694  0.470801173  0.27801347
## [79,] -0.25339812 -0.564027550 -0.66810365  1.440653561 -0.25151604
## [80,]  0.51288710  1.979118848 -0.57564604 -0.624777854  0.02946549
## [81,]  3.19278586  1.150308364 -0.50898911 -0.274566864  0.88842431
## [82,]  1.53995145  0.394560989 -0.52638861 -1.336213600 -0.28152958
## [83,] -0.93047517  0.371778562  1.19944855 -2.245247826 -1.52780298
## [84,] -0.73054038 -0.765764530 -1.18572083 -1.306838574  1.55755197
## [85,] -1.19445876  0.084546236 -0.15628796  1.463279954  1.79136935
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##  [86,]   0.46467949   0.329740730  -0.73178533  -0.338383713   1.70787852
##  [87,]   1.65747027  -1.085159289   0.84066304   0.340478578   0.46986468
##  [88,]   1.12382652   0.917159455   0.28837484   1.537348284   0.84390429
##  [89,]  -0.76205114  -2.190142392   0.80024098  -0.167399586  -0.19767940
##  [90,]  -0.81317344   0.677780997  -0.59483787   0.158647256   1.14756571
##  [91,]   0.93113542  -0.037221548   0.37537376  -0.230107793   1.05130579
##  [92,]   0.12375030   0.018033974  -1.46340074  -0.680654435  -0.50539702
##  [93,]   0.19336089   0.672972805  -1.21905453  -1.125127203  -1.20129871
##  [94,]  -2.79800898  -1.556393386  -0.32068827  -0.920057675   0.52251681
##  [95,]  -0.76946920   0.104416807  -0.29453724  -0.514610379  -1.55706895
##  [96,]   0.65100673   0.112138386  -0.70732286   0.250927883  -0.78536765
##  [97,]  -1.29921712  -0.747041208   0.69183180   0.653699692  -0.18671348
##  [98,]   0.14836770   0.302563634   0.33655638  -1.901230016   0.25972058
##  [99,]   0.73632483  -0.510924316   0.68088627  -0.442728840   0.51765301
## [100,]   0.54042805   0.559679997  -0.30641934  -0.115468875   0.37517171
##              [,61]        [,62]        [,63]        [,64]        [,65]
##   [1,]   0.78051115  -1.523077273  -0.245983986  -0.005092181   0.225212954
##   [2,]   0.43361489  -0.168683458   0.162934858  -0.183553608  -0.051299607
##   [3,]   0.53103276   0.010221709   2.927557337   1.585266314  -0.664393751
##   [4,]   0.39331389  -0.944389023  -1.673116945   0.312650749  -0.199495375
##   [5,]  -1.65914949  -0.582022721  -1.167269940   0.803230879  -0.028174979
##   [6,]  -1.24630422   0.954510226  -0.038351143   0.275564006  -1.475577840
##   [7,]   1.19899252   0.283271958   0.080168236  -1.776896345   0.963219483
##   [8,]   0.79938503   1.057962917   1.095196294  -1.224624785   0.319201955
##   [9,]  -0.09894661  -0.828120583   0.041899009   2.046690143   0.570615264
##  [10,]  -0.15890431   0.897395668  -0.230250054   1.163741010   0.345501727
##  [11,]  -0.29514180   1.005151593  -0.811706369  -1.002622828  -0.029972363
##  [12,]   1.45320619   0.062409983   0.650318818  -0.413263057   0.574901764
##  [13,]  -0.18484122   0.053804371  -1.120421078  -1.010054835  -1.342690782
##  [14,]   0.65258754   1.065792026   1.056815799  -0.374244700   0.398332696
##  [15,]  -0.19691544  -0.170293311   0.002790209   0.360945873  -0.456045339
##  [16,]   0.08600931   0.810004925  -0.788036650  -0.177408891   0.780385582
##  [17,]   0.44414040  -0.416631875  -0.272396593  -0.736980677  -0.847779404
##  [18,]  -0.49138780  -0.007882879   0.087094828   0.444505751  -0.296518947
##  [19,]  -1.55793566  -0.097348122   0.172121674   0.412213970  -0.107002328
##  [20,]   0.05762833   0.071807336   0.030170238  -0.212737937  -0.255230921
##  [21,]   1.17586040  -0.901822736  -1.465025886  -1.270534149   0.690110872
##  [22,]   1.06815905   1.080656415  -0.856793784   0.227286045   1.334418371
##  [23,]  -0.86929083  -1.053141271  -0.753504076  -0.969800162   1.618687600
##  [24,]  -0.38958682  -0.648824840  -0.444639036  -0.862796901   2.015722363
##  [25,]  -0.01575242  -0.518134626  -1.058870699   0.114484563  -1.062441249
##  [26,]  -1.47789280   1.575656465  -0.408042718  -0.820908903   0.307336169
##  [27,]   0.75738614  -0.959574491  -0.448953162   0.388865572  -0.872348853
##  [28,]   0.19036982   0.991741863  -1.229631657  -0.783614445   0.514090761
##  [29,]   0.05162114  -0.642972767  -0.394506515  -1.430069455  -0.184745349
##  [30,]  -0.71707886   1.277975300  -0.280079805  -0.488038938  -0.282003017
##  [31,]  -1.91225751  -0.308072614   0.475003017   0.061790726   0.805645444
##  [32,]  -1.51549343   1.046690180  -2.084441878   2.982561097  -0.594755708
##  [33,]   0.84547605  -1.034634163   1.524198735   0.653434170   1.524436195
##  [34,]  -0.87749288  -1.136779441  -1.078403453  -1.546934542   0.241919255
##  [35,]   0.35862006   0.479822818  -0.698452479  -1.298696021   0.669711580
##  [36,]   0.60674046   0.266186019  -0.246170015  -1.233268802  -0.370581285
##  [37,]   0.54070683   0.128998064   0.520155505  -0.680377689  -1.152727049
##  [38,]  -0.07400891  -1.103040947  -1.065859813   0.479681443   1.248688589
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## [39,]  0.49396027 -0.705802360  1.171337871 -0.792756789  0.120098825
## [40,]  0.10796732  2.051615002  0.066546996  1.551314273  0.006335366
## [41,]  0.26269666  0.618389995 -1.087025373  1.124295772 -0.256043241
## [42,] -0.30830153 -0.782586987 -1.011631684 -0.195136299 -0.369775381
## [43,] -0.46950748 -0.504477783 -0.585581688 -1.031396820 -0.314897509
## [44,]  0.46287727 -0.684140402 -0.844272454  0.828480987 -0.221449467
## [45,] -0.30974695 -0.178026983 -0.005740142 -0.615587781 -0.836747070
## [46,]  0.76924984  2.030840625 -0.267694889 -1.481335508 -0.836494749
## [47,]  0.28300739 -0.308693237 -0.074046516  0.516964697 -1.262026890
## [48,] -1.63041674  1.656542061 -0.348685165 -0.077343260  0.759666032
## [49,]  0.26148274  0.854758249  0.681133976  1.091828068  0.169802760
## [50,] -1.23958158  0.354510060 -0.047657110  0.314065894 -1.354477311
## [51,]  1.35842430 -1.566781702  0.010864989  0.506330754 -1.569631695
## [52,]  0.94635459 -0.616443609 -0.029889857  0.156228944  0.104525459
## [53,] -1.24654632  1.628305836  0.831006673 -0.317233500 -1.621194088
## [54,] -1.24154486 -1.366009356  0.455986778  1.158744861 -0.315735472
## [55,]  1.40272612  1.014596540 -0.146959760 -0.687770602  0.471187356
## [56,] -0.24788252  0.500987989  0.189832217  1.647072163  0.818214018
## [57,]  0.63694168 -0.891507067  0.566627226  0.067011580 -1.330251670
## [58,]  0.29518803 -0.991860490 -0.338361678 -0.326535933  1.075887587
## [59,]  0.36541539  1.609245620  0.958730111  0.174445597 -0.886349695
## [60,]  1.15404449  0.566578156  0.888968633  0.339551270 -0.129026777
## [61,] -0.33313040  1.001627846 -0.083749413  0.103617138 -1.080731561
## [62,]  1.38319627  1.033058990  1.457013484  0.672751195  1.218858777
## [63,] -0.35328068 -2.664402061 -0.399264243 -0.626588368 -0.714341168
## [64,]  0.11444864 -0.532386405  0.917520451  0.198266243  0.522214184
## [65,]  0.80823451  0.537288078  0.503856472 -0.118422429 -0.669150809
## [66,]  0.39418196 -1.009286963  0.378095259  0.958600745 -1.009194680
## [67,] -0.70701230 -0.904812390 -1.822456915  0.667661273  1.033639522
## [68,] -1.26922782  0.420241912  0.751265059 -0.601592146  0.557173868
## [69,]  1.08306305  0.452264440 -1.261606223 -0.959439802  2.468386802
## [70,] -0.57895484  1.408507773  0.615182502  1.493454732  0.051867374
## [71,] -0.34412039 -0.815729155 -0.310801538 -1.769186589  0.946628799
## [72,] -0.56894361  0.383311441  1.366093142  0.643916706  0.525684381
## [73,] -0.30202481  1.328410029  1.401798853 -1.324365323 -1.636076788
## [74,] -0.01734039  0.667918115 -1.081384253 -0.136192024 -1.249961476
## [75,]  0.60668434 -0.625350373  0.727972198 -1.132793088 -1.099643875
## [76,] -0.95406260 -0.944345527 -0.785803082 -1.088488087  1.006853935
## [77,] -0.20327444 -1.566185280 -0.326443156 -0.815577563 -0.403679009
## [78,]  0.26729369  0.307768733  0.646524255 -1.103126446 -0.647687966
## [79,] -0.86881715 -2.502999574 -2.392563093  2.130895045 -0.618995457
## [80,] -1.62363848  1.489096854 -0.536121112 -1.217709340 -0.039666882
## [81,] -0.34020201  0.580736819  0.887467787  0.439692565 -2.343772940
## [82,] -1.27586222 -0.125184689 -0.782460028 -0.939217718  0.698755244
## [83,] -0.24467099 -1.471449677 -0.651184313 -0.927866638  2.143276067
## [84,]  0.95927513 -0.890929897 -0.003024634 -0.666296809 -0.309508192
## [85,] -0.11205192  0.794334567 -1.452024664 -1.059578299  0.911844282
## [86,]  0.15951087 -1.330337797 -0.200741927 -0.990600285 -1.119256829
## [87,]  0.92237311 -0.728581851 -1.331064004  1.612901829  2.027664775
## [88,]  0.90667433 -0.267551649 -1.432162823  0.072599879  1.186390165
## [89,] -0.64155211  0.649211679 -0.250746344 -0.472787656 -0.066850421
## [90,] -0.60859222 -0.140688241 -0.887624895 -0.328510175 -2.059623960
## [91,]  0.03098931 -0.195623765  0.117509049  0.179411702 -0.672568667
## [92,] -1.02902035  0.168683140 -0.323740082  0.167632455  1.775202656
```

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## [93,]  -0.90372991 -0.670550491 -0.907175712  0.198256288  0.991700722
## [94,]   0.68722570  0.536167113 -1.282219852  1.797810522  0.242318029
## [95,]  -1.49898417 -0.481621683 -0.174874648 -0.127516495 -1.536042279
## [96,]   0.12607592  1.086255318 -2.030941485  0.253145026  1.035458209
## [97,]  -0.01345626 -0.335793044 -0.650388385  0.161183175 -0.061340157
## [98,]   0.25328625 -1.830869294  0.688969928  1.877003045  0.952560335
## [99,]  -0.74122343 -0.995811664  0.491520543 -0.034713376 -0.626705876
## [100,]  0.55468091  2.844251135 -2.126206307 -1.758080195 -0.837877922
##               [,66]        [,67]        [,68]        [,69]        [,70]
##   [1,]  -1.63157713  0.051677912 -0.6191986641  0.75524096  0.267018653
##   [2,]  -0.92945023  1.261407066  1.1569982456 -0.04419233 -1.037030072
##   [3,]  -0.80105412  1.714240117 -1.4805378573 -1.18869904  1.251590247
##   [4,]  -0.44416891 -0.311446294  0.0128612072  0.10643940  0.619296102
##   [5,]   0.80279507  1.706077495 -0.0581826673  0.49869683  0.319749126
##   [6,]  -1.20710544  0.072262668 -0.8743881815 -0.88252006 -0.484232415
##   [7,]   1.30826215 -0.199100742 -0.1570617141 -0.95460929 -0.075930655
##   [8,]   0.34782022 -1.048260330  0.0210955408 -0.34346445 -1.483343244
##   [9,]  -1.68301722 -1.404891774 -0.0509637418  0.97641807  0.147592601
##  [10,]   0.22328668  1.118834090 -0.6493068803  1.33566500 -0.047453720
##  [11,]   0.67538686  0.911228612  0.4869571337 -0.96393737  0.096082640
##  [12,]  -1.02672928 -0.313575594  0.3589201485 -0.46002266  0.272655979
##  [13,]   0.13436178 -1.513364341  0.3870056075 -0.89968754 -0.569761182
##  [14,]  -1.43672044 -1.542101833 -0.0009481861 -0.87879870 -1.396028948
##  [15,]   0.38019767 -0.505725703  1.7629280908  0.97487391  0.416048390
##  [16,]  -0.16176443  0.564198122 -0.1159856063 -0.26838948  0.421160904
##  [17,]  -0.20916744  0.036894298 -1.4340065612  2.20513303  0.080523563
##  [18,]   1.04644118  0.589915776 -0.4513244573 -0.71495713  1.166022392
##  [19,]   0.18690815  0.859077795  0.4489309729 -0.94551558  1.593995455
##  [20,]  -1.11475044  0.419555770 -0.6037224408  0.07052174 -1.475115482
##  [21,]  -1.37144207  1.992150461 -0.5812089832 -0.35975060 -0.414611035
##  [22,]   0.41254565 -0.239818270  0.4322409579  0.88051379  0.591923446
##  [23,]  -0.52485672 -0.890400719  1.2903272681  0.45933634  0.082785668
##  [24,]   0.73170615 -0.344899518 -0.0544657784 -1.92154471  1.284910477
##  [25,]  -0.55636835 -0.535006915  1.0017798472 -0.24637861 -0.574235189
##  [26,]  -1.48505230  1.982067618  1.1089051323  0.17102256 -2.130003477
##  [27,]   0.51876632  0.422250362 -0.1456099451 -0.69992765 -0.628849136
##  [28,]   0.30306557 -1.758123325 -1.1254667174 -0.12265974  0.119048500
##  [29,]  -0.61516790  0.935311653  0.1479471697 -1.79855962 -0.112197228
##  [30,]  -0.49505911  0.380344147  0.2519646920  1.36289351 -0.392046768
##  [31,]  -0.26901159  1.221583623 -0.8465143017  0.22777409  0.977032560
##  [32,]   0.51027648 -0.586673033 -1.1414484268 -0.49269212  0.758471966
##  [33,]   0.45324549 -0.037795975  0.9452655506 -0.54057080  0.262685110
##  [34,]   0.11953503  0.046668841 -0.4493883697 -1.10854491 -0.944838087
##  [35,]  -1.07139135  0.767555883  0.6341708815 -0.13208357  2.249276941
##  [36,]   0.59619119  1.229675886 -0.5861189006 -0.70748635 -1.064447959
##  [37,]   0.60667074  1.329455536  2.1095508602 -2.42614461  1.285810664
##  [38,]  -0.71829877  2.016714834 -0.7825875567 -0.71537839 -0.349525368
##  [39,]   0.89793143 -0.093910107  0.2415055710  0.89148001 -1.395545472
##  [40,]   0.61529612 -1.137766766  0.3480491873 -1.89289058 -1.405010464
##  [41,]  -1.90746329 -1.126434150  0.0800180426 -0.12788508 -0.340795437
##  [42,]   1.11941206 -0.757588978  0.3220231545  0.14103879 -0.647817548
##  [43,]  -0.71058730 -0.004435064  1.3857009976  0.71142869  0.853840260
##  [44,]  -2.26359338  1.435757221  0.7812596480  0.24299575 -1.057524187
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## [46,]  1.26880933 -1.741167792  0.4708342219 -0.50714320  0.513071928
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## [48,]  1.66823462  0.671637222  0.9592980888  1.05863511  0.616245512
## [49,] -2.51301680 -0.199754037  0.5260017919  0.76957022 -0.427460126
## [50,] -1.55668668  0.275406821  0.8564065835 -0.28432390  1.306072444
## [51,]  0.43655395  0.728910746 -0.5632741348  0.03067787  0.021930408
## [52,]  0.64576071  1.289111496 -0.5846086600 -0.64943992 -0.758271676
## [53,] -0.62739815  0.301421750 -0.5562803289  0.35661551  0.609815031
## [54,] -1.58451426 -0.282522017 -0.1556517226  0.60516198  1.540023105
## [55,] -1.30530596 -0.037334598 -2.3524285855  1.44682341 -0.022210322
## [56,]  0.43077829  0.701536299  0.2624964456 -0.28873710  1.770360989
## [57,] -0.36914916  0.616634775  0.6239018739  0.64005923 -0.199943814
## [58,]  0.25110060 -1.268110928  0.0453874387 -0.80635404  0.853234960
## [59,]  0.66109077  0.775893110  1.0058094622 -0.04424215  0.717757597
## [60,] -0.83002764 -0.121761721  1.0227206463  0.46538246 -0.142490218
## [61,]  0.29601464 -0.371575849 -2.0418275077 -0.78355323  2.327257956
## [62,]  0.51386079 -0.211824071 -0.4747707302 -1.52909860 -0.333134298
## [63,]  0.74542739  0.582725271 -0.1010804390  1.70963107  0.091928594
## [64,]  0.60604170 -0.727868665 -0.3508424271 -0.23742572  1.195989917
## [65,] -1.08019123  1.550057150 -1.5364788232  0.93981135 -1.822612528
## [66,] -0.44537900  1.049166688 -1.5607519036 -0.15582401 -1.761709904
## [67,]  1.38872662 -0.289495477  0.7369498088  1.37663278 -0.912258695
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## [69,] -1.89502066  0.420800000  0.0871173014  1.19924960  1.914659398
## [70,]  0.96794288 -1.389286707 -2.4268877839  0.45809298 -0.828251126
## [71,] -0.54653331  0.654096981  0.0220283282 -0.11948876 -0.685116013
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## [74,] -2.33052433 -1.885484830 -0.2968481575 -0.81190635 -0.735553320
## [75,] -1.03377626 -1.156464546 -0.0430709809 -1.34685804  1.806573675
## [76,] -0.66172342  1.797464432  1.3092111621  1.36805516 -0.775143732
## [77,] -1.08254051 -0.304516553 -0.0192200991 -0.17978637 -0.665814128
## [78,] -1.15894839  0.338402517  0.2033569319 -1.04910167  0.006329724
## [79,] -0.41734330  0.833523544  0.3867616868  1.51622467 -1.357208782
## [80,]  0.49389860  0.299191469  1.0057468404 -0.30340552  1.051334655
## [81,]  0.12596446 -0.505863490 -1.4528006857 -2.93411321 -1.741749736
## [82,]  0.35553857  0.364619249  0.3225747113 -0.43125518 -0.728408392
## [83,]  0.90298632 -0.524588013 -0.3360696499 -0.76364019  1.563923869
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## [85,] -1.15389950  0.057911971 -2.4432476720 -0.05254338 -0.371709647
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## [87,] -0.12346500  0.322026660 -1.7351920652  1.11127671  0.526103177
## [88,]  0.71249247  2.118958911 -0.9400163159 -1.50897138  0.659606654
## [89,]  0.63177147  0.367009810  0.5148355823  1.03001535 -0.456629135
## [90,] -0.86409550 -0.306970046  1.2852771515  0.05607073  0.312061931
## [91,] -0.74680666  0.071522461 -0.7231332305 -1.16277082 -0.228006409
## [92,] -0.97864252 -0.593496126  1.5666930422  0.48963235 -0.737848175
## [93,] -0.12165956  0.122960744 -0.4111440230  0.76080094 -0.666359230
## [94,]  0.91058660  0.558476393 -1.0156935294  0.96244926  0.700166550
## [95,]  2.39504625  1.047387553 -1.7590283600 -0.73618191  0.220640522
## [96,] -0.57464055  1.331485105 -0.7815549202  1.29182983  1.060224079
## [97,]  0.35403983  1.523945517  0.6495121956 -1.16005149  0.189918129
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## [100,] -0.10372980 -0.605288941  0.1843205586  1.68989512  0.513186635
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##    [1,] -0.64696372  1.171442815 -0.19583796   0.094827721 -0.43245196
##    [2,] -1.32475359  0.100325551  0.13841285  -1.489422922  1.97319655
##    [3,] -1.77703243 -1.269036403  1.26992220   0.451102811 -0.82326058
##    [4,] -0.64183564  0.930529603 -1.05814924  -0.277477341  0.40808545
##    [5,]  0.67532460 -0.917339157  0.67697213   0.597586334 -1.57554025
##    [6,]  0.19036670  2.333090232 -0.14748721   0.768308451 -0.77492374
##    [7,]  0.12564589 -1.448452213 -0.36731804  -0.453297837 -0.68386978
##    [8,]  2.74646202 -0.163707599 -1.51278189   1.051054297 -0.30817845
##    [9,] -1.54956179  0.719703420 -0.87000386  -0.366011533 -0.78958980
##   [10,]  0.10970418 -0.020436866  1.62694600   1.126159493  0.74989565
##   [11,]  0.72383777  1.490184420  1.06807818  -0.486034118  1.43211306
##   [12,] -2.19805809 -1.866825753 -0.43551167   0.112541777  2.14632539
##   [13,]  0.66433371 -2.497368918  0.99414955  -1.856938766  0.63197595
##   [14,] -0.28618567  0.041326725  1.74061028   0.032505766  0.61468096
##   [15,]  0.65302231  0.223087413 -2.26252581   0.143914455  0.54933322
##   [16,]  1.05006054 -2.113174228  0.13664307  -0.938265153  0.53490687
##   [17,]  2.81433936 -1.442427266  0.17275606  -0.377680053  0.01701982
##   [18,] -0.50209460 -1.025918786  0.69168281   1.420859436 -0.78840071
##   [19,]  0.58906913  0.979325916 -0.45271185   1.131392203  0.31213955
##   [20,]  0.34207373 -0.745562023  0.25529002  -1.733415876 -1.85436396
##   [21,]  0.92930550 -1.108618778  0.52305392   2.435288359 -0.43290012
##   [22,]  0.50416411 -0.540481624 -0.12761434  -0.807623084  0.70642611
##   [23,]  0.57128921  1.338634318  0.06898147  -0.190000147  0.89971493
##   [24,]  0.10881405  0.265923453 -0.02461017  -1.390504992  0.73572091
##   [25,]  0.43222569  1.120351308  0.71624869   0.303633633 -1.45298579
##   [26,] -0.94257436 -0.006261495 -0.99644319  -0.110260271  1.62821076
##   [27,]  1.41091052 -0.716503895  0.58453805   0.160505046  0.02062289
##   [28,] -1.86267340 -0.053104044  0.96352215   0.533835821  0.25313644
##   [29,]  0.08804076  2.035168375 -0.93336988  -0.104462421  0.50763283
##   [30,] -0.13029654 -0.936573708  0.66649445   0.616894505 -1.18176982
##   [31,]  0.29959946 -2.929056698  2.00794654  -0.593465163  1.02724767
##   [32,] -0.15608415 -0.311039393  0.08590772   1.906365923  0.87339175
##   [33,]  0.85060740 -0.673726897  0.25491511   0.789136467 -0.74064155
##   [34,]  1.44165728  1.385186890 -0.40779873   0.219178270  0.90683746
##   [35,]  2.07448808  0.871299563 -0.53697332   0.967188248 -0.17142303
##   [36,] -0.07138182 -1.750204066  0.24657886   0.970139264  1.11902741
##   [37,]  1.07826096  0.227826057 -0.05265018   0.316803707 -0.76868821
##   [38,] -1.36653533  1.703086332  0.74960273  -0.021935746 -1.18975098
##   [39,]  1.29680894  0.640851782 -0.15228239   0.683413369  0.92579555
##   [40,] -0.84948497 -0.316954861 -1.27987155   1.870418386  0.90462392
##   [41,] -0.15450792  0.479522684  2.28446739  -0.138962307  0.94088542
##   [42,] -0.59394168  0.460662232  1.06226975   0.558077394  1.78317202
##   [43,]  1.11422597 -0.049580157 -0.24562654  -0.385259416  0.33152922
##   [44,] -0.51842480 -0.968780409  1.83412747  -0.577113300 -0.29792594
##   [45,]  0.36676582 -0.391789730  2.54486075   1.011004156 -1.56308211
##   [46,] -1.02447405  0.463694695  0.06489210  -0.659965484 -0.51053405
##   [47,] -0.48919147 -1.613466139 -0.31464504   1.029530682 -0.88580217
##   [48,]  0.60939545  0.537028335 -1.34874187   0.183516253  1.27347014
##   [49,]  0.21022290 -1.528222918  0.04121335   1.219534877  1.55195035
##   [50,] -1.02465192 -1.221489770 -0.28397307  -0.604066002 -1.30817361
##   [51,] -0.50742346  0.814855485  0.11775741   2.048232179 -0.46603652
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## [53,]   0.31655060  0.092389745  2.12846209  0.263576802 -1.69484702
## [54,]   0.22848189  0.365141479  1.21848211  0.900540634  0.04186885
## [55,]  -0.43953915  0.272573022 -0.28803335  0.230303112 -0.39291055
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## [57,]   0.31184961 -1.949951816 -0.83924038 -0.348308527  0.35050292
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## [60,]  -0.29746798  0.112814028 -0.43882293  0.761490949  1.25356917
## [61,]  -0.34522113  0.339575579 -0.91005246 -0.836648747  0.31840758
## [62,]   1.96830947 -1.184859934  1.88956398 -0.320926565  0.34944714
## [63,]  -1.42761365  0.038827988  0.34692992  0.794390577  0.48492072
## [64,]   1.65345931  2.381559312 -0.92824628  0.425118171 -0.51392070
## [65,]  -1.76201190 -1.562034843 -1.16787597 -0.597108291  0.20584216
## [66,]   0.45914145  0.784212249  1.81115118 -1.029477690 -1.60698066
## [67,]   0.31803793  0.322056366 -1.37083258  0.185953241  0.48331174
## [68,]   0.11351793  0.190402476 -0.30658586 -0.498269729 -2.12848309
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## [70,]   0.72275784  0.955081398 -1.13347565 -0.919284420 -0.53165270
## [71,]   1.41011588 -0.930668630 -1.09990469  0.006529262  1.34849621
## [72,]  -1.20544292 -0.153349835  0.10570720 -0.289788451 -0.19383434
## [73,]  -0.04942074  0.210338906 -0.22830163 -0.063843787 -1.22261882
## [74,]  -0.26728618  0.258173498  0.45981911 -0.307426731 -0.18389576
## [75,]  -0.13540282  0.597754340  0.67874951 -1.308022589  0.04143923
## [76,]  -0.31373409  0.266012377 -0.71749122 -0.378658380 -1.32548144
## [77,]  -0.30141061 -1.352167768 -0.90205661  0.352546259 -1.07112834
## [78,]   1.03961591 -0.007148701  0.64312474  0.484168808  2.02546585
## [79,]  -1.94115130 -1.977225425 -1.24060404  0.943915352 -0.07951236
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## [82,]  -0.06732172 -1.721761603 -0.46805418 -0.660338837 -0.21978884
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## [85,]  -0.13394916  0.186444778 -0.38486689  0.987871201 -0.40547407
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## [87,]  -0.83776706  0.102647594 -0.81916083 -0.025969951  1.03637131
## [88,]  -0.74479454  0.675731673 -0.68851792 -1.767897387 -0.29524400
## [89,]   0.36749655 -0.266928270  1.71946840  0.473528588  0.21196692
## [90,]  -0.92772396  0.419440392  1.52318702 -2.159168505  0.39594613
## [91,]   1.14315110  0.200404603  0.38151401  1.642870544  0.69480832
## [92,]   1.51557909 -0.413419314  1.08207243  0.035085238 -0.82205375
## [93,]   1.34957285  0.853038122  0.30361675  0.470302851  0.06810019
## [94,]   0.14661190 -0.215523760 -0.58084436 -0.182989588  1.04102753
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## [98,]   2.29264915 -0.529391858  1.10136187 -0.667749479  0.50941202
## [99,]  -0.27752313  1.606022848  0.80346348  0.171900417  0.22972547
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##              [,76]       [,77]       [,78]        [,79]         [,80]
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##   [2,]  0.8928141566  0.073480498 -0.34698476  0.008190577 -0.5544174301
##   [3,] -0.6111845514  1.209707452 -0.59925860  1.126581636 -0.1465095501
##   [4,]  0.2348793614  1.072905446 -1.14585897 -0.211962837 -0.8256566830
##   [5,]  0.0361952817  0.789863437  0.67828777  0.321743092 -0.8311938297
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##  [6,]   1.8098667597 -1.568602482  0.14943473  0.600249940 -0.2004590130
##  [7,]   2.2652365761 -0.282031289 -1.48611099  2.403182220 -1.3545591019
##  [8,]   1.5444409610  0.530161825  2.24238199 -0.164841848  0.8042103009
##  [9,]   0.8729119250 -0.440866536  0.21299903  0.419300477 -1.2434548350
## [10,]  -0.4409062951  0.304604603  0.55887767 -0.873809976 -1.9533896746
## [11,]  -0.6169441436  0.212794559 -1.12108666 -1.068507643  1.3065161187
## [12,]  -0.7887436337  0.909199196  0.54067417  0.428935168  1.3976135904
## [13,]  -0.4059150430 -1.461911950 -0.12481099  0.374967847  1.0543661014
## [14,]  -0.7565506978  0.812270242  0.51994180 -1.572359767  0.0798804335
## [15,]   0.9889038046 -1.252547276  0.49972104 -1.230501602 -0.5801970267
## [16,]  -0.3204660685 -0.587737249 -0.79901583  0.579413213 -0.0724923848
## [17,]   0.7384726876 -0.283220624 -1.93702865 -0.760410335 -1.4676558251
## [18,]  -1.4179190158 -1.331745429 -0.95844239 -1.259784402 -0.9037330432
## [19,]   0.1258379537 -0.410339330 -1.42319056  0.492758366  1.8331774887
## [20,]  -1.5648629608  1.177482732 -0.26874895  0.447530064  0.2302124146
## [21,]  -0.9086677528 -1.064660462 -0.86392659  0.090827052  0.1663430245
## [22,]  -0.0919618316  1.329877695  0.15293360 -0.010300191  0.3026152549
## [23,]   1.3997383966 -1.026732721  0.33914071 -2.263962404 -0.0585733659
## [24,]  -1.1732904230  0.686564095  1.20422219  2.491757869 -1.8908554689
## [25,]   0.7921405212  0.837121136  0.22428669  1.247527234  0.1638948194
## [26,]  -0.5155621213 -2.037780015  0.07607765 -0.099581363 -0.3031808580
## [27,]  -1.0944488057 -0.337012481  0.17470872 -0.185571977  1.5678966311
## [28,]  -1.1355931609 -2.117914180  0.54243246  0.857058124  0.2529264705
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## [30,]   0.7359708317 -1.074772779 -1.48039190 -0.570886493  0.9960340036
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## [33,]   0.7787361434 -0.395913307 -0.29532346  0.860554330  0.1434015037
## [34,]  -0.3784351288  0.273289005  1.00346517  1.358071062 -2.1192954027
## [35,]  -0.6418277588 -0.269727931  0.16912610  1.324329202  0.5557382040
## [36,]   1.7075005450 -0.271597043 -1.28312662  1.476756519  1.1091305887
## [37,]  -0.4153775596 -0.063874341 -1.41443021  0.848844003  0.5388297060
## [38,]  -0.6302898876 -0.739383822  1.13740703 -0.001177174 -1.5916243667
## [39,]   1.1064143721  1.308264398  0.36753421  0.892753704 -0.7159918970
## [40,]   0.5405177095 -0.746203711  0.38297794 -0.976604973  0.4846423012
## [41,]   1.4508558990  0.703290360 -0.21717049 -0.186971572 -0.3505723700
## [42,]   0.7941375441  0.194078399 -0.54417774 -1.395438498 -1.5572900365
## [43,]   0.8140293065 -0.163090075 -0.51741934 -0.785901966 -0.3563118341
## [44,]  -0.1849183847  0.204255143 -0.55228714 -0.621115476  0.7081931291
## [45,]   0.1552513120  0.189905820 -0.71640963  0.480828638  0.2960841567
## [46,]  -0.0005673964  0.262765016 -2.62759981 -0.358201817 -0.2140329360
## [47,]  -0.6126338782  0.550045460  0.70174014  1.060764814 -0.4242583912
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## [49,]  -0.0335023863  1.522133529 -0.88797878  0.254763284  1.4938972516
## [50,]  -1.3131193935 -1.774561316 -1.67914564 -0.284849927  0.1404409495
## [51,]   1.2127949028 -1.633679731  1.15579110  0.148841470 -0.5675287313
## [52,]   0.6289538466 -1.670491199  0.84598538  0.274188974  1.8735770584
## [53,]  -0.3490107113  1.481097326 -0.16045976  1.426822428 -0.0006525727
## [54,]   1.7530758950  0.589743591  1.10139670 -0.733959045  0.7894625527
## [55,]   0.0868729372  0.035173832 -0.17817933 -0.298039252  0.1071488813
## [56,]   1.9063214367  0.554435531  0.91962463 -1.193530385  0.2398023483
## [57,]   0.3478542264 -0.904605142 -0.30256516  0.207096729  0.7041973483
## [58,]  -1.6167109140  0.701259208 -0.11628822 -1.535234900  0.1279879671
## [59,]   0.1407790201  0.540616792 -0.39070190 -0.432590475 -0.5022542224
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##  [60,]   0.5276388443 -0.006467768 -1.13184708 -1.037563687 -0.3943684645
##  [61,]  -0.7112950315 -0.410681453  0.90026249 -1.881215978  0.0677326093
##  [62,]   1.8477692857  1.379112224  1.97334369 -1.097727840  0.4781473499
##  [63,]   1.4334734197 -0.235317290 -0.52865128  0.271710665 -0.2686849459
##  [64,]   0.0322055351  0.661079198  2.11815565  2.179553328 -0.4467323509
##  [65,]   0.3845580664  0.693551858 -1.56616248  0.861733545  0.4016338291
##  [66,]  -0.3752095097 -0.507609336 -1.28661133 -0.058102341  0.2191598432
##  [67,]  -0.5238996935  1.343144122 -1.07144429 -1.170411268 -0.4323137263
##  [68,]  -2.2897814308  1.259089813  0.16536719  1.723198146  0.6891189702
##  [69,]  -0.2922268949 -1.179775123 -0.27784862  0.130423739  0.0278793308
##  [70,]  -1.1711574794  1.203717377 -2.12106758  0.213688393 -0.6716659668
##  [71,]  -0.7990157917  1.415584646  0.51638552 -0.127006341  0.5777949010
##  [72,]   0.8675685081  1.328624249  0.40162591  0.447451464 -0.7298876066
##  [73,]   0.6190665638 -0.571006396 -1.50676429 -0.454143125 -0.5497464601
##  [74,]  -0.5357870330  0.751077596  0.10985869 -0.370183567 -0.8866783336
##  [75,]  -0.1528549050  0.084566484 -0.36278914  1.982321993  0.3029624829
##  [76,]   1.4706127595 -0.638811282  0.04200290  0.284627017 -0.6241287568
##  [77,]  -1.0662979277 -0.541417006  1.67024759  0.896084860 -0.5289344240
##  [78,]  -0.5307605283  0.827796338  1.55098670 -0.165677375  0.0162544465
##  [79,]  -2.2194051229  1.776170990  0.91686398 -0.156480444  0.7161318219
##  [80,]   0.4939808392 -2.424698731 -0.07266249  0.678051521 -1.6215086760
##  [81,]  -1.3135250976  0.245650569  0.11298776  0.745692618 -0.8544789969
##  [82,]  -0.0644555416  0.419959946  0.22840387 -0.654944177 -0.8569182256
##  [83,]   1.7390844040  0.341238118  0.30071664 -2.451872315  0.1504138570
##  [84,]  -2.2052544514 -0.265018144  0.49987998  0.823514136  2.1875434324
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##  [86,]  -2.4020758679 -0.009135280  0.15996292 -1.012748987 -1.0663867556
##  [87,]   0.5886095189 -0.008882872  0.33077466 -1.093529274  0.2700596061
##  [88,]   2.0906063024  0.682227760 -0.04972848 -0.673518990 -0.7649046319
##  [89,]   0.1079713923  1.774412672  1.04961148 -0.169069312 -0.0234724094
##  [90,]   1.0518800082 -0.377026135  0.13287803 -2.056237230  0.2818794417
##  [91,]   0.1232144234  0.235153560  0.01725499  0.602100203 -2.8219595869
##  [92,]  -0.2183743530 -2.024199837  0.66795215 -0.036691345 -0.1511943467
##  [93,]   0.6153209488 -0.893246407  0.31509953 -0.830069972 -2.0060867048
##  [94,]   0.7885863722 -0.188578951 -0.54854113  0.480312649  0.1352759730
##  [95,]  -0.0277760888  0.863271189  1.05952610  2.437126530  2.1561842157
##  [96,]  -0.1823444078 -0.083611914 -1.83425921  0.769362783 -0.2050849305
##  [97,]  -1.6369477486  1.409680474  0.04162469 -0.097915401 -0.8268959038
##  [98,]  -0.1241344407  1.116707239  1.26680488 -0.591466825 -0.2192598129
##  [99,]   0.1738358550  2.158538876  0.31225246  0.204317303  0.5105027223
## [100,]  -2.9736297362  1.020958096  0.96167276  0.220254952 -1.6262367315
##              [,81]        [,82]        [,83]        [,84]       [,85]
##   [1,]  1.04557456 -1.707663770 -0.348563056  0.946591649 -0.46617694
##   [2,]  0.34079678 -0.227307455  0.701538332  0.815869846 -0.95459019
##   [3,]  0.06613566 -1.532587915  1.771204164  0.564946232  1.51167005
##   [4,] -0.23102495 -0.842605142 -0.889921387 -0.459939493  0.77925000
##   [5,] -0.22227681  0.376463990  0.803455788  2.001683499  0.27416505
##   [6,]  0.85765720 -0.385128198 -1.546160437 -2.685360397  0.76938792
##   [7,]  0.70428034  0.633996935  1.341798984 -0.972399271 -0.46865023
##   [8,] -1.12995860  1.580014938  1.895740971  0.192981509 -0.97069793
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##  [10,] -0.41103883 -2.169792088  0.535379159  0.210811972 -1.33114446
##  [11,] -0.37775757 -0.284175613  0.499258669 -1.883039807  0.41529560
##  [12,] -0.88088637  0.380701457 -1.139782415 -0.474716456 -0.52515254
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## [13,]   0.64661074 -1.961351750  1.017847345  0.252785223  0.25729741
## [14,]   2.76772787  0.294845284  0.055557338 -0.358699261  1.01356786
## [15,]  -1.06274149  1.380965168  1.395582841 -0.379058843  0.87769626
## [16,]  -0.42727307 -1.774735006  1.213751287  0.807688897  0.53875321
## [17,]  -0.42861167  1.046301094 -0.743038310 -1.484605000  1.18290365
## [18,]   0.42415082 -0.434846019  1.320770024  2.120635822 -1.43570967
## [19,]  -1.52014727 -0.207151615 -0.466718893 -1.116204991 -0.47897732
## [20,]   0.46203035 -0.570827112  0.319637279  0.757877171 -1.44531147
## [21,]   0.08873503  0.225520598  1.114933029 -1.125729687  0.07637302
## [22,]  -1.52432624  0.428509704 -0.999024275  2.569829820 -0.03719708
## [23,]  -1.12612066 -0.164867222  0.001703985  1.338952365  1.38091996
## [24,]  -0.01713436 -0.942143720 -1.896702596 -0.765019487  0.09167359
## [25,]   0.50136063 -1.045404948  0.492632461  1.131784884  0.22913131
## [26,]   0.30131153 -0.293017449 -0.052977696 -0.401206041  0.35572748
## [27,]   0.44051323  0.140319958  2.169958301 -0.447434619 -1.64620310
## [28,]   0.75361586  0.383857672 -0.948692445 -0.175086911  0.37812176
## [29,]   0.36057010 -0.121247034 -1.457845430  0.934126830  0.76437700
## [30,]  -0.08716097  0.817929282 -1.000473711 -0.758930043 -0.82520518
## [31,]   1.25708095 -0.092811230 -0.644660322  1.432305087 -0.22721447
## [32,]  -0.35167217 -0.486305735  0.028420511  0.334578037  0.97244862
## [33,]   0.69783886 -0.701845978  1.040301689 -0.851886895 -0.50246470
## [34,]   0.30279451 -0.059686816 -0.420797047 -0.472185327  0.89889047
## [35,]   0.59235711 -0.454916711  0.746354116 -0.506747485 -0.60899729
## [36,]   0.02689754  0.320262761  0.080660290  0.007353696  1.51345275
## [37,]  -0.69091839 -1.147112487  0.389611965  0.243096481 -0.04577217
## [38,]   1.27695742  1.380982694 -0.825112448  0.018942943  0.81218866
## [39,]  -0.70650791 -1.575422021  0.387822506 -1.076578335 -0.23721675
## [40,]   0.16124945 -1.244666828 -0.237529461  0.426974173 -0.05611000
## [41,]   1.06065845 -0.741735756 -0.003316561 -1.334938627  0.85121467
## [42,]   1.20782286  0.405977679  0.579766426 -0.221325429  1.38361027
## [43,]   0.11191176 -0.888053440 -0.619160140 -0.048951146 -0.40605760
## [44,]  -0.04540095  0.605269160  0.527604382  1.140061505  1.12986220
## [45,]   0.08402064 -0.216919654  0.500475292  1.326913753  0.84156830
## [46,]  -1.43902033  0.466689374 -0.752597919 -0.181984889  0.33079383
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## [50,]   0.12144728 -0.469021732  1.419566432  0.168654113 -1.64025175
## [51,]  -0.11146226 -1.266441134 -1.277194464  1.546248774  0.31581863
## [52,]  -0.91362986  2.264751588 -0.493817419 -0.864068259  0.43938920
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## [55,]   0.46611437 -1.257404807  1.366727553 -0.621777052 -0.22550976
## [56,]   0.42954547  0.645586459 -0.875959796  0.416045756  1.46264878
## [57,]   1.28772239  1.133534826  1.324385246 -2.734499390 -0.96353559
## [58,]   1.20091113 -0.661363287  0.232991393  0.102511440 -0.63650131
## [59,]  -0.11863093  0.104462665  0.585834648 -1.178550864 -1.76598938
## [60,]   0.37588350 -0.735782513 -0.297198793  1.009379943 -1.84522994
## [61,]   1.46036418 -0.058492279 -2.133679347 -0.210741150  0.70540564
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## [64,]  -0.24718226 -1.371375518 -0.921475234 -0.463270409  0.58562436
## [65,]   1.31561626 -0.050000694  2.241645597 -0.713597983  0.49909607
## [66,]  -1.07981059 -0.965933431 -1.521555086  3.216171096  0.23326399
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## [67,]  -0.29188517 -1.065250766  1.532470299 -0.800369753  2.10703514
## [68,]  -0.45613069 -0.837582213  0.640124464  1.403699292  1.00002026
## [69,]  -0.49558986 -1.436931631  0.655990753 -0.824811646 -0.12044791
## [70,]  -1.25028241  0.431258012 -0.277468583  0.958552118  2.20927076
## [71,]   0.19955107 -1.237645433  0.427012438  0.222259041 -1.48645123
## [72,]   0.57652319  1.079380622  0.510448884 -0.562292571 -0.10282532
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## [74,]  -1.13409611  0.002354793 -0.421833171 -1.705541483 -1.75393855
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## [77,]   0.33728457 -0.415474648  0.019338319 -0.445786866  1.06975915
## [78,]  -0.20529937 -0.476821059 -0.400111074 -0.064232318 -0.38384578
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## [80,]   1.50760759  0.466480832 -1.571958157  0.516092015  2.89924480
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## [82,]   0.30841395 -0.775904613 -0.996422320 -1.301781979 -2.02409965
## [83,]   0.33449874  0.184857224 -1.145273913  1.799878929  0.19319899
## [84,]  -0.68555260  0.402765520 -1.359654845  2.279975616 -0.09245809
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## [87,]  -1.39492785 -0.258255466  0.710229197 -0.076927499  0.12710094
## [88,]  -0.89651976  1.507452214  0.254948830  0.130670566  0.13780779
## [89,]  -0.86438715 -2.078108317  1.327208782 -0.796677838  0.31748904
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## [91,]   1.20050536 -0.568478588  0.566902438  1.170490547  0.41944781
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## [95,]   0.39369981 -1.520465958 -1.098587696 -2.655743592  0.45692007
## [96,]  -0.43468083  0.307909704  0.557277581 -0.383984194 -0.45410134
## [97,]   1.15490812 -0.884043792  0.147695632  0.123742340  0.64812957
## [98,]   0.21556960 -0.121852084  0.518675357  0.947782137  0.34942030
## [99,]   0.14578966 -0.559707876 -0.964527638  1.011918839 -0.52852871
## [100,] -0.78644863 -0.715447532  0.751197992 -0.981860369  0.03545725
##              [,86]       [,87]       [,88]       [,89]       [,90]
##   [1,]  -0.91388221 -0.70163852 -0.98410671 -1.13944449  0.41168475
##   [2,]  -1.50539338 -1.05509871 -0.19429053 -0.45885718  0.18164103
##   [3,]  -1.59230529  0.65504625 -1.43382413 -2.25911292 -2.22133087
##   [4,]   0.18664478 -0.80188691 -0.39857340  0.86213070 -1.58371322
##   [5,]  -1.98674152 -0.23571525 -0.43134141  0.90144541 -1.43112091
##   [6,]   1.38342666  1.11531339 -0.54503870 -0.49526441  2.35214576
##   [7,]  -0.14362395  0.33425886  0.53381486 -0.39070526 -0.28712930
##   [8,]   2.22989015 -0.55757959  0.88874268  1.25391397 -0.52902864
##   [9,]   1.51092512 -0.80374872 -0.07051533  0.53111054 -1.16161206
##  [10,]   0.24633456  1.67256318  0.20660295  0.38558063 -0.10478330
##  [11,]   0.17494877  0.35309201 -0.69836766 -0.56555034 -1.77441926
##  [12,]   0.33760671 -2.70680265  1.74457310 -0.07710834  0.08153367
##  [13,]   1.25630973  1.52408279  0.62095282 -0.43622419  0.79223799
##  [14,]   0.13108514  0.83294760  0.04257191  0.96975475 -1.28429322
##  [15,]  -0.35523752 -1.76984974  0.36164434  0.37997417  2.36271723
##  [16,]  -0.06412923  2.31783575  0.16290301  0.11046713  1.06775141
##  [17,]   0.58164801 -0.76156871  0.30632498 -1.42672418 -0.12319774
##  [18,]   1.71261170  0.57983243 -1.68534374 -0.21189483 -0.31059579
##  [19,]   0.61269872 -1.63157885  0.98522650  0.16751506 -0.04751218
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## [20,]  0.01092701   0.08577768  -1.83301626  -0.68151153  -0.65678850
## [21,]  0.23402359   1.62585549  -0.21047469  -0.50659513  -0.16251438
## [22,] -0.74127105   0.46822158  -0.03462979   0.02522993   0.17365229
## [23,]  2.49375609  -0.01392664   0.06596791  -0.06679375   0.86128995
## [24,]  0.71440896  -1.30775360  -1.18235487   0.38059811   3.50058456
## [25,]  1.50871982  -1.15354606   1.40986707  -1.42746836   0.70176253
## [26,] -0.19209984  -0.14847838  -1.42876547  -0.56284080  -0.53623866
## [27,] -1.13362711   0.13425203  -0.68386285   0.88827422   0.19846111
## [28,] -1.03798699  -0.34838154  -1.56405225  -0.43589329  -1.26689548
## [29,] -0.45415740   1.00021149  -0.21467352   0.28524786   0.23865664
## [30,]  0.44900506  -0.29717917   0.16088290   0.76534658  -1.72558723
## [31,]  0.12464454  -0.71465314   0.86135861   1.28378343   0.26116487
## [32,] -0.12214260  -0.22577772   1.25215150   0.34850639  -0.76907430
## [33,]  0.76530007  -0.57434519   0.16951937  -0.81563030  -1.38396482
## [34,]  0.02055042   1.30808053   0.74137124  -0.56882885   0.32048795
## [35,]  0.84023403   0.05942897   0.43326570   1.03703781   0.75013724
## [36,] -0.74231469   0.28913905   1.53797625  -0.84281959   0.27563771
## [37,]  1.99716442  -2.15303988   0.07186623   2.93620301   0.78478423
## [38,] -0.67429466   0.07456080   1.08859320  -0.98638654   0.11029216
## [39,]  1.69399750   0.12976291  -0.39555985  -0.61498803  -1.46004604
## [40,] -1.61299568  -1.71776324  -0.15296103  -1.40969604  -0.28109584
## [41,]  0.59939388  -1.37581604  -0.60379126   0.12253232   0.03553948
## [42,] -0.97944596  -0.53217327   0.51339889  -0.55945320  -1.11356032
## [43,]  0.95530682  -0.46523888  -0.41224443  -0.05427725   0.59125116
## [44,]  0.18434592  -1.51408471  -0.32543527   0.24509090  -0.31206900
## [45,]  0.52195821   0.74675370  -0.52766030  -0.38792878  -0.31340630
## [46,] -1.61551715  -0.17167859  -0.01208556   1.33965476   0.15789047
## [47,]  0.56178368  -1.53984020   1.00081743   0.93003825  -1.61089435
## [48,]  1.10500932  -0.67187981  -1.33623539   0.83346270  -0.06560354
## [49,]  0.72098830   0.11629689  -0.35474753  -1.34384357  -0.08397503
## [50,]  0.40331906   3.30419791   0.70805068   0.58984791  -1.00934244
## [51,]  1.53574339  -0.07022911   0.12461848  -0.59434968   0.29721918
## [52,]  0.94298882  -0.14436360   0.99219684   0.50314534   0.73430319
## [53,]  0.21492528  -1.50146225  -1.22349638  -1.18121765   0.14212934
## [54,]  0.69563859  -1.78214329  -0.31658100  -1.51511158   0.11088286
## [55,]  1.27118700   0.58124938  -0.22015401  -0.47975341  -1.51868587
## [56,] -0.48307258   0.05108228  -0.30770154   0.25837618   0.55296655
## [57,]  1.31352541  -0.09165002  -0.28564638   0.88600717  -0.79678461
## [58,]  1.57142262  -0.58085238  -0.33726070   1.62189198  -0.18753446
## [59,] -0.79263997   0.36810846  -0.43718182   2.13326717  -0.96291298
## [60,] -0.38697077  -0.61402163   2.25661264  -0.41098524   0.80530347
## [61,] -0.37382040   0.15523129   0.61100183  -0.09267711  -0.06614084
## [62,] -0.41400178  -0.67484293   0.54827024  -0.08809678   1.01726070
## [63,]  0.28712207  -0.55812372   0.79294978   0.81008025   0.41668965
## [64,]  0.87790650   0.87046157  -0.28482776   0.19933632  -1.54573621
## [65,]  0.36331930   0.90225513   0.32997070  -0.33949716  -1.17476970
## [66,] -0.87194968  -0.34673254  -0.05925068   0.20472789  -1.01948643
## [67,] -0.98434007   0.45824288   0.28271813   0.41599423   2.21246533
## [68,] -0.73929767   1.39784688  -1.24996414   0.94149933  -0.10689455
## [69,] -0.77072453   1.45043307  -0.41553183  -1.25903656   0.20252289
## [70,]  0.10949852   0.13369390   0.17628220   0.93722763   0.18619289
## [71,]  0.32639459   0.89241163  -0.82081430  -0.83408721   0.18632098
## [72,] -1.03824112  -0.69314600  -0.01609058   0.86756888   0.71378023
## [73,]  0.43866791  -3.21787319   0.10165188   0.32418457  -1.05818742
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##  [74,] -0.77252123  1.74337380 -1.68029013  0.72651835  0.01429265
##  [75,] -0.93763206 -0.74254210 -0.60048294 -1.20861026  0.99247141
##  [76,]  0.06966605 -0.28182398 -2.26071976  1.08207130  0.36417867
##  [77,] -1.00613292 -0.41836643 -1.61881244  0.19287654 -0.50087370
##  [78,]  1.37089106 -1.32755883  0.08158756 -0.16686040 -0.53787630
##  [79,] -2.30097052  0.93481075  1.41600321 -0.44928139 -0.39245577
##  [80,] -1.38964737  1.18377162 -0.55086306 -2.47377334 -0.14636859
##  [81,] -0.89102485  0.61132479 -0.09093114 -1.10081348  0.71459256
##  [82,]  0.07099588 -0.27855895  0.07502606 -0.58775811  2.18795470
##  [83,] -0.21307194 -1.21603301 -0.21708593 -0.31718357 -0.67155840
##  [84,] -0.61246093  1.88296788 -0.01916635  0.89828813  0.25809667
##  [85,]  0.06107556  1.13221706 -1.57864997  1.29355648 -1.21983732
##  [86,]  0.10273886  0.05139273  0.74839097  0.83969627 -1.12736979
##  [87,] -0.01697305  2.34351419 -0.58878140  0.46979661  0.41610006
##  [88,]  0.40135080  1.31308107  0.52912163 -0.14488386 -0.72887367
##  [89,]  1.46573563 -0.80783417  0.58839395  0.75572870  0.52876125
##  [90,]  1.66425578 -0.55806246 -0.74596756 -0.52910549  1.42838246
##  [91,]  0.35335464 -0.16956024  0.83083953  0.93123985 -0.35199995
##  [92,] -0.36430159  0.65255214 -0.49300981 -0.12025997 -0.19251642
##  [93,] -1.35362904  1.05017032 -0.63566350  1.84999609 -0.23612588
##  [94,]  0.04457645  1.14895278  0.90220719  0.81588340  1.45806030
##  [95,] -0.31244824 -0.45745910  0.57338345  1.66376707 -0.35724157
##  [96,]  0.06863892  0.03573686 -1.50765520  0.21369612 -0.11330123
##  [97,] -0.89051010  1.03420280 -0.47111711  0.58918873 -1.15544482
##  [98,] -0.82623407  2.06464094  1.68489521 -0.52995801  0.26534910
##  [99,] -1.04525087 -1.54530421  0.34679914  0.30086960  0.94590689
## [100,]  0.87437197 -0.67966529 -1.49264546  0.53671381 -0.03848747
##             [,91]        [,92]        [,93]         [,94]        [,95]
##   [1,] -2.692622307  0.6750064730  0.494438722  1.3772497065 -0.916528504
##   [2,] -1.168969160  0.0367025775  1.513759558 -0.0006826256 -0.206133734
##   [3,]  1.531333354  1.1825136951 -0.161295253  2.7209365821  0.763464690
##   [4,] -0.740267516 -0.3321966063 -0.136236566 -2.0195362661 -0.051801535
##   [5,]  0.392131072  0.2538873820 -1.638365308  1.3421014300  0.655453863
##   [6,] -0.821805532 -2.3567886271  0.560991884 -0.5997847300 -0.217788172
##   [7,] -0.468702452 -0.9004700310 -1.658915025  0.1290708385  0.791390398
##   [8,]  0.431090969  0.9763573382  0.384437030  0.9257023060 -0.961012270
##   [9,]  0.392364427  0.3976294288  1.121326548  0.0785079662 -1.375198641
##  [10,] -0.795833894  0.1533428422 -0.112616585 -0.8223629047 -0.927401183
##  [11,]  0.081173852 -0.6478720882  0.099536126 -0.6091949774 -0.379102416
##  [12,] -0.997948582 -0.0577563670 -1.500680131 -0.9657802226  0.617426093
##  [13,]  1.852940549 -0.2875376144  0.849230530 -1.0786352623 -0.735152555
##  [14,] -0.433002214 -1.4129668001 -0.088946746 -1.3628264405  1.075370180
##  [15,]  0.990503935 -0.7672041610 -0.186851029  1.0409248712 -0.831675885
##  [16,]  0.171569049  0.1884742265  0.566105071  0.0174965304 -1.795436172
##  [17,]  0.123672562 -0.7316512098  0.822496809  0.1688983735  0.552768367
##  [18,] -1.336336620  0.9171681187 -0.881304484 -0.6338377507  1.206265126
##  [19,]  0.230031470 -0.6252005407  0.001746887 -0.1143921213  0.568407594
##  [20,] -1.190552212 -0.0008618322 -1.527681460  0.3889512323 -0.447177580
##  [21,]  0.465228108 -0.8026254803 -1.239112147  1.0874259736  2.169965405
##  [22,]  0.306766051 -0.5489624522  0.717011416  0.3151969862 -0.131701535
##  [23,] -0.100338253  0.7906608648 -0.862400364  0.2424985029  0.445324473
##  [24,] -0.036459714 -0.1669801266 -1.594692184 -0.2336842357  0.320347933
##  [25,]  1.642613160 -0.7882444934  0.044178470 -0.7028271510  0.363644917
##  [26,] -1.088148127  0.3556284900  0.008577016 -1.6490601373  1.446834582
```

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## [27,] -1.566137072  0.0966561622  0.778804623 -0.0665753297  1.300893407
## [28,] -1.376382620  0.2269700048 -0.686304966  0.3733823407 -0.569471044
## [29,] -0.280583444  1.1973340438 -0.350632070  0.4094725158  0.625888604
## [30,] -0.943733612  0.4585734290 -0.468989717 -0.3222915035 -0.600617792
## [31,]  0.909988286  0.9641192345  0.862249216  2.6305530894  0.360836799
## [32,] -0.137396126 -1.0585634166  0.910423486  0.4662802226 -1.879006175
## [33,] -0.348087172  0.8193515805  0.057542881 -0.8259661582  0.880151554
## [34,] -0.533332729  0.7531089234  0.979950078 -0.6446935100 -1.426115809
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## [36,]  1.040700640 -1.8063461043 -1.083112999 -2.5423034859  1.186750411
## [37,] -1.061318756 -0.7559952852 -0.106333729 -1.9122182199 -1.642859450
## [38,]  1.034938803  0.1040306509  0.832883815  0.2168505002  0.322808058
## [39,] -0.578298996  0.0266069130  0.633664143 -1.0793936111 -0.638065082
## [40,]  0.005033962  1.1934358905  0.178792717  0.0359313660  0.628693402
## [41,]  0.209507949  1.9537708112 -0.460802308 -1.1375099189  0.482424684
## [42,]  1.390784372  0.5115839823 -1.692555154 -0.1652679889  1.357785339
## [43,]  0.238539017 -0.3641441356  1.315120496  0.4433140378 -0.002905162
## [44,]  0.108593344  0.2689753950 -0.216707510 -0.0498918187  1.827863368
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## [56,] -0.227462823  0.2295207928  1.115728531  0.5436320020 -0.527860609
## [57,] -1.458599290 -0.1443098106  0.246427704 -0.2624484938  0.033634099
## [58,] -0.976761049  0.6053693493 -0.734805305 -1.2051693256 -0.985516298
## [59,] -0.949940445  0.1495397831 -0.218401659  1.3912127777 -0.601993099
## [60,] -1.431040641 -0.2215859784 -0.538422138 -0.1775856392  1.594072922
## [61,]  0.032480162 -0.1127065811  1.704289206  0.1142125076 -0.505221635
## [62,]  0.261930875  0.3733803629 -0.707130816  1.0723708505 -1.896178547
## [63,] -1.681999530 -0.1490833868  0.113823481  1.4419772612 -0.492044000
## [64,]  1.230704703 -2.0035693277  1.337248772 -0.4019339470 -0.076338969
## [65,]  0.144939931  1.7723609355  1.556711976 -0.5314738991  1.557625470
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## [67,] -0.849210096  1.3196833628 -0.065171952 -0.5081005724  1.416423171
## [68,]  0.381236409 -0.3937056373 -0.300669422  0.2790556642 -1.077231456
## [69,] -0.869595346  0.8347980013 -0.168261724 -0.4715951227 -0.725483144
## [70,] -0.357967479 -0.3539550009 -1.041849904  0.6313191459 -1.642233254
## [71,] -0.798525107 -0.2126366773 -0.507454149 -0.6222838840  0.465854540
## [72,] -0.278217644  0.1601968911 -0.560622910 -2.6267827873 -0.737386667
## [73,]  0.725526276  1.2797617949 -0.207593974  0.4270890481  0.354033566
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## [76,]  1.265183444  0.0893089753 -0.234773067 -0.0374874229  0.297314181
## [77,] -1.166020659  0.5544079532  1.872695083  0.8266490537 -1.174579734
## [78,] -0.898864159  0.9413605618  0.531505172 -0.5677788890  2.064969154
## [79,] -1.163914313 -0.3146801402  0.667960369  0.4695261577  1.440369042
## [80,] -0.132390462 -0.7937129538  1.678458455 -0.2225191495 -0.888678996
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##  [81,] -1.891472077  0.0495057200 -0.747356753  0.4323718897  0.580978486
##  [82,]  0.205245497  0.5990185211  0.447480820  0.1560528140  0.735242946
##  [83,]  0.913215887 -0.5789655571 -0.757523624  0.7753745712 -1.419302540
##  [84,]  1.599904312 -1.7005501431  1.156263572 -1.5346434838  0.950939459
##  [85,] -0.352407934  2.0586798800 -1.106936185  0.2855454047  0.087599531
##  [86,]  1.304411657 -1.1383469673  0.168046160 -0.4256381346 -0.112460073
##  [87,] -1.200788396  0.6129079749  0.452907931  1.2786691970  0.553137117
##  [88,]  1.122635843 -0.6380048660 -0.112904388 -0.1968059139  0.116860979
##  [89,]  1.131027190  1.5086101886  2.187012613  0.7160799868 -0.424672763
##  [90,] -1.396487481  0.0180388639 -0.241008724 -1.3885104032 -1.582012605
##  [91,]  0.514843897 -0.5843672655  0.671689436  0.5918764454  1.103343598
##  [92,] -0.696079924  0.3100340806  1.013604013  0.7210312150 -1.484652312
##  [93,] -0.297402227 -2.2323264911  0.275920921  0.8859283167 -1.088214818
##  [94,]  1.231444469  1.7867607013 -0.351214686  1.3853955228  1.165926065
##  [95,]  2.184157749  1.0774213116 -0.643024840 -0.1050989116  1.608015756
##  [96,]  0.195192209  0.5825135438  2.098245316 -1.3523084373 -0.243488125
##  [97,] -1.988293964  0.0106302176 -0.959797920  0.0159231296 -0.082601334
##  [98,]  1.573004340  1.0756724735  0.849599425  0.2340532891  0.061573939
##  [99,]  0.386802709 -0.8878524664  0.974589269 -0.5338664885 -0.680747080
## [100,] -2.228219935  0.2113296476  0.513294508 -0.5401887264 -3.521906016
##              [,96]        [,97]        [,98]        [,99]       [,100]
##   [1,] -1.27474780  1.354520268  1.4692032339 -0.159614198  0.74111071
##   [2,]  0.49177291  0.077883720  0.4306430292 -1.032363279 -0.36547125
##   [3,] -0.43954918  0.244412341 -0.8949059387 -0.230051884 -0.85865950
##   [4,]  0.31717254  0.933773388 -0.5978560120  0.210534815 -0.12599130
##   [5,] -1.83297314 -0.221846495 -1.8335337168  0.825162201 -0.61881586
##   [6,]  0.04514524  2.039850468  0.2010155666  0.617906033 -1.07703227
##   [7,] -0.87673591 -0.474865939  0.2383421942  1.149685348  0.15642189
##   [8,]  2.42475254  0.034561173 -0.8698769071  1.155717284  0.92485985
##   [9,]  0.06001700  0.122759685 -4.3082098105 -0.413746431 -1.20589880
##  [10,] -0.37152855  1.369925619  1.3089691007  0.003113223  0.72720265
##  [11,]  1.80282882 -0.259288187  1.3297536662 -0.440323145  0.93083395
##  [12,] -0.26657056  1.004542580  0.4397521674 -1.108838241 -1.13792826
##  [13,]  0.65675769  0.604213739  0.1811195904 -0.751692452 -1.03548648
##  [14,] -0.91522197  0.404515743 -0.2619895325 -0.084091839  0.63755359
##  [15,]  0.25721442  1.049274762  0.4074925186 -0.263939480  0.74143848
##  [16,]  0.89977884 -0.741001017 -1.1044983686 -0.738388648 -0.37806462
##  [17,] -1.40579897 -0.285028364  0.4677338293 -1.361074976  1.03493790
##  [18,]  0.04563168  0.984598809  0.2982004393  0.019612418  1.16887002
##  [19,]  0.55931132  1.066071711 -0.0117882346 -0.025714429 -1.74328968
##  [20,]  1.28575495 -0.624957216  1.2761930892  1.445500194  0.05603083
##  [21,] -0.44082158  0.374399741  0.9452749692  0.182811250  0.19572165
##  [22,]  2.28265954 -0.131204854  0.3066724290 -0.038169638  0.68017447
##  [23,] -0.55075464  0.421835387  0.5227693584 -0.356236401  0.35375807
##  [24,]  0.54108139 -0.438298584  1.8541366741 -1.082174846 -1.07566854
##  [25,] -1.02421694  0.710766785 -0.3451345818  2.068897529  0.08328506
##  [26,] -0.72641638 -1.078275969 -0.3164931300 -1.163798879 -1.66190366
##  [27,]  1.34825769  0.427155934  0.5214338496 -0.591291562 -1.23590963
##  [28,]  0.19855672  1.163302928  0.3647977779  0.460394783  1.03730501
##  [29,]  0.14240941  0.395056458  0.7538819225 -0.148141249  1.40859615
##  [30,] -1.08759079 -0.050412281  1.6268835256 -0.101309669  0.17609950
##  [31,]  0.86904270  1.079971434  0.0600666963 -2.906113165 -1.73400868
##  [32,]  0.30384749  0.443758177 -1.0813335450 -0.333928540 -0.85514522
##  [33,]  0.60177834  0.867080233 -0.7949093893 -0.102066372 -0.45057976
```

```
## [34,]  0.35955696 -0.913503622  0.5714201761  0.091904805  0.40126274
## [35,] -1.04585650 -0.159240122 -0.1050282423  0.789432137 -1.16025688
## [36,] -0.28941172  0.152897165 -0.6689342762  1.277863478 -1.13956401
## [37,]  0.08145676 -1.218352796 -1.3212691553  0.487392122 -0.71017237
## [38,]  0.86059488 -0.334314275  1.8570489390 -0.328139394  1.05490148
## [39,]  0.62615373 -0.503945517 -2.0242906371 -1.168480474 -2.14725406
## [40,] -0.13677090  0.419784053  1.1916694325  0.126996379 -1.57604797
## [41,] -1.05457100  0.133947139 -0.7572357266 -0.151663930 -0.57080307
## [42,] -0.11924439  0.163806267 -1.4366417071  0.214816323  0.39785527
## [43,]  0.05265519  0.935229287 -1.7620845697 -0.271277971 -0.48849735
## [44,]  0.59870625 -0.945140668 -0.9866477283  0.962584116  0.07632585
## [45,]  0.13184891  0.811742006 -0.0004803698 -1.030416818 -0.21585093
## [46,]  1.00131296  1.619607593 -0.6034435287  0.506128055 -0.75163732
## [47,] -1.78165489  1.252346934 -0.2188794077  0.099864443  0.16178929
## [48,] -0.58278888 -0.648519923 -2.3793641253 -1.283404911  0.47705240
## [49,]  0.86961540 -1.397067007  0.6783220086  0.870090212 -0.87593725
## [50,]  0.68315567  0.798923706 -2.1755084612  0.643409210  0.57474624
## [51,] -1.42417359 -1.830480541 -1.3658631338  1.859811733  0.31709678
## [52,]  0.85276657  0.879548463 -0.4507743638  0.687557395  2.63119854
## [53,]  0.22345971  1.861294319 -0.5741821963 -0.806708109 -0.11334671
## [54,]  0.30390556  1.434601928  0.1145522063  1.458830749 -0.29478233
## [55,] -0.40890778 -1.115530400  0.0476201818 -0.123470648  1.52884692
## [56,]  2.14511108  0.014736352  1.0132638700  1.035703064  1.74249792
## [57,] -0.88658188  0.065124350  1.1586246924  0.081604197  1.15652473
## [58,]  0.97307541 -0.096546206  0.4879378659 -1.079126927 -1.88107050
## [59,] -0.45410970 -1.398912799  0.1313384881  1.081613607 -0.10664763
## [60,]  0.35571248 -2.084101908 -0.4738213169 -0.386309207 -0.76798762
## [61,] -0.86395112 -0.451180368 -0.7931195669 -1.581312355 -0.56258008
## [62,]  1.06745534 -0.840751913  1.2012363210  0.206441718  0.86101886
## [63,] -1.96491651 -0.564894295 -0.0380104018 -0.429032117  0.60546820
## [64,] -0.72049734 -0.071550838 -0.1520262653  0.064592610 -0.34118273
## [65,]  0.10147793  0.554382179 -0.0250895718 -0.531225598  0.93490341
## [66,]  1.62660812  0.348008487 -1.7324240503 -0.224896116  0.09434743
## [67,]  0.04031332 -0.572613310 -0.6599212768 -1.390633369 -1.37920487
## [68,]  1.37016205 -1.387639950  2.2328548752 -0.712486078 -1.42168524
## [69,] -1.66849114  0.108751536  0.1621686908 -0.172621030  1.31023399
## [70,] -1.96849255 -1.736703571 -2.0074911155 -1.653881090 -0.34830082
## [71,]  0.34494744  1.740010437  0.1126619655 -0.324647973 -0.34967712
## [72,] -2.02899395  1.385538226  0.2586384737  0.183604505  0.01926513
## [73,] -1.06648621 -0.716728737  2.4839033927  0.424892290  0.22354400
## [74,]  0.48481189 -0.664024684 -0.8146073742  1.606804245  0.55447976
## [75,] -0.54574742  1.235060173  0.1057362394  0.119715997 -0.15041048
## [76,]  1.43551565 -0.271105955  0.4598511198 -0.562058301 -1.81611624
## [77,] -0.27176955  0.492685802  0.6892355066  0.634034887  1.06211388
## [78,] -1.73297539 -0.007374464 -0.9833502122  1.107004340  0.39323089
## [79,] -1.39505608 -2.035919186 -0.1137071197  0.681151719  0.53521123
## [80,]  0.87578434 -0.874433398 -0.0424988677 -1.125182844  0.47031088
## [81,]  1.59526085  0.754686326 -1.4608064116 -0.612963208 -0.57475399
## [82,] -0.28537569 -2.427736947  0.7162375500 -0.698366628 -0.06774922
## [83,] -1.83818607 -0.836870266 -1.2905184398  1.097222062  0.23077943
## [84,]  1.14176188  1.130860577  1.3448048414 -0.314873546  1.32602030
## [85,] -2.64601138 -1.197931497 -0.8098191347  1.080091453 -0.04229422
## [86,] -1.43135669  1.008502317  2.1574172265 -1.582808123  0.16782728
## [87,]  0.26221938  2.335627589  0.5356576054 -0.549740883 -0.90821971
```

```
##   [88,] -1.40526588  1.023265904 -0.0775722754  0.285286316 -0.66904876
##   [89,]  1.10897323 -1.318148820  0.5915361334  1.392066956 -0.98964566
##   [90,]  1.13373175 -0.664001561  1.5900760695  0.315036033  0.38566163
##   [91,] -2.05849828 -0.076989489 -2.5159642043 -0.039834359 -0.29151646
##   [92,]  0.62062036  1.454758540 -0.2608585313  0.497478506 -0.58136822
##   [93,] -0.65507395  0.060491452  1.4418516230  0.584495974 -0.96039256
##   [94,] -1.63226365 -1.541458225  1.4625694389 -0.773305693  0.00346609
##   [95,] -0.21083074 -0.145429075  0.9698467867 -0.403440427  1.76274983
##   [96,] -0.19347371  1.436344320  0.0012068720  1.171671960 -2.35213558
##   [97,]  0.18116949  0.093033591 -0.0672609628 -0.642139589  0.82409963
##   [98,] -0.01579832 -0.713378611 -1.7994201106 -1.396698564  0.26329688
##   [99,] -0.24720640 -2.038072999  1.6437262501 -0.233832947  1.53763250
## [100,]  0.45436225 -0.633041854 -1.8553622294 -0.471281062 -0.55962005
```

```r
#for each time you make a for loop run save evry cbind you into a df
#run an ols y against x
#do another cbind
#print r^2 for each you do
```

Add one final column to X to bring the number of columns to 101. Then try to compute R^2. What happens and why?

```r
#X <- as.matrix(cbind(X, rnorm(100)))
```