R - Practice 06 - v1.1

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Contents

Functional Programming: purrr

map: apply function

```
## $ActualElapsedTime
## [1] 129.3237
##
## $AirTime
## [1] 108.1423
##
## $Distance
## [1] 787.7832
##
## $TaxiIn
## [1] 6.098855
##
## $TaxiOut
## [1] 15.0911
```

```
## $ActualElapsedTime
## [1] 34
##
## $AirTime
## [1] 11
##
## $Distance
## [1] 79
##
## $TaxiIn
## [1] 1
##
## $TaxiOut
## [1] 1
```

```
## $ActualElapsedTime
## [1] 575
##
## $AirTime
## [1] 549
##
## $Distance
## [1] 3904
##
## $TaxiIn
## [1] 165
##
## $TaxiOut
## [1] 163
```

```
## $ActualElapsedTime
## [1] 59.28584
##
## $AirTime
## [1] 56.55523
##
## $Distance
```

```
## [1] 453.6806
##
## $TaxiIn
## [1] 3.961069
##
## $TaxiOut
## [1] 7.740373
```

```
## tibble [234 x 11] (S3: tbl_df/tbl/data.frame)
##  $ manufacturer: chr [1:234] "audi" "audi" "audi" "audi" ...
##  $ model       : chr [1:234] "a4" "a4" "a4" "a4" ...
##  $ displ       : num [1:234] 1.8 1.8 2 2 2.8 2.8 3.1 1.8 1.8 2 ...
##  $ year        : int [1:234] 1999 1999 2008 2008 1999 1999 2008 1999 1999 2008 ...
##  $ cyl         : int [1:234] 4 4 4 4 6 6 6 4 4 4 ...
##  $ trans       : chr [1:234] "auto(l5)" "manual(m5)" "manual(m6)" "auto(av)" ...
##  $ drv         : chr [1:234] "f" "f" "f" "f" ...
##  $ cty         : int [1:234] 18 21 20 21 16 18 18 18 16 20 ...
##  $ hwy         : int [1:234] 29 29 31 30 26 26 27 26 25 28 ...
##  $ fl          : chr [1:234] "p" "p" "p" "p" ...
##  $ class       : chr [1:234] "compact" "compact" "compact" "compact" ...
```

```
## # A tibble: 234 x 5
##    displ  year   cyl   cty   hwy
##    <dbl> <int> <int> <int> <int>
##  1   1.8  1999     4    18    29
##  2   1.8  1999     4    21    29
##  3   2    2008     4    20    31
##  4   2    2008     4    21    30
##  5   2.8  1999     6    16    26
##  6   2.8  1999     6    18    26
##  7   3.1  2008     6    18    27
##  8   1.8  1999     4    18    26
##  9   1.8  1999     4    16    25
## 10   2    2008     4    20    28
## # i 224 more rows
```

```
## # A tibble: 234 x 5
##    displ  year   cyl   cty   hwy
##    <dbl> <int> <int> <int> <int>
##  1   1.8  1999     4    18    29
##  2   1.8  1999     4    21    29
##  3   2    2008     4    20    31
##  4   2    2008     4    21    30
##  5   2.8  1999     6    16    26
##  6   2.8  1999     6    18    26
##  7   3.1  2008     6    18    27
##  8   1.8  1999     4    18    26
##  9   1.8  1999     4    16    25
## 10   2    2008     4    20    28
## # i 224 more rows
```

```
## 'data.frame':    227496 obs. of  21 variables:
##  $ Year            : int  2011 2011 2011 2011 2011 2011 2011 2011 2011 2011 ...
##  $ Month           : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ DayofMonth      : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ DayOfWeek       : int  6 7 1 2 3 4 5 6 7 1 ...
```

```
##  $ DepTime          : int  1400 1401 1352 1403 1405 1359 1359 1355 1443 1443 ...
##  $ ArrTime          : int  1500 1501 1502 1513 1507 1503 1509 1454 1554 1553 ...
##  $ UniqueCarrier    : chr  "AA" "AA" "AA" "AA" ...
##  $ FlightNum        : int  428 428 428 428 428 428 428 428 428 428 ...
##  $ TailNum          : chr  "N576AA" "N557AA" "N541AA" "N403AA" ...
##  $ ActualElapsedTime: int  60 60 70 70 62 64 70 59 71 70 ...
##  $ AirTime          : int  40 45 48 39 44 45 43 40 41 45 ...
##  $ ArrDelay         : int  -10 -9 -8 3 -3 -7 -1 -16 44 43 ...
##  $ DepDelay         : int  0 1 -8 3 5 -1 -1 -5 43 43 ...
##  $ Origin           : chr  "IAH" "IAH" "IAH" "IAH" ...
##  $ Dest             : chr  "DFW" "DFW" "DFW" "DFW" ...
##  $ Distance         : int  224 224 224 224 224 224 224 224 224 224 ...
##  $ TaxiIn           : int  7 6 5 9 9 6 12 7 8 6 ...
##  $ TaxiOut          : int  13 9 17 22 9 13 15 12 22 19 ...
##  $ Cancelled        : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ CancellationCode : chr  "" "" "" "" ...
##  $ Diverted         : int  0 0 0 0 0 0 0 0 0 0 ...
```

```
## # A tibble: 227,496 x 16
##     Year Month DayofMonth DayOfWeek DepTime ArrTime FlightNum ActualElapsedTime
##    <int> <int>      <int>     <int>   <int>   <int>     <int>             <int>
##  1  2011     1          1         6    1400    1500       428                60
##  2  2011     1          2         7    1401    1501       428                60
##  3  2011     1          3         1    1352    1502       428                70
##  4  2011     1          4         2    1403    1513       428                70
##  5  2011     1          5         3    1405    1507       428                62
##  6  2011     1          6         4    1359    1503       428                64
##  7  2011     1          7         5    1359    1509       428                70
##  8  2011     1          8         6    1355    1454       428                59
##  9  2011     1          9         7    1443    1554       428                71
## 10  2011     1         10         1    1443    1553       428                70
## # i 227,486 more rows
## # i 8 more variables: AirTime <int>, ArrDelay <int>, DepDelay <int>,
## #   Distance <int>, TaxiIn <int>, TaxiOut <int>, Cancelled <int>,
## #   Diverted <int>
```

map: control output

map_dbl() - return a numeric (double) vector

```
## ActualElapsedTime           AirTime          Distance            TaxiIn
##        129.323745        108.142335        787.783245          6.098855
##           TaxiOut
##         15.091098
```

```
## ActualElapsedTime           AirTime          Distance            TaxiIn
##                34                11                79                 1
##           TaxiOut
##                 1
```

```
## ActualElapsedTime           AirTime          Distance            TaxiIn
##               575               549              3904               165
##           TaxiOut
##               163
```

```
## ActualElapsedTime           AirTime          Distance            TaxiIn
##         59.285838         56.555231        453.680566          3.961069
```

```
##           TaxiOut
##          7.740373
```

```
## # A tibble: 5 x 3
##   variable            mean     sd
##   <chr>              <dbl>  <dbl>
## 1 ActualElapsedTime 129.    59.3
## 2 AirTime           108.    56.6
## 3 Distance          788.   454.
## 4 TaxiIn              6.10   3.96
## 5 TaxiOut            15.1    7.74
```

map_int() - return an integer vector

```
## $a
## [1] 1
##
## $b
## [1] "word"
##
## $v
##  [1]  1  2  3  4  5  6  7  8  9 10
##
## $df
## # A tibble: 234 x 11
##    manufacturer model      displ  year   cyl trans drv     cty   hwy fl    class
##    <chr>        <chr>      <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
##  1 audi         a4           1.8  1999     4 auto~ f        18    29 p     comp~
##  2 audi         a4           1.8  1999     4 manu~ f        21    29 p     comp~
##  3 audi         a4           2    2008     4 manu~ f        20    31 p     comp~
##  4 audi         a4           2    2008     4 auto~ f        21    30 p     comp~
##  5 audi         a4           2.8  1999     6 auto~ f        16    26 p     comp~
##  6 audi         a4           2.8  1999     6 manu~ f        18    26 p     comp~
##  7 audi         a4           3.1  2008     6 auto~ f        18    27 p     comp~
##  8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p     comp~
##  9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p     comp~
## 10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p     comp~
## # i 224 more rows
```

```
##  a  b  v df
##  1  1 10 11
```

map_dfc() - data frame column bind

```
## # A tibble: 1 x 5
##   ActualElapsedTime AirTime Distance TaxiIn TaxiOut
##               <dbl>   <dbl>    <dbl>  <dbl>   <dbl>
## 1              129.    108.     788.   6.10    15.1
```

map shortcuts

fit multiple regression line - use mpg data set - fit regression line: hwy = beta X displ + alpha - for different number of cylinders - extract fit summaries by name of the given summary

```
## $`4`
##
```

```
## Call:
## lm(formula = hwy ~ displ, data = df)
##
## Coefficients:
## (Intercept)        displ
##      46.601       -8.295
##
##
## $`5`
##
## Call:
## lm(formula = hwy ~ displ, data = df)
##
## Coefficients:
## (Intercept)        displ
##       28.75           NA
##
##
## $`6`
##
## Call:
## lm(formula = hwy ~ displ, data = df)
##
## Coefficients:
## (Intercept)        displ
##      36.380       -3.977
##
##
## $`8`
##
## Call:
## lm(formula = hwy ~ displ, data = df)
##
## Coefficients:
## (Intercept)        displ
##      10.974        1.296
```

```
## $`4`
##
## Call:
## lm(formula = hwy ~ displ, data = .)
##
## Coefficients:
## (Intercept)        displ
##      46.601       -8.295
##
##
## $`5`
##
## Call:
## lm(formula = hwy ~ displ, data = .)
##
## Coefficients:
## (Intercept)        displ
```

```
##       28.75           NA
##
##
## $`6`
##
## Call:
## lm(formula = hwy ~ displ, data = .)
##
## Coefficients:
## (Intercept)        displ
##      36.380       -3.977
##
##
## $`8`
##
## Call:
## lm(formula = hwy ~ displ, data = .)
##
## Coefficients:
## (Intercept)        displ
##      10.974        1.296
```

Now extract R squared for each fitted model (line)

```
##          4          5          6          8
## 0.33502575 0.00000000 0.25890619 0.05482244
```

```
##          4          5          6          8
## 0.33502575 0.00000000 0.25890619 0.05482244
```

Shortcut for extracting elements by position

```
## [[1]]
## [1] 7 8 9
##
## [[2]]
## [1] 16 17 18
##
## [[3]]
## [1] 24 25 26
```

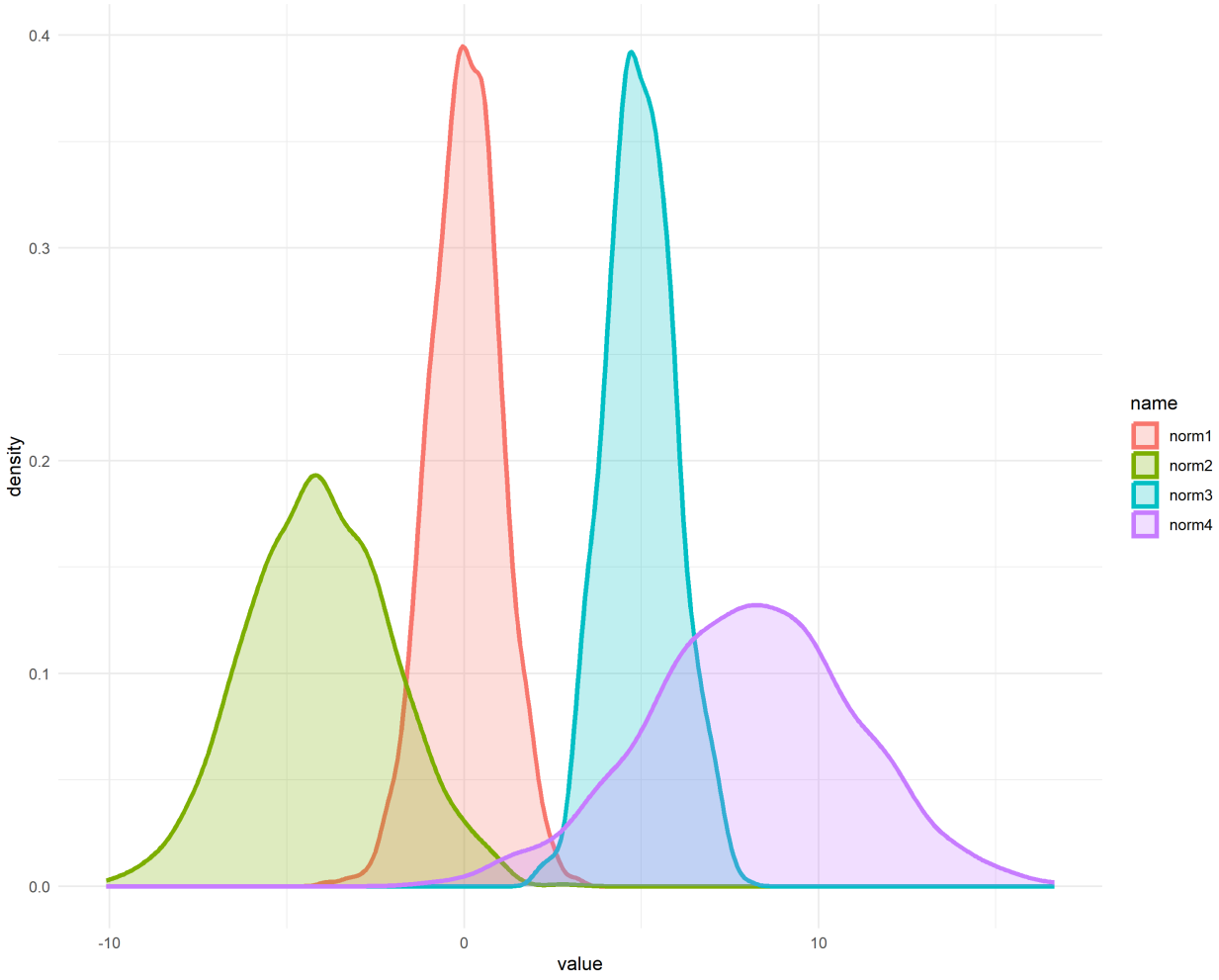
map over more than one argument

map2() - apply function to pair of elements

- generate data from different normal distributions
- mu and sigma are different, n is fixed
- rnorm() is used to sample from normal distribution
- we will visualize distribution of sampled data
- `?rnorm`

```
## # A tibble: 4 x 2
##   name      n
##   <chr> <int>
## 1 norm1  1000
## 2 norm2  1000
```

```
## 3 norm3  1000
## 4 norm4  1000
```

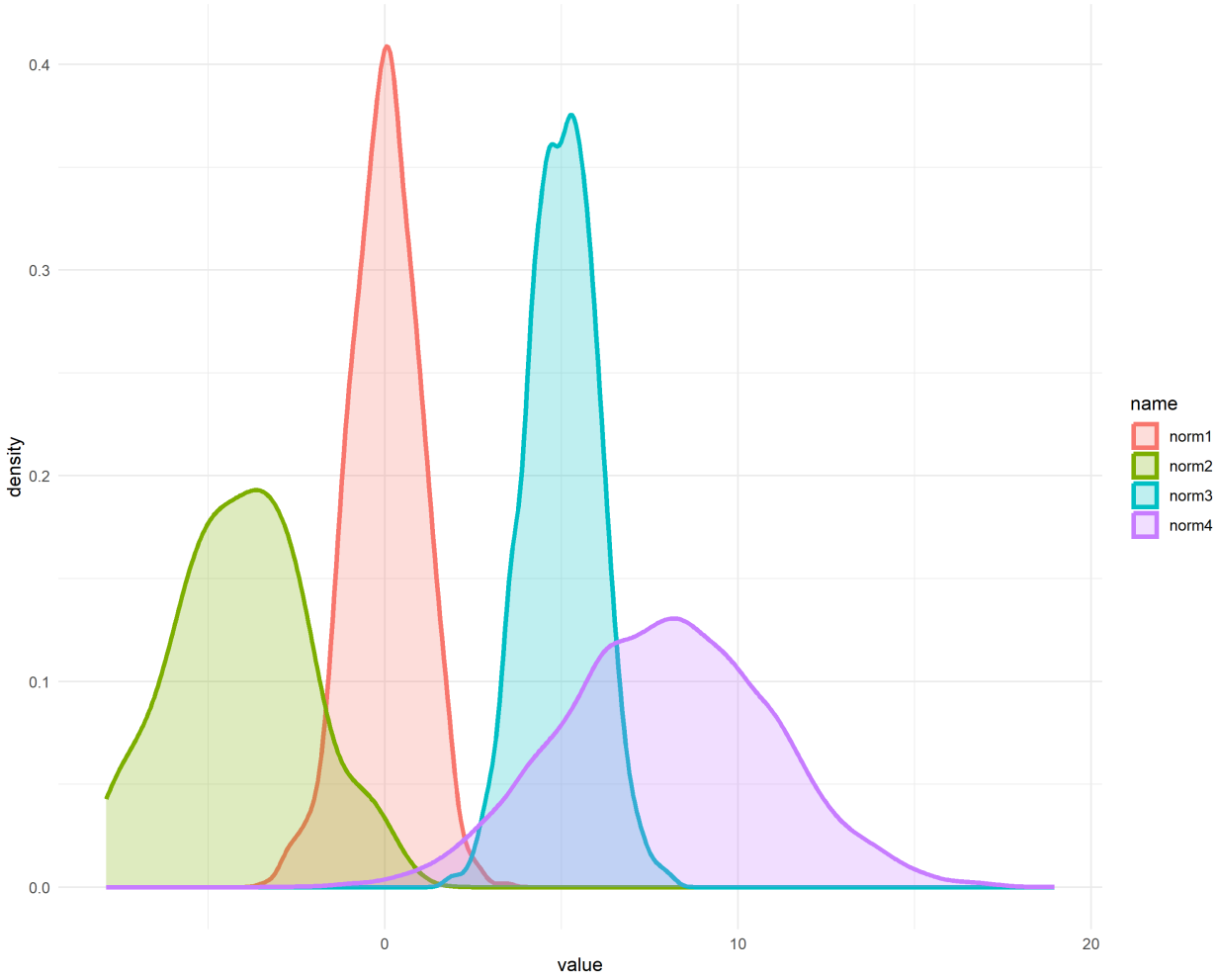


pmap() - apply function to groups of elements

- generate data from different normal distributions
- mu, sigma and n are different
- rnorm() is used to sample from normal distribution
- we will visualize distribution of sampled data

```
## List of 4
##  $ : num [1:1000] 0.812 -0.95 1.248 -2.139 -1.685 ...
##  $ : num [1:100] -8.327 -3.745 -6.928 -0.337 -4.254 ...
##  $ : num [1:1500] 4.94 3.46 4.66 3.85 4.02 ...
##  $ : num [1:10000] 7.96 10.81 8.85 3.79 9.19 ...
```

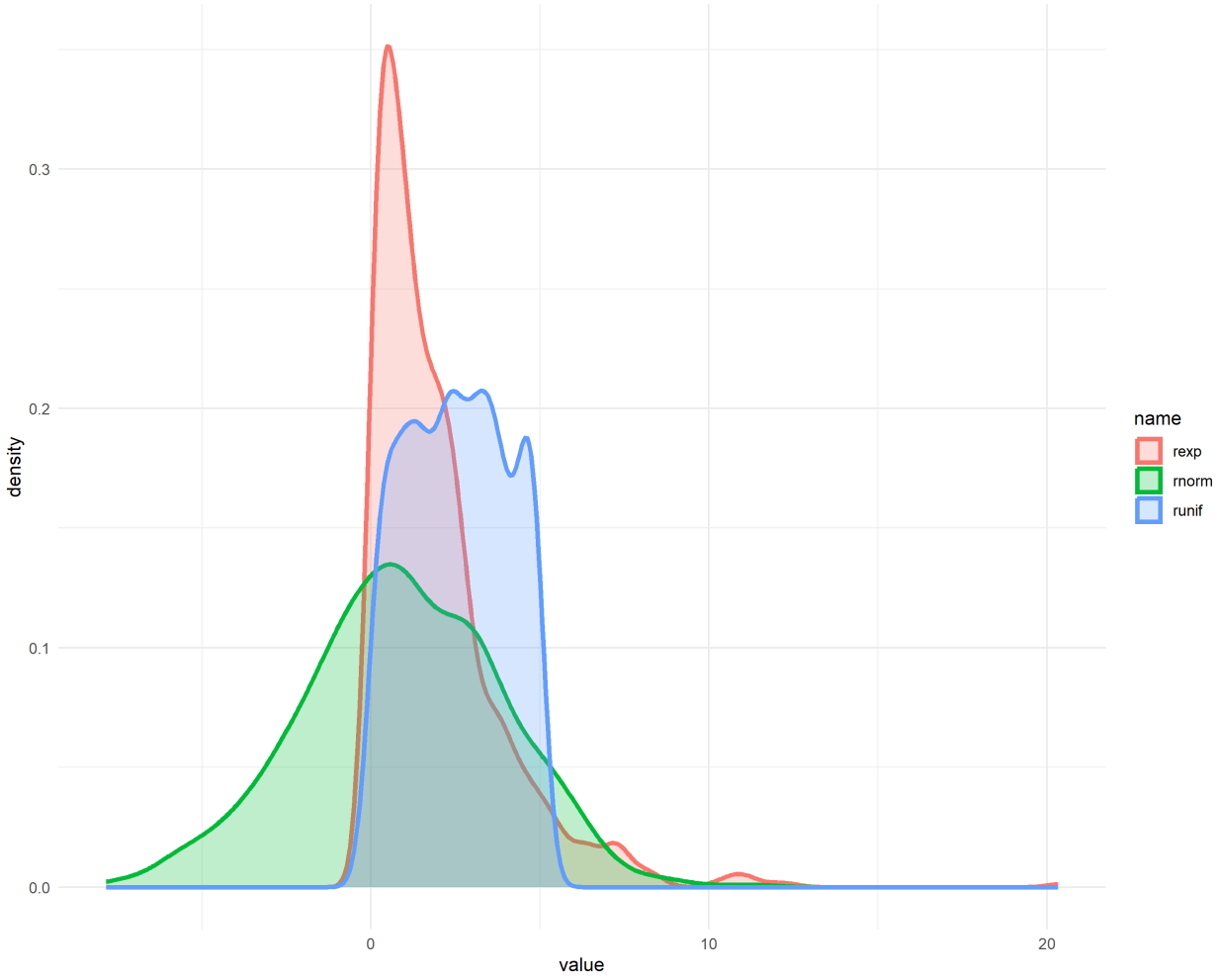
```
## # A tibble: 4 x 2
##   name      n
##   <chr> <int>
## 1 norm1  1000
## 2 norm2   100
## 3 norm3  1500
## 4 norm4 10000
```



invoke_map() - apply list of functions to groups of elements

- generate data from different distributions (normal, uniform, exponential)
- each distribution has its own number and type of parameters
- `rnorm()` is used to sample from normal distribution
- `runif()` is used to sample from uniform distribution
- `rexp()` is used to sample from exponential distribution
- we will visualize distribution of sampled data
- `?rnorm`
- `?runif`
- `?rexp`

```
## # A tibble: 3 x 2
##   name      n
##   <chr> <int>
## 1 rexp   1000
## 2 rnorm  1000
## 3 runif  1000
```



walk() - call a function for its side effect

```
## [[1]]
## [1] 1 2 3
##
## [[2]]
## [1] 2 4 6
```

```
## [1] 1 2 3
## [1] 2 4 6
```

```
## [[1]]
## [1] 1 2 3
##
## [[2]]
## [1] 2 4 6
```

```
## [1] 1 2 3
## [1] 2 4 6
```

work with lists

```
## $11
```

```
## [1] TRUE
##
## $l2
## [1] FALSE
##
## $s1
## [1] "imagine"
##
## $s2
## [1] "lead"
##
## $n1
## [1] 408.9769
##
## $n2
## [1] 883.0174
##
## $vec.l1
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
##
## $vec.l2
##  [1]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE
## [13] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE  TRUE
## [25]  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
## [37] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
## [49] FALSE FALSE  TRUE FALSE
##
## $vec.s1
##  [1] "specific"   "bring"      "picture"    "understand" "limit"
##  [6] "year"       "Christmas"  "quarter"    "perhaps"    "sir"
## [11] "close"      "hell"       "class"      "inside"     "accept"
## [16] "flat"       "soon"       "evening"    "stand"      "space"
## [21] "odd"        "teach"      "water"      "document"   "since"
## [26] "france"     "another"    "succeed"    "certain"    "land"
## [31] "send"       "not"        "ought"      "before"     "remember"
## [36] "too"        "another"    "council"    "sit"
##
## $vec.s2
##  [1] "except"     "past"       "make"       "soon"       "front"
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
```

```
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
##
## $vec.n1
##  [1] 919 538 235 289 185 765 413 627 522 309  54 205 875 779 537 564 794 391 409
## [20] 727 346 160 468 509 920  57 457 617 357 279 270 878 646 347 129 218 618 881
## [39] 698 337 797  26 539 519 757 666 553 724 390 498 222 671
##
## $vec.n2
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
##
## $t1
## # A tibble: 234 x 11
##    manufacturer model      displ  year   cyl trans drv     cty   hwy fl    class
##    <chr>        <chr>      <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
##  1 audi         a4           1.8  1999     4 auto~ f        18    29 p     comp~
##  2 audi         a4           1.8  1999     4 manu~ f        21    29 p     comp~
##  3 audi         a4           2    2008     4 manu~ f        20    31 p     comp~
##  4 audi         a4           2    2008     4 auto~ f        21    30 p     comp~
##  5 audi         a4           2.8  1999     6 auto~ f        16    26 p     comp~
##  6 audi         a4           2.8  1999     6 manu~ f        18    26 p     comp~
##  7 audi         a4           3.1  2008     6 auto~ f        18    27 p     comp~
##  8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p     comp~
##  9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p     comp~
## 10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p     comp~
## # i 224 more rows
##
## $t2
## # A tibble: 500 x 10
##    carat cut       color clarity depth table price     x     y     z
##    <dbl> <ord>     <ord> <ord>   <dbl> <dbl> <int> <dbl> <dbl> <dbl>
##  1  0.41 Very Good H     IF       62.9    54  1187  4.71  4.74  2.97
##  2  1.3  Premium   F     VVS1     59.3    59 14196  7.11  7.08  4.22
##  3  0.24 Very Good D     VVS1     59.2    59   478  4.04  4.1   2.41
##  4  0.35 Premium   E     VVS1     61      58  1116  4.56  4.52  2.77
##  5  0.3  Good      G     VS1      63.8    55   776  4.28  4.25  2.72
##  6  1.01 Good      F     SI1      61.6    63  4816  6.42  6.47  3.97
##  7  0.27 Ideal     H     SI1      61.3    55   383  4.17  4.21  2.57
##  8  1.16 Premium   I     SI1      62.7    57  4872  6.76  6.67  4.21
##  9  0.59 Very Good D     SI1      63.1    61  1771  5.35  5.3   3.36
## 10  1.17 Good      D     SI2      57.8    62  4639  6.97  6.91  4.01
## # i 490 more rows
##
## $list1
## $list1$a
## [1] 1
##
## $list1$b
## [1] "b"
```

```
##
## $list1$vec
##  [1]  1  2  3  4  5  6  7  8  9 10
##
##
## $list2
## $list2$vec
##   [1]  0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55
##  [13]  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15
##  [25]  1.20  1.25  1.30  1.35  1.40  1.45  1.50  1.55  1.60  1.65  1.70  1.75
##  [37]  1.80  1.85  1.90  1.95  2.00  2.05  2.10  2.15  2.20  2.25  2.30  2.35
##  [49]  2.40  2.45  2.50  2.55  2.60  2.65  2.70  2.75  2.80  2.85  2.90  2.95
##  [61]  3.00  3.05  3.10  3.15  3.20  3.25  3.30  3.35  3.40  3.45  3.50  3.55
##  [73]  3.60  3.65  3.70  3.75  3.80  3.85  3.90  3.95  4.00  4.05  4.10  4.15
##  [85]  4.20  4.25  4.30  4.35  4.40  4.45  4.50  4.55  4.60  4.65  4.70  4.75
##  [97]  4.80  4.85  4.90  4.95  5.00  5.05  5.10  5.15  5.20  5.25  5.30  5.35
## [109]  5.40  5.45  5.50  5.55  5.60  5.65  5.70  5.75  5.80  5.85  5.90  5.95
## [121]  6.00  6.05  6.10  6.15  6.20  6.25  6.30  6.35  6.40  6.45  6.50  6.55
## [133]  6.60  6.65  6.70  6.75  6.80  6.85  6.90  6.95  7.00  7.05  7.10  7.15
## [145]  7.20  7.25  7.30  7.35  7.40  7.45  7.50  7.55  7.60  7.65  7.70  7.75
## [157]  7.80  7.85  7.90  7.95  8.00  8.05  8.10  8.15  8.20  8.25  8.30  8.35
## [169]  8.40  8.45  8.50  8.55  8.60  8.65  8.70  8.75  8.80  8.85  8.90  8.95
## [181]  9.00  9.05  9.10  9.15  9.20  9.25  9.30  9.35  9.40  9.45  9.50  9.55
## [193]  9.60  9.65  9.70  9.75  9.80  9.85  9.90  9.95 10.00
##
## $list2$words
##  [1] "a"        "able"     "about"    "absolute" "accept"   "account"
##  [7] "achieve"  "across"   "act"      "active"
```

```
## List of 16
##  $ l1    : logi TRUE
##  $ l2    : logi FALSE
##  $ s1    : chr "imagine"
##  $ s2    : chr "lead"
##  $ n1    : num 409
##  $ n2    : num 883
##  $ vec.l1: logi [1:94] FALSE FALSE FALSE TRUE TRUE FALSE ...
##  $ vec.l2: logi [1:52] TRUE FALSE FALSE TRUE FALSE FALSE ...
##  $ vec.s1: chr [1:39] "specific" "bring" "picture" "understand" ...
##  $ vec.s2: chr [1:58] "except" "past" "make" "soon" ...
##  $ vec.n1: int [1:52] 919 538 235 289 185 765 413 627 522 309 ...
##  $ vec.n2: int [1:86] 421 57 660 163 238 673 578 516 330 225 ...
##  $ t1    : tibble [234 x 11] (S3: tbl_df/tbl/data.frame)
##   ..$ manufacturer: chr [1:234] "audi" "audi" "audi" "audi" ...
##   ..$ model       : chr [1:234] "a4" "a4" "a4" "a4" ...
##   ..$ displ       : num [1:234] 1.8 1.8 2 2 2.8 2.8 3.1 1.8 1.8 2 ...
##   ..$ year        : int [1:234] 1999 1999 2008 2008 1999 1999 2008 1999 1999 2008 ...
##   ..$ cyl         : int [1:234] 4 4 4 4 6 6 6 4 4 4 ...
##   ..$ trans       : chr [1:234] "auto(l5)" "manual(m5)" "manual(m6)" "auto(av)" ...
##   ..$ drv         : chr [1:234] "f" "f" "f" "f" ...
##   ..$ cty         : int [1:234] 18 21 20 21 16 18 18 18 16 20 ...
##   ..$ hwy         : int [1:234] 29 29 31 30 26 26 27 26 25 28 ...
##   ..$ fl          : chr [1:234] "p" "p" "p" "p" ...
##   ..$ class       : chr [1:234] "compact" "compact" "compact" "compact" ...
```

```
##  $ t2    : tibble [500 x 10] (S3: tbl_df/tbl/data.frame)
##   ..$ carat  : num [1:500] 0.41 1.3 0.24 0.35 0.3 1.01 0.27 1.16 0.59 1.17 ...
##   ..$ cut    : Ord.factor w/ 5 levels "Fair"<"Good"<..: 3 4 3 4 2 2 5 4 3 2 ...
##   ..$ color  : Ord.factor w/ 7 levels "D"<"E"<"F"<"G"<..: 5 3 1 2 4 3 5 6 1 1 ...
##   ..$ clarity: Ord.factor w/ 8 levels "I1"<"SI2"<"SI1"<..: 8 7 7 7 5 3 3 3 3 2 ...
##   ..$ depth  : num [1:500] 62.9 59.3 59.2 61 63.8 61.6 61.3 62.7 63.1 57.8 ...
##   ..$ table  : num [1:500] 54 59 59 58 55 63 55 57 61 62 ...
##   ..$ price  : int [1:500] 1187 14196 478 1116 776 4816 383 4872 1771 4639 ...
##   ..$ x      : num [1:500] 4.71 7.11 4.04 4.56 4.28 6.42 4.17 6.76 5.35 6.97 ...
##   ..$ y      : num [1:500] 4.74 7.08 4.1 4.52 4.25 6.47 4.21 6.67 5.3 6.91 ...
##   ..$ z      : num [1:500] 2.97 4.22 2.41 2.77 2.72 3.97 2.57 4.21 3.36 4.01 ...
##  $ list1 :List of 3
##   ..$ a  : num 1
##   ..$ b  : chr "b"
##   ..$ vec: int [1:10] 1 2 3 4 5 6 7 8 9 10
##  $ list2 :List of 2
##   ..$ vec  : num [1:201] 0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 ...
##   ..$ words: chr [1:10] "a" "able" "about" "absolute" ...
```

pluck() - select element from a list

```
##  [1] "except"     "past"       "make"       "soon"       "front"
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
```

```
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
```

keep() - select elements that pass a logical test

```
##       vec.s2       vec.n2           l2           n1        list2          t21
##  "character"    "integer"    "logical"    "numeric"       "list"     "tbl_df"
##          t22          t23          t11          t12          t13           s1
##        "tbl" "data.frame"     "tbl_df"        "tbl" "data.frame"  "character"
##           n2        list1       vec.l2       vec.s1           s2           l1
##    "numeric"       "list"    "logical"  "character"  "character"    "logical"
##       vec.n1       vec.l1
##    "integer"    "logical"
```

```
## $vec.s2
##  [1] "except"     "past"       "make"       "soon"       "front"
```

```
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
##
## $s1
## [1] "imagine"
##
## $vec.s1
##  [1] "specific"   "bring"      "picture"    "understand" "limit"
##  [6] "year"       "Christmas"  "quarter"    "perhaps"    "sir"
## [11] "close"      "hell"       "class"      "inside"     "accept"
## [16] "flat"       "soon"       "evening"    "stand"      "space"
## [21] "odd"        "teach"      "water"      "document"   "since"
## [26] "france"     "another"    "succeed"    "certain"    "land"
## [31] "send"       "not"        "ought"      "before"     "remember"
## [36] "too"        "another"    "council"    "sit"
##
## $s2
## [1] "lead"

## $l2
## [1] FALSE
##
## $vec.l2
##  [1]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE
## [13] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE  TRUE
## [25]  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
## [37] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
## [49] FALSE FALSE  TRUE FALSE
##
## $l1
## [1] TRUE
##
## $vec.l1
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE

## $t2
## # A tibble: 500 x 10
##    carat cut       color clarity depth table price     x     y     z
##    <dbl> <ord>     <ord> <ord>   <dbl> <dbl> <int> <dbl> <dbl> <dbl>
```

```
##  1  0.41 Very Good H     IF       62.9    54  1187  4.71  4.74  2.97
##  2  1.3  Premium   F     VVS1     59.3    59 14196  7.11  7.08  4.22
##  3  0.24 Very Good D     VVS1     59.2    59   478  4.04  4.1   2.41
##  4  0.35 Premium   E     VVS1     61      58  1116  4.56  4.52  2.77
##  5  0.3  Good      G     VS1      63.8    55   776  4.28  4.25  2.72
##  6  1.01 Good      F     SI1      61.6    63  4816  6.42  6.47  3.97
##  7  0.27 Ideal     H     SI1      61.3    55   383  4.17  4.21  2.57
##  8  1.16 Premium   I     SI1      62.7    57  4872  6.76  6.67  4.21
##  9  0.59 Very Good D     SI1      63.1    61  1771  5.35  5.3   3.36
## 10  1.17 Good      D     SI2      57.8    62  4639  6.97  6.91  4.01
## # i 490 more rows
##
## $t1
## # A tibble: 234 x 11
##    manufacturer model      displ  year   cyl trans drv     cty   hwy fl    class
##    <chr>        <chr>      <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
##  1 audi         a4           1.8  1999     4 auto~ f        18    29 p     comp~
##  2 audi         a4           1.8  1999     4 manu~ f        21    29 p     comp~
##  3 audi         a4           2    2008     4 manu~ f        20    31 p     comp~
##  4 audi         a4           2    2008     4 auto~ f        21    30 p     comp~
##  5 audi         a4           2.8  1999     6 auto~ f        16    26 p     comp~
##  6 audi         a4           2.8  1999     6 manu~ f        18    26 p     comp~
##  7 audi         a4           3.1  2008     6 auto~ f        18    27 p     comp~
##  8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p     comp~
##  9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p     comp~
## 10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p     comp~
## # i 224 more rows
```

```
## $l2
## [1] FALSE
##
## $vec.l2
##  [1]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE
## [13] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE  TRUE
## [25]  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
## [37] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
## [49] FALSE FALSE  TRUE FALSE
##
## $l1
## [1] TRUE
##
## $vec.l1
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
```

discard() - select elements that do not pass a logical test

```
## $vec.s2
##  [1] "except"     "past"       "make"       "soon"       "front"
```

```
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
##
## $l2
## [1] FALSE
##
## $list2
## $list2$vec
##   [1]  0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55
##  [13]  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15
##  [25]  1.20  1.25  1.30  1.35  1.40  1.45  1.50  1.55  1.60  1.65  1.70  1.75
##  [37]  1.80  1.85  1.90  1.95  2.00  2.05  2.10  2.15  2.20  2.25  2.30  2.35
##  [49]  2.40  2.45  2.50  2.55  2.60  2.65  2.70  2.75  2.80  2.85  2.90  2.95
##  [61]  3.00  3.05  3.10  3.15  3.20  3.25  3.30  3.35  3.40  3.45  3.50  3.55
##  [73]  3.60  3.65  3.70  3.75  3.80  3.85  3.90  3.95  4.00  4.05  4.10  4.15
##  [85]  4.20  4.25  4.30  4.35  4.40  4.45  4.50  4.55  4.60  4.65  4.70  4.75
##  [97]  4.80  4.85  4.90  4.95  5.00  5.05  5.10  5.15  5.20  5.25  5.30  5.35
## [109]  5.40  5.45  5.50  5.55  5.60  5.65  5.70  5.75  5.80  5.85  5.90  5.95
## [121]  6.00  6.05  6.10  6.15  6.20  6.25  6.30  6.35  6.40  6.45  6.50  6.55
## [133]  6.60  6.65  6.70  6.75  6.80  6.85  6.90  6.95  7.00  7.05  7.10  7.15
## [145]  7.20  7.25  7.30  7.35  7.40  7.45  7.50  7.55  7.60  7.65  7.70  7.75
## [157]  7.80  7.85  7.90  7.95  8.00  8.05  8.10  8.15  8.20  8.25  8.30  8.35
## [169]  8.40  8.45  8.50  8.55  8.60  8.65  8.70  8.75  8.80  8.85  8.90  8.95
## [181]  9.00  9.05  9.10  9.15  9.20  9.25  9.30  9.35  9.40  9.45  9.50  9.55
## [193]  9.60  9.65  9.70  9.75  9.80  9.85  9.90  9.95 10.00
##
## $list2$words
##  [1] "a"        "able"     "about"    "absolute" "accept"   "account"
##  [7] "achieve"  "across"   "act"      "active"
##
##
## $t2
## # A tibble: 500 x 10
##    carat cut       color clarity depth table price     x     y     z
##    <dbl> <ord>     <ord> <ord>   <dbl> <dbl> <int> <dbl> <dbl> <dbl>
##  1  0.41 Very Good H     IF       62.9    54  1187  4.71  4.74  2.97
##  2  1.3  Premium   F     VVS1     59.3    59 14196  7.11  7.08  4.22
##  3  0.24 Very Good D     VVS1     59.2    59   478  4.04  4.1   2.41
##  4  0.35 Premium   E     VVS1     61      58  1116  4.56  4.52  2.77
##  5  0.3  Good      G     VS1      63.8    55   776  4.28  4.25  2.72
##  6  1.01 Good      F     SI1      61.6    63  4816  6.42  6.47  3.97
##  7  0.27 Ideal     H     SI1      61.3    55   383  4.17  4.21  2.57
##  8  1.16 Premium   I     SI1      62.7    57  4872  6.76  6.67  4.21
##  9  0.59 Very Good D     SI1      63.1    61  1771  5.35  5.3   3.36
## 10  1.17 Good      D     SI2      57.8    62  4639  6.97  6.91  4.01
```

```
## # i 490 more rows
##
## $t1
## # A tibble: 234 x 11
##    manufacturer model      displ  year   cyl trans drv     cty   hwy fl    class
##    <chr>        <chr>      <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
##  1 audi         a4           1.8  1999     4 auto~ f        18    29 p     comp~
##  2 audi         a4           1.8  1999     4 manu~ f        21    29 p     comp~
##  3 audi         a4           2    2008     4 manu~ f        20    31 p     comp~
##  4 audi         a4           2    2008     4 auto~ f        21    30 p     comp~
##  5 audi         a4           2.8  1999     6 auto~ f        16    26 p     comp~
##  6 audi         a4           2.8  1999     6 manu~ f        18    26 p     comp~
##  7 audi         a4           3.1  2008     6 auto~ f        18    27 p     comp~
##  8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p     comp~
##  9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p     comp~
## 10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p     comp~
## # i 224 more rows
##
## $s1
## [1] "imagine"
##
## $list1
## $list1$a
## [1] 1
##
## $list1$b
## [1] "b"
##
## $list1$vec
##  [1]  1  2  3  4  5  6  7  8  9 10
##
##
## $vec.l2
##  [1]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE
## [13] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE  TRUE
## [25]  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
## [37] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
## [49] FALSE FALSE  TRUE FALSE
##
## $vec.s1
##  [1] "specific"   "bring"      "picture"    "understand" "limit"
##  [6] "year"       "Christmas"  "quarter"    "perhaps"    "sir"
## [11] "close"      "hell"       "class"      "inside"     "accept"
## [16] "flat"       "soon"       "evening"    "stand"      "space"
## [21] "odd"        "teach"      "water"      "document"   "since"
## [26] "france"     "another"    "succeed"    "certain"    "land"
## [31] "send"       "not"        "ought"      "before"     "remember"
## [36] "too"        "another"    "council"    "sit"
##
## $s2
## [1] "lead"
##
## $l1
## [1] TRUE
```

```
##
## $vec.l1
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
## $vec.n2
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
##
## $l2
## [1] FALSE
##
## $n1
## [1] 408.9769
##
## $list2
## $list2$vec
##   [1]  0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55
##  [13]  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15
##  [25]  1.20  1.25  1.30  1.35  1.40  1.45  1.50  1.55  1.60  1.65  1.70  1.75
##  [37]  1.80  1.85  1.90  1.95  2.00  2.05  2.10  2.15  2.20  2.25  2.30  2.35
##  [49]  2.40  2.45  2.50  2.55  2.60  2.65  2.70  2.75  2.80  2.85  2.90  2.95
##  [61]  3.00  3.05  3.10  3.15  3.20  3.25  3.30  3.35  3.40  3.45  3.50  3.55
##  [73]  3.60  3.65  3.70  3.75  3.80  3.85  3.90  3.95  4.00  4.05  4.10  4.15
##  [85]  4.20  4.25  4.30  4.35  4.40  4.45  4.50  4.55  4.60  4.65  4.70  4.75
##  [97]  4.80  4.85  4.90  4.95  5.00  5.05  5.10  5.15  5.20  5.25  5.30  5.35
## [109]  5.40  5.45  5.50  5.55  5.60  5.65  5.70  5.75  5.80  5.85  5.90  5.95
## [121]  6.00  6.05  6.10  6.15  6.20  6.25  6.30  6.35  6.40  6.45  6.50  6.55
## [133]  6.60  6.65  6.70  6.75  6.80  6.85  6.90  6.95  7.00  7.05  7.10  7.15
## [145]  7.20  7.25  7.30  7.35  7.40  7.45  7.50  7.55  7.60  7.65  7.70  7.75
## [157]  7.80  7.85  7.90  7.95  8.00  8.05  8.10  8.15  8.20  8.25  8.30  8.35
## [169]  8.40  8.45  8.50  8.55  8.60  8.65  8.70  8.75  8.80  8.85  8.90  8.95
## [181]  9.00  9.05  9.10  9.15  9.20  9.25  9.30  9.35  9.40  9.45  9.50  9.55
## [193]  9.60  9.65  9.70  9.75  9.80  9.85  9.90  9.95 10.00
##
## $list2$words
##  [1] "a"        "able"     "about"    "absolute" "accept"   "account"
##  [7] "achieve"  "across"   "act"      "active"
##
##
## $t2
## # A tibble: 500 x 10
##    carat cut       color clarity depth table price     x     y     z
##    <dbl> <ord>     <ord> <ord>   <dbl> <dbl> <int> <dbl> <dbl> <dbl>
##  1  0.41 Very Good H     IF       62.9    54  1187  4.71  4.74  2.97
```

```
##  2  1.3  Premium   F     VVS1     59.3    59 14196  7.11  7.08  4.22
##  3  0.24 Very Good D     VVS1     59.2    59   478  4.04  4.1   2.41
##  4  0.35 Premium   E     VVS1     61      58  1116  4.56  4.52  2.77
##  5  0.3  Good      G     VS1      63.8    55   776  4.28  4.25  2.72
##  6  1.01 Good      F     SI1      61.6    63  4816  6.42  6.47  3.97
##  7  0.27 Ideal     H     SI1      61.3    55   383  4.17  4.21  2.57
##  8  1.16 Premium   I     SI1      62.7    57  4872  6.76  6.67  4.21
##  9  0.59 Very Good D     SI1      63.1    61  1771  5.35  5.3   3.36
## 10  1.17 Good      D     SI2      57.8    62  4639  6.97  6.91  4.01
## # i 490 more rows
##
## $t1
## # A tibble: 234 x 11
##    manufacturer model      displ  year   cyl trans drv     cty   hwy fl    class
##    <chr>        <chr>      <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
##  1 audi         a4           1.8  1999     4 auto~ f        18    29 p     comp~
##  2 audi         a4           1.8  1999     4 manu~ f        21    29 p     comp~
##  3 audi         a4           2    2008     4 manu~ f        20    31 p     comp~
##  4 audi         a4           2    2008     4 auto~ f        21    30 p     comp~
##  5 audi         a4           2.8  1999     6 auto~ f        16    26 p     comp~
##  6 audi         a4           2.8  1999     6 manu~ f        18    26 p     comp~
##  7 audi         a4           3.1  2008     6 auto~ f        18    27 p     comp~
##  8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p     comp~
##  9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p     comp~
## 10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p     comp~
## # i 224 more rows
##
## $n2
## [1] 883.0174
##
## $list1
## $list1$a
## [1] 1
##
## $list1$b
## [1] "b"
##
## $list1$vec
##  [1]  1  2  3  4  5  6  7  8  9 10
##
##
## $vec.l2
##  [1]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE
## [13] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE  TRUE
## [25]  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
## [37] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
## [49] FALSE FALSE  TRUE FALSE
##
## $l1
## [1] TRUE
##
## $vec.n1
##  [1] 919 538 235 289 185 765 413 627 522 309  54 205 875 779 537 564 794 391 409
## [20] 727 346 160 468 509 920  57 457 617 357 279 270 878 646 347 129 218 618 881
```

```
## [39] 698 337 797  26 539 519 757 666 553 724 390 498 222 671
##
## $vec.l1
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
```

head_while() / tail_while() - return elements until one does not pass

```
## $vec.s2
##  [1] "except"     "past"       "make"       "soon"       "front"
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
```

```
## named list()
```

flatten() - remove a level of indexes from a list

```
##   [1] 29 29 31 30 26 26 27 26 25 28 27 25 25 25 25 24 25 23 20 15 20 17 17 26 23
##  [26] 26 25 24 19 14 15 17 27 30 26 29 26 24 24 22 22 24 24 17 22 21 23 23 19 18
##  [51] 17 17 19 19 12 17 15 17 17 12 17 16 18 15 16 12 17 17 16 12 15 16 17 15 17
##  [76] 17 18 17 19 17 19 19 17 17 17 16 16 17 15 17 26 25 26 24 21 22 23 22 20 33
## [101] 32 32 29 32 34 36 36 29 26 27 30 31 26 26 28 26 29 28 27 24 24 24 22 19 20
## [126] 17 12 19 18 14 15 18 18 15 17 16 18 17 19 19 17 29 27 31 32 27 26 26 25 25
## [151] 17 17 20 18 26 26 27 28 25 25 24 27 25 26 23 26 26 26 26 25 27 25 27 20 20
## [176] 19 17 20 17 29 27 31 31 26 26 28 27 29 31 31 26 26 27 30 33 35 37 35 15 18
## [201] 20 20 22 17 19 18 20 29 26 29 29 24 44 29 26 29 29 29 29 23 24 44 41 29 26
## [226] 28 29 29 29 28 29 26 26 26
```

```
##   [1] "audi"       "audi"       "audi"       "audi"       "audi"
##   [6] "audi"       "audi"       "audi"       "audi"       "audi"
##  [11] "audi"       "audi"       "audi"       "audi"       "audi"
##  [16] "audi"       "audi"       "audi"       "chevrolet"  "chevrolet"
##  [21] "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"
##  [26] "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"
##  [31] "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"
##  [36] "chevrolet"  "chevrolet"  "dodge"      "dodge"      "dodge"
##  [41] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [46] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [51] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [56] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [61] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
```

```
##  [66] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [71] "dodge"      "dodge"      "dodge"      "dodge"      "ford"
##  [76] "ford"       "ford"       "ford"       "ford"       "ford"
##  [81] "ford"       "ford"       "ford"       "ford"       "ford"
##  [86] "ford"       "ford"       "ford"       "ford"       "ford"
##  [91] "ford"       "ford"       "ford"       "ford"       "ford"
##  [96] "ford"       "ford"       "ford"       "ford"       "honda"
## [101] "honda"      "honda"      "honda"      "honda"      "honda"
## [106] "honda"      "honda"      "honda"      "hyundai"    "hyundai"
## [111] "hyundai"    "hyundai"    "hyundai"    "hyundai"    "hyundai"
## [116] "hyundai"    "hyundai"    "hyundai"    "hyundai"    "hyundai"
## [121] "hyundai"    "hyundai"    "jeep"       "jeep"       "jeep"
## [126] "jeep"       "jeep"       "jeep"       "jeep"       "jeep"
## [131] "land rover" "land rover" "land rover" "land rover" "lincoln"
## [136] "lincoln"    "lincoln"    "mercury"    "mercury"    "mercury"
## [141] "mercury"    "nissan"     "nissan"     "nissan"     "nissan"
## [146] "nissan"     "nissan"     "nissan"     "nissan"     "nissan"
## [151] "nissan"     "nissan"     "nissan"     "nissan"     "pontiac"
## [156] "pontiac"    "pontiac"    "pontiac"    "pontiac"    "subaru"
## [161] "subaru"     "subaru"     "subaru"     "subaru"     "subaru"
## [166] "subaru"     "subaru"     "subaru"     "subaru"     "subaru"
## [171] "subaru"     "subaru"     "subaru"     "toyota"     "toyota"
## [176] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [181] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [186] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [191] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [196] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [201] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [206] "toyota"     "toyota"     "volkswagen" "volkswagen" "volkswagen"
## [211] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [216] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [221] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [226] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [231] "volkswagen" "volkswagen" "volkswagen" "volkswagen"
```

transpose() - transpose the index order

```
## [[1]]
## [[1]]$vec.s2
## [1] "except"
##
## [[1]]$vec.n2
## [1] 421
##
## [[1]]$l2
## [1] FALSE
##
## [[1]]$n1
## [1] 408.9769
##
## [[1]]$list2
##   [1]  0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55
##  [13]  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15
##  [25]  1.20  1.25  1.30  1.35  1.40  1.45  1.50  1.55  1.60  1.65  1.70  1.75
```

```
##  [37]  1.80  1.85  1.90  1.95  2.00  2.05  2.10  2.15  2.20  2.25  2.30  2.35
##  [49]  2.40  2.45  2.50  2.55  2.60  2.65  2.70  2.75  2.80  2.85  2.90  2.95
##  [61]  3.00  3.05  3.10  3.15  3.20  3.25  3.30  3.35  3.40  3.45  3.50  3.55
##  [73]  3.60  3.65  3.70  3.75  3.80  3.85  3.90  3.95  4.00  4.05  4.10  4.15
##  [85]  4.20  4.25  4.30  4.35  4.40  4.45  4.50  4.55  4.60  4.65  4.70  4.75
##  [97]  4.80  4.85  4.90  4.95  5.00  5.05  5.10  5.15  5.20  5.25  5.30  5.35
## [109]  5.40  5.45  5.50  5.55  5.60  5.65  5.70  5.75  5.80  5.85  5.90  5.95
## [121]  6.00  6.05  6.10  6.15  6.20  6.25  6.30  6.35  6.40  6.45  6.50  6.55
## [133]  6.60  6.65  6.70  6.75  6.80  6.85  6.90  6.95  7.00  7.05  7.10  7.15
## [145]  7.20  7.25  7.30  7.35  7.40  7.45  7.50  7.55  7.60  7.65  7.70  7.75
## [157]  7.80  7.85  7.90  7.95  8.00  8.05  8.10  8.15  8.20  8.25  8.30  8.35
## [169]  8.40  8.45  8.50  8.55  8.60  8.65  8.70  8.75  8.80  8.85  8.90  8.95
## [181]  9.00  9.05  9.10  9.15  9.20  9.25  9.30  9.35  9.40  9.45  9.50  9.55
## [193]  9.60  9.65  9.70  9.75  9.80  9.85  9.90  9.95 10.00
##
## [[1]]$t2
##   [1] 0.41 1.30 0.24 0.35 0.30 1.01 0.27 1.16 0.59 1.17 0.50 1.50 0.55 0.36 1.05
##  [16] 0.30 0.90 1.00 0.51 0.81 0.74 0.72 0.33 0.23 0.51 0.84 0.59 0.91 0.52 0.87
##  [31] 0.30 0.96 0.63 1.09 0.92 1.01 0.30 0.31 1.00 2.20 1.01 0.71 0.72 1.31 0.77
##  [46] 0.51 0.59 1.54 0.57 0.71 0.51 1.31 1.01 1.00 1.50 1.06 0.32 0.34 0.31 1.11
##  [61] 0.41 0.72 0.32 0.53 0.74 0.40 0.70 1.50 1.13 0.50 0.41 1.04 0.92 1.50 0.90
##  [76] 0.31 1.14 0.58 1.57 0.91 0.70 0.70 0.92 0.30 2.00 1.32 0.58 1.05 0.70 0.35
##  [91] 0.70 1.50 0.58 1.01 0.31 0.32 0.70 1.52 0.70 0.70 0.92 0.90 0.34 0.33 1.50
## [106] 0.42 1.05 0.31 0.70 0.32 1.00 1.02 0.27 1.08 0.43 1.13 1.50 0.30 0.56 1.20
## [121] 0.36 0.33 0.51 2.07 1.01 0.33 0.60 0.60 0.35 0.75 1.12 0.26 1.01 0.43 0.27
## [136] 1.00 1.03 1.01 0.33 0.24 1.01 0.30 1.02 1.50 0.50 0.30 0.71 1.11 0.28 1.29
## [151] 0.51 0.57 0.33 0.75 0.35 0.32 0.32 0.29 1.03 1.70 0.90 0.32 0.61 0.51 1.13
## [166] 1.02 0.30 0.31 1.51 0.81 0.70 0.74 0.51 0.35 0.62 0.32 0.58 1.01 1.07 0.70
## [181] 1.04 0.51 0.53 0.30 0.90 0.78 0.33 1.51 1.02 0.43 1.00 0.38 0.60 0.54 0.49
## [196] 0.90 1.23 1.21 0.70 0.31 0.56 1.71 0.25 0.35 0.32 0.40 0.82 0.90 0.41 0.30
## [211] 1.50 0.76 0.51 0.40 0.70 0.24 0.31 0.31 0.73 0.41 0.28 1.17 1.50 1.50 1.26
## [226] 1.18 1.02 0.26 0.40 1.00 0.35 1.01 0.34 0.73 1.00 0.45 0.71 2.12 0.30 0.40
## [241] 0.32 0.31 0.33 1.01 1.52 1.77 1.08 0.33 0.32 0.27 0.32 1.24 0.36 0.71 0.54
## [256] 1.47 0.56 1.80 2.02 0.30 0.38 0.31 0.91 0.39 0.49 0.31 0.55 0.33 0.70 0.73
## [271] 0.42 1.30 1.24 0.72 1.01 1.72 0.72 1.21 0.33 0.71 0.70 0.73 1.50 1.01 2.00
## [286] 1.50 0.71 0.34 1.29 1.00 0.72 0.30 1.17 0.50 0.70 0.30 0.31 2.04 1.33 0.32
## [301] 1.00 1.52 0.71 0.30 0.33 0.34 0.34 1.01 1.52 2.02 1.64 0.40 1.00 0.38 0.30
## [316] 1.10 1.08 1.02 0.84 1.51 2.01 0.71 0.32 0.32 1.19 1.01 0.71 0.31 0.41 0.70
## [331] 1.25 0.87 1.50 0.59 1.01 0.36 0.31 0.78 0.70 0.39 0.70 1.07 0.40 1.04 0.36
## [346] 0.81 0.52 0.31 1.10 0.41 1.07 0.73 0.23 0.32 0.26 0.30 0.33 0.40 1.00 0.73
## [361] 0.71 0.38 0.39 0.41 0.35 0.55 1.01 0.42 0.31 0.43 1.12 0.51 0.52 0.30 0.44
## [376] 1.01 0.90 1.56 1.01 0.33 0.30 0.90 1.70 2.02 2.17 0.28 0.53 1.59 0.50 1.07
## [391] 0.53 0.42 0.33 1.08 0.32 0.44 0.73 0.84 0.41 0.55 0.32 0.31 0.30 1.51 0.50
## [406] 1.04 0.34 0.31 0.41 1.51 0.91 1.22 1.20 0.51 1.51 0.81 0.31 1.24 1.01 0.36
## [421] 0.70 1.04 0.50 1.02 0.31 0.41 1.12 0.42 0.27 0.68 2.14 0.53 0.35 0.31 0.70
## [436] 0.34 0.41 0.57 1.00 0.32 0.74 0.90 0.53 1.30 1.00 0.50 0.95 2.01 0.51 1.11
## [451] 0.74 0.75 1.50 0.72 0.74 0.70 1.01 0.24 1.01 0.43 0.43 0.41 1.24 2.03 2.01
## [466] 1.23 0.78 0.40 0.63 2.32 1.12 0.56 1.59 1.04 1.01 0.32 0.70 0.42 1.50 0.32
## [481] 1.00 2.04 1.05 1.53 1.48 1.12 1.01 0.82 1.51 0.56 0.30 0.25 0.93 1.08 0.60
## [496] 1.53 1.50 0.40 0.90 1.03
##
## [[1]]$t1
##   [1] "audi"       "audi"       "audi"       "audi"       "audi"
##   [6] "audi"       "audi"       "audi"       "audi"       "audi"
```

```
##  [11] "audi"       "audi"       "audi"       "audi"       "audi"
##  [16] "audi"       "audi"       "audi"       "chevrolet"  "chevrolet"
##  [21] "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"
##  [26] "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"
##  [31] "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"  "chevrolet"
##  [36] "chevrolet"  "chevrolet"  "dodge"      "dodge"      "dodge"
##  [41] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [46] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [51] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [56] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [61] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [66] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
##  [71] "dodge"      "dodge"      "dodge"      "dodge"      "ford"
##  [76] "ford"       "ford"       "ford"       "ford"       "ford"
##  [81] "ford"       "ford"       "ford"       "ford"       "ford"
##  [86] "ford"       "ford"       "ford"       "ford"       "ford"
##  [91] "ford"       "ford"       "ford"       "ford"       "ford"
##  [96] "ford"       "ford"       "ford"       "ford"       "honda"
## [101] "honda"      "honda"      "honda"      "honda"      "honda"
## [106] "honda"      "honda"      "honda"      "hyundai"    "hyundai"
## [111] "hyundai"    "hyundai"    "hyundai"    "hyundai"    "hyundai"
## [116] "hyundai"    "hyundai"    "hyundai"    "hyundai"    "hyundai"
## [121] "hyundai"    "hyundai"    "jeep"       "jeep"       "jeep"
## [126] "jeep"       "jeep"       "jeep"       "jeep"       "jeep"
## [131] "land rover" "land rover" "land rover" "land rover" "lincoln"
## [136] "lincoln"    "lincoln"    "mercury"    "mercury"    "mercury"
## [141] "mercury"    "nissan"     "nissan"     "nissan"     "nissan"
## [146] "nissan"     "nissan"     "nissan"     "nissan"     "nissan"
## [151] "nissan"     "nissan"     "nissan"     "nissan"     "pontiac"
## [156] "pontiac"    "pontiac"    "pontiac"    "pontiac"    "subaru"
## [161] "subaru"     "subaru"     "subaru"     "subaru"     "subaru"
## [166] "subaru"     "subaru"     "subaru"     "subaru"     "subaru"
## [171] "subaru"     "subaru"     "subaru"     "toyota"     "toyota"
## [176] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [181] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [186] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [191] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [196] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [201] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [206] "toyota"     "toyota"     "volkswagen" "volkswagen" "volkswagen"
## [211] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [216] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [221] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [226] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [231] "volkswagen" "volkswagen" "volkswagen" "volkswagen"
##
## [[1]]$s1
## [1] "imagine"
##
## [[1]]$n2
## [1] 883.0174
##
## [[1]]$list1
## [1] 1
```

```
##
## [[1]]$vec.l2
## [1] TRUE
##
## [[1]]$vec.s1
## [1] "specific"
##
## [[1]]$s2
## [1] "lead"
##
## [[1]]$l1
## [1] TRUE
##
## [[1]]$vec.n1
## [1] 919
##
## [[1]]$vec.l1
## [1] FALSE
##
##
## [[2]]
## [[2]]$vec.s2
## [1] "past"
##
## [[2]]$vec.n2
## [1] 57
##
## [[2]]$l2
## NULL
##
## [[2]]$n1
## NULL
##
## [[2]]$list2
##  [1] "a"        "able"     "about"    "absolute" "accept"   "account"
##  [7] "achieve"  "across"   "act"      "active"
##
## [[2]]$t2
##   [1] Very Good Premium   Very Good Premium   Good      Good      Ideal
##   [8] Premium   Very Good Good      Premium   Very Good Ideal     Ideal
##  [15] Premium   Ideal     Ideal     Very Good Very Good Premium   Premium
##  [22] Very Good Very Good Very Good Premium   Very Good Good      Premium
##  [29] Ideal     Very Good Premium   Premium   Premium   Ideal     Premium
##  [36] Good      Ideal     Very Good Premium   Ideal     Premium   Ideal
##  [43] Premium   Ideal     Ideal     Ideal     Ideal     Premium   Ideal
##  [50] Premium   Ideal     Premium   Good      Very Good Good      Ideal
##  [57] Ideal     Ideal     Very Good Premium   Ideal     Ideal     Very Good
##  [64] Good      Ideal     Good      Ideal     Ideal     Premium   Premium
##  [71] Ideal     Premium   Ideal     Very Good Very Good Premium   Ideal
##  [78] Ideal     Ideal     Very Good Ideal     Ideal     Fair      Ideal
##  [85] Premium   Ideal     Ideal     Premium   Ideal     Very Good Fair
##  [92] Fair      Ideal     Fair      Ideal     Ideal     Ideal     Premium
##  [99] Ideal     Premium   Very Good Very Good Ideal     Ideal     Premium
## [106] Very Good Premium   Ideal     Fair      Premium   Ideal     Premium
```

```
## [113] Ideal     Very Good Ideal     Good      Premium   Ideal     Ideal
## [120] Very Good Ideal     Ideal     Ideal     Premium   Fair      Very Good
## [127] Ideal     Very Good Premium   Ideal     Good      Very Good Ideal
## [134] Ideal     Very Good Good      Very Good Premium   Ideal     Very Good
## [141] Very Good Very Good Very Good Very Good Good      Very Good Premium
## [148] Very Good Very Good Fair      Ideal     Ideal     Ideal     Ideal
## [155] Premium   Ideal     Good      Very Good Very Good Good      Premium
## [162] Ideal     Premium   Ideal     Ideal     Premium   Ideal     Ideal
## [169] Fair      Premium   Good      Very Good Good      Ideal     Premium
## [176] Ideal     Ideal     Very Good Premium   Very Good Good      Ideal
## [183] Ideal     Ideal     Premium   Good      Ideal     Ideal     Premium
## [190] Premium   Ideal     Ideal     Ideal     Ideal     Premium   Premium
## [197] Premium   Premium   Premium   Ideal     Ideal     Ideal     Very Good
## [204] Premium   Ideal     Very Good Premium   Fair      Ideal     Ideal
## [211] Premium   Ideal     Premium   Premium   Ideal     Ideal     Ideal
## [218] Very Good Fair      Very Good Ideal     Very Good Good      Very Good
## [225] Ideal     Very Good Premium   Very Good Premium   Good      Ideal
## [232] Ideal     Ideal     Very Good Good      Premium   Ideal     Very Good
## [239] Very Good Ideal     Premium   Ideal     Ideal     Very Good Good
## [246] Very Good Premium   Premium   Ideal     Very Good Premium   Ideal
## [253] Very Good Ideal     Ideal     Very Good Very Good Ideal     Fair
## [260] Premium   Premium   Premium   Ideal     Ideal     Premium   Ideal
## [267] Ideal     Premium   Ideal     Good      Ideal     Very Good Premium
## [274] Very Good Premium   Very Good Very Good Premium   Ideal     Premium
## [281] Premium   Ideal     Premium   Very Good Very Good Premium   Premium
## [288] Very Good Very Good Good      Ideal     Ideal     Ideal     Ideal
## [295] Premium   Ideal     Ideal     Very Good Premium   Very Good Premium
## [302] Good      Very Good Ideal     Ideal     Ideal     Ideal     Premium
## [309] Ideal     Ideal     Ideal     Ideal     Good      Premium   Ideal
## [316] Ideal     Ideal     Ideal     Ideal     Premium   Premium   Premium
## [323] Premium   Premium   Fair      Good      Ideal     Very Good Ideal
## [330] Good      Premium   Premium   Premium   Good      Good      Premium
## [337] Very Good Ideal     Premium   Very Good Very Good Premium   Ideal
## [344] Ideal     Premium   Premium   Premium   Good      Very Good Ideal
## [351] Ideal     Premium   Ideal     Ideal     Very Good Very Good Premium
## [358] Premium   Fair      Ideal     Very Good Ideal     Premium   Good
## [365] Very Good Ideal     Good      Premium   Ideal     Premium   Good
## [372] Premium   Very Good Ideal     Ideal     Very Good Very Good Ideal
## [379] Very Good Premium   Very Good Very Good Very Good Very Good Very Good
## [386] Ideal     Ideal     Ideal     Ideal     Premium   Ideal     Ideal
## [393] Ideal     Premium   Ideal     Premium   Premium   Very Good Good
## [400] Ideal     Ideal     Very Good Very Good Very Good Premium   Very Good
## [407] Premium   Premium   Ideal     Premium   Very Good Premium   Very Good
## [414] Ideal     Very Good Good      Premium   Ideal     Premium   Ideal
## [421] Very Good Premium   Premium   Ideal     Premium   Ideal     Premium
## [428] Fair      Premium   Good      Premium   Ideal     Ideal     Ideal
## [435] Very Good Premium   Ideal     Ideal     Good      Good      Fair
## [442] Very Good Ideal     Premium   Premium   Fair      Very Good Ideal
## [449] Ideal     Premium   Ideal     Ideal     Ideal     Ideal     Very Good
## [456] Premium   Good      Ideal     Very Good Ideal     Good      Ideal
## [463] Ideal     Very Good Premium   Premium   Premium   Ideal     Premium
## [470] Premium   Ideal     Very Good Ideal     Ideal     Ideal     Very Good
## [477] Fair      Ideal     Good      Very Good Good      Very Good Ideal
## [484] Ideal     Very Good Premium   Good      Good      Good      Very Good
```

```
## [491] Ideal     Ideal     Good      Premium   Premium   Premium   Good
## [498] Ideal     Good      Ideal
## Levels: Fair < Good < Very Good < Premium < Ideal
##
## [[2]]$t1
##   [1] "a4"                    "a4"                    "a4"
##   [4] "a4"                    "a4"                    "a4"
##   [7] "a4"                    "a4 quattro"            "a4 quattro"
##  [10] "a4 quattro"            "a4 quattro"            "a4 quattro"
##  [13] "a4 quattro"            "a4 quattro"            "a4 quattro"
##  [16] "a6 quattro"            "a6 quattro"            "a6 quattro"
##  [19] "c1500 suburban 2wd"    "c1500 suburban 2wd"    "c1500 suburban 2wd"
##  [22] "c1500 suburban 2wd"    "c1500 suburban 2wd"    "corvette"
##  [25] "corvette"              "corvette"              "corvette"
##  [28] "corvette"              "k1500 tahoe 4wd"       "k1500 tahoe 4wd"
##  [31] "k1500 tahoe 4wd"       "k1500 tahoe 4wd"       "malibu"
##  [34] "malibu"                "malibu"                "malibu"
##  [37] "malibu"                "caravan 2wd"           "caravan 2wd"
##  [40] "caravan 2wd"           "caravan 2wd"           "caravan 2wd"
##  [43] "caravan 2wd"           "caravan 2wd"           "caravan 2wd"
##  [46] "caravan 2wd"           "caravan 2wd"           "caravan 2wd"
##  [49] "dakota pickup 4wd"     "dakota pickup 4wd"     "dakota pickup 4wd"
##  [52] "dakota pickup 4wd"     "dakota pickup 4wd"     "dakota pickup 4wd"
##  [55] "dakota pickup 4wd"     "dakota pickup 4wd"     "dakota pickup 4wd"
##  [58] "durango 4wd"           "durango 4wd"           "durango 4wd"
##  [61] "durango 4wd"           "durango 4wd"           "durango 4wd"
##  [64] "durango 4wd"           "ram 1500 pickup 4wd"   "ram 1500 pickup 4wd"
##  [67] "ram 1500 pickup 4wd"   "ram 1500 pickup 4wd"   "ram 1500 pickup 4wd"
##  [70] "ram 1500 pickup 4wd"   "ram 1500 pickup 4wd"   "ram 1500 pickup 4wd"
##  [73] "ram 1500 pickup 4wd"   "ram 1500 pickup 4wd"   "expedition 2wd"
##  [76] "expedition 2wd"        "expedition 2wd"        "explorer 4wd"
##  [79] "explorer 4wd"          "explorer 4wd"          "explorer 4wd"
##  [82] "explorer 4wd"          "explorer 4wd"          "f150 pickup 4wd"
##  [85] "f150 pickup 4wd"       "f150 pickup 4wd"       "f150 pickup 4wd"
##  [88] "f150 pickup 4wd"       "f150 pickup 4wd"       "f150 pickup 4wd"
##  [91] "mustang"               "mustang"               "mustang"
##  [94] "mustang"               "mustang"               "mustang"
##  [97] "mustang"               "mustang"               "mustang"
## [100] "civic"                 "civic"                 "civic"
## [103] "civic"                 "civic"                 "civic"
## [106] "civic"                 "civic"                 "civic"
## [109] "sonata"                "sonata"                "sonata"
## [112] "sonata"                "sonata"                "sonata"
## [115] "sonata"                "tiburon"               "tiburon"
## [118] "tiburon"               "tiburon"               "tiburon"
## [121] "tiburon"               "tiburon"               "grand cherokee 4wd"
## [124] "grand cherokee 4wd"    "grand cherokee 4wd"    "grand cherokee 4wd"
## [127] "grand cherokee 4wd"    "grand cherokee 4wd"    "grand cherokee 4wd"
## [130] "grand cherokee 4wd"    "range rover"           "range rover"
## [133] "range rover"           "range rover"           "navigator 2wd"
## [136] "navigator 2wd"         "navigator 2wd"         "mountaineer 4wd"
## [139] "mountaineer 4wd"       "mountaineer 4wd"       "mountaineer 4wd"
## [142] "altima"                "altima"                "altima"
## [145] "altima"                "altima"                "altima"
```

```
## [148] "maxima"                 "maxima"                 "maxima"
## [151] "pathfinder 4wd"         "pathfinder 4wd"         "pathfinder 4wd"
## [154] "pathfinder 4wd"         "grand prix"             "grand prix"
## [157] "grand prix"             "grand prix"             "grand prix"
## [160] "forester awd"           "forester awd"           "forester awd"
## [163] "forester awd"           "forester awd"           "forester awd"
## [166] "impreza awd"            "impreza awd"            "impreza awd"
## [169] "impreza awd"            "impreza awd"            "impreza awd"
## [172] "impreza awd"            "impreza awd"            "4runner 4wd"
## [175] "4runner 4wd"            "4runner 4wd"            "4runner 4wd"
## [178] "4runner 4wd"            "4runner 4wd"            "camry"
## [181] "camry"                  "camry"                  "camry"
## [184] "camry"                  "camry"                  "camry"
## [187] "camry solara"           "camry solara"           "camry solara"
## [190] "camry solara"           "camry solara"           "camry solara"
## [193] "camry solara"           "corolla"                "corolla"
## [196] "corolla"                "corolla"                "corolla"
## [199] "land cruiser wagon 4wd" "land cruiser wagon 4wd" "toyota tacoma 4wd"
## [202] "toyota tacoma 4wd"      "toyota tacoma 4wd"      "toyota tacoma 4wd"
## [205] "toyota tacoma 4wd"      "toyota tacoma 4wd"      "toyota tacoma 4wd"
## [208] "gti"                    "gti"                    "gti"
## [211] "gti"                    "gti"                    "jetta"
## [214] "jetta"                  "jetta"                  "jetta"
## [217] "jetta"                  "jetta"                  "jetta"
## [220] "jetta"                  "jetta"                  "new beetle"
## [223] "new beetle"             "new beetle"             "new beetle"
## [226] "new beetle"             "new beetle"             "passat"
## [229] "passat"                 "passat"                 "passat"
## [232] "passat"                 "passat"                 "passat"
##
## [[2]]$s1
## NULL
##
## [[2]]$n2
## NULL
##
## [[2]]$list1
## [1] "b"
##
## [[2]]$vec.l2
## [1] FALSE
##
## [[2]]$vec.s1
## [1] "bring"
##
## [[2]]$s2
## NULL
##
## [[2]]$l1
## NULL
##
## [[2]]$vec.n1
## [1] 538
##
```

```
## [[2]]$vec.l1
## [1] FALSE
##
##
## [[3]]
## [[3]]$vec.s2
## [1] "make"
##
## [[3]]$vec.n2
## [1] 660
##
## [[3]]$l2
## NULL
##
## [[3]]$n1
## NULL
##
## [[3]]$list2
## NULL
##
## [[3]]$t2
##   [1] H F D E G F H I D D E F D H F G G E E G H E G F F F F E F D E G G D F I D
##  [38] H H I F I D G E G E E G F G H I F F I D E I H F I I D F G H E H F D I E I
##  [75] G J G G H E I H F G H I E D G H H F H H G D D I E F G E E G E F H G H D D
## [112] F H G F F H F J E D F H H E G H G G H G D G E F D G H D E F J F D F D E E
## [149] H H D D E E G F F E G H D E I D H G G H F G G E E E I E F H F E F H G H H
## [186] D E I F H F H F I G H G J E F H H D G E J G D E H E E F H H F E G F J E H
## [223] G I J E E E G G G G F E D E E H E G I J H G E D J G D D F G G F H H E I J
## [260] D D H E F E G G G D E H I I J F I H J F E G G H F H E F I F G G E H G H F
## [297] H J H I F D D G G G G F H F G D G G G G G G G D G F E G J H E E I H E I D F
## [334] D E F D I H G D G G G E G E H G D H D E F F I D G G G J G G F D G G G F H
## [371] F D I H H G D H E G D J J I J F H I H D G I H G H I F G E E E G E I H G H
## [408] F H G I I I F G H E I D D H D G D I H J D H F G I G H H F J E E G E E G I
## [445] H G E I F H D F F E H H D F F G D G F G H I F I E I H G F G G D G G J E G
## [482] G F H H H F E H E E G D G D F H G I H
## Levels: D < E < F < G < H < I < J
##
## [[3]]$t1
##   [1] 1.8 1.8 2.0 2.0 2.8 2.8 3.1 1.8 1.8 2.0 2.0 2.8 2.8 3.1 3.1 2.8 3.1 4.2
##  [19] 5.3 5.3 5.3 5.7 6.0 5.7 5.7 6.2 6.2 7.0 5.3 5.3 5.7 6.5 2.4 2.4 3.1 3.5
##  [37] 3.6 2.4 3.0 3.3 3.3 3.3 3.3 3.3 3.3 3.8 3.8 3.8 4.0 3.7 3.7 3.9 3.9 4.7 4.7
##  [55] 4.7 5.2 5.2 3.9 4.7 4.7 4.7 5.2 5.7 5.9 4.7 4.7 4.7 4.7 4.7 4.7 5.2 5.2
##  [73] 5.7 5.9 4.6 5.4 5.4 4.0 4.0 4.0 4.0 4.6 5.0 4.2 4.2 4.6 4.6 4.6 5.4 5.4
##  [91] 3.8 3.8 4.0 4.0 4.6 4.6 4.6 4.6 5.4 1.6 1.6 1.6 1.6 1.6 1.8 1.8 1.8 2.0
## [109] 2.4 2.4 2.4 2.4 2.5 2.5 3.3 2.0 2.0 2.0 2.0 2.7 2.7 2.7 3.0 3.7 4.0 4.7
## [127] 4.7 4.7 5.7 6.1 4.0 4.2 4.4 4.6 5.4 5.4 5.4 4.0 4.0 4.6 5.0 2.4 2.4 2.5
## [145] 2.5 3.5 3.5 3.0 3.0 3.5 3.3 3.3 4.0 5.6 3.1 3.8 3.8 3.8 5.3 2.5 2.5 2.5
## [163] 2.5 2.5 2.5 2.2 2.2 2.5 2.5 2.5 2.5 2.5 2.5 2.7 2.7 3.4 3.4 4.0 4.7 2.2
## [181] 2.2 2.4 2.4 3.0 3.0 3.5 2.2 2.2 2.4 2.4 3.0 3.0 3.3 1.8 1.8 1.8 1.8 1.8
## [199] 4.7 5.7 2.7 2.7 2.7 3.4 3.4 4.0 4.0 2.0 2.0 2.0 2.0 2.8 1.9 2.0 2.0 2.0
## [217] 2.0 2.5 2.5 2.8 2.8 1.9 1.9 2.0 2.0 2.5 2.5 1.8 1.8 2.0 2.0 2.8 2.8 3.6
##
## [[3]]$s1
## NULL
```

```
##
## [[3]]$n2
## NULL
##
## [[3]]$list1
##  [1]  1  2  3  4  5  6  7  8  9 10
##
## [[3]]$vec.l2
## [1] FALSE
##
## [[3]]$vec.s1
## [1] "picture"
##
## [[3]]$s2
## NULL
##
## [[3]]$l1
## NULL
##
## [[3]]$vec.n1
## [1] 235
##
## [[3]]$vec.l1
## [1] FALSE
##
##
## [[4]]
## [[4]]$vec.s2
## [1] "soon"
##
## [[4]]$vec.n2
## [1] 163
##
## [[4]]$l2
## NULL
##
## [[4]]$n1
## NULL
##
## [[4]]$list2
## NULL
##
## [[4]]$t2
##   [1] IF   VVS1 VVS1 VVS1 VS1  SI1  SI1  SI1  SI1  SI2  VS2  SI1  VVS2 SI1  SI2
##  [16] VS2  SI1  SI1  VS2  SI2  VS1  SI2  VVS2 VS1  VS1  SI2  VS2  SI1  VS2  SI1
##  [31] SI1  SI1  VS2  VVS2 SI2  VS1  VVS2 VS2  VS2  VS1  SI1  VS1  SI2  VS1  SI1
##  [46] VS1  VVS2 SI2  VS2  VS2  VVS2 VS2  SI1  VS1  VS2  VS2  VVS2 VS1  VS2  VS2
##  [61] VVS1 VVS1 VS1  VS1  VS2  VS1  VS1  SI1  SI1  VS2  SI1  SI2  SI2  IF   SI2
##  [76] VS1  VS1  IF   VS2  SI1  VVS2 SI1  SI2  VVS2 SI2  VVS1 VS2  SI1  SI2  SI1
##  [91] VVS2 VS2  SI1  SI1  SI1  VS2  VS2  VVS2 SI1  SI2  SI1  SI1  SI1  VS1  SI2
## [106] VS1  VS2  VS2  VS1  VVS2 SI2  VS2  SI1  SI2  SI1  SI2  VS2  VS1  VS2  VVS1
## [121] SI1  VVS1 IF   SI1  I1   VS2  VS1  VVS2 IF   VVS2 IF   VVS2 SI1  VVS2 VS2
## [136] SI2  VS1  SI2  VS2  VS2  VS2  VS2  SI1  VS2  VS2  SI1  VS2  SI1  VS1  I1
## [151] VVS2 SI2  VS2  VS2  VS1  VS2  VS2  VS1  VS2  VS2  SI2  VS1  VS2  SI1  SI2
```

```
## [166] SI1  IF   VVS2 I1   VS1  SI2  SI2  VS1  VS2  VS2  SI2  VS1  SI1  VS1  SI1
## [181] SI2  IF   VS1  VS1  VS1  SI1  VS2  SI1  SI2  SI1  SI1  VS1  SI2  IF   VS2
## [196] VVS2 VS1  VVS1 SI2  IF   IF   VS2  VVS2 VS1  IF   IF   SI1  SI1  VS2  VVS1
## [211] SI2  VS2  VS1  VS1  SI1  VS1  IF   SI1  VS1  VS2  VVS2 SI2  SI1  SI1  SI2
## [226] I1   I1   VVS1 SI1  SI1  IF   SI2  VS1  VS2  VS2  VS1  SI1  SI1  SI1  IF
## [241] SI1  SI1  VS2  VS2  VS1  SI1  SI1  IF   VS2  VVS2 SI1  VVS2 VVS2 SI2  SI1
## [256] SI2  VVS2 VS1  SI2  VS2  SI1  VVS1 SI1  SI1  SI2  VS2  VS2  VS1  SI1  SI1
## [271] SI1  VS1  VVS2 VS2  SI1  VS1  SI2  SI1  IF   SI1  I1   SI1  VS2  SI1  SI1
## [286] SI2  VS1  VVS2 I1   SI1  SI2  SI1  SI2  VVS1 SI1  IF   VS2  VS1  SI2  SI2
## [301] SI1  SI2  VS1  VVS1 VVS2 IF   SI1  VVS1 I1   SI2  VS2  VS1  SI1  VS1  VVS2
## [316] SI1  VS2  VS2  SI1  SI2  SI2  VS2  VS1  VS2  SI1  SI1  SI2  VS1  VS2  SI2
## [331] VS1  SI1  VS2  SI1  SI1  VS2  SI2  VS2  VVS2 VS1  VS1  VS1  VS1  VS1  VVS1
## [346] VS1  VS2  VVS2 VVS1 SI2  VS1  VS2  VVS2 VS2  VVS2 VS1  VVS2 VS1  VS1  VS1
## [361] VS2  SI1  SI1  VVS2 SI1  VVS2 VVS2 VS1  VVS1 VS1  VVS2 VS2  SI1  VVS2 SI1
## [376] SI2  SI1  VS2  VS2  VS2  VS2  VS2  VS1  SI2  SI2  IF   SI1  SI1  SI1  SI2
## [391] VVS2 VVS1 VVS1 VS2  VS2  VVS2 VS2  SI2  SI1  VVS2 VVS2 SI1  SI1  SI1  SI2
## [406] SI1  VS1  IF   VVS1 SI1  VS1  SI2  VS1  VS2  VS2  SI1  VS1  SI1  SI1  SI1
## [421] VS1  SI2  VVS2 VS1  VS1  VVS1 SI1  SI1  VVS2 VS1  SI2  SI2  IF   VVS2 SI1
## [436] VS2  VS2  VS2  SI2  VS1  I1   SI1  VVS2 VS2  VS2  I1   SI2  SI1  VS1  SI2
## [451] SI1  SI1  VVS2 SI1  SI2  VS1  SI1  VVS1 SI1  VS1  SI2  VS2  SI2  SI1  SI1
## [466] SI2  VS2  VS2  IF   SI1  SI1  VS1  VS1  VS2  VS2  SI1  VS1  VVS2 VS2  VS2
## [481] SI2  SI2  VVS2 SI2  SI1  VS1  SI1  SI2  VS1  VVS2 VS1  VS2  SI2  SI2  SI2
## [496] VS2  VS2  VVS2 IF   SI1
## Levels: I1 < SI2 < SI1 < VS2 < VS1 < VVS2 < VVS1 < IF
##
## [[4]]$t1
##   [1] 1999 1999 2008 2008 1999 1999 2008 1999 1999 2008 2008 1999 1999 2008 2008
##  [16] 1999 2008 2008 2008 2008 2008 1999 2008 1999 1999 2008 2008 2008 2008 2008
##  [31] 1999 1999 1999 2008 1999 2008 2008 1999 1999 1999 1999 2008 2008 2008 1999
##  [46] 1999 2008 2008 2008 2008 1999 1999 2008 2008 2008 1999 1999 1999 2008 2008
##  [61] 2008 1999 2008 1999 2008 2008 2008 2008 2008 2008 1999 1999 2008 1999 1999
##  [76] 1999 2008 1999 1999 1999 2008 2008 1999 1999 1999 1999 1999 2008 1999 2008
##  [91] 1999 1999 2008 2008 1999 1999 2008 2008 2008 1999 1999 1999 1999 1999 2008
## [106] 2008 2008 2008 1999 1999 2008 2008 1999 1999 2008 1999 1999 2008 2008 2008
## [121] 2008 2008 2008 2008 1999 1999 2008 2008 2008 2008 1999 2008 2008 1999 1999
## [136] 1999 2008 1999 2008 2008 1999 1999 1999 2008 2008 2008 2008 1999 1999 2008
## [151] 1999 1999 2008 2008 1999 1999 1999 2008 2008 1999 1999 2008 2008 2008 2008
## [166] 1999 1999 1999 1999 2008 2008 2008 2008 1999 1999 1999 1999 2008 2008 1999
## [181] 1999 2008 2008 1999 1999 2008 1999 1999 2008 2008 1999 1999 2008 1999 1999
## [196] 1999 2008 2008 1999 2008 1999 1999 2008 1999 1999 2008 2008 1999 1999 2008
## [211] 2008 1999 1999 1999 1999 2008 2008 2008 2008 1999 1999 1999 1999 1999 1999
## [226] 2008 2008 1999 1999 2008 2008 1999 1999 2008
##
## [[4]]$s1
## NULL
##
## [[4]]$n2
## NULL
##
## [[4]]$list1
## NULL
##
## [[4]]$vec.l2
## [1] TRUE
```

```
##
## [[4]]$vec.s1
## [1] "understand"
##
## [[4]]$s2
## NULL
##
## [[4]]$l1
## NULL
##
## [[4]]$vec.n1
## [1] 289
##
## [[4]]$vec.l1
## [1] TRUE
##
##
## [[5]]
## [[5]]$vec.s2
## [1] "front"
##
## [[5]]$vec.n2
## [1] 238
##
## [[5]]$l2
## NULL
##
## [[5]]$n1
## NULL
##
## [[5]]$list2
## NULL
##
## [[5]]$t2
##   [1] 62.9 59.3 59.2 61.0 63.8 61.6 61.3 62.7 63.1 57.8 62.1 63.4 60.8 62.4 62.8
##  [16] 61.7 61.9 63.0 63.1 62.2 60.6 59.4 61.9 60.0 62.2 62.8 64.9 62.1 61.7 60.2
##  [31] 61.3 62.0 60.4 61.3 61.8 59.0 61.6 63.2 59.8 61.4 62.3 62.0 60.5 61.6 61.6
##  [46] 61.6 61.8 59.9 60.2 59.6 60.1 62.5 63.6 63.7 63.6 60.3 61.2 61.2 63.2 61.7
##  [61] 62.3 61.3 63.1 60.2 60.5 63.4 62.0 60.4 62.1 62.2 62.6 61.6 62.6 62.9 60.1
##  [76] 60.7 61.8 61.3 61.5 61.9 62.3 62.1 65.3 62.2 62.8 61.0 61.8 58.6 62.4 63.2
##  [91] 65.8 65.3 61.6 65.3 61.9 62.0 62.7 61.6 61.8 61.2 63.8 62.8 62.2 61.4 61.1
## [106] 59.9 62.7 62.3 67.2 61.5 61.5 62.4 61.6 62.9 61.7 64.0 61.8 62.1 62.0 61.3
## [121] 62.0 61.1 60.3 62.0 64.5 60.8 61.6 62.2 62.2 62.0 59.6 62.8 61.4 60.8 58.7
## [136] 64.0 62.2 60.3 62.5 60.1 59.2 61.6 63.0 62.4 59.7 61.0 62.4 62.4 61.9 67.7
## [151] 61.3 61.9 61.9 61.6 60.7 61.4 63.2 60.0 62.2 63.3 61.0 61.7 61.8 62.8 61.0
## [166] 61.9 62.8 61.5 67.5 61.7 64.1 63.0 61.3 62.0 61.9 62.7 61.4 62.5 60.6 63.5
## [181] 63.1 62.0 61.9 62.5 62.4 60.1 61.1 62.2 62.0 59.0 62.4 60.6 61.7 60.8 61.0
## [196] 62.4 59.6 61.3 62.0 62.3 61.3 62.5 62.1 62.3 62.9 62.2 61.8 66.4 61.8 62.4
## [211] 60.8 61.5 60.7 62.7 61.7 61.3 61.9 63.2 58.6 63.4 62.1 62.7 63.7 60.7 62.5
## [226] 59.9 60.4 61.5 59.3 63.3 60.2 62.8 61.9 61.5 63.1 60.8 61.3 60.7 62.9 62.0
## [241] 61.6 61.3 60.7 63.0 63.9 59.2 61.0 60.8 61.5 62.3 59.3 61.4 61.9 60.7 61.1
## [256] 62.6 60.7 62.4 67.5 60.7 60.7 62.1 60.8 61.3 61.7 59.6 61.2 61.4 62.3 63.6
## [271] 62.4 62.1 62.7 63.2 59.7 60.5 63.5 59.7 62.2 61.8 62.3 61.4 60.0 60.3 62.7
## [286] 61.5 58.6 63.1 58.2 62.2 62.1 62.3 62.4 62.2 62.3 60.8 61.4 62.6 62.8 63.4
```

```
## [301] 62.7 63.2 62.9 61.9 61.5 61.0 61.5 62.5 61.6 62.2 61.5 62.9 62.5 61.0 61.1
## [316] 61.6 62.1 60.6 62.4 62.4 59.5 62.1 59.2 61.9 64.4 64.1 61.2 62.8 61.3 57.5
## [331] 59.4 62.1 60.9 63.7 64.3 59.4 62.9 59.8 62.1 62.4 62.9 59.6 62.2 61.2 62.4
## [346] 62.3 62.8 63.7 61.4 61.0 61.0 59.8 62.5 60.3 59.2 63.4 62.6 61.3 63.1 61.2
## [361] 60.1 62.0 61.4 58.6 60.2 62.0 58.2 62.5 62.1 60.0 57.9 58.0 62.5 61.1 61.9
## [376] 63.7 61.1 60.7 62.9 61.4 62.9 63.5 62.9 63.3 60.8 62.6 61.0 62.4 62.5 62.4
## [391] 61.7 60.2 61.8 62.3 62.1 61.5 62.7 62.8 63.9 61.1 61.3 63.2 63.2 63.5 62.6
## [406] 61.8 62.1 61.6 62.7 62.6 61.9 62.5 62.4 61.9 64.0 63.0 60.2 62.0 61.8 61.6
## [421] 62.2 61.0 61.4 60.8 60.8 61.5 62.3 64.7 60.7 60.0 60.7 61.8 62.3 62.8 63.5
## [436] 61.2 62.4 61.7 63.7 60.8 58.2 62.9 60.4 60.3 60.2 64.9 58.7 62.2 61.6 61.5
## [451] 62.2 61.5 63.1 62.3 62.1 60.6 61.7 62.0 62.9 61.9 63.1 60.9 61.7 61.3 60.6
## [466] 62.5 62.6 62.3 60.3 61.2 60.9 60.2 62.9 62.8 61.7 63.1 65.2 60.6 59.6 61.3
## [481] 64.2 61.4 62.1 62.5 62.5 62.1 63.7 61.8 59.1 62.1 61.9 61.8 64.5 63.0 62.0
## [496] 58.5 63.9 62.4 63.7 62.0
##
## [[5]]$t1
##   [1] 4 4 4 4 6 6 6 4 4 4 4 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 4 4 6 6 6
##  [38] 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 8 8 8 8 8 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8
##  [75] 8 8 8 6 6 6 6 8 8 6 6 8 8 8 8 8 6 6 6 6 8 8 8 8 8 4 4 4 4 4 4 4 4 4 4 4
## [112] 4 6 6 6 4 4 4 4 6 6 6 6 6 6 8 8 8 8 8 8 8 8 8 8 8 8 6 6 8 8 4 4 4 4 6 6 6
## [149] 6 6 6 6 6 8 6 6 6 6 8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 6 6 8 4 4 4 4 6 6
## [186] 6 4 4 4 4 6 6 6 4 4 4 4 4 8 8 4 4 4 6 6 6 6 4 4 4 4 6 4 4 4 4 4 5 5 6 6 4
## [223] 4 4 4 5 5 4 4 4 4 6 6 6
##
## [[5]]$s1
## NULL
##
## [[5]]$n2
## NULL
##
## [[5]]$list1
## NULL
##
## [[5]]$vec.l2
## [1] FALSE
##
## [[5]]$vec.s1
## [1] "limit"
##
## [[5]]$s2
## NULL
##
## [[5]]$l1
## NULL
##
## [[5]]$vec.n1
## [1] 185
##
## [[5]]$vec.l1
## [1] TRUE
##
##
## [[6]]
## [[6]]$vec.s2
```

```
## [1] "field"
##
## [[6]]$vec.n2
## [1] 673
##
## [[6]]$l2
## NULL
##
## [[6]]$n1
## NULL
##
## [[6]]$list2
## NULL
##
## [[6]]$t2
##   [1] 54.0 59.0 59.0 58.0 55.0 63.0 55.0 57.0 61.0 62.0 62.0 58.0 56.0 53.0 55.0
##  [16] 56.0 57.0 54.0 57.0 59.0 60.0 63.0 56.0 57.0 58.0 57.0 57.0 58.0 56.0 60.0
##  [31] 60.0 57.0 58.0 57.0 58.0 63.5 57.0 58.0 56.0 57.0 59.0 58.0 58.0 57.0 57.0
##  [46] 54.0 57.0 60.0 59.0 59.0 56.0 58.0 55.0 57.0 55.0 57.0 56.0 55.0 55.0 58.0
##  [61] 57.0 57.0 56.0 56.0 59.0 56.0 59.0 59.0 58.0 59.0 57.0 58.0 57.0 58.0 60.0
##  [76] 60.0 57.0 56.0 54.0 61.0 55.0 56.0 58.0 54.0 57.0 56.0 57.0 60.0 56.0 57.0
##  [91] 58.0 57.0 57.0 61.0 55.0 55.0 57.0 58.0 56.0 59.0 57.0 58.0 55.0 55.0 58.0
## [106] 61.0 59.0 56.0 55.0 60.0 56.0 59.0 57.0 59.0 54.0 58.0 59.0 55.0 56.0 60.0
## [121] 56.0 55.0 58.0 58.0 58.0 62.0 56.0 56.0 58.0 55.1 56.0 60.0 57.0 57.0 58.0
## [136] 59.0 57.0 59.0 56.0 58.0 60.0 61.0 58.0 57.0 63.0 60.0 60.0 57.0 56.0 62.0
## [151] 57.0 56.0 56.0 57.0 61.0 55.0 58.0 57.0 57.0 57.0 61.0 56.0 56.0 56.0 60.0
## [166] 58.0 57.0 56.0 56.0 59.0 56.0 58.0 63.0 55.0 59.0 55.0 56.0 58.0 61.0 59.0
## [181] 60.0 54.0 56.0 56.0 58.0 61.0 55.0 56.0 59.0 58.0 55.0 57.0 56.0 56.0 59.0
## [196] 58.0 60.0 59.0 55.0 54.0 55.0 57.0 57.0 59.0 54.0 61.0 58.0 59.0 54.0 53.0
## [211] 59.0 56.0 59.0 59.0 57.0 56.0 56.0 54.0 66.0 56.0 56.0 56.0 59.0 58.0 53.0
## [226] 63.0 62.0 56.0 59.0 60.0 55.0 56.0 55.0 58.0 56.0 60.0 55.0 55.0 57.0 57.0
## [241] 61.0 56.0 57.0 57.0 56.0 61.0 60.0 58.0 56.0 57.0 58.0 58.0 58.0 57.0 56.0
## [256] 58.0 57.0 54.0 59.0 60.0 60.0 58.0 57.0 56.0 57.0 57.0 55.0 59.0 53.0 57.0
## [271] 57.0 59.0 58.0 60.0 61.0 59.0 55.0 60.0 53.0 56.0 56.0 57.0 62.0 60.0 56.0
## [286] 60.0 62.0 56.0 61.0 62.0 59.0 57.0 53.0 54.0 58.0 57.0 56.0 58.0 52.0 56.0
## [301] 59.0 58.0 56.0 55.0 56.0 55.0 55.0 58.0 56.0 57.0 56.0 56.0 65.0 58.0 58.0
## [316] 56.0 57.0 56.0 57.0 57.0 59.0 59.0 59.0 59.0 58.0 62.0 57.0 55.0 56.0 58.0
## [331] 60.0 58.0 60.0 56.0 59.0 56.0 54.0 58.0 58.0 57.0 60.0 58.0 56.0 58.0 56.0
## [346] 56.0 55.0 55.0 60.0 56.0 57.0 58.0 57.0 55.0 60.0 54.0 56.0 60.0 63.0 56.0
## [361] 61.0 55.0 56.0 60.0 57.0 57.0 55.0 59.0 54.0 59.0 57.0 60.0 59.0 55.0 57.0
## [376] 57.0 63.0 57.0 58.0 60.0 55.0 56.0 58.0 59.0 59.0 53.0 56.0 58.0 57.0 61.0
## [391] 56.0 57.0 55.0 58.0 56.0 57.0 58.0 57.0 58.0 57.0 57.0 57.0 57.0 57.0 61.0
## [406] 59.0 58.0 58.0 54.0 58.0 57.0 58.0 56.0 55.0 56.0 58.0 58.0 58.0 58.0 56.0
## [421] 57.0 59.0 57.0 55.0 59.0 55.0 57.0 61.0 59.0 60.8 59.0 55.0 55.0 57.0 57.0
## [436] 59.0 55.0 56.0 61.0 62.0 65.0 56.0 56.0 60.0 62.0 57.0 63.0 56.0 55.0 59.0
## [451] 57.0 55.0 57.0 57.0 58.0 59.0 62.0 56.0 57.0 55.0 59.0 57.0 57.0 59.0 59.0
## [466] 60.0 58.0 54.0 62.0 58.0 57.0 56.0 57.0 56.0 57.0 57.0 57.0 56.0 60.0 57.0
## [481] 57.0 58.0 54.0 57.0 59.0 58.0 57.0 56.0 58.0 58.0 56.0 58.0 58.0 54.0 57.0
## [496] 60.0 60.0 56.0 64.0 57.0
##
## [[6]]$t1
##   [1] "auto(l5)"   "manual(m5)" "manual(m6)" "auto(av)"   "auto(l5)"
##   [6] "manual(m5)" "auto(av)"   "manual(m5)" "auto(l5)"   "manual(m6)"
##  [11] "auto(s6)"   "auto(l5)"   "manual(m5)" "auto(s6)"   "manual(m6)"
```

```
##  [16] "auto(l5)"   "auto(s6)"   "auto(s6)"   "auto(l4)"   "auto(l4)"
##  [21] "auto(l4)"   "auto(l4)"   "auto(l4)"   "manual(m6)" "auto(l4)"
##  [26] "manual(m6)" "auto(s6)"   "manual(m6)" "auto(l4)"   "auto(l4)"
##  [31] "auto(l4)"   "auto(l4)"   "auto(l4)"   "auto(l4)"   "auto(l4)"
##  [36] "auto(l4)"   "auto(s6)"   "auto(l3)"   "auto(l4)"   "auto(l4)"
##  [41] "auto(l4)"   "auto(l4)"   "auto(l4)"   "auto(l4)"   "auto(l4)"
##  [46] "auto(l4)"   "auto(l6)"   "auto(l6)"   "manual(m6)" "auto(l4)"
##  [51] "auto(l4)"   "manual(m5)" "auto(l5)"   "auto(l5)"   "auto(l5)"
##  [56] "manual(m5)" "auto(l4)"   "auto(l4)"   "auto(l5)"   "auto(l5)"
##  [61] "auto(l5)"   "auto(l4)"   "auto(l5)"   "auto(l4)"   "manual(m6)"
##  [66] "auto(l5)"   "auto(l5)"   "auto(l5)"   "manual(m6)" "manual(m6)"
##  [71] "auto(l4)"   "manual(m5)" "auto(l5)"   "auto(l4)"   "auto(l4)"
##  [76] "auto(l4)"   "auto(l6)"   "auto(l5)"   "manual(m5)" "auto(l5)"
##  [81] "auto(l5)"   "auto(l6)"   "auto(l4)"   "auto(l4)"   "manual(m5)"
##  [86] "manual(m5)" "auto(l4)"   "auto(l4)"   "auto(l4)"   "auto(l4)"
##  [91] "manual(m5)" "auto(l4)"   "manual(m5)" "auto(l5)"   "auto(l4)"
##  [96] "manual(m5)" "manual(m5)" "auto(l5)"   "manual(m6)" "manual(m5)"
## [101] "auto(l4)"   "manual(m5)" "manual(m5)" "auto(l4)"   "manual(m5)"
## [106] "auto(l5)"   "auto(l5)"   "manual(m6)" "auto(l4)"   "manual(m5)"
## [111] "auto(l4)"   "manual(m5)" "auto(l4)"   "manual(m5)" "auto(l5)"
## [116] "auto(l4)"   "manual(m5)" "manual(m5)" "auto(l4)"   "auto(l4)"
## [121] "manual(m6)" "manual(m5)" "auto(l5)"   "auto(l5)"   "auto(l4)"
## [126] "auto(l4)"   "auto(l5)"   "auto(l5)"   "auto(l5)"   "auto(l5)"
## [131] "auto(l4)"   "auto(s6)"   "auto(s6)"   "auto(l4)"   "auto(l4)"
## [136] "auto(l4)"   "auto(l6)"   "auto(l5)"   "auto(l5)"   "auto(l6)"
## [141] "auto(l4)"   "manual(m5)" "auto(l4)"   "auto(av)"   "manual(m6)"
## [146] "manual(m6)" "auto(av)"   "auto(l4)"   "manual(m5)" "auto(av)"
## [151] "auto(l4)"   "manual(m5)" "auto(l5)"   "auto(s5)"   "auto(l4)"
## [156] "auto(l4)"   "auto(l4)"   "auto(l4)"   "auto(s4)"   "manual(m5)"
## [161] "auto(l4)"   "manual(m5)" "manual(m5)" "auto(l4)"   "auto(l4)"
## [166] "auto(l4)"   "manual(m5)" "manual(m5)" "auto(l4)"   "auto(s4)"
## [171] "auto(s4)"   "manual(m5)" "manual(m5)" "manual(m5)" "auto(l4)"
## [176] "auto(l4)"   "manual(m5)" "auto(l5)"   "auto(l5)"   "manual(m5)"
## [181] "auto(l4)"   "manual(m5)" "auto(l5)"   "auto(l4)"   "manual(m5)"
## [186] "auto(s6)"   "auto(l4)"   "manual(m5)" "manual(m5)" "auto(s5)"
## [191] "auto(l4)"   "manual(m5)" "auto(s5)"   "auto(l3)"   "auto(l4)"
## [196] "manual(m5)" "manual(m5)" "auto(l4)"   "auto(l4)"   "auto(s6)"
## [201] "manual(m5)" "auto(l4)"   "manual(m5)" "manual(m5)" "auto(l4)"
## [206] "manual(m6)" "auto(l5)"   "manual(m5)" "auto(l4)"   "manual(m6)"
## [211] "auto(s6)"   "manual(m5)" "manual(m5)" "manual(m5)" "auto(l4)"
## [216] "auto(s6)"   "manual(m6)" "auto(s6)"   "manual(m5)" "auto(l4)"
## [221] "manual(m5)" "manual(m5)" "auto(l4)"   "manual(m5)" "auto(l4)"
## [226] "manual(m5)" "auto(s6)"   "manual(m5)" "auto(l5)"   "auto(s6)"
## [231] "manual(m6)" "auto(l5)"   "manual(m5)" "auto(s6)"
##
## [[6]]$s1
## NULL
##
## [[6]]$n2
## NULL
##
## [[6]]$list1
## NULL
##
```

```
## [[6]]$vec.l2
## [1] FALSE
##
## [[6]]$vec.s1
## [1] "year"
##
## [[6]]$s2
## NULL
##
## [[6]]$l1
## NULL
##
## [[6]]$vec.n1
## [1] 765
##
## [[6]]$vec.l1
## [1] FALSE
##
##
## [[7]]
## [[7]]$vec.s2
## [1] "late"
##
## [[7]]$vec.n2
## [1] 578
##
## [[7]]$l2
## NULL
##
## [[7]]$n1
## NULL
##
## [[7]]$list2
## NULL
##
## [[7]]$t2
##   [1]  1187 14196   478  1116   776  4816   383  4872  1771  4639  1559 10962
##  [13]  3468   538  4363   675  4871  7145  1662  2616  2744  2125   692   402
##  [25]  1749  2656  1643  4256  1591  3664   526  3355  2391 12185  3787  5056
##  [37]   814   628  3819 15092  4969  2266  2670 12008  3189  1599  3026  8408
##  [49]  1642  2686  1974  7277  3959  7350 13853  5516  1030   875   558  5450
##  [61]  1356  2642   648  1775  2936   783  2648 12265  4689  1436  1015  3512
##  [73]  4309 10147  3114   523  9090  2528 12809  4031  2353  2113  3282   638
##  [85] 11975  8501  1903  5821  2092   647  2500 13853  1184  3869   493   972
##  [97]  3448 11021  2576  1792  3724  4760   596   854  7560  1031  5468   698
## [109]  1811   926  4956  6652   393  4544  1016  4025 11360   612  1224 13015
## [121]   663   854  1899 13786  2788   579  1820  2130  1116  2992  8973   554
## [133]  4653  1062   470  3634  6539  3676   781   419  6204   368  4594 17153
## [145]  1354   552  2590  6563   429  2596  2718  1359   723  2940   906   781
## [157]   645   619  6786 12117  3312   758  1438  1687  4535  4381   956   625
## [169]  3734  3402  1935  2282  1841   984  1378   576  1953  4306  6885  2838
## [181]  4427  1879  1813   675  4309  3253   738  7145  4238   919  4939   871
## [193]  1562  1669  1225  4657  8145  5893  2135   914  2157 13445   548   906
## [205]  1018   828  3674  3382   999   878  9157  3249  1627   938  2375   419
```

```
## [217]  1060   593  3002   784   646  4826 10428  8475  4742  3278  3519   657
## [229]   702  4543   979  4269   760  3307  7114  1282  2817 18118   526  1193
## [241]   540   418   668  5919 15649 14561  4173  1052   758   622   684 10395
## [253]   821  2291  1268  7438  2442 14959  9095   710   941   907  4429   919
## [265]   949   698  1833   854  2726  2871   898  7333  6383  1814  4989 12451
## [277]  1799  4492   957  2516  1206  3089 11322  4972 17247  7182  3082   765
## [289]  3774  4416  2139   499  5423  1883  2020   873   507 14527  6405   480
## [301]  5292  8868  3465   976   965   974   540  7741  6793 16256 16297  1200
## [313]  4528  1069   638  5610  5559  6333  3685  7695 15841  2711   645   393
## [325]  5622  4480  2398   489   941  2229  5331  4189 13853  1821  4766   905
## [337]   462  2652  2536   855  3231  5967   877  7375  1035  3266  1743   625
## [349]  9257   683  7440  3250   530   828   554   608  1002  1125  4630  3589
## [361]  1869   969   936  1172   644  2129  7306   921   840   867  8430  1928
## [373]   978   776   941  4498  4068 12146  6221   579   610  3145 10165 11390
## [385] 13782   787  1268  9209  1140  4949  2051   884   713  6532   505  1063
## [397]  2801  3015   755  2664   779   593   675  8214  1024  5070   596  1122
## [409]  1115 11255  3734  5226  6167  1591 13068  2534   734  6232  6075   801
## [421]  2145  4811  1909  8818   628  1011  4064   675   623  2516 13540   844
## [433]  1116   802  2106   686   613  1949  4265   548  1865  4286  2051  5242
## [445]  4514   727  3590 15116  1870  4212  2655  3336 18159  2857  2222  2636
## [457]  5443   678  6075   943   669  1061  5889 18257 13387  5269  2874   667
## [469]  2879 18026  5818  1686 17366  6542  6104   756  2290   933  7368   656
## [481]  3906 15092  9092  7617  8815  5845  4899  3050 11512  2040   670   459
## [493]  3839  4124  1196 14483 10886  1050  3734  5063
##
## [[7]]$t1
##   [1] "f" "f" "f" "f" "f" "f" "f" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4"
##  [19] "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "4" "4" "4" "4" "f" "f" "f" "f"
##  [37] "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "4" "4" "4" "4" "4" "4"
##  [55] "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4"
##  [73] "4" "4" "r" "r" "r" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4"
##  [91] "r" "r" "r" "r" "r" "r" "r" "r" "r" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f"
## [109] "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "4" "4" "4" "4"
## [127] "4" "4" "4" "4" "4" "4" "4" "4" "r" "r" "r" "4" "4" "4" "4" "f" "f" "f"
## [145] "f" "f" "f" "f" "f" "f" "4" "4" "4" "4" "f" "f" "f" "f" "f" "4" "4" "4"
## [163] "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "4" "f"
## [181] "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f"
## [199] "4" "4" "4" "4" "4" "4" "4" "4" "4" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f"
## [217] "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f" "f"
##
## [[7]]$s1
## NULL
##
## [[7]]$n2
## NULL
##
## [[7]]$list1
## NULL
##
## [[7]]$vec.l2
## [1] TRUE
##
## [[7]]$vec.s1
## [1] "Christmas"
```

```
##
## [[7]]$s2
## NULL
##
## [[7]]$l1
## NULL
##
## [[7]]$vec.n1
## [1] 413
##
## [[7]]$vec.l1
## [1] FALSE
##
##
## [[8]]
## [[8]]$vec.s2
## [1] "when"
##
## [[8]]$vec.n2
## [1] 516
##
## [[8]]$l2
## NULL
##
## [[8]]$n1
## NULL
##
## [[8]]$list2
## NULL
##
## [[8]]$t2
##   [1] 4.71 7.11 4.04 4.56 4.28 6.42 4.17 6.76 5.35 6.97 5.10 7.20 5.29 4.58 6.55
##  [16] 4.35 6.16 6.36 5.12 5.96 5.91 5.87 4.46 4.00 5.14 5.99 5.20 6.18 5.16 6.12
##  [31] 4.27 6.34 5.60 6.61 6.23 6.50 4.31 4.33 6.50 8.41 6.38 5.75 5.88 6.99 5.87
##  [46] 5.16 5.35 7.49 5.38 5.81 5.22 6.97 6.39 6.33 7.27 6.61 4.43 4.52 4.40 6.64
##  [61] 4.77 5.74 4.40 5.22 5.81 4.68 5.68 7.38 6.70 5.06 4.78 6.58 6.22 7.21 6.22
##  [76] 4.39 6.67 5.36 7.47 6.11 5.66 5.74 6.08 4.29 8.05 7.09 5.32 6.73 5.65 4.51
##  [91] 5.49 7.15 5.34 6.23 4.38 4.42 5.65 7.41 5.72 5.75 6.13 6.09 4.45 4.48 7.34
## [106] 4.84 6.49 4.34 5.48 4.37 6.45 6.40 4.13 6.53 4.90 6.58 7.30 4.31 5.27 6.77
## [121] 4.55 4.48 5.15 8.17 6.29 4.42 5.40 5.39 4.52 5.83 6.80 4.01 6.44 4.87 4.25
## [136] 6.29 6.42 6.51 4.43 4.01 6.46 4.28 6.36 7.20 5.08 4.30 5.66 6.58 4.22 6.69
## [151] 5.14 5.30 4.43 5.84 4.58 4.42 4.32 4.33 6.43 7.54 6.17 4.39 5.44 5.09 6.73
## [166] 6.47 4.30 4.35 7.17 6.07 5.64 5.73 5.11 4.54 5.46 4.42 5.38 6.35 6.62 5.53
## [181] 6.35 5.14 5.20 4.27 6.15 5.92 4.47 7.36 6.42 4.96 6.45 4.70 5.41 5.28 5.13
## [196] 6.15 6.94 6.81 5.65 4.37 5.31 7.59 4.02 4.53 4.37 4.68 6.02 5.97 4.79 4.31
## [211] 7.34 5.89 5.11 4.71 5.70 4.00 4.35 4.33 5.92 4.73 4.19 6.68 7.19 7.34 6.90
## [226] 6.85 6.52 4.10 4.80 6.24 4.63 6.40 4.49 5.71 6.36 4.94 5.77 8.28 4.25 4.73
## [241] 4.40 4.37 4.48 6.35 7.21 7.86 6.62 4.46 4.39 4.13 4.50 6.88 4.54 5.78 5.25
## [256] 7.17 5.31 7.77 7.76 4.33 4.69 4.36 6.27 4.69 5.08 4.43 5.30 4.49 5.70 5.70
## [271] 4.79 6.97 6.85 5.77 6.55 7.72 5.66 6.90 4.46 5.77 5.66 5.74 7.41 6.46 7.98
## [286] 7.29 5.88 4.47 7.11 6.34 5.71 4.29 6.74 5.10 5.63 4.34 4.38 8.06 7.15 4.37
## [301] 6.40 7.25 5.65 4.32 4.49 4.51 4.49 6.35 7.75 8.07 7.59 4.71 6.24 4.71 4.33
## [316] 6.59 6.54 6.56 6.03 7.35 8.24 5.68 4.45 4.35 6.69 6.26 5.74 4.31 4.81 5.80
## [331] 7.10 6.08 7.42 5.35 6.31 4.71 4.30 5.98 5.71 4.62 5.57 6.66 4.72 6.50 4.57
```

```
## [346] 5.95 5.15 4.28 6.59 4.78 6.59 5.89 3.92 4.45 4.19 4.32 4.47 4.71 6.38 5.82
## [361] 5.77 4.67 4.75 4.83 4.56 5.26 6.65 4.72 4.37 4.86 6.86 5.29 5.06 4.36 4.92
## [376] 6.30 6.17 7.49 6.37 4.41 4.31 6.12 7.54 7.93 8.37 4.18 5.23 7.43 5.06 6.51
## [391] 5.23 4.85 4.42 6.54 4.37 4.92 5.76 6.00 4.70 5.30 4.39 4.30 4.30 7.19 5.06
## [406] 6.49 4.46 4.37 4.79 7.30 6.19 6.80 6.78 5.11 7.22 5.79 4.38 6.83 6.42 4.59
## [421] 5.67 6.54 5.16 6.55 4.41 4.81 6.72 4.70 4.21 5.67 8.37 5.22 4.52 4.33 5.59
## [436] 4.49 4.75 5.36 6.27 4.40 6.03 6.09 5.29 7.01 6.46 5.01 6.37 8.12 5.14 6.61
## [451] 5.81 5.88 7.32 5.76 5.82 5.81 6.30 3.99 6.35 4.84 4.80 4.84 6.95 8.08 8.23
## [466] 6.82 5.91 4.74 5.55 8.57 6.70 5.35 7.38 6.48 6.48 4.38 5.56 4.86 7.31 4.38
## [481] 6.25 8.04 6.52 7.36 7.16 6.60 6.35 5.95 7.48 5.27 4.28 4.04 6.11 6.58 5.43
## [496] 7.62 7.22 4.68 6.02 6.53
##
## [[8]]$t1
##   [1] 18 21 20 21 16 18 18 18 16 20 19 15 17 17 15 15 17 16 14 11 14 13 12 16 15
##  [26] 16 15 15 14 11 11 14 19 22 18 18 17 18 17 16 16 17 17 11 15 15 16 16 15 14
##  [51] 13 14 14 14  9 11 11 13 13  9 13 11 13 11 12  9 13 13 12  9 11 11 13 11 11
##  [76] 11 12 14 15 14 13 13 13 14 14 13 13 13 11 13 18 18 17 16 15 15 15 15 14 28
## [101] 24 25 23 24 26 25 24 21 18 18 21 21 18 18 19 19 19 20 20 17 16 17 17 15 15
## [126] 14  9 14 13 11 11 12 12 11 11 11 12 14 13 13 13 21 19 23 23 19 19 18 19 19
## [151] 14 15 14 12 18 16 17 18 16 18 18 20 19 20 18 21 19 19 19 20 20 19 20 15 16
## [176] 15 15 16 14 21 21 21 21 18 18 19 21 21 21 22 18 18 18 24 24 26 28 26 11 13
## [201] 15 16 17 15 15 15 16 21 19 21 22 17 33 21 19 22 21 21 21 16 17 35 29 21 19
## [226] 20 20 21 18 19 21 16 18 17
##
## [[8]]$s1
## NULL
##
## [[8]]$n2
## NULL
##
## [[8]]$list1
## NULL
##
## [[8]]$vec.l2
## [1] TRUE
##
## [[8]]$vec.s1
## [1] "quarter"
##
## [[8]]$s2
## NULL
##
## [[8]]$l1
## NULL
##
## [[8]]$vec.n1
## [1] 627
##
## [[8]]$vec.l1
## [1] FALSE
##
##
## [[9]]
## [[9]]$vec.s2
```

```
## [1] "again"
##
## [[9]]$vec.n2
## [1] 330
##
## [[9]]$l2
## NULL
##
## [[9]]$n1
## NULL
##
## [[9]]$list2
## NULL
##
## [[9]]$t2
##   [1] 4.74 7.08 4.10 4.52 4.25 6.47 4.21 6.67 5.30 6.91 5.08 7.16 5.32 4.59 6.48
##  [16] 4.31 6.19 6.40 5.08 5.90 5.84 5.82 4.49 4.03 5.12 6.04 5.25 6.15 5.18 6.17
##  [31] 4.31 6.31 5.59 6.66 6.19 6.57 4.32 4.31 6.48 8.37 6.40 5.72 5.79 7.04 5.91
##  [46] 5.19 5.40 7.38 5.42 5.77 5.19 6.94 6.31 6.35 7.22 6.66 4.39 4.56 4.30 6.69
##  [61] 4.73 5.77 4.38 5.28 5.86 4.72 5.71 7.43 6.66 5.10 4.74 6.47 6.18 7.31 6.32
##  [76] 4.34 6.70 5.39 7.50 6.14 5.70 5.67 6.04 4.33 8.01 7.07 5.36 6.66 5.67 4.48
##  [91] 5.42 7.12 5.38 6.18 4.41 4.38 5.67 7.37 5.68 5.72 6.16 6.13 4.49 4.44 7.31
## [106] 4.88 6.43 4.29 5.54 4.41 6.41 6.45 4.15 6.57 4.86 6.52 7.35 4.35 5.31 6.84
## [121] 4.61 4.52 5.17 8.09 6.21 4.46 5.42 5.42 4.45 5.85 6.85 4.05 6.50 4.90 4.30
## [136] 6.24 6.47 6.45 4.46 4.04 6.51 4.33 6.40 7.25 5.10 4.35 5.68 6.60 4.24 6.59
## [151] 5.17 5.34 4.46 5.81 4.54 4.44 4.35 4.34 6.46 7.59 6.15 4.42 5.41 5.07 6.69
## [166] 6.42 4.27 4.37 7.05 5.96 5.59 5.77 5.16 4.52 5.50 4.39 5.40 6.38 6.56 5.49
## [181] 6.42 5.18 5.17 4.24 6.19 5.89 4.51 7.27 6.33 4.93 6.37 4.73 5.38 5.37 5.06
## [196] 6.12 6.99 6.86 5.61 4.39 5.33 7.63 4.07 4.49 4.41 4.71 5.98 5.92 4.76 4.28
## [211] 7.36 5.92 5.13 4.63 5.68 4.03 4.37 4.31 5.88 4.70 4.21 6.74 7.23 7.40 6.86
## [226] 6.80 6.47 4.15 4.82 6.33 4.64 6.44 4.52 5.80 6.40 4.90 5.72 8.36 4.30 4.75
## [241] 4.36 4.40 4.45 6.42 7.25 7.98 6.57 4.42 4.42 4.15 4.47 6.92 4.60 5.81 5.27
## [256] 7.24 5.36 7.80 7.65 4.37 4.63 4.33 6.29 4.72 5.06 4.40 5.35 4.43 5.72 5.72
## [271] 4.76 7.01 6.89 5.70 6.49 7.76 5.62 6.93 4.48 5.72 5.61 5.79 7.38 6.55 8.02
## [286] 7.22 5.82 4.43 7.15 6.39 5.76 4.31 6.76 5.13 5.57 4.38 4.42 8.11 7.06 4.34
## [301] 6.36 7.31 5.70 4.34 4.45 4.54 4.52 6.41 7.73 8.03 7.62 4.67 6.31 4.67 4.35
## [316] 6.68 6.57 6.52 6.08 7.29 8.15 5.72 4.47 4.38 6.64 6.19 5.82 4.35 4.84 5.85
## [331] 7.03 6.13 7.35 5.32 6.34 4.69 4.35 6.02 5.66 4.68 5.62 6.70 4.74 6.53 4.53
## [346] 5.89 5.11 4.32 6.67 4.83 6.63 5.85 3.99 4.40 4.22 4.29 4.44 4.66 6.29 5.85
## [361] 5.82 4.64 4.70 4.87 4.61 5.22 6.68 4.79 4.39 4.98 6.83 5.26 5.12 4.32 4.90
## [376] 6.35 6.21 7.53 6.47 4.45 4.34 6.10 7.67 8.00 8.41 4.19 5.26 7.48 5.08 6.48
## [391] 5.20 4.88 4.44 6.50 4.42 4.87 5.70 6.04 4.72 5.33 4.42 4.27 4.25 7.24 5.03
## [406] 6.55 4.49 4.33 4.78 7.27 6.24 6.76 6.74 5.15 7.30 5.87 4.43 6.88 6.37 4.60
## [421] 5.72 6.51 5.10 6.50 4.37 4.79 6.61 4.73 4.19 5.71 8.31 5.26 4.50 4.30 5.66
## [436] 4.53 4.77 5.34 6.20 4.45 5.89 6.12 5.24 6.99 6.43 4.97 6.43 8.06 5.18 6.56
## [451] 5.77 5.90 7.23 5.70 5.78 5.74 6.34 4.01 6.40 4.86 4.81 4.79 6.88 8.11 8.17
## [466] 6.75 5.82 4.77 5.53 8.52 6.73 5.37 7.48 6.42 6.45 4.37 5.52 4.88 7.38 4.41
## [481] 6.27 8.11 6.55 7.39 7.23 6.64 6.40 5.99 7.52 5.33 4.31 4.08 6.14 6.54 5.35
## [496] 7.56 7.17 4.64 6.07 6.47
##
## [[9]]$t1
##   [1] 29 29 31 30 26 26 27 26 25 28 27 25 25 25 25 24 25 23 20 15 20 17 17 26 23
##  [26] 26 25 24 19 14 15 17 27 30 26 29 26 24 24 22 22 24 24 17 22 21 23 23 19 18
##  [51] 17 17 19 19 12 17 15 17 17 12 17 16 18 15 16 12 17 17 16 12 15 16 17 15 17
```

```
##  [76] 17 18 17 19 17 19 19 17 17 17 16 16 17 15 17 26 25 26 24 21 22 23 22 20 33
## [101] 32 32 29 32 34 36 36 29 26 27 30 31 26 26 28 26 29 28 27 24 24 24 22 19 20
## [126] 17 12 19 18 14 15 18 18 15 17 16 18 17 19 19 17 29 27 31 32 27 26 26 25 25
## [151] 17 17 20 18 26 26 27 28 25 25 24 27 25 26 23 26 26 26 26 25 27 25 27 20 20
## [176] 19 17 20 17 29 27 31 31 26 26 28 27 29 31 31 26 26 27 30 33 35 37 35 15 18
## [201] 20 20 22 17 19 18 20 29 26 29 29 24 44 29 26 29 29 29 29 23 24 44 41 29 26
## [226] 28 29 29 29 28 29 26 26 26
##
## [[9]]$s1
## NULL
##
## [[9]]$n2
## NULL
##
## [[9]]$list1
## NULL
##
## [[9]]$vec.l2
## [1] TRUE
##
## [[9]]$vec.s1
## [1] "perhaps"
##
## [[9]]$s2
## NULL
##
## [[9]]$l1
## NULL
##
## [[9]]$vec.n1
## [1] 522
##
## [[9]]$vec.l1
## [1] TRUE
##
##
## [[10]]
## [[10]]$vec.s2
## [1] "tie"
##
## [[10]]$vec.n2
## [1] 225
##
## [[10]]$l2
## NULL
##
## [[10]]$n1
## NULL
##
## [[10]]$list2
## NULL
##
## [[10]]$t2
##   [1] 2.97 4.22 2.41 2.77 2.72 3.97 2.57 4.21 3.36 4.01 3.16 4.55 3.23 2.86 4.09
```

```
##  [16] 2.67 3.82 4.02 3.22 3.69 3.56 3.47 2.77 2.41 3.19 3.78 3.39 3.83 3.19 3.70
##  [31] 2.63 3.92 3.38 4.07 3.84 3.86 2.66 2.73 3.88 5.15 3.98 3.55 3.53 4.32 3.63
##  [46] 3.19 3.32 4.46 3.25 3.45 3.13 4.35 4.04 4.04 4.61 4.01 2.70 2.77 2.75 4.11
##  [61] 2.96 3.53 2.77 3.16 3.53 2.98 3.53 4.47 4.15 3.16 2.98 4.02 3.88 4.57 3.77
##  [76] 2.65 4.12 3.29 4.61 3.79 3.54 3.54 3.96 2.68 5.04 4.32 3.30 3.92 3.53 2.84
##  [91] 3.59 4.66 3.30 4.05 2.72 2.73 3.55 4.55 3.52 3.51 3.92 3.84 2.78 2.74 4.47
## [106] 2.91 4.05 2.69 3.70 2.70 3.95 4.01 2.55 4.12 3.01 4.19 4.53 2.69 3.28 4.17
## [121] 2.84 2.75 3.11 5.04 4.03 2.70 3.33 3.36 2.79 3.62 4.07 2.53 3.97 2.97 2.51
## [136] 4.01 4.01 3.91 2.78 2.42 3.84 2.65 4.02 4.51 3.04 2.64 3.54 4.11 2.61 4.50
## [151] 3.16 3.30 2.75 3.59 2.77 2.72 2.74 2.60 4.01 4.79 3.76 2.72 3.35 3.19 4.09
## [166] 3.99 2.69 2.68 4.80 3.71 3.60 3.62 3.15 2.81 3.39 2.76 3.31 3.98 3.99 3.50
## [181] 4.03 3.20 3.21 2.66 3.85 3.55 2.74 4.55 3.95 2.92 4.00 2.85 3.33 3.24 3.11
## [196] 3.83 4.15 4.19 3.49 2.73 3.26 4.76 2.51 2.81 2.76 2.92 3.71 3.95 2.95 2.68
## [211] 4.47 3.63 3.11 2.93 3.51 2.46 2.70 2.73 3.46 2.99 2.61 4.21 4.59 4.47 4.30
## [226] 4.09 3.92 2.53 2.85 3.98 2.79 4.03 2.79 3.54 4.02 2.99 3.52 5.05 2.69 2.94
## [241] 2.70 2.69 2.71 4.02 4.62 4.69 4.02 2.70 2.71 2.58 2.66 4.24 2.83 3.52 3.21
## [256] 4.51 3.24 4.86 5.20 2.64 2.83 2.70 3.82 2.88 3.13 2.63 3.26 2.74 3.56 3.63
## [271] 2.98 4.34 4.31 3.63 3.89 4.68 3.58 4.13 2.78 3.55 3.51 3.54 4.44 3.92 5.02
## [286] 4.46 3.43 2.81 4.15 3.96 3.56 2.68 4.21 3.18 3.49 2.65 2.70 5.06 4.46 2.76
## [301] 4.00 4.60 3.57 2.68 2.75 2.76 2.77 3.99 4.77 5.01 4.68 2.95 3.92 2.86 2.65
## [316] 4.09 4.07 3.96 3.78 4.57 4.88 3.54 2.64 2.70 4.29 3.99 3.54 2.72 2.96 3.35
## [331] 4.20 3.79 4.50 3.40 4.07 2.79 2.72 3.59 3.53 2.90 3.52 3.98 2.94 3.99 2.84
## [346] 3.69 3.22 2.74 4.07 2.93 4.03 3.51 2.47 2.67 2.49 2.73 2.79 2.87 4.00 3.57
## [361] 3.48 2.89 2.90 2.84 2.76 3.25 3.88 2.97 2.72 2.95 3.96 3.06 3.18 2.65 3.04
## [376] 4.03 3.78 4.56 4.04 2.72 2.72 3.88 4.79 5.04 5.10 2.62 3.20 4.65 3.17 4.05
## [391] 3.22 2.93 2.74 4.06 2.73 3.01 3.59 3.78 3.01 3.24 2.70 2.71 2.70 4.58 3.10
## [406] 4.03 2.78 2.68 3.00 4.56 3.85 4.24 4.22 3.18 4.65 3.67 2.65 4.25 3.95 2.83
## [421] 3.54 3.98 3.15 3.97 2.67 2.95 4.15 3.05 2.55 3.41 5.06 3.24 2.81 2.71 3.59
## [436] 2.76 2.97 3.30 3.97 2.69 3.47 3.84 3.18 4.22 3.88 3.24 3.76 5.03 3.18 4.05
## [451] 3.60 3.62 4.59 3.57 3.60 3.50 3.90 2.48 4.01 3.00 3.03 2.93 4.27 4.96 4.97
## [466] 4.24 3.67 2.96 3.34 5.23 4.09 3.23 4.62 4.05 3.99 2.76 3.61 2.95 4.38 2.69
## [481] 4.02 4.96 4.06 4.61 4.50 4.11 4.06 3.69 4.43 3.30 2.66 2.51 3.95 4.13 3.34
## [496] 4.44 4.60 2.91 3.85 4.03
##
## [[10]]$t1
##   [1] "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p" "p"
##  [19] "r" "e" "r" "r" "r" "p" "p" "p" "p" "p" "r" "e" "r" "d" "r" "r" "r" "r"
##  [37] "r" "r" "r" "r" "r" "r" "r" "e" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r"
##  [55] "e" "r" "r" "r" "r" "e" "r" "r" "r" "r" "r" "e" "r" "r" "r" "e" "r" "r"
##  [73] "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r"
##  [91] "r" "r" "r" "r" "r" "r" "r" "r" "p" "r" "r" "r" "p" "r" "r" "r" "c" "p"
## [109] "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "d" "r" "r" "r"
## [127] "e" "r" "r" "p" "p" "r" "r" "p" "r" "p" "r" "r" "r" "r" "r" "r" "r" "r" "r"
## [145] "r" "p" "p" "r" "r" "p" "r" "r" "p" "p" "r" "p" "r" "r" "p" "r" "r" "r"
## [163] "p" "r" "p" "r" "r" "r" "r" "p" "r" "p" "r" "r" "r" "r" "r" "r" "r" "r" "r"
## [181] "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r"
## [199] "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "r" "p" "p" "r" "d" "r" "r" "p"
## [217] "p" "r" "r" "r" "r" "d" "d" "r" "r" "r" "r" "p" "p" "p" "p" "p" "p" "p"
##
## [[10]]$s1
## NULL
##
## [[10]]$n2
## NULL
```

```
##
## [[10]]$list1
## NULL
##
## [[10]]$vec.l2
## [1] FALSE
##
## [[10]]$vec.s1
## [1] "sir"
##
## [[10]]$s2
## NULL
##
## [[10]]$l1
## NULL
##
## [[10]]$vec.n1
## [1] 309
##
## [[10]]$vec.l1
## [1] FALSE
##
##
## [[11]]
## [[11]]$vec.s2
## [1] "could"
##
## [[11]]$vec.n2
## [1] 389
##
## [[11]]$l2
## NULL
##
## [[11]]$n1
## NULL
##
## [[11]]$list2
## NULL
##
## [[11]]$t2
## NULL
##
## [[11]]$t1
##   [1] "compact"    "compact"    "compact"    "compact"    "compact"
##   [6] "compact"    "compact"    "compact"    "compact"    "compact"
##  [11] "compact"    "compact"    "compact"    "compact"    "compact"
##  [16] "midsize"    "midsize"    "midsize"    "suv"        "suv"
##  [21] "suv"        "suv"        "suv"        "2seater"    "2seater"
##  [26] "2seater"    "2seater"    "2seater"    "suv"        "suv"
##  [31] "suv"        "suv"        "midsize"    "midsize"    "midsize"
##  [36] "midsize"    "midsize"    "minivan"    "minivan"    "minivan"
##  [41] "minivan"    "minivan"    "minivan"    "minivan"    "minivan"
##  [46] "minivan"    "minivan"    "minivan"    "pickup"     "pickup"
##  [51] "pickup"     "pickup"     "pickup"     "pickup"     "pickup"
```

```
##  [56] "pickup"     "pickup"     "suv"        "suv"        "suv"
##  [61] "suv"        "suv"        "suv"        "suv"        "pickup"
##  [66] "pickup"     "pickup"     "pickup"     "pickup"     "pickup"
##  [71] "pickup"     "pickup"     "pickup"     "pickup"     "suv"
##  [76] "suv"        "suv"        "suv"        "suv"        "suv"
##  [81] "suv"        "suv"        "suv"        "pickup"     "pickup"
##  [86] "pickup"     "pickup"     "pickup"     "pickup"     "pickup"
##  [91] "subcompact" "subcompact" "subcompact" "subcompact" "subcompact"
##  [96] "subcompact" "subcompact" "subcompact" "subcompact" "subcompact"
## [101] "subcompact" "subcompact" "subcompact" "subcompact" "subcompact"
## [106] "subcompact" "subcompact" "subcompact" "midsize"    "midsize"
## [111] "midsize"    "midsize"    "midsize"    "midsize"    "midsize"
## [116] "subcompact" "subcompact" "subcompact" "subcompact" "subcompact"
## [121] "subcompact" "subcompact" "suv"        "suv"        "suv"
## [126] "suv"        "suv"        "suv"        "suv"        "suv"
## [131] "suv"        "suv"        "suv"        "suv"        "suv"
## [136] "suv"        "suv"        "suv"        "suv"        "suv"
## [141] "suv"        "compact"    "compact"    "midsize"    "midsize"
## [146] "midsize"    "midsize"    "midsize"    "midsize"    "midsize"
## [151] "suv"        "suv"        "suv"        "suv"        "midsize"
## [156] "midsize"    "midsize"    "midsize"    "midsize"    "suv"
## [161] "suv"        "suv"        "suv"        "suv"        "suv"
## [166] "subcompact" "subcompact" "subcompact" "subcompact" "compact"
## [171] "compact"    "compact"    "compact"    "suv"        "suv"
## [176] "suv"        "suv"        "suv"        "suv"        "midsize"
## [181] "midsize"    "midsize"    "midsize"    "midsize"    "midsize"
## [186] "midsize"    "compact"    "compact"    "compact"    "compact"
## [191] "compact"    "compact"    "compact"    "compact"    "compact"
## [196] "compact"    "compact"    "compact"    "suv"        "suv"
## [201] "pickup"     "pickup"     "pickup"     "pickup"     "pickup"
## [206] "pickup"     "pickup"     "compact"    "compact"    "compact"
## [211] "compact"    "compact"    "compact"    "compact"    "compact"
## [216] "compact"    "compact"    "compact"    "compact"    "compact"
## [221] "compact"    "subcompact" "subcompact" "subcompact" "subcompact"
## [226] "subcompact" "subcompact" "midsize"    "midsize"    "midsize"
## [231] "midsize"    "midsize"    "midsize"    "midsize"
##
## [[11]]$s1
## NULL
##
## [[11]]$n2
## NULL
##
## [[11]]$list1
## NULL
##
## [[11]]$vec.l2
## [1] FALSE
##
## [[11]]$vec.s1
## [1] "close"
##
## [[11]]$s2
## NULL
```

```
##
## [[11]]$l1
## NULL
##
## [[11]]$vec.n1
## [1] 54
##
## [[11]]$vec.l1
## [1] TRUE
##
##
## [[12]]
## [[12]]$vec.s2
## [1] "think"
##
## [[12]]$vec.n2
## [1] 117
##
## [[12]]$l2
## NULL
##
## [[12]]$n1
## NULL
##
## [[12]]$list2
## NULL
##
## [[12]]$t2
## NULL
##
## [[12]]$t1
## NULL
##
## [[12]]$s1
## NULL
##
## [[12]]$n2
## NULL
##
## [[12]]$list1
## NULL
##
## [[12]]$vec.l2
## [1] FALSE
##
## [[12]]$vec.s1
## [1] "hell"
##
## [[12]]$s2
## NULL
##
## [[12]]$l1
## NULL
##
```

```
## [[12]]$vec.n1
## [1] 205
##
## [[12]]$vec.l1
## [1] FALSE
##
##
## [[13]]
## [[13]]$vec.s2
## [1] "coffee"
##
## [[13]]$vec.n2
## [1] 537
##
## [[13]]$l2
## NULL
##
## [[13]]$n1
## NULL
##
## [[13]]$list2
## NULL
##
## [[13]]$t2
## NULL
##
## [[13]]$t1
## NULL
##
## [[13]]$s1
## NULL
##
## [[13]]$n2
## NULL
##
## [[13]]$list1
## NULL
##
## [[13]]$vec.l2
## [1] FALSE
##
## [[13]]$vec.s1
## [1] "class"
##
## [[13]]$s2
## NULL
##
## [[13]]$l1
## NULL
##
## [[13]]$vec.n1
## [1] 875
##
## [[13]]$vec.l1
```

```
## [1] TRUE
##
##
## [[14]]
## [[14]]$vec.s2
## [1] "around"
##
## [[14]]$vec.n2
## [1] 648
##
## [[14]]$l2
## NULL
##
## [[14]]$n1
## NULL
##
## [[14]]$list2
## NULL
##
## [[14]]$t2
## NULL
##
## [[14]]$t1
## NULL
##
## [[14]]$s1
## NULL
##
## [[14]]$n2
## NULL
##
## [[14]]$list1
## NULL
##
## [[14]]$vec.l2
## [1] TRUE
##
## [[14]]$vec.s1
## [1] "inside"
##
## [[14]]$s2
## NULL
##
## [[14]]$l1
## NULL
##
## [[14]]$vec.n1
## [1] 779
##
## [[14]]$vec.l1
## [1] TRUE
##
##
## [[15]]
```

```
## [[15]]$vec.s2
## [1] "together"
##
## [[15]]$vec.n2
## [1] 55
##
## [[15]]$l2
## NULL
##
## [[15]]$n1
## NULL
##
## [[15]]$list2
## NULL
##
## [[15]]$t2
## NULL
##
## [[15]]$t1
## NULL
##
## [[15]]$s1
## NULL
##
## [[15]]$n2
## NULL
##
## [[15]]$list1
## NULL
##
## [[15]]$vec.l2
## [1] TRUE
##
## [[15]]$vec.s1
## [1] "accept"
##
## [[15]]$s2
## NULL
##
## [[15]]$l1
## NULL
##
## [[15]]$vec.n1
## [1] 537
##
## [[15]]$vec.l1
## [1] TRUE
##
##
## [[16]]
## [[16]]$vec.s2
## [1] "most"
##
## [[16]]$vec.n2
```

```
## [1] 217
##
## [[16]]$l2
## NULL
##
## [[16]]$n1
## NULL
##
## [[16]]$list2
## NULL
##
## [[16]]$t2
## NULL
##
## [[16]]$t1
## NULL
##
## [[16]]$s1
## NULL
##
## [[16]]$n2
## NULL
##
## [[16]]$list1
## NULL
##
## [[16]]$vec.l2
## [1] FALSE
##
## [[16]]$vec.s1
## [1] "flat"
##
## [[16]]$s2
## NULL
##
## [[16]]$l1
## NULL
##
## [[16]]$vec.n1
## [1] 564
##
## [[16]]$vec.l1
## [1] TRUE
##
##
## [[17]]
## [[17]]$vec.s2
## [1] "compare"
##
## [[17]]$vec.n2
## [1] 597
##
## [[17]]$l2
## NULL
```

```
##
## [[17]]$n1
## NULL
##
## [[17]]$list2
## NULL
##
## [[17]]$t2
## NULL
##
## [[17]]$t1
## NULL
##
## [[17]]$s1
## NULL
##
## [[17]]$n2
## NULL
##
## [[17]]$list1
## NULL
##
## [[17]]$vec.l2
## [1] FALSE
##
## [[17]]$vec.s1
## [1] "soon"
##
## [[17]]$s2
## NULL
##
## [[17]]$l1
## NULL
##
## [[17]]$vec.n1
## [1] 794
##
## [[17]]$vec.l1
## [1] FALSE
##
##
## [[18]]
## [[18]]$vec.s2
## [1] "nine"
##
## [[18]]$vec.n2
## [1] 557
##
## [[18]]$l2
## NULL
##
## [[18]]$n1
## NULL
##
```

```
## [[18]]$list2
## NULL
##
## [[18]]$t2
## NULL
##
## [[18]]$t1
## NULL
##
## [[18]]$s1
## NULL
##
## [[18]]$n2
## NULL
##
## [[18]]$list1
## NULL
##
## [[18]]$vec.l2
## [1] FALSE
##
## [[18]]$vec.s1
## [1] "evening"
##
## [[18]]$s2
## NULL
##
## [[18]]$l1
## NULL
##
## [[18]]$vec.n1
## [1] 391
##
## [[18]]$vec.l1
## [1] TRUE
##
##
## [[19]]
## [[19]]$vec.s2
## [1] "summer"
##
## [[19]]$vec.n2
## [1] 658
##
## [[19]]$l2
## NULL
##
## [[19]]$n1
## NULL
##
## [[19]]$list2
## NULL
##
## [[19]]$t2
```

```
## NULL
##
## [[19]]$t1
## NULL
##
## [[19]]$s1
## NULL
##
## [[19]]$n2
## NULL
##
## [[19]]$list1
## NULL
##
## [[19]]$vec.l2
## [1] TRUE
##
## [[19]]$vec.s1
## [1] "stand"
##
## [[19]]$s2
## NULL
##
## [[19]]$l1
## NULL
##
## [[19]]$vec.n1
## [1] 409
##
## [[19]]$vec.l1
## [1] TRUE
##
##
## [[20]]
## [[20]]$vec.s2
## [1] "begin"
##
## [[20]]$vec.n2
## [1] 682
##
## [[20]]$l2
## NULL
##
## [[20]]$n1
## NULL
##
## [[20]]$list2
## NULL
##
## [[20]]$t2
## NULL
##
## [[20]]$t1
## NULL
```

```
##
## [[20]]$s1
## NULL
##
## [[20]]$n2
## NULL
##
## [[20]]$list1
## NULL
##
## [[20]]$vec.l2
## [1] FALSE
##
## [[20]]$vec.s1
## [1] "space"
##
## [[20]]$s2
## NULL
##
## [[20]]$l1
## NULL
##
## [[20]]$vec.n1
## [1] 727
##
## [[20]]$vec.l1
## [1] TRUE
##
##
## [[21]]
## [[21]]$vec.s2
## [1] "minister"
##
## [[21]]$vec.n2
## [1] 415
##
## [[21]]$l2
## NULL
##
## [[21]]$n1
## NULL
##
## [[21]]$list2
## NULL
##
## [[21]]$t2
## NULL
##
## [[21]]$t1
## NULL
##
## [[21]]$s1
## NULL
##
```

```
## [[21]]$n2
## NULL
##
## [[21]]$list1
## NULL
##
## [[21]]$vec.l2
## [1] TRUE
##
## [[21]]$vec.s1
## [1] "odd"
##
## [[21]]$s2
## NULL
##
## [[21]]$l1
## NULL
##
## [[21]]$vec.n1
## [1] 346
##
## [[21]]$vec.l1
## [1] TRUE
##
##
## [[22]]
## [[22]]$vec.s2
## [1] "possible"
##
## [[22]]$vec.n2
## [1] 134
##
## [[22]]$l2
## NULL
##
## [[22]]$n1
## NULL
##
## [[22]]$list2
## NULL
##
## [[22]]$t2
## NULL
##
## [[22]]$t1
## NULL
##
## [[22]]$s1
## NULL
##
## [[22]]$n2
## NULL
##
## [[22]]$list1
```

```
## NULL
##
## [[22]]$vec.l2
## [1] FALSE
##
## [[22]]$vec.s1
## [1] "teach"
##
## [[22]]$s2
## NULL
##
## [[22]]$l1
## NULL
##
## [[22]]$vec.n1
## [1] 160
##
## [[22]]$vec.l1
## [1] FALSE
##
##
## [[23]]
## [[23]]$vec.s2
## [1] "whole"
##
## [[23]]$vec.n2
## [1] 711
##
## [[23]]$l2
## NULL
##
## [[23]]$n1
## NULL
##
## [[23]]$list2
## NULL
##
## [[23]]$t2
## NULL
##
## [[23]]$t1
## NULL
##
## [[23]]$s1
## NULL
##
## [[23]]$n2
## NULL
##
## [[23]]$list1
## NULL
##
## [[23]]$vec.l2
## [1] TRUE
```

```
##
## [[23]]$vec.s1
## [1] "water"
##
## [[23]]$s2
## NULL
##
## [[23]]$l1
## NULL
##
## [[23]]$vec.n1
## [1] 468
##
## [[23]]$vec.l1
## [1] FALSE
##
##
## [[24]]
## [[24]]$vec.s2
## [1] "help"
##
## [[24]]$vec.n2
## [1] 688
##
## [[24]]$l2
## NULL
##
## [[24]]$n1
## NULL
##
## [[24]]$list2
## NULL
##
## [[24]]$t2
## NULL
##
## [[24]]$t1
## NULL
##
## [[24]]$s1
## NULL
##
## [[24]]$n2
## NULL
##
## [[24]]$list1
## NULL
##
## [[24]]$vec.l2
## [1] TRUE
##
## [[24]]$vec.s1
## [1] "document"
##
```

```
## [[24]]$s2
## NULL
##
## [[24]]$l1
## NULL
##
## [[24]]$vec.n1
## [1] 509
##
## [[24]]$vec.l1
## [1] TRUE
##
##
## [[25]]
## [[25]]$vec.s2
## [1] "far"
##
## [[25]]$vec.n2
## [1] 757
##
## [[25]]$l2
## NULL
##
## [[25]]$n1
## NULL
##
## [[25]]$list2
## NULL
##
## [[25]]$t2
## NULL
##
## [[25]]$t1
## NULL
##
## [[25]]$s1
## NULL
##
## [[25]]$n2
## NULL
##
## [[25]]$list1
## NULL
##
## [[25]]$vec.l2
## [1] TRUE
##
## [[25]]$vec.s1
## [1] "since"
##
## [[25]]$s2
## NULL
##
## [[25]]$l1
```

```
## NULL
##
## [[25]]$vec.n1
## [1] 920
##
## [[25]]$vec.l1
## [1] FALSE
##
##
## [[26]]
## [[26]]$vec.s2
## [1] "paper"
##
## [[26]]$vec.n2
## [1] 447
##
## [[26]]$l2
## NULL
##
## [[26]]$n1
## NULL
##
## [[26]]$list2
## NULL
##
## [[26]]$t2
## NULL
##
## [[26]]$t1
## NULL
##
## [[26]]$s1
## NULL
##
## [[26]]$n2
## NULL
##
## [[26]]$list1
## NULL
##
## [[26]]$vec.l2
## [1] FALSE
##
## [[26]]$vec.s1
## [1] "france"
##
## [[26]]$s2
## NULL
##
## [[26]]$l1
## NULL
##
## [[26]]$vec.n1
## [1] 57
```

```
##
## [[26]]$vec.l1
## [1] TRUE
##
##
## [[27]]
## [[27]]$vec.s2
## [1] "tomorrow"
##
## [[27]]$vec.n2
## [1] 821
##
## [[27]]$l2
## NULL
##
## [[27]]$n1
## NULL
##
## [[27]]$list2
## NULL
##
## [[27]]$t2
## NULL
##
## [[27]]$t1
## NULL
##
## [[27]]$s1
## NULL
##
## [[27]]$n2
## NULL
##
## [[27]]$list1
## NULL
##
## [[27]]$vec.l2
## [1] FALSE
##
## [[27]]$vec.s1
## [1] "another"
##
## [[27]]$s2
## NULL
##
## [[27]]$l1
## NULL
##
## [[27]]$vec.n1
## [1] 457
##
## [[27]]$vec.l1
## [1] FALSE
##
```

```
##
## [[28]]
## [[28]]$vec.s2
## [1] "return"
##
## [[28]]$vec.n2
## [1] 104
##
## [[28]]$l2
## NULL
##
## [[28]]$n1
## NULL
##
## [[28]]$list2
## NULL
##
## [[28]]$t2
## NULL
##
## [[28]]$t1
## NULL
##
## [[28]]$s1
## NULL
##
## [[28]]$n2
## NULL
##
## [[28]]$list1
## NULL
##
## [[28]]$vec.l2
## [1] TRUE
##
## [[28]]$vec.s1
## [1] "succeed"
##
## [[28]]$s2
## NULL
##
## [[28]]$l1
## NULL
##
## [[28]]$vec.n1
## [1] 617
##
## [[28]]$vec.l1
## [1] TRUE
##
##
## [[29]]
## [[29]]$vec.s2
## [1] "picture"
```

```
##
## [[29]]$vec.n2
## [1] 821
##
## [[29]]$l2
## NULL
##
## [[29]]$n1
## NULL
##
## [[29]]$list2
## NULL
##
## [[29]]$t2
## NULL
##
## [[29]]$t1
## NULL
##
## [[29]]$s1
## NULL
##
## [[29]]$n2
## NULL
##
## [[29]]$list1
## NULL
##
## [[29]]$vec.l2
## [1] TRUE
##
## [[29]]$vec.s1
## [1] "certain"
##
## [[29]]$s2
## NULL
##
## [[29]]$l1
## NULL
##
## [[29]]$vec.n1
## [1] 357
##
## [[29]]$vec.l1
## [1] FALSE
##
##
## [[30]]
## [[30]]$vec.s2
## [1] "ought"
##
## [[30]]$vec.n2
## [1] 831
##
```

```
## [[30]]$l2
## NULL
##
## [[30]]$n1
## NULL
##
## [[30]]$list2
## NULL
##
## [[30]]$t2
## NULL
##
## [[30]]$t1
## NULL
##
## [[30]]$s1
## NULL
##
## [[30]]$n2
## NULL
##
## [[30]]$list1
## NULL
##
## [[30]]$vec.l2
## [1] TRUE
##
## [[30]]$vec.s1
## [1] "land"
##
## [[30]]$s2
## NULL
##
## [[30]]$l1
## NULL
##
## [[30]]$vec.n1
## [1] 279
##
## [[30]]$vec.l1
## [1] FALSE
##
##
## [[31]]
## [[31]]$vec.s2
## [1] "into"
##
## [[31]]$vec.n2
## [1] 711
##
## [[31]]$l2
## NULL
##
## [[31]]$n1
```

```
## NULL
##
## [[31]]$list2
## NULL
##
## [[31]]$t2
## NULL
##
## [[31]]$t1
## NULL
##
## [[31]]$s1
## NULL
##
## [[31]]$n2
## NULL
##
## [[31]]$list1
## NULL
##
## [[31]]$vec.l2
## [1] FALSE
##
## [[31]]$vec.s1
## [1] "send"
##
## [[31]]$s2
## NULL
##
## [[31]]$l1
## NULL
##
## [[31]]$vec.n1
## [1] 270
##
## [[31]]$vec.l1
## [1] TRUE
##
##
## [[32]]
## [[32]]$vec.s2
## [1] "rise"
##
## [[32]]$vec.n2
## [1] 468
##
## [[32]]$l2
## NULL
##
## [[32]]$n1
## NULL
##
## [[32]]$list2
## NULL
```

```
##
## [[32]]$t2
## NULL
##
## [[32]]$t1
## NULL
##
## [[32]]$s1
## NULL
##
## [[32]]$n2
## NULL
##
## [[32]]$list1
## NULL
##
## [[32]]$vec.l2
## [1] TRUE
##
## [[32]]$vec.s1
## [1] "not"
##
## [[32]]$s2
## NULL
##
## [[32]]$l1
## NULL
##
## [[32]]$vec.n1
## [1] 878
##
## [[32]]$vec.l1
## [1] TRUE
##
##
## [[33]]
## [[33]]$vec.s2
## [1] "sign"
##
## [[33]]$vec.n2
## [1] 210
##
## [[33]]$l2
## NULL
##
## [[33]]$n1
## NULL
##
## [[33]]$list2
## NULL
##
## [[33]]$t2
## NULL
##
```

```
## [[33]]$t1
## NULL
##
## [[33]]$s1
## NULL
##
## [[33]]$n2
## NULL
##
## [[33]]$list1
## NULL
##
## [[33]]$vec.l2
## [1] FALSE
##
## [[33]]$vec.s1
## [1] "ought"
##
## [[33]]$s2
## NULL
##
## [[33]]$l1
## NULL
##
## [[33]]$vec.n1
## [1] 646
##
## [[33]]$vec.l1
## [1] TRUE
##
##
## [[34]]
## [[34]]$vec.s2
## [1] "role"
##
## [[34]]$vec.n2
## [1] 349
##
## [[34]]$l2
## NULL
##
## [[34]]$n1
## NULL
##
## [[34]]$list2
## NULL
##
## [[34]]$t2
## NULL
##
## [[34]]$t1
## NULL
##
## [[34]]$s1
```

```
## NULL
##
## [[34]]$n2
## NULL
##
## [[34]]$list1
## NULL
##
## [[34]]$vec.l2
## [1] FALSE
##
## [[34]]$vec.s1
## [1] "before"
##
## [[34]]$s2
## NULL
##
## [[34]]$l1
## NULL
##
## [[34]]$vec.n1
## [1] 347
##
## [[34]]$vec.l1
## [1] TRUE
##
##
## [[35]]
## [[35]]$vec.s2
## [1] "insure"
##
## [[35]]$vec.n2
## [1] 401
##
## [[35]]$l2
## NULL
##
## [[35]]$n1
## NULL
##
## [[35]]$list2
## NULL
##
## [[35]]$t2
## NULL
##
## [[35]]$t1
## NULL
##
## [[35]]$s1
## NULL
##
## [[35]]$n2
## NULL
```

```
##
## [[35]]$list1
## NULL
##
## [[35]]$vec.l2
## [1] FALSE
##
## [[35]]$vec.s1
## [1] "remember"
##
## [[35]]$s2
## NULL
##
## [[35]]$l1
## NULL
##
## [[35]]$vec.n1
## [1] 129
##
## [[35]]$vec.l1
## [1] FALSE
##
##
## [[36]]
## [[36]]$vec.s2
## [1] "radio"
##
## [[36]]$vec.n2
## [1] 737
##
## [[36]]$l2
## NULL
##
## [[36]]$n1
## NULL
##
## [[36]]$list2
## NULL
##
## [[36]]$t2
## NULL
##
## [[36]]$t1
## NULL
##
## [[36]]$s1
## NULL
##
## [[36]]$n2
## NULL
##
## [[36]]$list1
## NULL
##
```

```
## [[36]]$vec.l2
## [1] FALSE
##
## [[36]]$vec.s1
## [1] "too"
##
## [[36]]$s2
## NULL
##
## [[36]]$l1
## NULL
##
## [[36]]$vec.n1
## [1] 218
##
## [[36]]$vec.l1
## [1] TRUE
##
##
## [[37]]
## [[37]]$vec.s2
## [1] "due"
##
## [[37]]$vec.n2
## [1] 258
##
## [[37]]$l2
## NULL
##
## [[37]]$n1
## NULL
##
## [[37]]$list2
## NULL
##
## [[37]]$t2
## NULL
##
## [[37]]$t1
## NULL
##
## [[37]]$s1
## NULL
##
## [[37]]$n2
## NULL
##
## [[37]]$list1
## NULL
##
## [[37]]$vec.l2
## [1] FALSE
##
## [[37]]$vec.s1
```

```
## [1] "another"
##
## [[37]]$s2
## NULL
##
## [[37]]$l1
## NULL
##
## [[37]]$vec.n1
## [1] 618
##
## [[37]]$vec.l1
## [1] FALSE
##
##
## [[38]]
## [[38]]$vec.s2
## [1] "station"
##
## [[38]]$vec.n2
## [1] 177
##
## [[38]]$l2
## NULL
##
## [[38]]$n1
## NULL
##
## [[38]]$list2
## NULL
##
## [[38]]$t2
## NULL
##
## [[38]]$t1
## NULL
##
## [[38]]$s1
## NULL
##
## [[38]]$n2
## NULL
##
## [[38]]$list1
## NULL
##
## [[38]]$vec.l2
## [1] FALSE
##
## [[38]]$vec.s1
## [1] "council"
##
## [[38]]$s2
## NULL
```

```
##
## [[38]]$l1
## NULL
##
## [[38]]$vec.n1
## [1] 881
##
## [[38]]$vec.l1
## [1] FALSE
##
##
## [[39]]
## [[39]]$vec.s2
## [1] "interest"
##
## [[39]]$vec.n2
## [1] 386
##
## [[39]]$l2
## NULL
##
## [[39]]$n1
## NULL
##
## [[39]]$list2
## NULL
##
## [[39]]$t2
## NULL
##
## [[39]]$t1
## NULL
##
## [[39]]$s1
## NULL
##
## [[39]]$n2
## NULL
##
## [[39]]$list1
## NULL
##
## [[39]]$vec.l2
## [1] FALSE
##
## [[39]]$vec.s1
## [1] "sit"
##
## [[39]]$s2
## NULL
##
## [[39]]$l1
## NULL
##
```

```
## [[39]]$vec.n1
## [1] 698
##
## [[39]]$vec.l1
## [1] TRUE
##
##
## [[40]]
## [[40]]$vec.s2
## [1] "holiday"
##
## [[40]]$vec.n2
## [1] 141
##
## [[40]]$l2
## NULL
##
## [[40]]$n1
## NULL
##
## [[40]]$list2
## NULL
##
## [[40]]$t2
## NULL
##
## [[40]]$t1
## NULL
##
## [[40]]$s1
## NULL
##
## [[40]]$n2
## NULL
##
## [[40]]$list1
## NULL
##
## [[40]]$vec.l2
## [1] TRUE
##
## [[40]]$vec.s1
## NULL
##
## [[40]]$s2
## NULL
##
## [[40]]$l1
## NULL
##
## [[40]]$vec.n1
## [1] 337
##
## [[40]]$vec.l1
```

```
## [1] TRUE
##
##
## [[41]]
## [[41]]$vec.s2
## [1] "moment"
##
## [[41]]$vec.n2
## [1] 24
##
## [[41]]$l2
## NULL
##
## [[41]]$n1
## NULL
##
## [[41]]$list2
## NULL
##
## [[41]]$t2
## NULL
##
## [[41]]$t1
## NULL
##
## [[41]]$s1
## NULL
##
## [[41]]$n2
## NULL
##
## [[41]]$list1
## NULL
##
## [[41]]$vec.l2
## [1] FALSE
##
## [[41]]$vec.s1
## NULL
##
## [[41]]$s2
## NULL
##
## [[41]]$l1
## NULL
##
## [[41]]$vec.n1
## [1] 797
##
## [[41]]$vec.l1
## [1] TRUE
##
##
## [[42]]
```

```
## [[42]]$vec.s2
## [1] "hard"
##
## [[42]]$vec.n2
## [1] 466
##
## [[42]]$l2
## NULL
##
## [[42]]$n1
## NULL
##
## [[42]]$list2
## NULL
##
## [[42]]$t2
## NULL
##
## [[42]]$t1
## NULL
##
## [[42]]$s1
## NULL
##
## [[42]]$n2
## NULL
##
## [[42]]$list1
## NULL
##
## [[42]]$vec.l2
## [1] FALSE
##
## [[42]]$vec.s1
## NULL
##
## [[42]]$s2
## NULL
##
## [[42]]$l1
## NULL
##
## [[42]]$vec.n1
## [1] 26
##
## [[42]]$vec.l1
## [1] TRUE
##
##
## [[43]]
## [[43]]$vec.s2
## [1] "near"
##
## [[43]]$vec.n2
```

```
## [1] 130
##
## [[43]]$l2
## NULL
##
## [[43]]$n1
## NULL
##
## [[43]]$list2
## NULL
##
## [[43]]$t2
## NULL
##
## [[43]]$t1
## NULL
##
## [[43]]$s1
## NULL
##
## [[43]]$n2
## NULL
##
## [[43]]$list1
## NULL
##
## [[43]]$vec.l2
## [1] FALSE
##
## [[43]]$vec.s1
## NULL
##
## [[43]]$s2
## NULL
##
## [[43]]$l1
## NULL
##
## [[43]]$vec.n1
## [1] 539
##
## [[43]]$vec.l1
## [1] FALSE
##
##
## [[44]]
## [[44]]$vec.s2
## [1] "answer"
##
## [[44]]$vec.n2
## [1] 165
##
## [[44]]$l2
## NULL
```

```
##
## [[44]]$n1
## NULL
##
## [[44]]$list2
## NULL
##
## [[44]]$t2
## NULL
##
## [[44]]$t1
## NULL
##
## [[44]]$s1
## NULL
##
## [[44]]$n2
## NULL
##
## [[44]]$list1
## NULL
##
## [[44]]$vec.l2
## [1] TRUE
##
## [[44]]$vec.s1
## NULL
##
## [[44]]$s2
## NULL
##
## [[44]]$l1
## NULL
##
## [[44]]$vec.n1
## [1] 519
##
## [[44]]$vec.l1
## [1] TRUE
##
##
## [[45]]
## [[45]]$vec.s2
## [1] "wednesday"
##
## [[45]]$vec.n2
## [1] 703
##
## [[45]]$l2
## NULL
##
## [[45]]$n1
## NULL
##
```

```
## [[45]]$list2
## NULL
##
## [[45]]$t2
## NULL
##
## [[45]]$t1
## NULL
##
## [[45]]$s1
## NULL
##
## [[45]]$n2
## NULL
##
## [[45]]$list1
## NULL
##
## [[45]]$vec.l2
## [1] FALSE
##
## [[45]]$vec.s1
## NULL
##
## [[45]]$s2
## NULL
##
## [[45]]$l1
## NULL
##
## [[45]]$vec.n1
## [1] 757
##
## [[45]]$vec.l1
## [1] TRUE
##
##
## [[46]]
## [[46]]$vec.s2
## [1] "mind"
##
## [[46]]$vec.n2
## [1] 588
##
## [[46]]$l2
## NULL
##
## [[46]]$n1
## NULL
##
## [[46]]$list2
## NULL
##
## [[46]]$t2
```

```
## NULL
##
## [[46]]$t1
## NULL
##
## [[46]]$s1
## NULL
##
## [[46]]$n2
## NULL
##
## [[46]]$list1
## NULL
##
## [[46]]$vec.l2
## [1] FALSE
##
## [[46]]$vec.s1
## NULL
##
## [[46]]$s2
## NULL
##
## [[46]]$l1
## NULL
##
## [[46]]$vec.n1
## [1] 666
##
## [[46]]$vec.l1
## [1] FALSE
##
##
## [[47]]
## [[47]]$vec.s2
## [1] "life"
##
## [[47]]$vec.n2
## [1] 377
##
## [[47]]$l2
## NULL
##
## [[47]]$n1
## NULL
##
## [[47]]$list2
## NULL
##
## [[47]]$t2
## NULL
##
## [[47]]$t1
## NULL
```

```
##
## [[47]]$s1
## NULL
##
## [[47]]$n2
## NULL
##
## [[47]]$list1
## NULL
##
## [[47]]$vec.l2
## [1] FALSE
##
## [[47]]$vec.s1
## NULL
##
## [[47]]$s2
## NULL
##
## [[47]]$l1
## NULL
##
## [[47]]$vec.n1
## [1] 553
##
## [[47]]$vec.l1
## [1] TRUE
##
##
## [[48]]
## [[48]]$vec.s2
## [1] "couple"
##
## [[48]]$vec.n2
## [1] 781
##
## [[48]]$l2
## NULL
##
## [[48]]$n1
## NULL
##
## [[48]]$list2
## NULL
##
## [[48]]$t2
## NULL
##
## [[48]]$t1
## NULL
##
## [[48]]$s1
## NULL
##
```

```
## [[48]]$n2
## NULL
##
## [[48]]$list1
## NULL
##
## [[48]]$vec.l2
## [1] TRUE
##
## [[48]]$vec.s1
## NULL
##
## [[48]]$s2
## NULL
##
## [[48]]$l1
## NULL
##
## [[48]]$vec.n1
## [1] 724
##
## [[48]]$vec.l1
## [1] TRUE
##
##
## [[49]]
## [[49]]$vec.s2
## [1] "yet"
##
## [[49]]$vec.n2
## [1] 170
##
## [[49]]$l2
## NULL
##
## [[49]]$n1
## NULL
##
## [[49]]$list2
## NULL
##
## [[49]]$t2
## NULL
##
## [[49]]$t1
## NULL
##
## [[49]]$s1
## NULL
##
## [[49]]$n2
## NULL
##
## [[49]]$list1
```

```
## NULL
##
## [[49]]$vec.l2
## [1] FALSE
##
## [[49]]$vec.s1
## NULL
##
## [[49]]$s2
## NULL
##
## [[49]]$l1
## NULL
##
## [[49]]$vec.n1
## [1] 390
##
## [[49]]$vec.l1
## [1] TRUE
##
##
## [[50]]
## [[50]]$vec.s2
## [1] "call"
##
## [[50]]$vec.n2
## [1] 445
##
## [[50]]$l2
## NULL
##
## [[50]]$n1
## NULL
##
## [[50]]$list2
## NULL
##
## [[50]]$t2
## NULL
##
## [[50]]$t1
## NULL
##
## [[50]]$s1
## NULL
##
## [[50]]$n2
## NULL
##
## [[50]]$list1
## NULL
##
## [[50]]$vec.l2
## [1] FALSE
```

```
##
## [[50]]$vec.s1
## NULL
##
## [[50]]$s2
## NULL
##
## [[50]]$l1
## NULL
##
## [[50]]$vec.n1
## [1] 498
##
## [[50]]$vec.l1
## [1] TRUE
##
##
## [[51]]
## [[51]]$vec.s2
## [1] "eleven"
##
## [[51]]$vec.n2
## [1] 710
##
## [[51]]$l2
## NULL
##
## [[51]]$n1
## NULL
##
## [[51]]$list2
## NULL
##
## [[51]]$t2
## NULL
##
## [[51]]$t1
## NULL
##
## [[51]]$s1
## NULL
##
## [[51]]$n2
## NULL
##
## [[51]]$list1
## NULL
##
## [[51]]$vec.l2
## [1] TRUE
##
## [[51]]$vec.s1
## NULL
##
```

```
## [[51]]$s2
## NULL
##
## [[51]]$l1
## NULL
##
## [[51]]$vec.n1
## [1] 222
##
## [[51]]$vec.l1
## [1] FALSE
##
##
## [[52]]
## [[52]]$vec.s2
## [1] "slight"
##
## [[52]]$vec.n2
## [1] 234
##
## [[52]]$l2
## NULL
##
## [[52]]$n1
## NULL
##
## [[52]]$list2
## NULL
##
## [[52]]$t2
## NULL
##
## [[52]]$t1
## NULL
##
## [[52]]$s1
## NULL
##
## [[52]]$n2
## NULL
##
## [[52]]$list1
## NULL
##
## [[52]]$vec.l2
## [1] FALSE
##
## [[52]]$vec.s1
## NULL
##
## [[52]]$s2
## NULL
##
## [[52]]$l1
```

```
## NULL
##
## [[52]]$vec.n1
## [1] 671
##
## [[52]]$vec.l1
## [1] FALSE
##
##
## [[53]]
## [[53]]$vec.s2
## [1] "understand"
##
## [[53]]$vec.n2
## [1] 422
##
## [[53]]$l2
## NULL
##
## [[53]]$n1
## NULL
##
## [[53]]$list2
## NULL
##
## [[53]]$t2
## NULL
##
## [[53]]$t1
## NULL
##
## [[53]]$s1
## NULL
##
## [[53]]$n2
## NULL
##
## [[53]]$list1
## NULL
##
## [[53]]$vec.l2
## NULL
##
## [[53]]$vec.s1
## NULL
##
## [[53]]$s2
## NULL
##
## [[53]]$l1
## NULL
##
## [[53]]$vec.n1
## NULL
```

```
##
## [[53]]$vec.l1
## [1] TRUE
##
##
## [[54]]
## [[54]]$vec.s2
## [1] "continue"
##
## [[54]]$vec.n2
## [1] 508
##
## [[54]]$l2
## NULL
##
## [[54]]$n1
## NULL
##
## [[54]]$list2
## NULL
##
## [[54]]$t2
## NULL
##
## [[54]]$t1
## NULL
##
## [[54]]$s1
## NULL
##
## [[54]]$n2
## NULL
##
## [[54]]$list1
## NULL
##
## [[54]]$vec.l2
## NULL
##
## [[54]]$vec.s1
## NULL
##
## [[54]]$s2
## NULL
##
## [[54]]$l1
## NULL
##
## [[54]]$vec.n1
## NULL
##
## [[54]]$vec.l1
## [1] FALSE
##
```

```
##
## [[55]]
## [[55]]$vec.s2
## [1] "okay"
##
## [[55]]$vec.n2
## [1] 64
##
## [[55]]$l2
## NULL
##
## [[55]]$n1
## NULL
##
## [[55]]$list2
## NULL
##
## [[55]]$t2
## NULL
##
## [[55]]$t1
## NULL
##
## [[55]]$s1
## NULL
##
## [[55]]$n2
## NULL
##
## [[55]]$list1
## NULL
##
## [[55]]$vec.l2
## NULL
##
## [[55]]$vec.s1
## NULL
##
## [[55]]$s2
## NULL
##
## [[55]]$l1
## NULL
##
## [[55]]$vec.n1
## NULL
##
## [[55]]$vec.l1
## [1] TRUE
##
##
## [[56]]
## [[56]]$vec.s2
## [1] "each"
```

```
##
## [[56]]$vec.n2
## [1] 80
##
## [[56]]$l2
## NULL
##
## [[56]]$n1
## NULL
##
## [[56]]$list2
## NULL
##
## [[56]]$t2
## NULL
##
## [[56]]$t1
## NULL
##
## [[56]]$s1
## NULL
##
## [[56]]$n2
## NULL
##
## [[56]]$list1
## NULL
##
## [[56]]$vec.l2
## NULL
##
## [[56]]$vec.s1
## NULL
##
## [[56]]$s2
## NULL
##
## [[56]]$l1
## NULL
##
## [[56]]$vec.n1
## NULL
##
## [[56]]$vec.l1
## [1] TRUE
##
##
## [[57]]
## [[57]]$vec.s2
## [1] "last"
##
## [[57]]$vec.n2
## [1] 483
##
```

```
## [[57]]$l2
## NULL
##
## [[57]]$n1
## NULL
##
## [[57]]$list2
## NULL
##
## [[57]]$t2
## NULL
##
## [[57]]$t1
## NULL
##
## [[57]]$s1
## NULL
##
## [[57]]$n2
## NULL
##
## [[57]]$list1
## NULL
##
## [[57]]$vec.l2
## NULL
##
## [[57]]$vec.s1
## NULL
##
## [[57]]$s2
## NULL
##
## [[57]]$l1
## NULL
##
## [[57]]$vec.n1
## NULL
##
## [[57]]$vec.l1
## [1] FALSE
##
##
## [[58]]
## [[58]]$vec.s2
## [1] "church"
##
## [[58]]$vec.n2
## [1] 548
##
## [[58]]$l2
## NULL
##
## [[58]]$n1
```

```
## NULL
##
## [[58]]$list2
## NULL
##
## [[58]]$t2
## NULL
##
## [[58]]$t1
## NULL
##
## [[58]]$s1
## NULL
##
## [[58]]$n2
## NULL
##
## [[58]]$list1
## NULL
##
## [[58]]$vec.l2
## NULL
##
## [[58]]$vec.s1
## NULL
##
## [[58]]$s2
## NULL
##
## [[58]]$l1
## NULL
##
## [[58]]$vec.n1
## NULL
##
## [[58]]$vec.l1
## [1] FALSE
```

```
## List of 58
##  $ :List of 16
##   ..$ vec.s2: chr "except"
##   ..$ vec.n2: int 421
##   ..$ l2    : logi FALSE
##   ..$ n1    : num 409
##   ..$ list2 : num [1:201] 0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 ...
##   ..$ t2    : num [1:500] 0.41 1.3 0.24 0.35 0.3 1.01 0.27 1.16 0.59 1.17 ...
##   ..$ t1    : chr [1:234] "audi" "audi" "audi" "audi" ...
##   ..$ s1    : chr "imagine"
##   ..$ n2    : num 883
##   ..$ list1 : num 1
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "specific"
##   ..$ s2    : chr "lead"
##   ..$ l1    : logi TRUE
```

```
##   ..$ vec.n1: int 919
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "past"
##   ..$ vec.n2: int 57
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : chr [1:10] "a" "able" "about" "absolute" ...
##   ..$ t2    : Ord.factor w/ 5 levels "Fair"<"Good"<..: 3 4 3 4 2 2 5 4 3 2 ...
##   ..$ t1    : chr [1:234] "a4" "a4" "a4" "a4" ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : chr "b"
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "bring"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 538
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "make"
##   ..$ vec.n2: int 660
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : Ord.factor w/ 7 levels "D"<"E"<"F"<"G"<..: 5 3 1 2 4 3 5 6 1 1 ...
##   ..$ t1    : num [1:234] 1.8 1.8 2 2 2.8 2.8 3.1 1.8 1.8 2 ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : int [1:10] 1 2 3 4 5 6 7 8 9 10
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "picture"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 235
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "soon"
##   ..$ vec.n2: int 163
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : Ord.factor w/ 8 levels "I1"<"SI2"<"SI1"<..: 8 7 7 7 5 3 3 3 3 2 ...
##   ..$ t1    : int [1:234] 1999 1999 2008 2008 1999 1999 2008 1999 1999 2008 ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "understand"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 289
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
```

```
##   ..$ vec.s2: chr "front"
##   ..$ vec.n2: int 238
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : num [1:500] 62.9 59.3 59.2 61 63.8 61.6 61.3 62.7 63.1 57.8 ...
##   ..$ t1    : int [1:234] 4 4 4 4 6 6 6 4 4 4 ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "limit"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 185
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "field"
##   ..$ vec.n2: int 673
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : num [1:500] 54 59 59 58 55 63 55 57 61 62 ...
##   ..$ t1    : chr [1:234] "auto(l5)" "manual(m5)" "manual(m6)" "auto(av)" ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "year"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 765
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "late"
##   ..$ vec.n2: int 578
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : int [1:500] 1187 14196 478 1116 776 4816 383 4872 1771 4639 ...
##   ..$ t1    : chr [1:234] "f" "f" "f" "f" ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "Christmas"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 413
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "when"
##   ..$ vec.n2: int 516
##   ..$ l2    : NULL
```

```
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : num [1:500] 4.71 7.11 4.04 4.56 4.28 6.42 4.17 6.76 5.35 6.97 ...
##   ..$ t1    : int [1:234] 18 21 20 21 16 18 18 18 16 20 ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "quarter"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 627
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "again"
##   ..$ vec.n2: int 330
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : num [1:500] 4.74 7.08 4.1 4.52 4.25 6.47 4.21 6.67 5.3 6.91 ...
##   ..$ t1    : int [1:234] 29 29 31 30 26 26 27 26 25 28 ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "perhaps"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 522
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "tie"
##   ..$ vec.n2: int 225
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : num [1:500] 2.97 4.22 2.41 2.77 2.72 3.97 2.57 4.21 3.36 4.01 ...
##   ..$ t1    : chr [1:234] "p" "p" "p" "p" ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "sir"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 309
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "could"
##   ..$ vec.n2: int 389
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
```

```
##   ..$ t1    : chr [1:234] "compact" "compact" "compact" "compact" ...
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "close"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 54
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "think"
##   ..$ vec.n2: int 117
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "hell"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 205
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "coffee"
##   ..$ vec.n2: int 537
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "class"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 875
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "around"
##   ..$ vec.n2: int 648
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
```

```
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "inside"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 779
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "together"
##   ..$ vec.n2: int 55
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "accept"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 537
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "most"
##   ..$ vec.n2: int 217
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "flat"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 564
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "compare"
##   ..$ vec.n2: int 597
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "soon"
```

```
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 794
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "nine"
##   ..$ vec.n2: int 557
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "evening"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 391
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "summer"
##   ..$ vec.n2: int 658
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "stand"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 409
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "begin"
##   ..$ vec.n2: int 682
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "space"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 727
```

```
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "minister"
##   ..$ vec.n2: int 415
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "odd"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 346
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "possible"
##   ..$ vec.n2: int 134
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "teach"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 160
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "whole"
##   ..$ vec.n2: int 711
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "water"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 468
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "help"
```

```
##   ..$ vec.n2: int 688
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "document"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 509
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "far"
##   ..$ vec.n2: int 757
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "since"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 920
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "paper"
##   ..$ vec.n2: int 447
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "france"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 57
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "tomorrow"
##   ..$ vec.n2: int 821
##   ..$ l2    : NULL
##   ..$ n1    : NULL
```

```
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "another"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 457
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "return"
##   ..$ vec.n2: int 104
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "succeed"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 617
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "picture"
##   ..$ vec.n2: int 821
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "certain"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 357
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "ought"
##   ..$ vec.n2: int 831
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
```

```
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "land"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 279
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "into"
##   ..$ vec.n2: int 711
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "send"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 270
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "rise"
##   ..$ vec.n2: int 468
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: chr "not"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 878
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "sign"
##   ..$ vec.n2: int 210
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
```

```
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "ought"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 646
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "role"
##   ..$ vec.n2: int 349
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "before"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 347
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "insure"
##   ..$ vec.n2: int 401
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "remember"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 129
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "radio"
##   ..$ vec.n2: int 737
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "too"
##   ..$ s2    : NULL
```

```
##   ..$ l1    : NULL
##   ..$ vec.n1: int 218
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "due"
##   ..$ vec.n2: int 258
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "another"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 618
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "station"
##   ..$ vec.n2: int 177
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "council"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 881
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "interest"
##   ..$ vec.n2: int 386
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: chr "sit"
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 698
##   ..$ vec.l1: logi TRUE
```

```
##  $ :List of 16
##   ..$ vec.s2: chr "holiday"
##   ..$ vec.n2: int 141
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 337
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "moment"
##   ..$ vec.n2: int 24
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 797
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "hard"
##   ..$ vec.n2: int 466
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 26
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "near"
##   ..$ vec.n2: int 130
```

```
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 539
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "answer"
##   ..$ vec.n2: int 165
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 519
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "wednesday"
##   ..$ vec.n2: int 703
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 757
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "mind"
##   ..$ vec.n2: int 588
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
```

```
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 666
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "life"
##   ..$ vec.n2: int 377
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 553
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "couple"
##   ..$ vec.n2: int 781
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 724
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "yet"
##   ..$ vec.n2: int 170
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
```

```
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 390
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "call"
##   ..$ vec.n2: int 445
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 498
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "eleven"
##   ..$ vec.n2: int 710
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi TRUE
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 222
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "slight"
##   ..$ vec.n2: int 234
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: logi FALSE
```

```
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: int 671
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "understand"
##   ..$ vec.n2: int 422
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: NULL
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: NULL
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "continue"
##   ..$ vec.n2: int 508
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: NULL
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: NULL
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "okay"
##   ..$ vec.n2: int 64
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: NULL
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
```

```
##   ..$ vec.n1: NULL
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "each"
##   ..$ vec.n2: int 80
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: NULL
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: NULL
##   ..$ vec.l1: logi TRUE
##  $ :List of 16
##   ..$ vec.s2: chr "last"
##   ..$ vec.n2: int 483
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: NULL
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: NULL
##   ..$ vec.l1: logi FALSE
##  $ :List of 16
##   ..$ vec.s2: chr "church"
##   ..$ vec.n2: int 548
##   ..$ l2    : NULL
##   ..$ n1    : NULL
##   ..$ list2 : NULL
##   ..$ t2    : NULL
##   ..$ t1    : NULL
##   ..$ s1    : NULL
##   ..$ n2    : NULL
##   ..$ list1 : NULL
##   ..$ vec.l2: NULL
##   ..$ vec.s1: NULL
##   ..$ s2    : NULL
##   ..$ l1    : NULL
##   ..$ vec.n1: NULL
##   ..$ vec.l1: logi FALSE
```

```
## [[1]]
##  a  b  c  d  e  f  g  h  i  j
##  1  2  3  4  5  6  7  8  9 10
##
## [[2]]
##  a  b  c  d  e  f  g  h  i  j
## 11 12 13 14 15 16 17 18 19 20
##
## [[3]]
##  a  b  c  d  e  f  g  h  i  j
## 21 22 23 24 25 26 27 28 29 30
```

```
## $a
## $a[[1]]
## [1] 1
##
## $a[[2]]
## [1] 11
##
## $a[[3]]
## [1] 21
##
##
## $b
## $b[[1]]
## [1] 2
##
## $b[[2]]
## [1] 12
##
## $b[[3]]
## [1] 22
##
##
## $c
## $c[[1]]
## [1] 3
##
## $c[[2]]
## [1] 13
##
## $c[[3]]
## [1] 23
##
##
## $d
## $d[[1]]
## [1] 4
##
## $d[[2]]
## [1] 14
##
## $d[[3]]
## [1] 24
```

```
##
##
## $e
## $e[[1]]
## [1] 5
##
## $e[[2]]
## [1] 15
##
## $e[[3]]
## [1] 25
##
##
## $f
## $f[[1]]
## [1] 6
##
## $f[[2]]
## [1] 16
##
## $f[[3]]
## [1] 26
##
##
## $g
## $g[[1]]
## [1] 7
##
## $g[[2]]
## [1] 17
##
## $g[[3]]
## [1] 27
##
##
## $h
## $h[[1]]
## [1] 8
##
## $h[[2]]
## [1] 18
##
## $h[[3]]
## [1] 28
##
##
## $i
## $i[[1]]
## [1] 9
##
## $i[[2]]
## [1] 19
##
## $i[[3]]
```

```
## [1] 29
##
##
## $j
## $j[[1]]
## [1] 10
##
## $j[[2]]
## [1] 20
##
## $j[[3]]
## [1] 30
```

Summarise and join lists

every() / some() - do all or some elements pass the test?

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

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

has_element() - does list contain an element?

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

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

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

```
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
```

```
## [1] 2
```

```
## [1] 3
```

```
## [1] 2
```

```
## [1] 2
```

```
## [1] 3
```

append() / prepend() - add elements to a list

```
## [[1]]
##  [1] "except"     "past"       "make"       "soon"       "front"
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
```

```
##
## [[2]]
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
```

```
## [[1]]
## [1] FALSE
##
## [[2]]
## [1] 408.9769
```

```
## [[1]]
##  [1] "except"     "past"       "make"       "soon"       "front"
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
##
## [[2]]
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
##
## [[3]]
## [1] FALSE
##
## [[4]]
## [1] 408.9769
```

```
## [[1]]
## [1] FALSE
##
## [[2]]
## [1] 408.9769
##
## [[3]]
##  [1] "except"     "past"       "make"       "soon"       "front"
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
```

```
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
##
## [[4]]
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
```

splice() - combine object into a list

```
## [[1]]
## [1] TRUE
##
## [[2]]
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
##
## [[3]]
##  a  b  c  d  e  f  g  h  i  j
##  1  2  3  4  5  6  7  8  9 10
##
## [[4]]
##  a  b  c  d  e  f  g  h  i  j
## 11 12 13 14 15 16 17 18 19 20
##
## [[5]]
##  a  b  c  d  e  f  g  h  i  j
## 21 22 23 24 25 26 27 28 29 30
```

Transform lists

modify() / _at() / _if() - apply a function to list element

```
## $vec.s2
## [1] "character"
##
## $vec.n2
## [1] "integer"
##
## $l2
## [1] "logical"
##
## $n1
## [1] "double"
```

```
##
## $list2
## [1] "list"
##
## $t2
## [1] "list"
##
## $t1
## [1] "list"
##
## $s1
## [1] "character"
##
## $n2
## [1] "double"
##
## $list1
## [1] "list"
##
## $vec.l2
## [1] "logical"
##
## $vec.s1
## [1] "character"
##
## $s2
## [1] "character"
##
## $l1
## [1] "logical"
##
## $vec.n1
## [1] "integer"
##
## $vec.l1
## [1] "logical"
##
## $vec.s2
## [1] "character"
##
## $vec.n2
## [1] "integer"
##
## $l2
## [1] "logical"
##
## $n1
## [1] "numeric"
##
## $list2
## [1] "list"
##
## $t2
## [1] "tbl_df"     "tbl"        "data.frame"
```

```
##
## $t1
## [1] "tbl_df"     "tbl"        "data.frame"
##
## $s1
## [1] "character"
##
## $n2
## [1] "numeric"
##
## $list1
## [1] "list"
##
## $vec.l2
## [1] "logical"
##
## $vec.s1
## [1] "character"
##
## $s2
## [1] "character"
##
## $l1
## [1] "logical"
##
## $vec.n1
## [1] "integer"
##
## $vec.l1
## [1] "logical"
## $vec.s2
##  [1] "except"     "past"       "make"       "soon"       "front"
##  [6] "field"      "late"       "when"       "again"      "tie"
## [11] "could"      "think"      "coffee"     "around"     "together"
## [16] "most"       "compare"    "nine"       "summer"     "begin"
## [21] "minister"   "possible"   "whole"      "help"       "far"
## [26] "paper"      "tomorrow"   "return"     "picture"    "ought"
## [31] "into"       "rise"       "sign"       "role"       "insure"
## [36] "radio"      "due"        "station"    "interest"   "holiday"
## [41] "moment"     "hard"       "near"       "answer"     "wednesday"
## [46] "mind"       "life"       "couple"     "yet"        "call"
## [51] "eleven"     "slight"     "understand" "continue"   "okay"
## [56] "each"       "last"       "church"
##
## $vec.n2
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
##
## $l2
## [1] FALSE
```

```
##
## $n1
## [1] 408.9769
##
## $list2
## $list2$vec
##   [1]  0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55
##  [13]  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15
##  [25]  1.20  1.25  1.30  1.35  1.40  1.45  1.50  1.55  1.60  1.65  1.70  1.75
##  [37]  1.80  1.85  1.90  1.95  2.00  2.05  2.10  2.15  2.20  2.25  2.30  2.35
##  [49]  2.40  2.45  2.50  2.55  2.60  2.65  2.70  2.75  2.80  2.85  2.90  2.95
##  [61]  3.00  3.05  3.10  3.15  3.20  3.25  3.30  3.35  3.40  3.45  3.50  3.55
##  [73]  3.60  3.65  3.70  3.75  3.80  3.85  3.90  3.95  4.00  4.05  4.10  4.15
##  [85]  4.20  4.25  4.30  4.35  4.40  4.45  4.50  4.55  4.60  4.65  4.70  4.75
##  [97]  4.80  4.85  4.90  4.95  5.00  5.05  5.10  5.15  5.20  5.25  5.30  5.35
## [109]  5.40  5.45  5.50  5.55  5.60  5.65  5.70  5.75  5.80  5.85  5.90  5.95
## [121]  6.00  6.05  6.10  6.15  6.20  6.25  6.30  6.35  6.40  6.45  6.50  6.55
## [133]  6.60  6.65  6.70  6.75  6.80  6.85  6.90  6.95  7.00  7.05  7.10  7.15
## [145]  7.20  7.25  7.30  7.35  7.40  7.45  7.50  7.55  7.60  7.65  7.70  7.75
## [157]  7.80  7.85  7.90  7.95  8.00  8.05  8.10  8.15  8.20  8.25  8.30  8.35
## [169]  8.40  8.45  8.50  8.55  8.60  8.65  8.70  8.75  8.80  8.85  8.90  8.95
## [181]  9.00  9.05  9.10  9.15  9.20  9.25  9.30  9.35  9.40  9.45  9.50  9.55
## [193]  9.60  9.65  9.70  9.75  9.80  9.85  9.90  9.95 10.00
##
## $list2$words
##  [1] "a"        "able"     "about"    "absolute" "accept"   "account"
##  [7] "achieve"  "across"   "act"      "active"
##
##
## $t2
## [1] 500
##
## $t1
## [1] 234
##
## $s1
## [1] "imagine"
##
## $n2
## [1] 883.0174
##
## $list1
## $list1$a
## [1] 1
##
## $list1$b
## [1] "b"
##
## $list1$vec
##  [1]  1  2  3  4  5  6  7  8  9 10
##
##
## $vec.l2
##  [1]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE
```

```
## [13] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE  TRUE
## [25]  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
## [37] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
## [49] FALSE FALSE  TRUE FALSE
##
## $vec.s1
##  [1] "specific"   "bring"      "picture"    "understand" "limit"
##  [6] "year"       "Christmas"  "quarter"    "perhaps"    "sir"
## [11] "close"      "hell"       "class"      "inside"     "accept"
## [16] "flat"       "soon"       "evening"    "stand"      "space"
## [21] "odd"        "teach"      "water"      "document"   "since"
## [26] "france"     "another"    "succeed"    "certain"    "land"
## [31] "send"       "not"        "ought"      "before"     "remember"
## [36] "too"        "another"    "council"    "sit"
##
## $s2
## [1] "lead"
##
## $l1
## [1] TRUE
##
## $vec.n1
##  [1] 919 538 235 289 185 765 413 627 522 309  54 205 875 779 537 564 794 391 409
## [20] 727 346 160 468 509 920  57 457 617 357 279 270 878 646 347 129 218 618 881
## [39] 698 337 797  26 539 519 757 666 553 724 390 498 222 671
##
## $vec.l1
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
## $vec.s2
## [1] 58
##
## $vec.n2
##  [1] 421  57 660 163 238 673 578 516 330 225 389 117 537 648  55 217 597 557 658
## [20] 682 415 134 711 688 757 447 821 104 821 831 711 468 210 349 401 737 258 177
## [39] 386 141  24 466 130 165 703 588 377 781 170 445 710 234 422 508  64  80 483
## [58] 548 475 291 765 343 323 479 560 450 111 791 317 807 222 287 734 585 292 226
## [77] 790 684 297 605 637 811  39 237 165 619
##
## $l2
## [1] FALSE
##
## $n1
## [1] 408.9769
##
## $list2
## $list2$vec
```

```
##   [1]  0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55
##  [13]  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15
##  [25]  1.20  1.25  1.30  1.35  1.40  1.45  1.50  1.55  1.60  1.65  1.70  1.75
##  [37]  1.80  1.85  1.90  1.95  2.00  2.05  2.10  2.15  2.20  2.25  2.30  2.35
##  [49]  2.40  2.45  2.50  2.55  2.60  2.65  2.70  2.75  2.80  2.85  2.90  2.95
##  [61]  3.00  3.05  3.10  3.15  3.20  3.25  3.30  3.35  3.40  3.45  3.50  3.55
##  [73]  3.60  3.65  3.70  3.75  3.80  3.85  3.90  3.95  4.00  4.05  4.10  4.15
##  [85]  4.20  4.25  4.30  4.35  4.40  4.45  4.50  4.55  4.60  4.65  4.70  4.75
##  [97]  4.80  4.85  4.90  4.95  5.00  5.05  5.10  5.15  5.20  5.25  5.30  5.35
## [109]  5.40  5.45  5.50  5.55  5.60  5.65  5.70  5.75  5.80  5.85  5.90  5.95
## [121]  6.00  6.05  6.10  6.15  6.20  6.25  6.30  6.35  6.40  6.45  6.50  6.55
## [133]  6.60  6.65  6.70  6.75  6.80  6.85  6.90  6.95  7.00  7.05  7.10  7.15
## [145]  7.20  7.25  7.30  7.35  7.40  7.45  7.50  7.55  7.60  7.65  7.70  7.75
## [157]  7.80  7.85  7.90  7.95  8.00  8.05  8.10  8.15  8.20  8.25  8.30  8.35
## [169]  8.40  8.45  8.50  8.55  8.60  8.65  8.70  8.75  8.80  8.85  8.90  8.95
## [181]  9.00  9.05  9.10  9.15  9.20  9.25  9.30  9.35  9.40  9.45  9.50  9.55
## [193]  9.60  9.65  9.70  9.75  9.80  9.85  9.90  9.95 10.00
##
## $list2$words
##  [1] "a"        "able"     "about"    "absolute" "accept"   "account"
##  [7] "achieve"  "across"   "act"      "active"
##
##
## $t2
## # A tibble: 500 x 10
##    carat cut       color clarity depth table price     x     y     z
##    <dbl> <ord>     <ord> <ord>   <dbl> <dbl> <int> <dbl> <dbl> <dbl>
##  1  0.41 Very Good H     IF       62.9    54  1187  4.71  4.74  2.97
##  2  1.3  Premium   F     VVS1     59.3    59 14196  7.11  7.08  4.22
##  3  0.24 Very Good D     VVS1     59.2    59   478  4.04  4.1   2.41
##  4  0.35 Premium   E     VVS1     61      58  1116  4.56  4.52  2.77
##  5  0.3  Good      G     VS1      63.8    55   776  4.28  4.25  2.72
##  6  1.01 Good      F     SI1      61.6    63  4816  6.42  6.47  3.97
##  7  0.27 Ideal     H     SI1      61.3    55   383  4.17  4.21  2.57
##  8  1.16 Premium   I     SI1      62.7    57  4872  6.76  6.67  4.21
##  9  0.59 Very Good D     SI1      63.1    61  1771  5.35  5.3   3.36
## 10  1.17 Good      D     SI2      57.8    62  4639  6.97  6.91  4.01
## # i 490 more rows
##
## $t1
## # A tibble: 234 x 11
##    manufacturer model      displ  year   cyl trans drv     cty   hwy fl    class
##    <chr>        <chr>      <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
##  1 audi         a4           1.8  1999     4 auto~ f        18    29 p     comp~
##  2 audi         a4           1.8  1999     4 manu~ f        21    29 p     comp~
##  3 audi         a4           2    2008     4 manu~ f        20    31 p     comp~
##  4 audi         a4           2    2008     4 auto~ f        21    30 p     comp~
##  5 audi         a4           2.8  1999     6 auto~ f        16    26 p     comp~
##  6 audi         a4           2.8  1999     6 manu~ f        18    26 p     comp~
##  7 audi         a4           3.1  2008     6 auto~ f        18    27 p     comp~
##  8 audi         a4 quattro   1.8  1999     4 manu~ 4        18    26 p     comp~
##  9 audi         a4 quattro   1.8  1999     4 auto~ 4        16    25 p     comp~
## 10 audi         a4 quattro   2    2008     4 manu~ 4        20    28 p     comp~
## # i 224 more rows
```

```
##
## $s1
## [1] "imagine"
##
## $n2
## [1] 883.0174
##
## $list1
## $list1$a
## [1] 1
##
## $list1$b
## [1] "b"
##
## $list1$vec
##  [1]  1  2  3  4  5  6  7  8  9 10
##
##
## $vec.l2
##  [1]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE
## [13] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE  TRUE  TRUE
## [25]  TRUE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
## [37] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE
## [49] FALSE FALSE  TRUE FALSE
##
## $vec.s1
##  [1] "specific"   "bring"      "picture"    "understand" "limit"
##  [6] "year"       "Christmas"  "quarter"    "perhaps"    "sir"
## [11] "close"      "hell"       "class"      "inside"     "accept"
## [16] "flat"       "soon"       "evening"    "stand"      "space"
## [21] "odd"        "teach"      "water"      "document"   "since"
## [26] "france"     "another"    "succeed"    "certain"    "land"
## [31] "send"       "not"        "ought"      "before"     "remember"
## [36] "too"        "another"    "council"    "sit"
##
## $s2
## [1] "lead"
##
## $l1
## [1] TRUE
##
## $vec.n1
##  [1] 919 538 235 289 185 765 413 627 522 309  54 205 875 779 537 564 794 391 409
## [20] 727 346 160 468 509 920  57 457 617 357 279 270 878 646 347 129 218 618 881
## [39] 698 337 797  26 539 519 757 666 553 724 390 498 222 671
##
## $vec.l1
##  [1] FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE
## [13]  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE  TRUE
## [25] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE
## [37] FALSE FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE  TRUE
## [49]  TRUE  TRUE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE FALSE  TRUE  TRUE
## [61] FALSE  TRUE  TRUE  TRUE  TRUE FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE
## [73]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE
```

```
## [85]  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE
```

cross2() - get all combinations of elements

reduce() - apply function recursively to each element

```
## [[1]]
##  [1] "o" "r" "g" "i" "n" "k" "t" "q" "l" "y" "c" "w" "m" "s" "f" "p" "u"
##
## [[2]]
##  [1] "k" "d" "v" "z" "b" "g" "f" "u" "y" "p" "n" "o" "l" "m" "r" "i" "e"
##
## [[3]]
##  [1] "p" "k" "z" "i" "s" "o" "y" "q" "w" "u" "l" "n" "c" "d" "g" "t" "r"
##
## [[4]]
##  [1] "z" "n" "x" "s" "k" "a" "i" "t" "q" "j" "h" "b" "p" "f" "w" "o" "g"
```

```
## [[1]]
##  [1] 0.98985280 0.61540849 0.27307767 0.06370684 0.07230328 0.87351121
##  [7] 0.36282500 0.94562215 0.55831894 0.51266115
##
## [[2]]
##  [1] 0.94777166 0.10980160 0.81890755 0.37734211 0.55664105 0.31387119
##  [7] 0.08234288 0.77993754 0.19323473 0.65558547
##
## [[3]]
##  [1] 0.43514705 0.19714833 0.99466042 0.44674287 0.03142666 0.93701656
##  [7] 0.87098395 0.60124628 0.29901546 0.80934628
##
## [[4]]
##  [1] 0.952142385 0.852053971 0.127309736 0.968882350 0.557101009 0.005364447
##  [7] 0.135763920 0.005847102 0.816874062 0.782163588
```

```
## [1] "o" "g" "i" "n" "k" "p"
```

```
## [1] 20.92896
```

accumulate() - similar to reduce but keeps score track of mid-step operations

```
## [[1]]
##  [1] "o" "r" "g" "i" "n" "k" "t" "q" "l" "y" "c" "w" "m" "s" "f" "p" "u"
##
## [[2]]
##  [1] "o" "r" "g" "i" "n" "k" "l" "y" "m" "f" "p" "u"
##
## [[3]]
##  [1] "o" "r" "g" "i" "n" "k" "l" "y" "p" "u"
##
## [[4]]
## [1] "o" "g" "i" "n" "k" "p"
```

```
## [[1]]
##  [1] 0.98985280 0.61540849 0.27307767 0.06370684 0.07230328 0.87351121
##  [7] 0.36282500 0.94562215 0.55831894 0.51266115
##
## [[2]]
```

```
## [1] 10.10272
##
## [[3]]
## [1] 15.72546
##
## [[4]]
## [1] 20.92896
```

Nested data

```
## # A tibble: 15 x 5
##    manufacturer model              displ   cyl   hwy
##    <chr>        <chr>              <dbl> <int> <int>
##  1 jeep         grand cherokee 4wd   3       6    22
##  2 jeep         grand cherokee 4wd   3.7     6    19
##  3 jeep         grand cherokee 4wd   4       6    20
##  4 jeep         grand cherokee 4wd   4.7     8    17
##  5 jeep         grand cherokee 4wd   4.7     8    12
##  6 jeep         grand cherokee 4wd   4.7     8    19
##  7 jeep         grand cherokee 4wd   5.7     8    18
##  8 jeep         grand cherokee 4wd   6.1     8    14
##  9 land rover   range rover          4       8    15
## 10 land rover   range rover          4.2     8    18
## 11 land rover   range rover          4.4     8    18
## 12 land rover   range rover          4.6     8    15
## 13 lincoln      navigator 2wd        5.4     8    17
## 14 lincoln      navigator 2wd        5.4     8    16
## 15 lincoln      navigator 2wd        5.4     8    18
```

```
## # A tibble: 3 x 2
## # Groups:   manufacturer [3]
##   manufacturer data
##   <chr>        <list>
## 1 jeep         <tibble [8 x 4]>
## 2 land rover   <tibble [4 x 4]>
## 3 lincoln      <tibble [3 x 4]>
```

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

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

Operations that go with nesting

```
## [[1]]
## [1] 8
##
## [[2]]
## [1] 4
##
## [[3]]
## [1] 3
```

```
## [[1]]
## [1] 17.625
##
## [[2]]
```

```
## [1] 16.5
##
## [[3]]
## [1] 17
```

Nesting a larger data frame

```
## # A tibble: 15 x 2
## # Groups:   manufacturer [15]
##    manufacturer data
##    <chr>        <list>
##  1 audi         <tibble [18 x 10]>
##  2 chevrolet    <tibble [19 x 10]>
##  3 dodge        <tibble [37 x 10]>
##  4 ford         <tibble [25 x 10]>
##  5 honda        <tibble [9 x 10]>
##  6 hyundai      <tibble [14 x 10]>
##  7 jeep         <tibble [8 x 10]>
##  8 land rover   <tibble [4 x 10]>
##  9 lincoln      <tibble [3 x 10]>
## 10 mercury      <tibble [4 x 10]>
## 11 nissan       <tibble [13 x 10]>
## 12 pontiac      <tibble [5 x 10]>
## 13 subaru       <tibble [14 x 10]>
## 14 toyota       <tibble [34 x 10]>
## 15 volkswagen   <tibble [27 x 10]>
```

```
## # A tibble: 35 x 5
## # Groups:   cut, color [35]
##    cut       color data                 `avg price` `nr diamonds`
##    <ord>     <ord> <list>                     <dbl>         <int>
##  1 Ideal     E     <tibble [3,903 x 8]>       2598.          3903
##  2 Premium   E     <tibble [2,337 x 8]>       3539.          2337
##  3 Good      E     <tibble [933 x 8]>         3424.           933
##  4 Premium   I     <tibble [1,428 x 8]>       5946.          1428
##  5 Good      J     <tibble [307 x 8]>         4574.           307
##  6 Very Good J     <tibble [678 x 8]>         5104.           678
##  7 Very Good I     <tibble [1,204 x 8]>       5256.          1204
##  8 Very Good H     <tibble [1,824 x 8]>       4535.          1824
##  9 Fair      E     <tibble [224 x 8]>         3682.           224
## 10 Ideal     J     <tibble [896 x 8]>         4918.           896
## # i 25 more rows
```

Nested data workflow

Modeling steps involved: - we will use mpg data set - for each manufacturer we will fir a separate linear model - with model we would like to predict variable hwy (y) - model will use two input variables: displ (x1), cyl (x2) - general model structure: hwy = a1 X displ + a2 x cyl + a0 - all models mus be nested inside nested data frame - extract model's estimated parameters, and r squared value in a separate columns

```
## # A tibble: 15 x 3
## # Groups:   manufacturer [15]
##    manufacturer data               model
##    <chr>        <list>             <list>
##  1 audi         <tibble [18 x 10]> <lm>
```

```
##  2 chevrolet    <tibble [19 x 10]> <lm>
##  3 dodge        <tibble [37 x 10]> <lm>
##  4 ford         <tibble [25 x 10]> <lm>
##  5 honda        <tibble [9 x 10]>  <lm>
##  6 hyundai      <tibble [14 x 10]> <lm>
##  7 jeep         <tibble [8 x 10]>  <lm>
##  8 land rover   <tibble [4 x 10]>  <lm>
##  9 lincoln      <tibble [3 x 10]>  <lm>
## 10 mercury      <tibble [4 x 10]>  <lm>
## 11 nissan       <tibble [13 x 10]> <lm>
## 12 pontiac      <tibble [5 x 10]>  <lm>
## 13 subaru       <tibble [14 x 10]> <lm>
## 14 toyota       <tibble [34 x 10]> <lm>
## 15 volkswagen   <tibble [27 x 10]> <lm>
```

```
## [[1]]
##
## Call:
## lm(formula = hwy ~ displ + cyl, data = .)
##
## Coefficients:
## (Intercept)        displ          cyl
##      34.357        3.076       -3.014
```

```
## $coefficients
## (Intercept)       displ         cyl
##   34.356580    3.076490   -3.014061
##
## $residuals
##          1          2          3          4          5          6          7
##  1.1619798  1.1619798  2.5466817  1.5466817  1.1136108  1.1136108  1.1906637
##          8          9         10         11         12         13         14
## -1.8380202 -2.8380202 -0.4533183 -1.4533183  0.1136108  0.1136108 -0.8093363
##         15         16         17         18
## -0.8093363 -0.8863892 -0.8093363 -0.1653543
##
## $effects
##  (Intercept)        displ          cyl
## -112.1942759   -6.2527038   -3.0525020    0.7249004    1.5424558    1.5424558
##
##    0.8111099   -2.1208690   -3.1208690   -1.2750996   -2.2750996    0.5424558
##
##    0.5424558   -1.1888901   -1.1888901   -0.4575442   -1.1888901   -0.1026806
##
## $rank
## [1] 3
##
## $fitted.values
##        1        2        3        4        5        6        7        8
## 27.83802 27.83802 28.45332 28.45332 24.88639 24.88639 25.80934 27.83802
##        9       10       11       12       13       14       15       16
## 27.83802 28.45332 28.45332 24.88639 24.88639 25.80934 25.80934 24.88639
##       17       18
## 25.80934 23.16535
##
```

```
## $assign
## [1] 0 1 2
##
## $qr
## $qr
##    (Intercept)       displ          cyl
## 1   -4.2426407 -10.7951635 -22.15601248
## 2    0.2357023   2.7756881   4.90769197
## 3    0.2357023   0.1449898   1.01275397
## 4    0.2357023   0.1449898   0.28298206
## 5    0.2357023  -0.1432270  -0.31295829
## 6    0.2357023  -0.1432270  -0.31295829
## 7    0.2357023  -0.2513083   0.20411906
## 8    0.2357023   0.2170440  -0.06173617
## 9    0.2357023   0.2170440  -0.06173617
## 10   0.2357023   0.1449898   0.28298206
## 11   0.2357023   0.1449898   0.28298206
## 12   0.2357023  -0.1432270  -0.31295829
## 13   0.2357023  -0.1432270  -0.31295829
## 14   0.2357023  -0.2513083   0.20411906
## 15   0.2357023  -0.2513083   0.20411906
## 16   0.2357023  -0.1432270  -0.31295829
## 17   0.2357023  -0.2513083   0.20411906
## 18   0.2357023  -0.6476065   0.12525605
## attr(,"assign")
## [1] 0 1 2
##
## $qraux
## [1] 1.235702 1.217044 1.282982
##
## $pivot
## [1] 1 2 3
##
## $tol
## [1] 1e-07
##
## $rank
## [1] 3
##
## attr(,"class")
## [1] "qr"
##
## $df.residual
## [1] 15
##
## $xlevels
## named list()
##
## $call
## lm(formula = hwy ~ displ + cyl, data = .)
##
## $terms
## hwy ~ displ + cyl
## attr(,"variables")
```

```
## list(hwy, displ, cyl)
## attr(,"factors")
##       displ cyl
## hwy       0   0
## displ     1   0
## cyl       0   1
## attr(,"term.labels")
## [1] "displ" "cyl"
## attr(,"order")
## [1] 1 1
## attr(,"intercept")
## [1] 1
## attr(,"response")
## [1] 1
## attr(,".Environment")
## <environment: 0x000001b294efc9c8>
## attr(,"predvars")
## list(hwy, displ, cyl)
## attr(,"dataClasses")
##       hwy     displ       cyl
## "numeric" "numeric" "numeric"
##
## $model
##    hwy displ cyl
## 1   29   1.8   4
## 2   29   1.8   4
## 3   31   2.0   4
## 4   30   2.0   4
## 5   26   2.8   6
## 6   26   2.8   6
## 7   27   3.1   6
## 8   26   1.8   4
## 9   25   1.8   4
## 10  28   2.0   4
## 11  27   2.0   4
## 12  25   2.8   6
## 13  25   2.8   6
## 14  25   3.1   6
## 15  25   3.1   6
## 16  24   2.8   6
## 17  25   3.1   6
## 18  23   4.2   8
```

```
##  [1] "coefficients"  "residuals"     "effects"       "rank"
##  [5] "fitted.values" "assign"        "qr"            "df.residual"
##  [9] "xlevels"       "call"          "terms"         "model"
```

```
## (Intercept)       displ         cyl
##   34.356580    3.076490   -3.014061
```

```
## # A tibble: 3 x 2
##   name        value
##   <chr>       <dbl>
## 1 (Intercept) 34.4
## 2 displ        3.08
```

```
## 3 cyl         -3.01
```

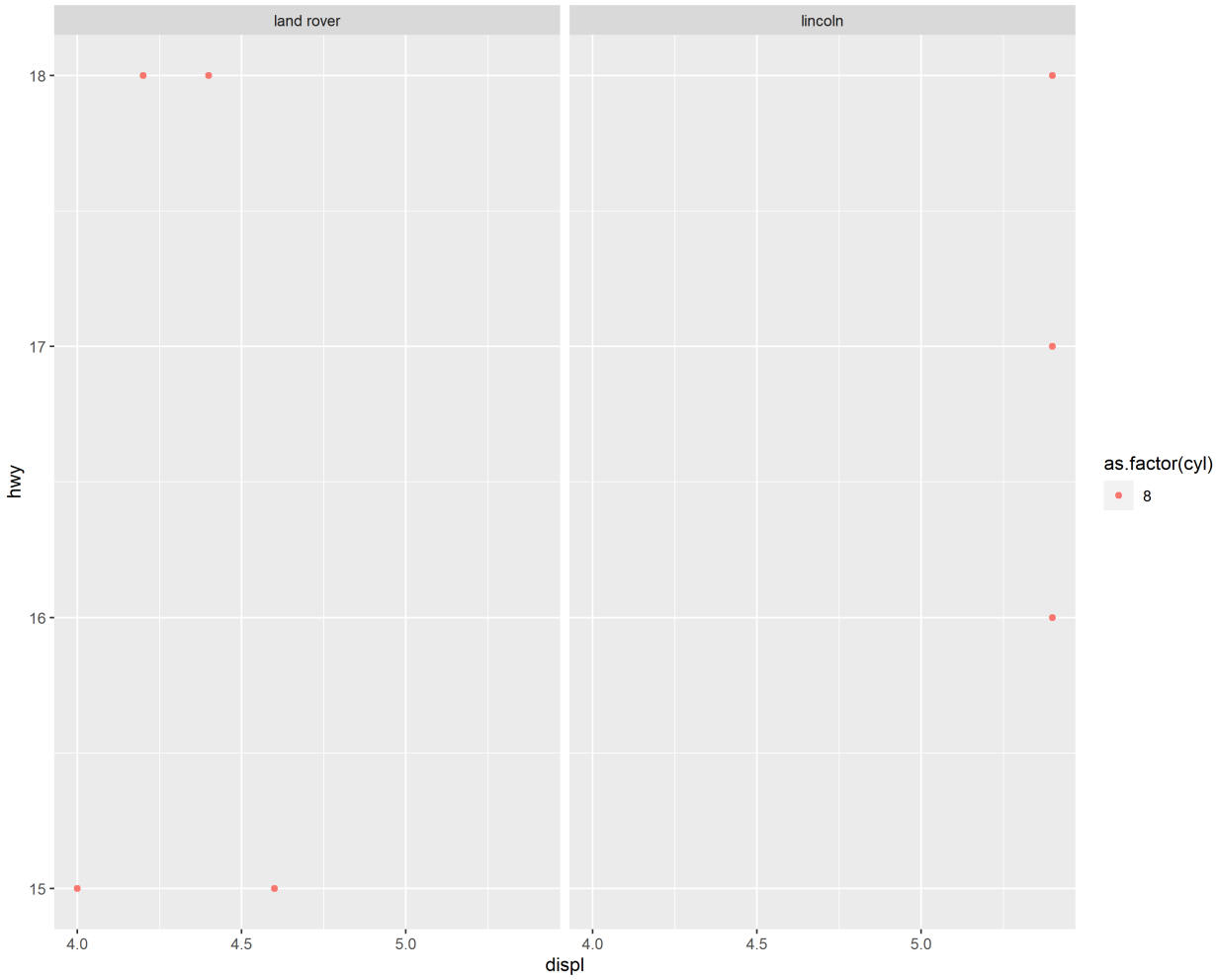
```
## [1] 34.35658
```

```
## [1] 3.07649
```

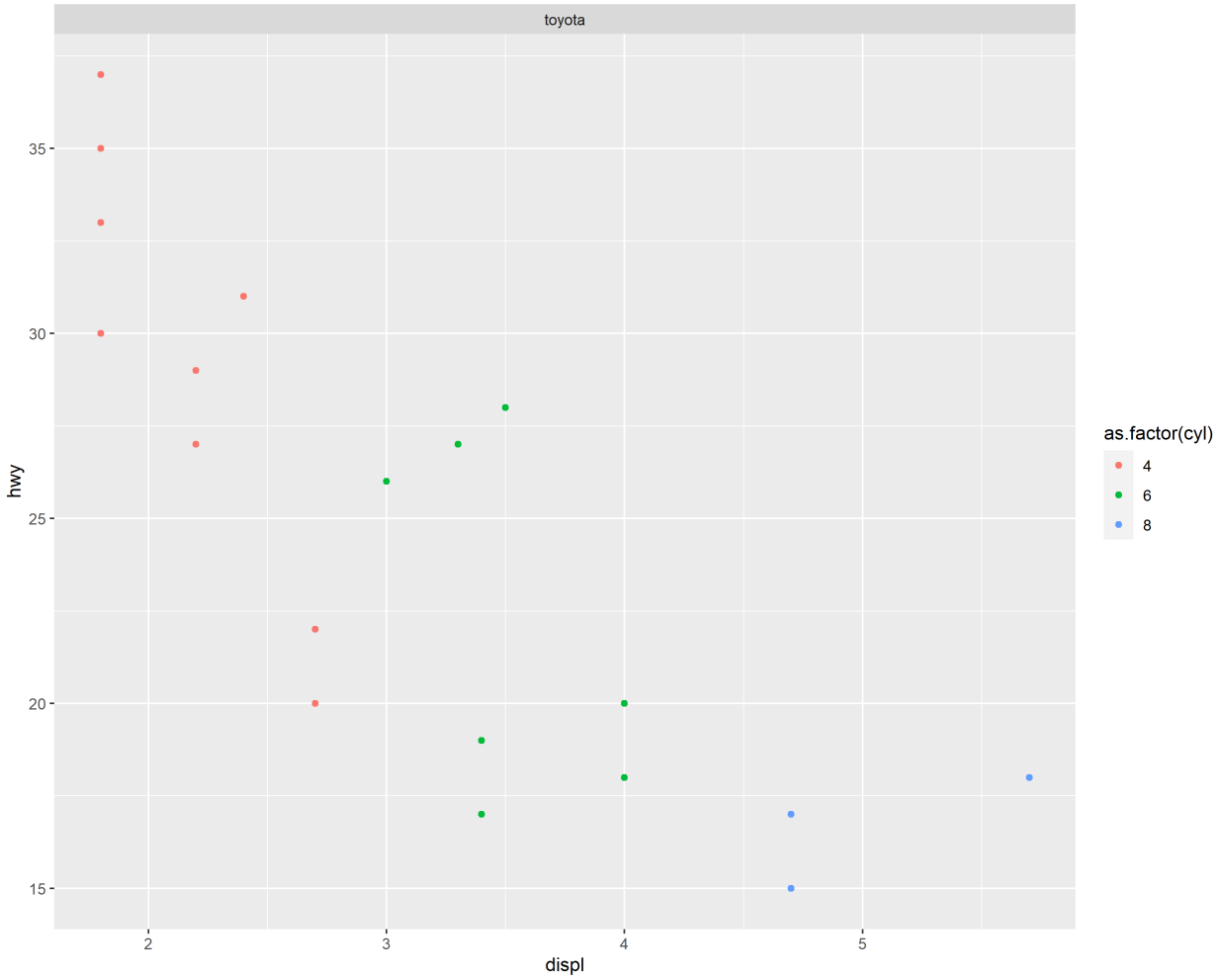
```
## [1] -3.014061
```

```
## [1] 0.6018324
```

```
## # A tibble: 2 x 8
## # Groups:   manufacturer [2]
##   manufacturer data     model  summary    `r squared` `coef a0` `coef a1`
##   <chr>        <list>   <list> <list>           <dbl>     <dbl>     <dbl>
## 1 land rover   <tibble> <lm>   <smmry.lm>           0      16.5  4.97e-15
## 2 lincoln      <tibble> <lm>   <smmry.lm>           0      17   NA
## # i 1 more variable: `coef a2` <dbl>
```




```
## # A tibble: 1 x 8
## # Groups:   manufacturer [1]
##   manufacturer data     model  summary    `r squared` `coef a0` `coef a1`
##   <chr>        <list>   <list> <list>           <dbl>     <dbl>     <dbl>
## 1 toyota       <tibble> <lm>   <smmry.lm>       0.637      37.2     -7.93
## # i 1 more variable: `coef a2` <dbl>
```



purrr practices

some additional tips and tricks when it comes to purr

loop over columns in a data frame: - missing values count - get class of the column/variable - number of distinct values - preserve column names

very useful for initial table exploration

```
##        variable missing_values disitnct_values     class
## 1  manufacturer              0              15 character
## 2         model              0              38 character
## 3         displ              0              35   numeric
## 4          year              0               2   integer
## 5           cyl              0               4   integer
## 6         trans              0              10 character
## 7           drv              0               3 character
## 8           cty              0              21   integer
## 9           hwy              0              27   integer
## 10           fl              0               5 character
## 11        class              0               7 character
```

import multiple files into R with map() - for example you must import many flat files - files have similar

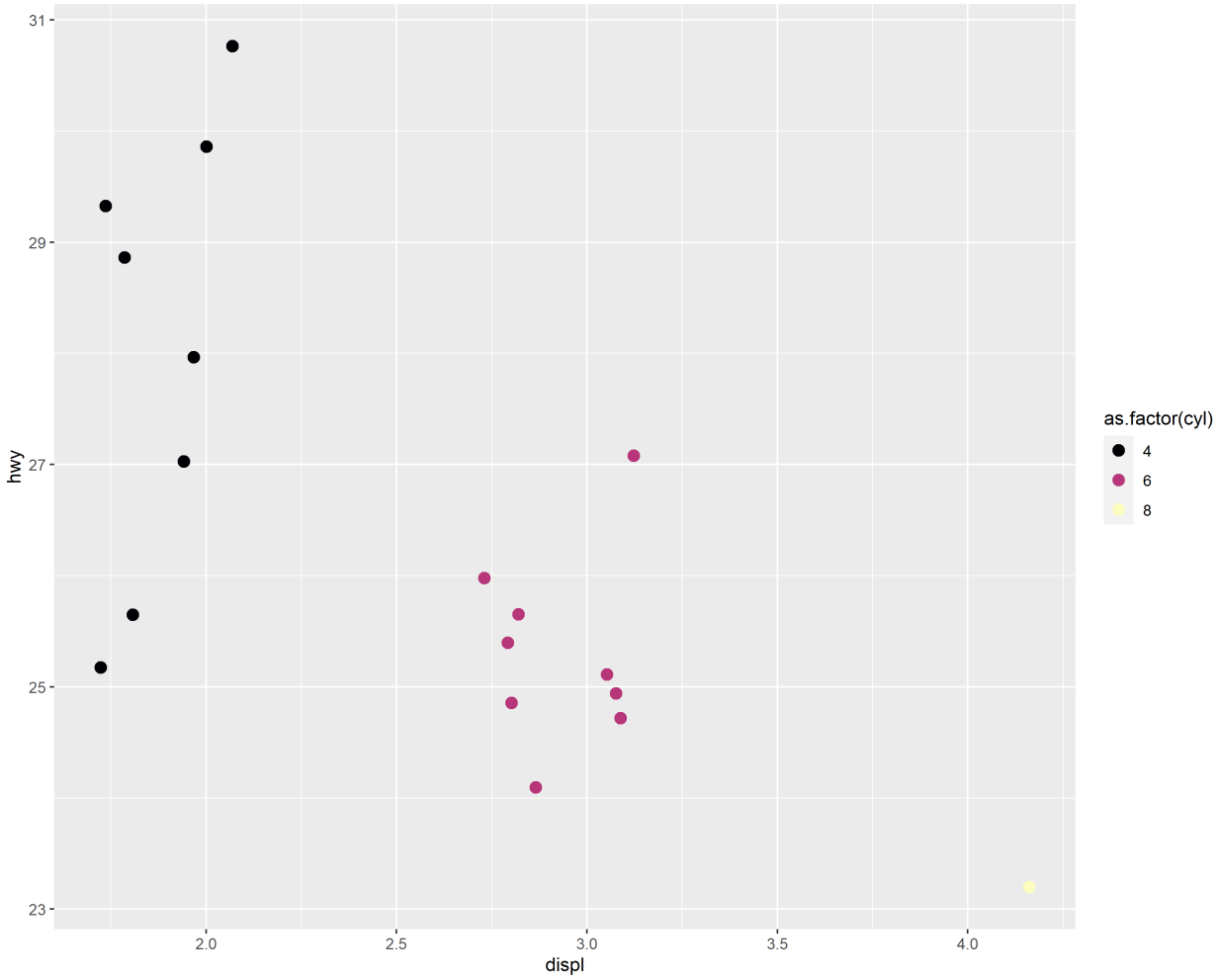
structure - you can first read the file names into an object - then import them using map()

export multiple tibbles into multiple into .csv files with map() - for example you must export data frame into multiple files - files have similar structure - first we prepare the smaller tibbles - then export them using map() and nested data frame

for example we will split mpg data set per each car level - we will export each car in a .csv file named: [manufacturer]_[model]_car[id].csv - create a directory for the export

```
## function (...)
## capture_output(.f(...))
## <bytecode: 0x000001b2946f20b0>
## <environment: 0x000001b2946f23c0>
```

draw multiple plots per one tibble with map() and export plots into separate .png files - first draw plots and store into a data frame list - then export plots on your disk




```
## function (...)
## capture_output(.f(...))
## <bytecode: 0x0000027f4d3ba8f0>
## <environment: 0x0000027f4d3bac00>
```