# NBA 22-23

Gao

2023-10-19

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.2     v readr     2.1.4
## v forcats   1.0.0     v stringr   1.5.0
## v ggplot2   3.4.3     v tibble    3.2.1
## v lubridate 1.9.2     v tidyr     1.3.0
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(tidymodels)
```

```
## -- Attaching packages --------------------------------------- tidymodels 1.1.1 --
## v broom        1.0.5     v rsample      1.2.0
## v dials        1.2.0     v tune         1.1.2
## v infer        1.0.5     v workflows    1.1.3
## v modeldata    1.2.0     v workflowsets 1.0.1
## v parsnip      1.1.1     v yardstick    1.2.0
## v recipes      1.0.8
## -- Conflicts ------------------------------------------ tidymodels_conflicts() --
## x scales::discard() masks purrr::discard()
## x dplyr::filter()   masks stats::filter()
## x recipes::fixed()  masks stringr::fixed()
## x dplyr::lag()      masks stats::lag()
## x yardstick::spec() masks readr::spec()
## x recipes::step()   masks stats::step()
## * Use tidymodels_prefer() to resolve common conflicts.
```

```
library(ggforce)
library(yardstick)
library(car)
```

```
## Loading required package: carData
##
## Attaching package: 'car'
##
## The following object is masked from 'package:dplyr':
```

```
##
##     recode
##
## The following object is masked from 'package:purrr':
##
##     some
```

```
library(moments)
library(GGally)
```

```
## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg   ggplot2
```

```
library(psych)
```

```
##
## Attaching package: 'psych'
##
## The following object is masked from 'package:car':
##
##     logit
##
## The following objects are masked from 'package:scales':
##
##     alpha, rescale
##
## The following objects are masked from 'package:ggplot2':
##
##     %+%, alpha
```

```
library(fastDummies)
```

```
## Thank you for using fastDummies!
## To acknowledge our work, please cite the package:
## Kaplan, J. & Schlegel, B. (2023). fastDummies: Fast Creation of Dummy (Binary) Columns and Rows from
```

```
NBA <- read_csv("NBA22.csv") %>% as_tibble()
```

```
## Rows: 539 Columns: 45
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (8): FIRST, LAST, TEAM, COLLEGE, COUNTRY, DRAFT_YEAR, DRAFT_ROUND, DRAF...
## dbl (37): AGE, HEIGHT, INCHES, TOTAL_HEIGHT, WEIGHT, GP, W, L, MIN, PTS, FGM...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
cor(NBA$PTS, NBA$AGE)
```

```
## [1] 0.105353
```

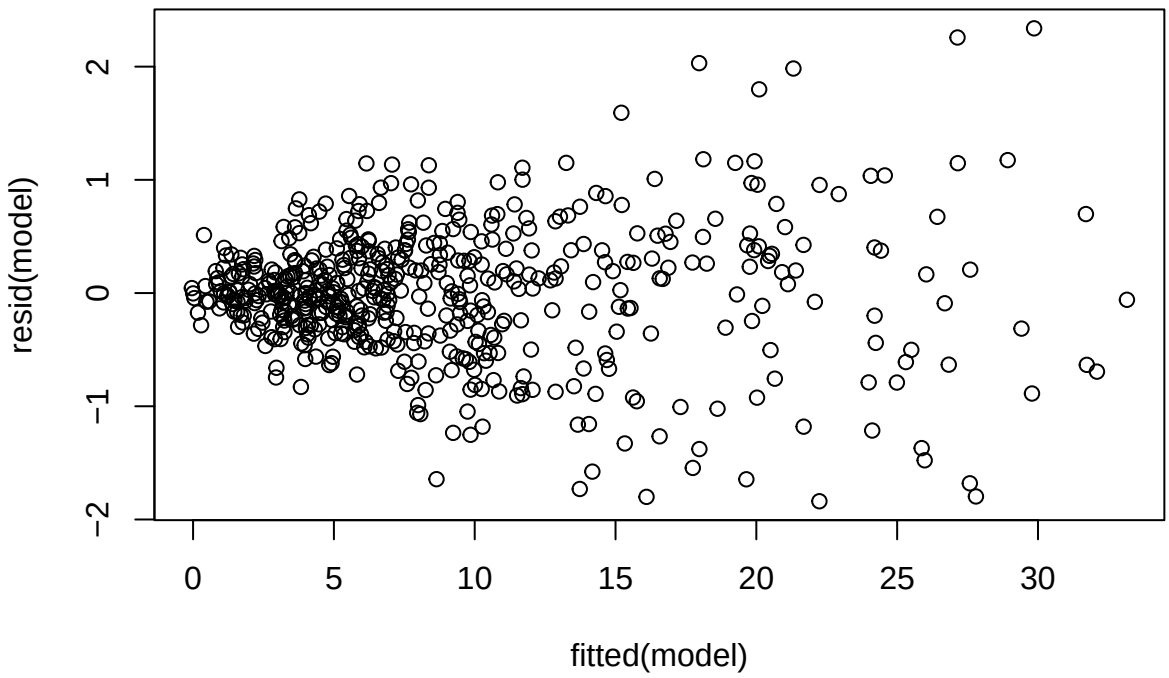
```r
cor(NBA$PTS, select_if(NBA, is.numeric))
```

```
##           AGE     HEIGHT      INCHES TOTAL_HEIGHT     WEIGHT        GP
## [1,] 0.105353 0.06700926 -0.08555374  -0.01010688 0.03943856 0.5068927
##              W         L       MIN PTS       FGM       FGA       FG%       3PM
## [1,] 0.4785077 0.4134082 0.8743863   1 0.9917528 0.9820704 0.2019397 0.7027053
##            3PA       3P%       FTM       FTA       FT%      OREB      DREB
## [1,] 0.7155858 0.2181655 0.9001796 0.8902233 0.3278894 0.3043068 0.7142162
##            REB       AST       TOV       STL       BLK        PF        FP
## [1,] 0.6353543 0.7221607 0.8521601 0.5818423 0.3271584 0.6040127 0.9526629
##            DD2       TD3       +/-    NETRTG      OREB%      DREB%      USG%
## [1,] 0.5558736 0.2720614 0.2536767 0.1449639 -0.1419348 0.09481329 0.7176454
##            TS%      AST%
## [1,] 0.2853946 0.4390633
```

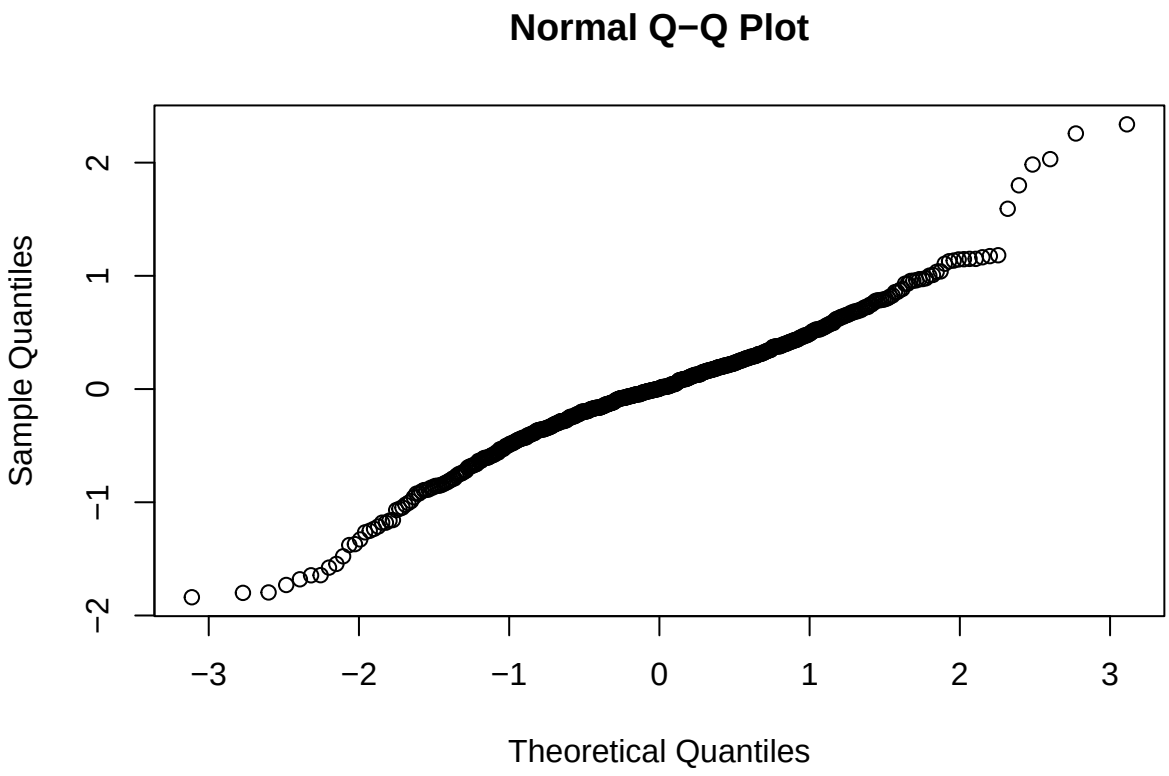
```r
model <- lm(PTS ~ HEIGHT + MIN + FGM + FTM + PF, data = NBA)
model
```

```
##
## Call:
## lm(formula = PTS ~ HEIGHT + MIN + FGM + FTM + PF, data = NBA)
##
## Coefficients:
## (Intercept)       HEIGHT          MIN          FGM          FTM           PF
##     1.59543     -0.26825      0.05852      2.20716      0.81916     -0.33988
```

```r
plot(fitted(model),resid(model))
```




```
qqnorm(resid(model))
```



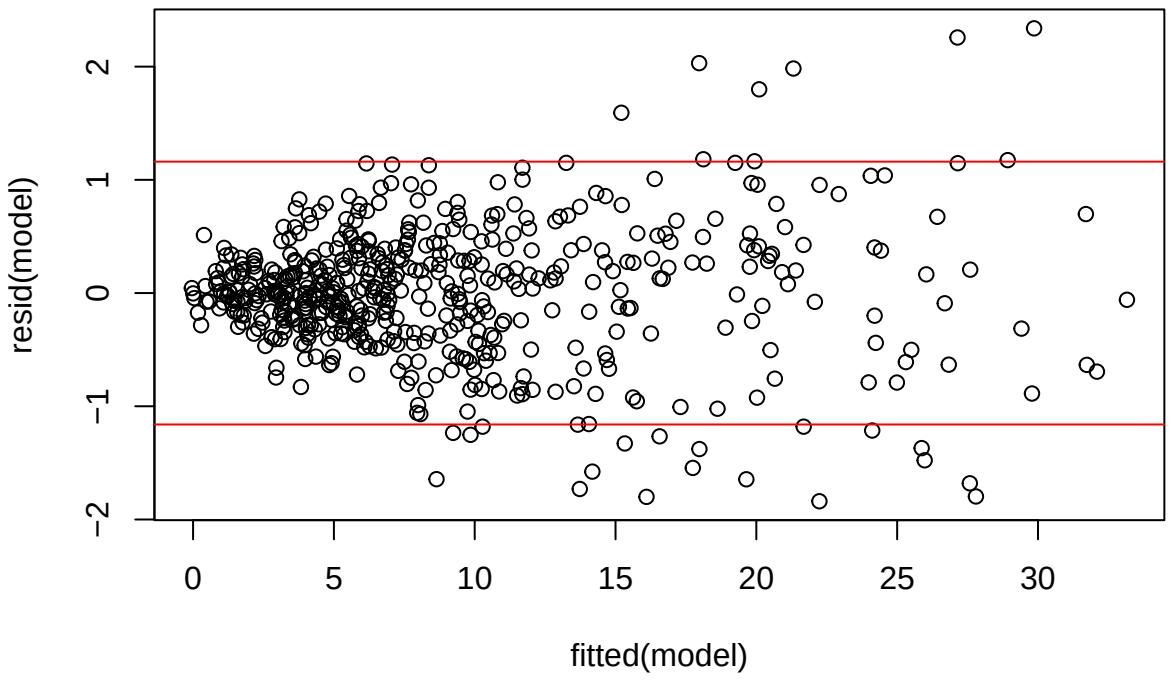

```
standard_error <- sqrt(deviance(model)/df.residual(model))
standard_error
```

```
## [1] 0.5803848
```

```
2*standard_error
```

```
## [1] 1.16077
```

```
plot(fitted(model),resid(model))
abline(h=2*standard_error, col = "red")
abline(h=-2*standard_error, col = "red")
```




```
residual <- resid(model)
residual
```

```
##             1             2             3             4             5
## -6.079934e-01 -1.251859e+00 -1.838806e+00  3.748794e-01  4.425816e-01
##             6             7             8             9            10
##  4.169008e-01  5.393823e-01 -1.800251e+00  2.509084e-01 -8.475143e-01
##            11            12            13            14            15
## -6.341986e-01 -5.904977e-02  1.812040e-01  1.249861e-01  1.310019e-02
##            16            17            18            19            20
##  1.477588e-02 -1.645010e+00 -4.605432e-01 -8.720513e-01  4.848599e-01
##            21            22            23            24            25
##  1.983333e+00  7.247669e-01 -5.037472e-01  7.873563e-01  7.877312e-02
##            26            27            28            29            30
## -2.835339e-01 -1.213763e-01 -1.265619e+00 -2.468928e-01  2.680230e-02
##            31            32            33            34            35
## -4.301418e-01 -4.495140e-01  5.155228e-01 -2.137590e-01 -7.892184e-01
##            36            37            38            39            40
##  1.001615e+00  3.834043e-01  8.275530e-01  3.713589e-01  3.780020e-01
##            41            42            43            44            45
## -2.230890e-01 -1.747767e-01 -6.189994e-01  2.389425e-02  6.856063e-01
##            46            47            48            49            50
##  5.827849e-01 -5.835421e-01 -7.619851e-02  2.068145e-01  5.127391e-02
##            51            52            53            54            55
## -7.511786e-03  2.945574e-01 -2.156493e-01  1.688563e-01 -3.699985e-01
##            56            57            58            59            60
```

```
##  3.944103e-01 -3.543547e-01 -1.130452e-01  4.035327e-02  2.723692e-01
##            61            62            63            64            65
##  4.331430e-01 -4.990494e-01 -9.024159e-02 -7.704478e-02 -1.310817e-02
##            66            67            68            69            70
## -3.025994e-03 -4.421029e-02  1.578201e-01 -2.000245e-01 -5.976686e-01
##            71            72            73            74            75
##  3.909714e-01  1.106953e+00 -1.731979e-01  2.189931e-01 -1.214226e+00
##            76            77            78            79            80
##  2.610533e-01 -3.286941e-01  9.408100e-02 -1.633967e-01  1.593988e-01
##            81            82            83            84            85
## -1.730524e+00 -7.340878e-02  4.338022e-01  2.548731e-02 -2.357635e-02
##            86            87            88            89            90
##  1.236825e-01  7.432897e-01 -2.609378e-01 -7.456894e-01 -1.916845e-02
##            91            92            93            94            95
## -4.704549e-01 -8.692294e-01  3.290741e-01 -1.577223e+00 -2.246052e-01
##            96            97            98            99           100
## -4.827927e-01  3.674385e-02 -1.643828e+00  5.264490e-01  3.139789e-01
##           101           102           103           104           105
## -5.612939e-01  5.512730e-01  2.188486e-02  3.084348e-01 -4.012600e-01
##           106           107           108           109           110
## -7.563848e-01  4.394733e-01  2.257345e+00 -2.823659e-01 -1.680258e+00
##           111           112           113           114           115
## -1.985752e-01  7.844789e-01 -1.987749e-01  3.422849e-01  8.682374e-02
##           116           117           118           119           120
##  1.462614e-01 -1.477261e+00 -4.063128e-01  4.396287e-02 -6.777498e-01
##           121           122           123           124           125
##  2.905182e-01 -8.774604e-02  5.241011e-01  5.477784e-01  6.977499e-01
##           126           127           128           129           130
## -1.910362e-02  6.743881e-01 -5.178607e-01  6.162332e-02 -3.897541e-01
##           131           132           133           134           135
## -6.688159e-02  1.033469e-01 -4.884217e-01  2.244873e-01 -3.644863e-01
##           136           137           138           139           140
## -6.664620e-01 -3.138812e-01 -1.180193e+00 -1.789605e-01  4.026112e-01
##           141           142           143           144           145
##  1.088513e-01  3.318922e-01 -5.930898e-02 -6.865905e-01 -9.676522e-02
##           146           147           148           149           150
##  8.786041e-02  3.201095e-01  4.324921e-01  1.536930e-01 -6.600638e-01
##           151           152           153           154           155
## -4.445116e-02  4.885515e-01 -5.015130e-01 -1.328378e+00 -3.876540e-01
##           156           157           158           159           160
## -8.529160e-01  1.992210e-01  1.153903e-01  2.095384e-01 -8.142252e-02
##           161           162           163           164           165
##  8.740124e-01  5.755240e-02 -1.377859e+00 -6.940619e-01 -2.023222e-01
##           166           167           168           169           170
## -8.293607e-01 -8.905741e-01 -1.729405e-01 -1.006285e+00  1.297543e-01
##           171           172           173           174           175
##  7.963301e-01  4.126844e-01  7.780792e-01  7.479416e-01  7.902819e-01
##           176           177           178           179           180
## -6.811486e-01  4.254485e-01  1.721217e-01 -5.079384e-02 -4.267409e-01
##           181           182           183           184           185
##  8.833284e-02  1.849087e-01  1.920869e-01  6.842564e-01 -8.546713e-01
##           186           187           188           189           190
##  2.831950e-01 -4.890128e-02  1.869728e-02  1.149796e+00  9.569376e-01
##           191           192           193           194           195
```

```
##  6.214831e-01 -6.249195e-02 -4.792411e-01  6.220991e-01  9.311339e-01
##           196           197           198           199           200
##  4.642253e-02 -3.410939e-01 -1.983701e-01 -5.308375e-01 -1.250987e-01
##           201           202           203           204           205
##  2.735870e-01  6.394269e-01  4.148986e-02 -1.680724e-01 -9.227396e-01
##           206           207           208           209           210
## -1.921701e-01 -7.102169e-03  4.212962e-01  1.592496e+00 -4.549948e-02
##           211           212           213           214           215
## -1.267301e-01  9.384262e-02 -6.667796e-02 -1.229592e-02  2.885719e-01
##           216           217           218           219           220
## -1.607751e-01  5.653254e-01 -2.753240e-01 -2.828531e-02  1.763798e-01
##           221           222           223           224           225
##  1.741126e-01  8.842326e-01  1.144900e+00 -1.320633e-01  9.784413e-01
##           226           227           228           229           230
## -2.998408e-02 -4.674394e-01  7.253078e-01 -6.097011e-01  6.734059e-01
##           231           232           233           234           235
## -3.011887e-01  5.272854e-01 -2.843882e-01 -3.446145e-01  7.883588e-02
##           236           237           238           239           240
## -4.813306e-01 -6.315086e-02  4.955441e-01 -8.872948e-01 -6.328549e-02
##           241           242           243           244           245
##  1.128862e+00 -3.585607e-01  8.561674e-01 -3.639752e-01  8.673903e-02
##           246           247           248           249           250
## -7.770976e-02  1.537275e-01 -1.480560e-01 -1.369630e+00 -1.199649e-02
##           251           252           253           254           255
## -1.822989e-03 -3.327325e-01 -4.449078e-01 -1.156894e+00 -3.932951e-01
##           256           257           258           259           260
## -1.554374e-01 -7.199345e-01  1.967452e-01 -1.657776e-02  2.153528e-02
##           261           262           263           264           265
## -2.597298e-01  2.917491e-01  1.939133e-01  9.304589e-01 -8.116737e-01
##           266           267           268           269           270
## -9.705649e-02  2.030874e+00  4.726630e-01  1.845960e-02  1.695686e-01
##           271           272           273           274           275
##  3.696157e-01  1.823757e-01 -7.478383e-02 -2.051969e-02 -1.355628e-01
##           276           277           278           279           280
## -1.915328e-02 -1.942930e-01  7.850302e-02  4.617449e-01 -2.448479e-01
##           281           282           283           284           285
## -6.064398e-01  2.076427e-01  3.745178e-01  1.379722e-01  5.397949e-01
##           286           287           288           289           290
## -2.229529e-01  3.413966e-01 -4.401086e-01  6.880333e-01  1.631605e-01
##           291           292           293           294           295
##  2.170606e-01  2.338120e+00 -4.671329e-02  4.740203e-01  6.982190e-03
##           296           297           298           299           300
## -9.894747e-01  2.668585e-01  1.917924e-02  5.632034e-01  6.058711e-01
##           301           302           303           304           305
##  4.021709e-01 -1.687109e-01 -1.871695e-01 -3.314187e-01  2.957943e-01
##           306           307           308           309           310
##  1.606926e-03  1.039052e+00 -2.770685e-01 -4.315390e-01 -3.637337e-01
##           311           312           313           314           315
## -2.980937e-01 -8.230499e-01  6.174457e-01  1.300190e-01  1.278091e-01
##           316           317           318           319           320
##  5.257111e-01 -1.367219e-01  1.472999e-01  6.632253e-01  3.461632e-01
##           321           322           323           324           325
## -1.046482e+00  4.033892e-02 -5.471025e-02  8.043357e-01 -5.252008e-02
##           326           327           328           329           330
```

```
## -1.638503e-01  4.770717e-01 -3.084263e-01  6.479972e-01  2.327403e-01
##           331           332           333           334           335
## -3.563498e-01  1.934158e-01  3.077156e-01 -3.754918e-01 -1.762660e-01
##           336           337           338           339           340
## -8.072618e-02 -2.915550e-01  1.147009e+00 -1.544496e+00 -1.057355e-02
##           341           342           343           344           345
##  1.628619e-02  6.339132e-01  1.155118e-01 -6.847408e-02 -1.663542e-01
##           346           347           348           349           350
## -6.324648e-01  5.837796e-01 -5.293728e-01  1.941245e-01  7.624148e-01
##           351           352           353           354           355
## -1.179974e+00  2.324305e-01  7.830495e-01  6.535218e-01  3.450534e-01
##           356           357           358           359           360
## -8.029207e-01 -2.460353e-01  7.087824e-01 -1.006144e-01  1.134894e+00
##           361           362           363           364           365
## -8.171233e-05 -1.982796e-01 -8.845840e-02 -2.453793e-01  1.823720e-02
##           366           367           368           369           370
##  2.434462e-01  2.357187e-01  2.550335e-01  7.732670e-02  1.247975e-01
##           371           372           373           374           375
## -7.691988e-01 -3.772648e-02  5.026312e-03  4.566289e-01  5.710210e-01
##           376           377           378           379           380
##  2.707875e-01  8.176779e-01  4.202339e-01  3.790942e-01 -1.647508e-01
##           381           382           383           384           385
##  3.166267e-01 -1.228293e-01  2.344627e-01 -2.649573e-02 -8.395438e-01
##           386           387           388           389           390
## -1.162073e+00  2.001601e-01  1.149813e+00  6.561340e-01  1.008135e+00
##           391           392           393           394           395
## -2.637485e-01 -5.913346e-01  9.548179e-01  1.230485e-01 -4.252355e-01
##           396           397           398           399           400
##  5.067661e-01 -3.002893e-01 -2.206784e-01  3.358445e-01  2.209976e-01
##           401           402           403           404           405
## -1.477904e-01  1.759882e-01  3.774113e-01  3.279801e-01  1.035673e+00
##           406           407           408           409           410
##  1.288179e-01 -1.553502e-01  7.911515e-02 -2.764150e-01  1.031077e-01
##           411           412           413           414           415
## -4.352835e-02 -1.380413e-01  2.830233e-01 -1.816626e-01  8.576526e-01
##           416           417           418           419           420
## -8.563051e-01 -3.940296e-01 -1.081374e-01 -4.641606e-02 -5.961262e-02
##           421           422           423           424           425
##  1.477865e-01 -2.836708e-01  1.985051e-01  1.845100e-01  8.910380e-02
##           426           427           428           429           430
##  6.388536e-01  4.590873e-01 -9.237898e-01  1.523816e-01  4.098818e-01
##           431           432           433           434           435
## -3.211963e-01  3.990136e-01  2.416801e-01 -1.522858e-01  4.278991e-02
##           436           437           438           439           440
## -1.354180e-01 -9.555996e-01  9.688612e-02  9.606267e-01 -8.017209e-02
##           441           442           443           444           445
##  6.822853e-02 -7.904063e-01  3.111085e-01 -1.057848e+00 -8.274660e-02
##           446           447           448           449           450
##  5.123134e-01  1.164002e+00 -5.823670e-01  3.910097e-01 -8.859976e-03
##           451           452           453           454           455
## -4.068684e-01 -7.893348e-02 -5.593808e-01  1.123755e-01  5.292771e-01
##           456           457           458           459           460
## -7.368418e-01 -1.632998e-01 -4.298590e-01  1.655053e-01  6.972846e-01
##           461           462           463           464           465
```

```
##  2.848170e-01  2.115516e-01  2.218823e-01 -4.767723e-02  1.174199e+00
##           466           467           468           469           470
## -3.446003e-01  2.106806e-01 -3.115414e-03 -7.480334e-01  1.276030e-01
##           471           472           473           474           475
##  1.799471e+00 -1.649555e-01  1.123790e-01 -1.069117e+00 -1.942591e-01
##           476           477           478           479           480
##  1.636115e-01 -2.424040e-01  9.718092e-01  4.518372e-01 -2.834160e-01
##           481           482           483           484           485
##  2.694996e-01  2.528514e-01 -5.336655e-01 -7.264931e-01  1.181977e+00
##           486           487           488           489           490
##  2.600597e-01  3.565798e-01 -5.125982e-04 -1.021610e+00  2.079272e-01
##           491           492           493           494           495
## -3.058617e-01  2.518120e-01  5.807666e-01 -1.298999e-01 -3.016233e-02
##           496           497           498           499           500
##  2.174746e-01 -2.407478e-01 -3.514773e-01  2.751271e-01  3.776934e-01
##           501           502           503           504           505
## -2.386938e-01  2.477404e-01  7.191847e-01 -4.416793e-01 -2.349171e-01
##           506           507           508           509           510
## -2.004006e-01 -3.570802e-01  2.873639e-01  3.765301e-01 -2.971961e-02
##           511           512           513           514           515
##  1.320189e-01 -3.394338e-01  2.236334e-01  8.858353e-02  4.379099e-02
##           516           517           518           519           520
## -3.159893e-01  4.717511e-01 -6.690613e-01  3.110793e-01 -3.565677e-01
##           521           522           523           524           525
## -5.765651e-01 -9.048760e-01 -1.185950e-01 -1.176992e-01 -1.234607e+00
##           526           527           528           529           530
##  2.868017e-02 -1.796490e+00 -3.576960e-02 -4.541351e-01 -5.302546e-01
##           531           532           533           534           535
##  3.044880e-01 -6.052113e-01 -6.357093e-01  9.706186e-01 -5.624567e-01
##           536           537           538           539
##  1.651528e-01  2.307108e-02 -4.094633e-01 -8.928381e-01
```

```
sort(residual)
```

```
##             3             8           527            81           110
## -1.838806e+00 -1.800251e+00 -1.796490e+00 -1.730524e+00 -1.680258e+00
##            17            98            94           339           117
## -1.645010e+00 -1.643828e+00 -1.577223e+00 -1.544496e+00 -1.477261e+00
##           163           249           154            28             2
## -1.377859e+00 -1.369630e+00 -1.328378e+00 -1.265619e+00 -1.251859e+00
##           525            75           138           351           386
## -1.234607e+00 -1.214226e+00 -1.180193e+00 -1.179974e+00 -1.162073e+00
##           254           474           444           321           489
## -1.156894e+00 -1.069117e+00 -1.057848e+00 -1.046482e+00 -1.021610e+00
##           169           296           437           428           205
## -1.006285e+00 -9.894747e-01 -9.555996e-01 -9.237898e-01 -9.227396e-01
##           522           539           167           239            19
## -9.048760e-01 -8.928381e-01 -8.905741e-01 -8.872948e-01 -8.720513e-01
##            92           416           185           156            10
## -8.692294e-01 -8.563051e-01 -8.546713e-01 -8.529160e-01 -8.475143e-01
##           385           166           312           265           356
## -8.395438e-01 -8.293607e-01 -8.230499e-01 -8.116737e-01 -8.029207e-01
##           442            35           371           106           469
## -7.904063e-01 -7.892184e-01 -7.691988e-01 -7.563848e-01 -7.480334e-01
```

```
##             89            456            484            257            164
## -7.456894e-01 -7.368418e-01 -7.264931e-01 -7.199345e-01 -6.940619e-01
##            144            176            120            518            136
## -6.865905e-01 -6.811486e-01 -6.777498e-01 -6.690613e-01 -6.664620e-01
##            150            533             11            346             43
## -6.600638e-01 -6.357093e-01 -6.341986e-01 -6.324648e-01 -6.189994e-01
##            229              1            281            532             70
## -6.097011e-01 -6.079934e-01 -6.064398e-01 -6.052113e-01 -5.976686e-01
##            392             47            448            521            535
## -5.913346e-01 -5.835421e-01 -5.823670e-01 -5.765651e-01 -5.624567e-01
##            101            453            483            199            530
## -5.612939e-01 -5.593808e-01 -5.336655e-01 -5.308375e-01 -5.302546e-01
##            348            128             23            153             62
## -5.293728e-01 -5.178607e-01 -5.037472e-01 -5.015130e-01 -4.990494e-01
##            133             96            236            193             91
## -4.884217e-01 -4.827927e-01 -4.813306e-01 -4.792411e-01 -4.704549e-01
##            227             18            529             32            253
## -4.674394e-01 -4.605432e-01 -4.541351e-01 -4.495140e-01 -4.449078e-01
##            504            288            309             31            458
## -4.416793e-01 -4.401086e-01 -4.315390e-01 -4.301418e-01 -4.298590e-01
##            180            395            538            451            118
## -4.267409e-01 -4.252355e-01 -4.094633e-01 -4.068684e-01 -4.063128e-01
##            105            417            255            130            155
## -4.012600e-01 -3.940296e-01 -3.932951e-01 -3.897541e-01 -3.876540e-01
##            334             55            135            244            310
## -3.754918e-01 -3.699985e-01 -3.644863e-01 -3.639752e-01 -3.637337e-01
##            242            507            520            331             57
## -3.585607e-01 -3.570802e-01 -3.565677e-01 -3.563498e-01 -3.543547e-01
##            498            234            466            197            512
## -3.514773e-01 -3.446145e-01 -3.446003e-01 -3.410939e-01 -3.394338e-01
##            252            304             77            431            516
## -3.327325e-01 -3.314187e-01 -3.286941e-01 -3.211963e-01 -3.159893e-01
##            137            328            491            231            397
## -3.138812e-01 -3.084263e-01 -3.058617e-01 -3.011887e-01 -3.002893e-01
##            311            337            233            422             26
## -2.980937e-01 -2.915550e-01 -2.843882e-01 -2.836708e-01 -2.835339e-01
##            480            109            308            409            218
## -2.834160e-01 -2.823659e-01 -2.770685e-01 -2.764150e-01 -2.753240e-01
##            391             88            261             29            357
## -2.637485e-01 -2.609378e-01 -2.597298e-01 -2.468928e-01 -2.460353e-01
##            364            280            477            497            501
## -2.453793e-01 -2.448479e-01 -2.424040e-01 -2.407478e-01 -2.386938e-01
##            505             95             41            286            398
## -2.349171e-01 -2.246052e-01 -2.230890e-01 -2.229529e-01 -2.206784e-01
##             53             34            165            506             69
## -2.156493e-01 -2.137590e-01 -2.023222e-01 -2.004006e-01 -2.000245e-01
##            113            111            198            362            277
## -1.987749e-01 -1.985752e-01 -1.983701e-01 -1.982796e-01 -1.942930e-01
##            475            206            303            414            139
## -1.942591e-01 -1.921701e-01 -1.871695e-01 -1.816626e-01 -1.789605e-01
##            335             42             73            168            302
## -1.762660e-01 -1.747767e-01 -1.731979e-01 -1.729405e-01 -1.687109e-01
##            204            345            472            380            326
## -1.680724e-01 -1.663542e-01 -1.649555e-01 -1.647508e-01 -1.638503e-01
```

```
##            79           457           216           256           407
## -1.633967e-01 -1.632998e-01 -1.607751e-01 -1.554374e-01 -1.553502e-01
##           434           248           401           412           317
## -1.522858e-01 -1.480560e-01 -1.477904e-01 -1.380413e-01 -1.367219e-01
##           275           436           224           494           211
## -1.355628e-01 -1.354180e-01 -1.320633e-01 -1.298999e-01 -1.267301e-01
##           200           382            27           523           524
## -1.250987e-01 -1.228293e-01 -1.213763e-01 -1.185950e-01 -1.176992e-01
##            58           418           359           266           145
## -1.130452e-01 -1.081374e-01 -1.006144e-01 -9.705649e-02 -9.676522e-02
##            63           363           122           445           160
## -9.024159e-02 -8.845840e-02 -8.774604e-02 -8.274660e-02 -8.142252e-02
##           336           440           452           246            64
## -8.072618e-02 -8.017209e-02 -7.893348e-02 -7.770976e-02 -7.704478e-02
##            48           273            82           344           131
## -7.619851e-02 -7.478383e-02 -7.340878e-02 -6.847408e-02 -6.688159e-02
##           213           240           237           192           420
## -6.667796e-02 -6.328549e-02 -6.315086e-02 -6.249195e-02 -5.961262e-02
##           143            12           323           325           179
## -5.930898e-02 -5.904977e-02 -5.471025e-02 -5.252008e-02 -5.079384e-02
##           187           464           293           419           210
## -4.890128e-02 -4.767723e-02 -4.671329e-02 -4.641606e-02 -4.549948e-02
##           151            67           411           372           528
## -4.445116e-02 -4.421029e-02 -4.352835e-02 -3.772648e-02 -3.576960e-02
##           495           226           510           219           384
## -3.016233e-02 -2.998408e-02 -2.971961e-02 -2.828531e-02 -2.649573e-02
##            85           274            90           276           126
## -2.357635e-02 -2.051969e-02 -1.916845e-02 -1.915328e-02 -1.910362e-02
##           259            65           214           250           340
## -1.657776e-02 -1.310817e-02 -1.229592e-02 -1.199649e-02 -1.057355e-02
##           450            51           207           468            66
## -8.859976e-03 -7.511786e-03 -7.102169e-03 -3.115414e-03 -3.025994e-03
##           251           488           361           306           373
## -1.822989e-03 -5.125982e-04 -8.171233e-05  1.606926e-03  5.026312e-03
##           295            15            16           341           365
##  6.982190e-03  1.310019e-02  1.477588e-02  1.628619e-02  1.823720e-02
##           269           188           298           260           103
##  1.845960e-02  1.869728e-02  1.917924e-02  2.153528e-02  2.188486e-02
##           537            44            84            30           526
##  2.307108e-02  2.389425e-02  2.548731e-02  2.680230e-02  2.868017e-02
##            97           322            59           203           435
##  3.674385e-02  4.033892e-02  4.035327e-02  4.148986e-02  4.278991e-02
##           515           119           196            50           162
##  4.379099e-02  4.396287e-02  4.642253e-02  5.127391e-02  5.755240e-02
##           129           441           369           278            25
##  6.162332e-02  6.822853e-02  7.732670e-02  7.850302e-02  7.877312e-02
##           235           408           245           115           146
##  7.883588e-02  7.911515e-02  8.673903e-02  8.682374e-02  8.786041e-02
##           181           514           425           212            78
##  8.833284e-02  8.858353e-02  8.910380e-02  9.384262e-02  9.408100e-02
##           438           410           132           141           454
##  9.688612e-02  1.031077e-01  1.033469e-01  1.088513e-01  1.123755e-01
##           473           158           343           394            86
##  1.123790e-01  1.153903e-01  1.155118e-01  1.230485e-01  1.236825e-01
```

```
##          370           14          470          315          406
##  1.247975e-01  1.249861e-01  1.276030e-01  1.278091e-01  1.288179e-01
##          170          314          511          284          116
##  1.297543e-01  1.300190e-01  1.320189e-01  1.379722e-01  1.462614e-01
##          318          421          429          149          247
##  1.472999e-01  1.477865e-01  1.523816e-01  1.536930e-01  1.537275e-01
##           68           80          290          476          536
##  1.578201e-01  1.593988e-01  1.631605e-01  1.636115e-01  1.651528e-01
##          459           54          270          178          221
##  1.655053e-01  1.688563e-01  1.695686e-01  1.721217e-01  1.741126e-01
##          402          220           13          272          424
##  1.759882e-01  1.763798e-01  1.812040e-01  1.823757e-01  1.845100e-01
##          182          183          332          263          349
##  1.849087e-01  1.920869e-01  1.934158e-01  1.939133e-01  1.941245e-01
##          258          423          157          387           49
##  1.967452e-01  1.985051e-01  1.992210e-01  2.001601e-01  2.068145e-01
##          282          490          159          467          462
##  2.076427e-01  2.079272e-01  2.095384e-01  2.106806e-01  2.115516e-01
##          291          496           74          400          463
##  2.170606e-01  2.174746e-01  2.189931e-01  2.209976e-01  2.218823e-01
##          513          134          352          330          383
##  2.236334e-01  2.244873e-01  2.324305e-01  2.327403e-01  2.344627e-01
##          367          433          366          502            9
##  2.357187e-01  2.416801e-01  2.434462e-01  2.477404e-01  2.509084e-01
##          492          482          368          486           76
##  2.518120e-01  2.528514e-01  2.550335e-01  2.600597e-01  2.610533e-01
##          297          481          376           60          201
##  2.668585e-01  2.694996e-01  2.707875e-01  2.723692e-01  2.735870e-01
##          499          413          186          461          508
##  2.751271e-01  2.830233e-01  2.831950e-01  2.848170e-01  2.873639e-01
##          215          121          262           52          305
##  2.885719e-01  2.905182e-01  2.917491e-01  2.945574e-01  2.957943e-01
##          531          333          104          519          443
##  3.044880e-01  3.077156e-01  3.084348e-01  3.110793e-01  3.111085e-01
##          100          381          147          404           93
##  3.139789e-01  3.166267e-01  3.201095e-01  3.279801e-01  3.290741e-01
##          142          399          287          114          355
##  3.318922e-01  3.358445e-01  3.413966e-01  3.422849e-01  3.450534e-01
##          320          487          271           39          283
##  3.461632e-01  3.565798e-01  3.696157e-01  3.713589e-01  3.745178e-01
##            4          509          403          500           40
##  3.748794e-01  3.765301e-01  3.774113e-01  3.776934e-01  3.780020e-01
##          379           37           71          449           56
##  3.790942e-01  3.834043e-01  3.909714e-01  3.910097e-01  3.944103e-01
##          432          301          140          430          172
##  3.990136e-01  4.021709e-01  4.026112e-01  4.098818e-01  4.126844e-01
##            6          378          208          177          148
##  4.169008e-01  4.202339e-01  4.212962e-01  4.254485e-01  4.324921e-01
##           61           83          107            5          479
##  4.331430e-01  4.338022e-01  4.394733e-01  4.425816e-01  4.518372e-01
##          374          427          279          517          268
##  4.566289e-01  4.590873e-01  4.617449e-01  4.717511e-01  4.726630e-01
##          294          327           20          152          238
##  4.740203e-01  4.770717e-01  4.848599e-01  4.885515e-01  4.955441e-01
```

```
##           396           446            33           123           316
##  5.067661e-01  5.123134e-01  5.155228e-01  5.241011e-01  5.257111e-01
##            99           232           455             7           285
##  5.264490e-01  5.272854e-01  5.292771e-01  5.393823e-01  5.397949e-01
##           124           102           299           217           375
##  5.477784e-01  5.512730e-01  5.632034e-01  5.653254e-01  5.710210e-01
##           493            46           347           300           313
##  5.807666e-01  5.827849e-01  5.837796e-01  6.058711e-01  6.174457e-01
##           191           194           342           426           202
##  6.214831e-01  6.220991e-01  6.339132e-01  6.388536e-01  6.394269e-01
##           329           354           389           319           230
##  6.479972e-01  6.535218e-01  6.561340e-01  6.632253e-01  6.734059e-01
##           127           184            45           289           460
##  6.743881e-01  6.842564e-01  6.856063e-01  6.880333e-01  6.972846e-01
##           125           358           503            22           228
##  6.977499e-01  7.087824e-01  7.191847e-01  7.247669e-01  7.253078e-01
##            87           174           350           173           353
##  7.432897e-01  7.479416e-01  7.624148e-01  7.780792e-01  7.830495e-01
##           112            24           175           171           324
##  7.844789e-01  7.873563e-01  7.902819e-01  7.963301e-01  8.043357e-01
##           377            38           243           415           161
##  8.176779e-01  8.275530e-01  8.561674e-01  8.576526e-01  8.740124e-01
##           222           264           195           393           190
##  8.842326e-01  9.304589e-01  9.311339e-01  9.548179e-01  9.569376e-01
##           439           534           478           225            36
##  9.606267e-01  9.706186e-01  9.718092e-01  9.784413e-01  1.001615e+00
##           390           405           307            72           241
##  1.008135e+00  1.035673e+00  1.039052e+00  1.106953e+00  1.128862e+00
##           360           223           338           189           388
##  1.134894e+00  1.144900e+00  1.147009e+00  1.149796e+00  1.149813e+00
##           447           465           485           209           471
##  1.164002e+00  1.174199e+00  1.181977e+00  1.592496e+00  1.799471e+00
##            21           267           108           292
##  1.983333e+00  2.030874e+00  2.257345e+00  2.338120e+00
```

```
h <- 2*(5+1)/539
h
```

```
## [1] 0.02226345
```

```
sort(hatvalues(model))
```

```
##         334         168           1         512         378         281
## 0.002211261 0.002247274 0.002247987 0.002308437 0.002339895 0.002400156
##         418         241         218          52         240         534
## 0.002436800 0.002444748 0.002495853 0.002511913 0.002514407 0.002550259
##          51         502         504           6         303         248
## 0.002559172 0.002573729 0.002581622 0.002597024 0.002602012 0.002646600
##         420           4          80         148           9         474
## 0.002673141 0.002673616 0.002678926 0.002688554 0.002701000 0.002702478
##          57         271          37         152         160         439
## 0.002760187 0.002763553 0.002810657 0.002811967 0.002830904 0.002849076
##         497         354          77         104         180         147
```

```
## 0.002890022 0.002895507 0.002928372 0.002935335 0.002955201 0.002955703
##         299         213         244         301         304         101
## 0.002959251 0.002981870 0.003010351 0.003018803 0.003071869 0.003149892
##         179         219         305         524         134         342
## 0.003175154 0.003182068 0.003182642 0.003195411 0.003195741 0.003203679
##         256         415          19         285         413         122
## 0.003221462 0.003223647 0.003226702 0.003227514 0.003230605 0.003257795
##         356         105         102         107         215         191
## 0.003269123 0.003297572 0.003305150 0.003365215 0.003381318 0.003390618
##         327         503         535         368         251          34
## 0.003408904 0.003427582 0.003440625 0.003451289 0.003585512 0.003585695
##         253         360         132         494         259         425
## 0.003613978 0.003615206 0.003616015 0.003618592 0.003626226 0.003633168
##         188          70         337         458         419         293
## 0.003639805 0.003640871 0.003643370 0.003709406 0.003721375 0.003722175
##         225         343          53         141          38         477
## 0.003723835 0.003767320 0.003778970 0.003786676 0.003808478 0.003814936
##         282         226         506         243         111         258
## 0.003818576 0.003834498 0.003840376 0.003870008 0.003883008 0.003913259
##         441         461         359         473         399         318
## 0.003943473 0.003944847 0.004014997 0.004033290 0.004034475 0.004049392
##          87         498         507         472         430         257
## 0.004077440 0.004077667 0.004083993 0.004085682 0.004086029 0.004088549
##         202         313         247         139         448         411
## 0.004116032 0.004122801 0.004132288 0.004144844 0.004153103 0.004155342
##         310         407         403         149         324         435
## 0.004157910 0.004165901 0.004176199 0.004186355 0.004289977 0.004306400
##         144         193         381         210         501         365
## 0.004310896 0.004318706 0.004322934 0.004327449 0.004327622 0.004359130
##         417         429         433         514         332          60
## 0.004412693 0.004437514 0.004437771 0.004490698 0.004511682 0.004525756
##         495         525         165         237         427          85
## 0.004526995 0.004528154 0.004545036 0.004573768 0.004636358 0.004641765
##          30         109         183          15         374         227
## 0.004673286 0.004673741 0.004694807 0.004699184 0.004702892 0.004714420
##         333         220          91         382         476         196
## 0.004716189 0.004739628 0.004767314 0.004781379 0.004782922 0.004809573
##         509         291         195         279          18         347
## 0.004812625 0.004817014 0.004827314 0.004841154 0.004845006 0.004845127
##          50         383         496         508         331          83
## 0.004848488 0.004850960 0.004854090 0.004855145 0.004882939 0.004884007
##         174         178         450         518         135          62
## 0.004884166 0.004898714 0.004931814 0.004943115 0.004951492 0.004958947
##         451          90         319         280         118         302
## 0.004959072 0.004979999 0.005003935 0.005029796 0.005076116 0.005109757
##         312          55         484         408         453         469
## 0.005121901 0.005124815 0.005137505 0.005142698 0.005148793 0.005177463
##         456         175         400         466         206          43
## 0.005188425 0.005193824 0.005228602 0.005243757 0.005271901 0.005275508
##         242         112         423         315         321         277
## 0.005286355 0.005296159 0.005301278 0.005349291 0.005349520 0.005377408
##         414         150          42         487         526          41
## 0.005415489 0.005417852 0.005424660 0.005441068 0.005493727 0.005497990
##           2         355         156         361         372         264
```

```
## 0.005534454 0.005548548 0.005658836 0.005669529 0.005683216 0.005705554
##          13         286         216         158         308         330
## 0.005711929 0.005724498 0.005738818 0.005775499 0.005791421 0.005806628
##         171         373         340         493         182         119
## 0.005823556 0.005832923 0.005844725 0.005869653 0.005871634 0.005876670
##         366         187         505          25          26           8
## 0.005884029 0.005887175 0.005891349 0.005913589 0.005920404 0.005931779
##         133         116         169          56         128         261
## 0.005948523 0.005948808 0.005956198 0.005963630 0.005974448 0.005987985
##         491          95         273          84          44         364
## 0.005997961 0.006003147 0.006024572 0.006033540 0.006040396 0.006046437
##         467         323          33         369         201         260
## 0.006064162 0.006074681 0.006092849 0.006136262 0.006147384 0.006176869
##         154         401         475         274         422         211
## 0.006187332 0.006192664 0.006204769 0.006289050 0.006298928 0.006302804
##         130         194         452         276         155         490
## 0.006315489 0.006322763 0.006341326 0.006358601 0.006379183 0.006419048
##         520          67         519          66         138         349
## 0.006432736 0.006440360 0.006448405 0.006454669 0.006461843 0.006497123
##         431         121         294         181          48         362
## 0.006498847 0.006509119 0.006510422 0.006629886 0.006631748 0.006662266
##          12         462          92         336         389         290
## 0.006669717 0.006708829 0.006768884 0.006776684 0.006819121 0.006822997
##         397         460         231          59         468         370
## 0.006826106 0.006849760 0.006869419 0.006869894 0.006930711 0.006944075
##         129         515         463         270         236         103
## 0.006966604 0.006981525 0.007015789 0.007020153 0.007032566 0.007037013
##         136         350          94          10         394         228
## 0.007051640 0.007078909 0.007107569 0.007122078 0.007145253 0.007152079
##         120         531         421         124         470         345
## 0.007219118 0.007296200 0.007339190 0.007351552 0.007387528 0.007402741
##         339         224          88         113          40         426
## 0.007412370 0.007425243 0.007428088 0.007429114 0.007444360 0.007451343
##          72         357         455         329         142         284
## 0.007460872 0.007463859 0.007496460 0.007523055 0.007535415 0.007595718
##         162         131         396         457         114          29
## 0.007616630 0.007626504 0.007651621 0.007662348 0.007682395 0.007702079
##          20         511         409         380         488         344
## 0.007709357 0.007727341 0.007786078 0.007787907 0.007808678 0.007862889
##          31         235         510         296         326         184
## 0.007865815 0.007952945 0.008012872 0.008064532 0.008111929 0.008180057
##         185         440         328         438         376         391
## 0.008186834 0.008190492 0.008202525 0.008210354 0.008217471 0.008285120
##          32         250         454         384         523         363
## 0.008295135 0.008304099 0.008371522 0.008432026 0.008446873 0.008545196
##         192         499         316          74         317          28
## 0.008548341 0.008558690 0.008575765 0.008721980 0.008770589 0.008780941
##         204         459         341         189          96         432
## 0.008785523 0.008811987 0.008828276 0.008858739 0.008913407 0.008921507
##          68          64          82          81         517         335
## 0.008962879 0.009028316 0.009035241 0.009137992 0.009174871 0.009205382
##         222          93         234         500         245         309
## 0.009254699 0.009435969 0.009482257 0.009527897 0.009615431 0.009649003
##          16         254         221         145         295          45
```

```
## 0.009671159 0.009677975 0.009689224 0.009714377 0.009724480 0.009808234
##         157         123         538          14         311         198
## 0.009829200 0.009918858 0.009924920 0.009932231 0.009958686 0.009984355
##         353           3         379          54         115           7
## 0.010067826 0.010089977 0.010154725 0.010178740 0.010229291 0.010294893
##         436         207          73         233         537          99
## 0.010330071 0.010531565 0.010574401 0.010656813 0.010750179 0.010760420
##         388         246         212         449          46         263
## 0.010856115 0.010870385 0.010877695 0.010989479 0.010989827 0.011010240
##         269         159         492         532         398         485
## 0.011072569 0.011072985 0.011097167 0.011101746 0.011210342 0.011242426
##          86         392         445         161         197         528
## 0.011302932 0.011332643 0.011380010 0.011411003 0.011478726 0.011523137
##         479         447         172          58         151         209
## 0.011632859 0.011672028 0.011681542 0.011711053 0.011725999 0.012174076
##         100         106         266          24         205          69
## 0.012245795 0.012351405 0.012420540 0.012541522 0.012731938 0.012779512
##          61         395         404         348         283         371
## 0.013099189 0.013127487 0.013195721 0.013375419 0.013403491 0.013452372
##          78          36         140         358         268         352
## 0.013665254 0.013760406 0.013836161 0.013910477 0.013950630 0.013999745
##         390         322         127         516         300         529
## 0.014279564 0.014312748 0.014321552 0.014418399 0.014445864 0.014570662
##         278         437         199         252         146         424
## 0.014716131 0.014803937 0.014956579 0.015218778 0.015225075 0.015234692
##         232         405         483         522         126         170
## 0.015253577 0.015266280 0.015325152 0.015336231 0.015490491 0.015653138
##         176         442         177         214         444         229
## 0.015982224 0.016000606 0.016128522 0.016234013 0.016309636 0.016332069
##         486         217          39          97         434         288
## 0.016390588 0.016606345 0.016708421 0.016770073 0.017014865 0.017245291
##          35         320         410         153         481         249
## 0.017423509 0.017537607 0.017836257 0.018085980 0.018428617 0.018574945
##         480         208         377          21          71         489
## 0.018880059 0.019195035 0.019229703 0.019249112 0.019909114 0.020017325
##         186         375         464         513         117         314
## 0.020018537 0.020207038 0.020893898 0.021245439 0.021363709 0.021489120
##         406         338         230         255         163         238
## 0.021754860 0.021810174 0.022100480 0.022212777 0.022440778 0.023605294
##          23         108         110         521          98         527
## 0.023709271 0.024500054 0.024755446 0.024845685 0.025379614 0.025447829
##          49         482          22         289         346         530
## 0.025540357 0.025930045 0.026096245 0.026576332 0.026733482 0.027116872
##         203         443         412         265           5         137
## 0.027152236 0.027311337 0.027488497 0.027536833 0.027696143 0.027736401
##         275         298         471          65         385          63
## 0.027829683 0.027847073 0.027899029 0.028006323 0.028011423 0.028171609
##         325         287         386         272          76         539
## 0.028303523 0.028803668 0.029008546 0.029281959 0.029586574 0.029841830
##         387         200         223         402         167         428
## 0.030247497 0.030499549 0.030551203 0.030698653 0.030732725 0.030952891
##         297         446         262         465         533          47
## 0.031428870 0.031429798 0.031561505 0.032433221 0.032682501 0.032887384
##         416         367         190         393         478         351
```

```
## 0.033346496 0.033641274 0.033782708 0.034412930 0.034564809 0.034704086
##         306          89          79         307          27         125
## 0.034886369 0.034994844 0.035334239 0.037610045 0.038763358 0.041123082
##          17         239         173          75         536         292
## 0.041316693 0.043570323 0.048567142 0.058980841 0.060317257 0.064992593
##          11         164         267         143         166
## 0.065650842 0.084075759 0.094961840 0.096223371 0.101082746
```

```
t <- qt(df = 539 - 5 - 2, 0.95)
t
```

```
## [1] 1.647723
```

```
sort(jackknife <- rstudent(model))
```

```
##             3           527             8            81           110
## -3.2120715548 -3.1618503199 -3.1367553878 -3.0181006504 -2.9527404748
##            17            98            94           339           117
## -2.9150644669 -2.8886456943 -2.7439089897 -2.6866108738 -2.5866446844
##           163           249           154            28             2
## -2.4119649078 -2.3926271092 -2.3051753262 -2.1981519823 -2.1704571146
##            75           525           351           138           386
## -2.1641114666 -2.1391946935 -2.0757258258 -2.0461578149 -2.0379351926
##           254           474           444           321           489
## -2.0087326101 -1.8487558390 -1.8418332986 -1.8117926339 -1.7817386807
##           169           296           437           428           205
## -1.7423274786 -1.7148898845 -1.6615552173 -1.6193646295 -1.6024459711
##           522           239           539           167           166
## -1.5733644870 -1.5653644588 -1.5639530403 -1.5606892105 -1.5089929723
##            19            92           416           185           156
## -1.5067623784 -1.5045527978 -1.5024107766 -1.4803109956 -1.4753716393
##           385            10           312           265           356
## -1.4688173963 -1.4670740058 -1.4231231964 -1.4195216379 -1.3868949851
##           442            35           371           106            89
## -1.3740369350 -1.3729611949 -1.3353106586 -1.3122588881 -1.3087822583
##           469           456           484           164           257
## -1.2930214384 -1.2736236438 -1.2556504971 -1.2502062429 -1.2436241694
##           144           176           120           518           136
## -1.1860022416 -1.1835526788 -1.1724091329 -1.1560135587 -1.1527363405
##           150            11           533           346            43
## -1.1407020659 -1.1307539767 -1.1139254876 -1.1048270540 -1.0695014985
##           229             1           532           281            70
## -1.0593182385 -1.0488474234 -1.0487110979 -1.0462417612 -1.0317220514
##           392            47           521           448           535
## -1.0247374404 -1.0224359469 -1.0060059440 -1.0055159720 -0.9707289982
##           101           453           483           530           199
## -0.9685771098 -0.9662409471 -0.9265075700 -0.9261473996 -0.9214172640
##           348           128            23           153            62
## -0.9181330469 -0.8947813212 -0.8782413148 -0.8718297408 -0.8617914094
##           133            96           236           193            91
## -0.8438343415 -0.8353447585 -0.8320214195 -0.8272737619 -0.8122711537
##           227            18           529            32           253
## -0.8070367883 -0.7951684898 -0.7879556896 -0.7774541348 -0.7676668381
```

```
##           288           504           309            31           458
## -0.7646312301 -0.7616951709 -0.7468428942 -0.7437522136 -0.7417092049
##           395           180           538           451           118
## -0.7372195796 -0.7360446503 -0.7086993984 -0.7024428132 -0.7015239903
##           105           255           417           130           155
## -0.6921731323 -0.6849580310 -0.6800706362 -0.6733294284 -0.6697196909
##           334            55           135           244           310
## -0.6473338345 -0.6387903727 -0.6292118032 -0.6277163843 -0.6276611636
##           242           507           520           331            57
## -0.6190792786 -0.6161486561 -0.6159909946 -0.6151344616 -0.6110361336
##           498           234           466           197           512
## -0.6064720091 -0.5962434672 -0.5949465084 -0.5907443730 -0.5851575601
##           252           304            77           431           137
## -0.5773478310 -0.5715504931 -0.5668080315 -0.5548660335 -0.5481155116
##           516           328           491           231           397
## -0.5480559148 -0.5332515555 -0.5282281225 -0.5203819780 -0.5188158258
##           311           337           480           233           422
## -0.5158351627 -0.5029126306 -0.4926501041 -0.4922811357 -0.4899602542
##            26           109           308           409           218
## -0.4896304960 -0.4873069182 -0.4784295079 -0.4777803819 -0.4746296420
##           391            88           261            29           357
## -0.4559924520 -0.4509363666 -0.4485225174 -0.4267149756 -0.4251813618
##           364           280           477           497           501
## -0.4237446957 -0.4226106931 -0.4181356860 -0.4150851996 -0.4118397953
##           505            95            41           286           398
## -0.4056402494 -0.3878509621 -0.3851341286 -0.3849429305 -0.3820706662
##            53            34           165            69           506
## -0.3719657029 -0.3686686276 -0.3491071498 -0.3465782661 -0.3456681844
##           113           198           111           362           475
## -0.3434828810 -0.3432254083 -0.3425262864 -0.3424945510 -0.3354710232
##           277           206           303           414           139
## -0.3353899499 -0.3317071400 -0.3226409763 -0.3135891805 -0.3087267363
##           335            42            73           168           302
## -0.3048532093 -0.3017019064 -0.2997532136 -0.2980558942 -0.2911831933
##           204           345            79           380           472
## -0.2906185182 -0.2874465180 -0.2863944637 -0.2847308164 -0.2845541602
##           326           457           216           256           407
## -0.2832206776 -0.2822049784 -0.2775722866 -0.2680165385 -0.2679932170
##           434           248           401           412           275
## -0.2644178004 -0.2552138829 -0.2552101287 -0.2409692199 -0.2366838001
##           317           436           224           494           211
## -0.2364014332 -0.2343310288 -0.2281906684 -0.2240230105 -0.2188509224
##           200            27           382           523           524
## -0.2187129697 -0.2131147365 -0.2119519155 -0.2050226678 -0.2029370971
##            58           418           359           266           145
## -0.1957500150 -0.1863786957 -0.1735490345 -0.1681226824 -0.1673889133
##            63           363           122           445           160
## -0.1575789717 -0.1529284740 -0.1512939857 -0.1432583830 -0.1403603218
##           336           440           452           246            64
## -0.1394360484 -0.1385776160 -0.1363095967 -0.1345031796 -0.1332281588
##            48           273            82           344           131
## -0.1316056744 -0.1291227806 -0.1269409275 -0.1183374675 -0.1155714719
##           213           240           237           192           143
## -0.1149508961 -0.1090766802 -0.1089571590 -0.1080361834 -0.1073917233
```

```
##           420           12          323          325          179
## -0.1027542855 -0.1019886426 -0.0944651507 -0.0917148508 -0.0875751529
##           187          464          293          419          210
## -0.0844270189 -0.0829421249 -0.0805617912 -0.0800491402 -0.0784922713
##           151           67          411          372          528
## -0.0769702808 -0.0763492779 -0.0750852923 -0.0651271144 -0.0619310713
##           495          226          510          219          384
## -0.0520388121 -0.0517133084 -0.0513650148 -0.0487674675 -0.0458027578
##            85          274          126           90          276
## -0.0406783953 -0.0354337827 -0.0331422750 -0.0330786479 -0.0330753892
##           259           65          214          250          340
## -0.0285884886 -0.0228868921 -0.0213398606 -0.0207367846 -0.0182544998
##           450           51          207          468           66
## -0.0152891183 -0.0129472019 -0.0122904075 -0.0053814850 -0.0052257725
##           251          488          361          306          373
## -0.0031436931 -0.0008858406 -0.0001410582  0.0028156776  0.0086775264
##           295           15           16          341          365
##  0.0120778579  0.0226035502  0.0255587744  0.0281592813  0.0314617813
##           269          188          298          260          103
##  0.0319533663  0.0322438524  0.0334842572  0.0371854265  0.0378054205
##           537           44           84           30          526
##  0.0399293142  0.0412558882  0.0440063270  0.0462451689  0.0495056863
##            97           59          322          203          435
##  0.0637874024  0.0697033724  0.0699411630  0.0724098905  0.0738170959
##           515          119          196           50          162
##  0.0756457670  0.0759004734  0.0801040655  0.0884771776  0.0994498050
##           129          441          369           25          278
##  0.1064495937  0.1176808724  0.1335209928  0.1360033909  0.1361411507
##           235          408          245          115          146
##  0.1362515775  0.1365409903  0.1500368693  0.1502299753  0.1524089319
##           181          514          425          212           78
##  0.1525640924  0.1528326164  0.1536640999  0.1624284482  0.1630710310
##           438          132          410          141          473
##  0.1674709314  0.1782268272  0.1790969696  0.1877361645  0.1938448095
##           454          158          343          394           86
##  0.1942624785  0.1992138188  0.1992224630  0.2125828446  0.2141269883
##           370           14          470          315          406
##  0.2155828918  0.2162342296  0.2204788762  0.2206087331  0.2242070185
##           170          314          511          284          116
##  0.2251358739  0.2262669213  0.2281487078  0.2384222163  0.2525385031
##           318          421          429          149          247
##  0.2540892203  0.2553507890  0.2629073561  0.2651367851  0.2651890306
##            68           80          290          476          459
##  0.2729128907  0.2747733449  0.2818450186  0.2823343540  0.2861828496
##            54          270          536          178          221
##  0.2921796154  0.2929452015  0.2932963025  0.2970394642  0.3012018698
##           220          402           13          272          182
##  0.3043648219  0.3077293548  0.3128439366  0.3186677815  0.3192668475
##           424          183          332          349          263
##  0.3200896328  0.3314673456  0.3337301493  0.3352879307  0.3356865151
##           258          423          157          387          282
##  0.3393741053  0.3426494154  0.3446709560  0.3499235064  0.3581590756
##           490           49          159          467          462
##  0.3591191139  0.3606851703  0.3627533753  0.3638107500  0.3654337345
```

```
##          291          496           74          400          463
##  0.3745959328 0.3753174803 0.3786756330 0.3814710477 0.3833430451
##          134          513          330          352          383
##  0.3871008736 0.3891684973 0.4018631893 0.4029925476 0.4046437209
##          367          433          366          502            9
##  0.4128293020 0.4170171640 0.4203710512 0.4270778296 0.4325687066
##          492          368          482          486           76
##  0.4359668082 0.4398484156 0.4410886485 0.4514618627 0.4562594459
##          297          376          481           60          201
##  0.4668533223 0.4681511177 0.4683417773 0.4700124991 0.4724998841
##          499          413          461          186          508
##  0.4757386752 0.4880882243 0.4913590385 0.4925517513 0.4959816417
##          215          121           52          305          262
##  0.4976990806 0.5018458605 0.5078055562 0.5101106654 0.5104532395
##          531          333          104          519          443
##  0.5261983310 0.5310889784 0.5318550301 0.5373656298 0.5431521249
##          100          381          147          404           93
##  0.5439675421 0.5463692229 0.5520035571 0.5685125358 0.5693258408
##          142          399          114          355          287
##  0.5736539592 0.5794678015 0.5916725662 0.5958206058 0.5965228069
##          320          487          271           39            4
##  0.6013768064 0.6157044676 0.6373724635 0.6449091230 0.6464272259
##          283          509          403           40          500
##  0.6493081629 0.6499737835 0.6512878136 0.6533818655 0.6535348756
##          379           37          449           71           56
##  0.6561684278 0.6611845503 0.6770960771 0.6801061986 0.6812595870
##          432          301          140          430          172
##  0.6902465172 0.6936488180 0.6982104689 0.7073396613 0.7149148939
##            6          378          208          177          148
##  0.7189264253 0.7245864347 0.7326412051 0.7387145580 0.7458748399
##           83           61          107            5          479
##  0.7489622248 0.7509322538 0.7581849225 0.7730585188 0.7827966442
##          374          427          279          517          294
##  0.7883457385 0.7925684722 0.7972443045 0.8163236918 0.8191532646
##          268          327           20          152          238
##  0.8198844387 0.8231476044 0.8384163378 0.8427285412 0.8638735652
##          396           33          446          123          316
##  0.8763243336 0.8907888764 0.8967562084 0.9073851861 0.9095593221
##           99          455          232          285            7
##  0.9118447104 0.9152398229 0.9153801708 0.9314526156 0.9340621864
##          124          102          299          217          375
##  0.9472166077 0.9513294214 0.9717847915 0.9822101391 0.9939487320
##          493          347           46          300          313
##  1.0036144319 1.0083106861 1.0097174110 1.0516400451 1.0661923284
##          191          194          342          202          426
##  1.0727839359 1.0754361874 1.0941853179 1.1042308655 1.1050948609
##          329          354          389          319          127
##  1.1209892434 1.1279364296 1.1346958386 1.1459402510 1.1707851944
##          230          184           45          289          460
##  1.1737283739 1.1842690492 1.1875892697 1.2020531975 1.2060678282
##          125          358          503          228           22
##  1.2283142920 1.2304047334 1.2419119694 1.2548706804 1.2661053548
##           87          174          350          112          353
##  1.2840841650 1.2926711074 1.3192264615 1.3563137014 1.3571040873
```

```
##           24          175          173          171          324
##  1.3663082680 1.3663112807 1.3755675076 1.3772426052 1.3900625613
##          377           38          243          415          161
##  1.4239701436 1.4299921117 1.4796831632 1.4817778401 1.5164304380
##          222          264          195          439          393
##  1.5325628883 1.6101693013 1.6106285185 1.6602465489 1.6770498757
##          534          190          225          478           36
##  1.6773538426 1.6802415321 1.6919457731 1.7071906017 1.7410843982
##          390          405          307           72          241
##  1.7529466695 1.8020257833 1.8289388919 1.9192420768 1.9525368372
##          360          189          388          338          223
##  1.9642065079 1.9954849408 1.9975435893 2.0038457258 2.0091988981
##          447          485          465          209          471
##  2.0232225828 2.0542623628 2.0630396054 2.7780609973 3.1712602783
##           21          267          108          292
##  3.4865705316 3.7222771163 3.9927493813 4.2317956705
```

```
sort(cooks.distance(model))
```

```
##          361          488          251           66          468          306
## 1.894425e-11 1.031235e-09 5.938212e-09 2.962454e-08 3.374946e-08 4.785281e-08
##           51          373          450          295          207          340
## 7.181719e-08 7.377056e-08 1.934563e-07 2.391962e-07 2.684650e-07 3.271250e-07
##           15          259          250          188          365           90
## 4.027962e-07 4.966822e-07 6.012579e-07 6.341895e-07 7.236477e-07 9.144424e-07
##           16          276          341          214          219           85
## 1.065229e-06 1.168975e-06 1.179326e-06 1.254819e-06 1.267700e-06 1.288529e-06
##          274          260           30          103          226           44
## 1.326855e-06 1.435053e-06 1.676687e-06 1.691323e-06 1.718873e-06 1.727156e-06
##          269           84          495          526           65          126
## 1.908889e-06 1.962879e-06 2.056352e-06 2.260643e-06 2.520172e-06 2.885847e-06
##          537          384          510          411          435          419
## 2.893053e-06 2.978896e-06 3.558600e-06 3.928119e-06 3.935160e-06 3.996640e-06
##          372          293          179          210          420          240
## 4.048125e-06 4.048868e-06 4.079114e-06 4.471245e-06 4.725415e-06 5.007805e-06
##          196          298           59          119           67           50
## 5.178077e-06 5.362777e-06 5.611925e-06 5.686429e-06 6.309364e-06 6.368506e-06
##          213          515          187          528          323          237
## 6.598784e-06 6.717719e-06 7.048434e-06 7.465908e-06 9.106888e-06 9.108172e-06
##          441          160           97           12          151          322
## 9.155028e-06 9.338848e-06 1.158806e-05 1.166200e-05 1.173757e-05 1.186069e-05
##          122          162          129          418          425          408
## 1.249194e-05 1.267499e-05 1.327396e-05 1.416798e-05 1.437660e-05 1.609183e-05
##          192          273          131          514           25          369
## 1.680365e-05 1.687357e-05 1.713977e-05 1.759324e-05 1.837282e-05 1.837917e-05
##          344          132           48          452          359          524
## 1.853139e-05 1.924811e-05 1.930710e-05 1.979907e-05 2.027293e-05 2.204298e-05
##          336          141          203          464           82          235
## 2.214975e-05 2.236852e-05 2.443524e-05 2.451313e-05 2.453217e-05 2.485009e-05
##          343          473          181          440           64          248
## 2.505995e-05 2.540719e-05 2.593851e-05 2.647991e-05 2.700147e-05 2.885752e-05
##          494          246          168          363           80          382
## 3.043145e-05 3.319758e-05 3.340568e-05 3.365666e-05 3.385928e-05 3.603603e-05
##          245          158          256          438          115          445
```

```
## 3.649277e-05 3.849248e-05 3.875995e-05 3.876704e-05 3.894664e-05 3.944581e-05
##          325          315          318          303          145          278
## 4.091162e-05 4.370143e-05 4.382643e-05 4.533768e-05 4.589330e-05 4.622323e-05
##          212          247          149          407          211          429
## 4.844555e-05 4.871997e-05 4.934066e-05 5.016204e-05 5.072263e-05 5.143806e-05
##          454          370          394          472          266          523
## 5.319451e-05 5.426198e-05 5.430199e-05 5.545883e-05 5.935568e-05 5.978797e-05
##          146          470           78          116          476          224
## 5.996373e-05 6.040572e-05 6.151622e-05 6.372189e-05 6.395908e-05 6.503768e-05
##          139          511          401          178          284          302
## 6.622882e-05 6.767947e-05 6.776139e-05 7.251625e-05 7.264263e-05 7.270308e-05
##          220          216          258           58          111          506
## 7.365211e-05 7.424644e-05 7.553865e-05 7.581387e-05 7.635092e-05 7.690073e-05
##           14          502          134          421           34          282
## 7.831716e-05 7.856180e-05 8.019588e-05 8.048830e-05 8.165056e-05 8.208703e-05
##          317           42          497          332            9          183
## 8.256073e-05 8.288596e-05 8.335974e-05 8.426876e-05 8.459037e-05 8.652022e-05
##           86           53          414          290          165           13
## 8.751804e-05 8.761428e-05 8.939273e-05 9.111056e-05 9.289621e-05 9.386647e-05
##          218          436          410          206          182          270
## 9.407938e-05 9.569561e-05 9.726004e-05 9.735249e-05 1.005091e-04 1.012915e-04
##          277          457          345          423          380           52
## 1.015283e-04 1.026670e-04 1.028799e-04 1.044618e-04 1.062388e-04 1.083791e-04
##          326          477          368           68          291          496
## 1.095242e-04 1.117644e-04 1.118395e-04 1.124629e-04 1.133838e-04 1.147012e-04
##          475           63          459          349          501          204
## 1.173036e-04 1.201884e-04 1.215633e-04 1.227327e-04 1.230596e-04 1.249804e-04
##          400          413          433          362          512          383
## 1.276824e-04 1.288712e-04 1.293978e-04 1.313412e-04 1.322063e-04 1.332342e-04
##          170          467           41          305          104          490
## 1.345754e-04 1.348093e-04 1.368881e-04 1.386606e-04 1.389807e-04 1.390924e-04
##          215          286          335           54          113          221
## 1.402661e-04 1.424186e-04 1.441545e-04 1.465655e-04 1.474191e-04 1.481914e-04
##          462          280          147           95          337          334
## 1.505715e-04 1.507092e-04 1.507460e-04 1.516580e-04 1.543588e-04 1.549460e-04
##          330           77          461           73          505           60
## 1.574498e-04 1.574614e-04 1.595923e-04 1.603213e-04 1.627770e-04 1.676347e-04
##          304           57          463          366          364          109
## 1.679754e-04 1.724377e-04 1.733220e-04 1.745917e-04 1.823307e-04 1.861122e-04
##          406            4          314          271          157          198
## 1.866510e-04 1.869065e-04 1.877231e-04 1.878404e-04 1.968724e-04 1.983376e-04
##          244          508          434          261          143          378
## 1.985163e-04 2.003137e-04 2.020553e-04 2.022822e-04 2.050293e-04 2.054140e-04
##           37          263           74          381          308          333
## 2.055811e-04 2.094330e-04 2.106210e-04 2.162984e-04 2.225466e-04 2.230555e-04
##            6          357          399          201           29           26
## 2.245002e-04 2.269250e-04 2.269821e-04 2.304909e-04 2.359160e-04 2.383064e-04
##          301          159          148          504          200          498
## 2.430518e-04 2.459690e-04 2.501671e-04 2.504775e-04 2.512579e-04 2.512881e-04
##          422           88           69          507          105          424
## 2.539809e-04 2.540060e-04 2.595787e-04 2.597693e-04 2.644427e-04 2.646213e-04
##          275          180          412          310          121          398
## 2.677451e-04 2.678570e-04 2.740289e-04 2.744593e-04 2.753961e-04 2.762788e-04
##          491          391          403          409          376           27
```

```
## 2.809933e-04 2.899492e-04 2.967993e-04 2.989841e-04 3.030954e-04 3.058055e-04
##          397          331          466          231          519          107
## 3.087584e-04 3.098153e-04 3.113560e-04 3.126090e-04 3.127738e-04 3.237594e-04
##          499          135          355          152          431          531
## 3.261045e-04 3.287205e-04 3.305228e-04 3.339593e-04 3.360913e-04 3.396365e-04
##          242          509          458          417          430          487
## 3.398618e-04 3.408697e-04 3.416655e-04 3.419946e-04 3.424457e-04 3.460615e-04
##           55          492          253          352          327          328
## 3.507177e-04 3.560201e-04 3.565225e-04 3.849186e-04 3.865136e-04 3.924832e-04
##          520          451            1          142          118          233
## 4.099226e-04 4.102448e-04 4.130123e-04 4.169538e-04 4.188799e-04 4.356857e-04
##          281          311          114           83           56          299
## 4.388527e-04 4.467019e-04 4.522592e-04 4.592287e-04 4.645359e-04 4.672003e-04
##          285          155          130          427          374          101
## 4.683281e-04 4.804286e-04 4.807375e-04 4.880009e-04 4.897822e-04 4.941211e-04
##          193          102          402           79          272           18
## 4.950371e-04 5.002843e-04 5.007090e-04 5.015861e-04 5.114048e-04 5.134171e-04
##          227           93          279           91           40          535
## 5.145175e-04 5.152590e-04 5.156858e-04 5.270809e-04 5.342231e-04 5.422829e-04
##          513          486          234           49          100          354
## 5.487922e-04 5.669072e-04 5.678988e-04 5.692169e-04 6.122192e-04 6.154322e-04
##           62          387          342           70          191          197
## 6.171791e-04 6.375865e-04 6.410802e-04 6.482029e-04 6.523854e-04 6.762175e-04
##          500          481          448          133          432          404
## 6.855011e-04 6.873564e-04 7.027451e-04 7.105556e-04 7.155075e-04 7.212449e-04
##           31          294          516          379          480          313
## 7.315481e-04 7.333191e-04 7.333197e-04 7.369610e-04 7.795153e-04 7.841425e-04
##          128          453           33          236          347          186
## 8.023157e-04 8.054175e-04 8.110379e-04 8.176123e-04 8.249704e-04 8.271505e-04
##          202          538           32          449          252          482
## 8.395756e-04 8.399192e-04 8.432605e-04 8.498984e-04 8.596217e-04 8.645108e-04
##          503          309           20          536          283          396
## 8.832176e-04 9.064859e-04 9.107299e-04 9.218656e-04 9.556533e-04 9.873177e-04
##          367          493          172           43          144          517
## 9.903765e-04 9.911646e-04 1.007765e-03 1.010778e-03 1.014221e-03 1.029078e-03
##           96          356          455          257           76          320
## 1.046547e-03 1.049633e-03 1.054812e-03 1.057135e-03 1.059390e-03 1.077251e-03
##          319          518          124           87          140           39
## 1.100039e-03 1.105741e-03 1.107681e-03 1.123749e-03 1.141053e-03 1.179166e-03
##          297          150          415          316          534          479
## 1.180442e-03 1.180686e-03 1.180841e-03 1.193067e-03 1.194858e-03 1.202903e-03
##          395           19          194           61           38          439
## 1.205966e-03 1.221988e-03 1.226174e-03 1.248466e-03 1.300391e-03 1.308303e-03
##          484          174          123          443          324          456
## 1.355520e-03 1.365197e-03 1.375204e-03 1.382406e-03 1.385098e-03 1.408378e-03
##          243          262          137          469          389          177
## 1.414536e-03 1.417259e-03 1.430307e-03 1.448386e-03 1.472562e-03 1.492205e-03
##           99            7          426          529          474          241
## 1.507841e-03 1.512935e-03 1.527392e-03 1.531141e-03 1.536666e-03 1.549027e-03
##           71          136          268          329          175          112
## 1.567566e-03 1.571826e-03 1.586048e-03 1.586779e-03 1.621777e-03 1.629869e-03
##          120          460          288          312          208          287
## 1.664688e-03 1.670638e-03 1.711263e-03 1.734445e-03 1.752328e-03 1.761038e-03
##          225          255          171           46          228          348
```

```
## 1.777122e-03 1.778148e-03 1.848691e-03 1.888090e-03 1.888549e-03 1.905212e-03
##          184          392          532          156          350          195
## 1.926394e-03 2.005923e-03 2.057400e-03 2.060087e-03 2.065077e-03 2.090979e-03
##          199          232          483          360           45          153
## 2.149124e-03 2.163870e-03 2.227276e-03 2.320633e-03 2.326583e-03 2.334405e-03
##          264           92           10          300          217            5
## 2.472173e-03 2.565086e-03 2.567590e-03 2.701218e-03 2.715395e-03 2.839349e-03
##          321          185          238          169          229          353
## 2.929909e-03 3.007954e-03 3.008430e-03 3.020066e-03 3.104523e-03 3.116880e-03
##           23          127          375          525          358          106
## 3.123215e-03 3.317081e-03 3.395900e-03 3.446176e-03 3.555919e-03 3.584378e-03
##          222          176           24          296          530          371
## 3.647439e-03 3.789062e-03 3.945226e-03 3.970438e-03 3.985693e-03 4.046286e-03
##          521            2          446          161          138           72
## 4.297517e-03 4.339334e-03 4.350785e-03 4.413104e-03 4.511386e-03 4.591654e-03
##          442          230          154          205           35          346
## 5.108157e-03 5.185419e-03 5.469589e-03 5.502998e-03 5.561782e-03 5.585748e-03
##          189           47          522          254          289          377
## 5.898737e-03 5.924290e-03 6.408222e-03 6.534842e-03 6.569418e-03 6.613315e-03
##          437          533           36           28           22          388
## 6.891290e-03 6.984110e-03 7.022394e-03 7.083118e-03 7.150878e-03 7.258161e-03
##          390          485          447          405           94          339
## 7.390293e-03 7.949045e-03 8.010655e-03 8.355220e-03 8.874000e-03 8.879928e-03
##          444          265            8           89          385          489
## 9.332334e-03 9.491773e-03 9.625772e-03 1.033897e-02 1.033990e-02 1.076356e-02
##          125          539          167          416           81          428
## 1.077398e-02 1.250554e-02 1.283722e-02 1.294739e-02 1.379102e-02 1.391792e-02
##          338           11          209          173          190          393
## 1.483759e-02 1.496543e-02 1.565484e-02 1.607129e-02 1.639566e-02 1.664932e-02
##            3          478          249          239          386          223
## 1.722611e-02 1.732873e-02 1.789932e-02 1.855399e-02 2.055788e-02 2.108291e-02
##          307          163          465          164          117          351
## 2.169169e-02 2.205859e-02 2.363349e-02 2.388718e-02 2.408604e-02 2.565791e-02
##           98          110           21          166          527          471
## 3.572263e-02 3.635904e-02 3.894945e-02 4.257368e-02 4.278653e-02 4.730125e-02
##           75           17          108          292          267
## 4.858806e-02 6.019063e-02 6.491203e-02 2.010870e-01 2.365909e-01
```

```
skewness(jackknife)
```

```
## [1] -0.0005651455
```

```
kurtosis(jackknife)
```

```
## [1] 4.882543
```

```
NBA <- dummy_cols(NBA, select_columns = "DRAFT_ROUND", remove_first_dummy = TRUE)
NBA
```

```
## # A tibble: 539 x 49
##    FIRST    LAST   TEAM    AGE HEIGHT INCHES TOTAL_HEIGHT WEIGHT COLLEGE COUNTRY
##    <chr>    <chr>  <chr> <dbl>  <dbl>  <dbl>        <dbl>  <dbl> <chr>   <chr>
```

```
##  1 Precious Achiu~ TOR      23      6      8           80    225 Memphis Nigeria
##  2 Steven   Adams  MEM      29      6     11           83    265 Pittsb~ New Ze~
##  3 Bam      Adeba~ MIA      25      6      9           81    255 Kentuc~ USA
##  4 Ochai    Agbaji UTA      23      6      5           77    215 Kansas  USA
##  5 Santi    Aldama MEM      22      7      1           85    215 Loyola~ Spain
##  6 Nickeil  Alexa~ MIN      24      6      5           77    205 Virgin~ Canada
##  7 Grayson  Allen  MIL      27      6      4           76    198 Duke    USA
##  8 Jarrett  Allen  CLE      25      6      9           81    243 Texas   USA
##  9 Jose     Alvar~ NOP      25      6      1           73    179 Georgi~ USA
## 10 Kyle     Ander~ MIN      29      6      9           81    230 UCLA    USA
## # i 529 more rows
## # i 39 more variables: DRAFT_YEAR <chr>, DRAFT_ROUND <chr>, DRAFT_NUMBER <chr>,
## #   GP <dbl>, W <dbl>, L <dbl>, MIN <dbl>, PTS <dbl>, FGM <dbl>, FGA <dbl>,
## #   `FG%` <dbl>, `3PM` <dbl>, `3PA` <dbl>, `3P%` <dbl>, FTM <dbl>, FTA <dbl>,
## #   `FT%` <dbl>, OREB <dbl>, DREB <dbl>, REB <dbl>, AST <dbl>, TOV <dbl>,
## #   STL <dbl>, BLK <dbl>, PF <dbl>, FP <dbl>, DD2 <dbl>, TD3 <dbl>,
## #   `+/-` <dbl>, NETRTG <dbl>, `OREB%` <dbl>, `DREB%` <dbl>, `USG%` <dbl>, ...
```

```
model2 <- lm(PTS ~ HEIGHT + MIN + FGM + FTM + PF + DRAFT_ROUND_2 + DRAFT_ROUND_Undrafted, data = NBA)
summary(model2)
```

```
##
## Call:
## lm(formula = PTS ~ HEIGHT + MIN + FGM + FTM + PF + DRAFT_ROUND_2 +
##     DRAFT_ROUND_Undrafted, data = NBA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.84321 -0.29160  0.00745  0.31655  2.33387
##
## Coefficients:
##                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)              1.471345   0.601195   2.447  0.01471 *
## HEIGHT                  -0.254026   0.097735  -2.599  0.00961 **
## MIN                      0.059484   0.006885   8.640  < 2e-16 ***
## FGM                      2.209876   0.030926  71.456  < 2e-16 ***
## FTM                      0.817471   0.032754  24.958  < 2e-16 ***
## PF                      -0.341527   0.049874  -6.848 2.09e-11 ***
## DRAFT_ROUND_2           -0.038080   0.066142  -0.576  0.56504
## DRAFT_ROUND_Undrafted    0.094052   0.068268   1.378  0.16888
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5807 on 529 degrees of freedom
##   (2 observations deleted due to missingness)
## Multiple R-squared:  0.9929, Adjusted R-squared:  0.9928
## F-statistic: 1.058e+04 on 7 and 529 DF,  p-value: < 2.2e-16
```

```
model2 %>% tidy()
```

```
## # A tibble: 8 x 5
##   term                  estimate std.error statistic   p.value
##   <chr>                    <dbl>     <dbl>     <dbl>     <dbl>
```

```
## 1 (Intercept)             1.47     0.601       2.45  1.47e-  2
## 2 HEIGHT                 -0.254    0.0977     -2.60  9.61e-  3
## 3 MIN                     0.0595   0.00688     8.64  6.67e- 17
## 4 FGM                     2.21     0.0309     71.5   6.37e-274
## 5 FTM                     0.817    0.0328     25.0   1.93e- 91
## 6 PF                     -0.342    0.0499     -6.85  2.09e- 11
## 7 DRAFT_ROUND_2          -0.0381   0.0661     -0.576 5.65e-  1
## 8 DRAFT_ROUND_Undrafted   0.0941   0.0683      1.38  1.69e-  1
```