Joining-Vectors

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2023-03-16

What are vectors?

they are unidemnsional matrices they can only hold one type of data, either numeric (integer or double), character, or logical (complex numbers)

What are data frames

It is a two dimentismoal matix: rows, and columns it can hold any type of data it can only hold different types of data in a certain way: only column can have different data types within a column, all rows must have same data type

A data frame can also be defined as a collection of vectors (they can be of different or the same type) all of same length!

```
surveys <- read.csv(file = "../data-raw/surveys (1).csv")
str(surveys)</pre>
```

```
## 'data.frame':
                 35549 obs. of 9 variables:
## $ record_id
                  : int 1 2 3 4 5 6 7 8 9 10 ...
                  : int 7777777777...
## $ month
##
   $ day
                        16 16 16 16 16 16 16 16 16 16 ...
                  : int
                       ##
  $ year
                  : int
##
  $ plot_id
                  : int
                        2 3 2 7 3 1 2 1 1 6 ...
                        "NL" "NL" "DM" "DM" ...
## $ species_id
                  : chr
                       "M" "M" "F" "M" ...
## $ sex
                  : chr
## $ hindfoot length: int 32 33 37 36 35 14 NA 37 34 20 ...
## $ weight
                  : int NA NA NA NA NA NA NA NA NA ...
```

creating vector

```
c("luna", "avi", "Anita", "James", "Charles", "Damian", "Davinder") -> our_names
str(our_names)

## chr [1:7] "luna" "avi" "Anita" "James" "Charles" "Damian" "Davinder"

1:7 # the colon operator creates a vector of numbers
```

```
## [1] 1 2 3 4 5 6 7
```

```
1:7 -> my_numbers
-100:200
      [1] -100
                 -99
                       -98
                             -97
                                   -96
                                         -95
                                               -94
                                                    -93
                                                          -92
                                                                -91
                                                                      -90
                                                                            -89
                                                                                  -88
                                                                                        -87
                                                                                              -86
##
##
    [16]
           -85
                 -84
                       -83
                             -82
                                   -81
                                         -80
                                               -79
                                                     -78
                                                           -77
                                                                 -76
                                                                      -75
                                                                            -74
                                                                                  -73
                                                                                        -72
                                                                                              -71
    [31]
           -70
##
                 -69
                       -68
                             -67
                                   -66
                                         -65
                                               -64
                                                     -63
                                                           -62
                                                                 -61
                                                                      -60
                                                                            -59
                                                                                  -58
                                                                                        -57
                                                                                              -56
##
    [46]
           -55
                 -54
                       -53
                             -52
                                   -51
                                         -50
                                               -49
                                                     -48
                                                           -47
                                                                 -46
                                                                      -45
                                                                            -44
                                                                                  -43
                                                                                        -42
                                                                                              -41
##
    [61]
           -40
                 -39
                       -38
                             -37
                                   -36
                                         -35
                                               -34
                                                     -33
                                                           -32
                                                                 -31
                                                                      -30
                                                                            -29
                                                                                  -28
                                                                                        -27
                                                                                              -26
##
    [76]
           -25
                 -24
                       -23
                             -22
                                   -21
                                         -20
                                               -19
                                                     -18
                                                           -17
                                                                 -16
                                                                      -15
                                                                            -14
                                                                                  -13
                                                                                        -12
                                                                                              -11
##
    [91]
           -10
                  -9
                        -8
                              -7
                                    -6
                                          -5
                                                -4
                                                      -3
                                                            -2
                                                                  -1
                                                                         0
                                                                                    2
                                                                                          3
                                                                                                4
                                                                               1
                         7
##
   [106]
             5
                   6
                               8
                                     9
                                          10
                                                11
                                                      12
                                                            13
                                                                  14
                                                                        15
                                                                             16
                                                                                   17
                                                                                         18
                                                                                               19
##
   [121]
             20
                  21
                        22
                              23
                                    24
                                          25
                                                26
                                                      27
                                                                  29
                                                                        30
                                                                             31
                                                                                   32
                                                                                         33
                                                                                               34
                              38
                                                                  44
## [136]
            35
                  36
                        37
                                    39
                                          40
                                                41
                                                      42
                                                                        45
                                                                             46
                                                                                   47
                                                                                         48
                                                                                               49
                                                            43
## [151]
            50
                  51
                        52
                              53
                                    54
                                          55
                                                56
                                                      57
                                                            58
                                                                        60
                                                                             61
                                                                                   62
                                                                                         63
                                                                                               64
## [166]
                                          70
                                                71
                                                      72
                                                            73
                                                                  74
                                                                       75
                                                                             76
                                                                                   77
                                                                                               79
            65
                  66
                        67
                              68
                                    69
                                                                                         78
                                                86
                                                      87
                                                                  89
                                                                             91
                                                                                   92
## [181]
            80
                  81
                        82
                              83
                                    84
                                          85
                                                            88
                                                                       90
                                                                                         93
                                                                                               94
## [196]
            95
                  96
                        97
                              98
                                    99
                                         100
                                               101
                                                     102
                                                           103
                                                                 104
                                                                      105
                                                                            106
                                                                                  107
                                                                                        108
                                                                                              109
##
   [211]
           110
                 111
                       112
                             113
                                   114
                                         115
                                               116
                                                     117
                                                           118
                                                                 119
                                                                      120
                                                                            121
                                                                                  122
                                                                                        123
                                                                                              124
##
   [226]
           125
                 126
                       127
                             128
                                   129
                                         130
                                               131
                                                     132
                                                           133
                                                                 134
                                                                      135
                                                                            136
                                                                                  137
                                                                                        138
                                                                                              139
   [241]
           140
                 141
                       142
                             143
                                   144
                                         145
                                               146
                                                    147
                                                           148
                                                                 149
                                                                      150
                                                                            151
                                                                                  152
                                                                                        153
                                                                                              154
## [256]
           155
                 156
                       157
                             158
                                   159
                                         160
                                               161
                                                     162
                                                          163
                                                                 164
                                                                      165
                                                                            166
                                                                                  167
                                                                                        168
                                                                                              169
   [271]
           170
                 171
                       172
                             173
                                   174
                                         175
                                               176
                                                    177
                                                           178
                                                                 179
                                                                      180
                                                                            181
                                                                                  182
                                                                                        183
                                                                                              184
## [286]
           185
                 186
                       187
                             188
                                   189
                                         190
                                               191
                                                     192
                                                           193
                                                                 194
                                                                      195
                                                                            196
                                                                                  197
                                                                                        198
                                                                                              199
## [301]
           200
```

In how many steps or units does the colon operator increase? It increases in a step of 1.

What do we do if I won to create a numeric sequence that increases in steps different than 1? ?seq

```
seq(-100, 200, by = 0.1) -> my_numbers
str(my_numbers)

## num [1:3001] -100 -99.9 -99.8 -99.7 -99.6 -99.5 -99.4 -99.3 -99.2 -99.1 ...

letters

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

LETTERS

## [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R" "S"
## [20] "T" "U" "V" "W" "X" "Y" "Z"
```

Creating data frames from vectors

the most general way to do this is with the function 'data.frame()':

```
data.frame(names = our_names, numbers = my_numbers)
```

Error in data.frame(names = our_names, numbers = my_numbers): arguments imply differing number of ro

Rember: vectors must have the same length to be part of a data.frame! must be a multiple of vector

```
data.frame(names = our_names, numbers = 1:7)
```

```
##
        names numbers
## 1
          luna
## 2
                      2
           avi
                      3
## 3
        Anita
                      4
## 4
        James
## 5
      Charles
                      5
## 6
       Damian
                      6
## 7 Davinder
                      7
```

Even though we can't use vectors that are larger to create a data frame, we can use vector that or eshorter, and R will recycle the values

```
data.frame(names = our_names, numbers =1)
```

```
##
        names numbers
## 1
          luna
## 2
                      1
           avi
## 3
         Anita
                      1
## 4
                      1
         James
## 5
      Charles
                      1
## 6
       Damian
                      1
## 7 Davinder
                      1
```

R will recycle the value only if they are multiple of vector of names two times, so it is a multiple of 2.

```
data.frame(names = rep(our_names, 2), numbers = c(2, 5.5))
```

```
##
         names numbers
## 1
           luna
                     2.0
## 2
            avi
                     5.5
## 3
          Anita
                     2.0
## 4
          James
                     5.5
## 5
       Charles
                     2.0
## 6
        Damian
                     5.5
## 7
      Davinder
                     2.0
## 8
           luna
                     5.5
## 9
            avi
                     2.0
                     5.5
## 10
          Anita
## 11
          James
                     2.0
## 12
       Charles
                     5.5
## 13
        Damian
                     2.0
## 14 Davinder
                     5.5
```

?data.frame ## Excerise 6

```
length <- c(2.2, 2.1, 2.7, 3.0, 3.1, 2.5, 1.9, 1.1, 3.5, 2.9)
width <- c(1.3, 2.2, 1.5, 4.5, 3.1, NA, 1.8, 0.5, 2.0, 2.7)
height <- c(9.6, 7.6, 2.2, 1.5, 4.0, 3.0, 4.5, 2.3, 7.5, 3.2)
data.frame(length, width, height, genus = "Taxus", species = "epithet baccata")
```

```
##
     length width height genus
                                    species
## 1
        2.2
                    9.6 Taxus epithet baccata
             1.3
        2.1
                    7.6 Taxus epithet baccata
## 2
             2.2
        2.7 1.5
## 3
                    2.2 Taxus epithet baccata
        3.0 4.5 1.5 Taxus epithet baccata
## 4
## 5
        3.1 3.1 4.0 Taxus epithet baccata
        2.5 NA 3.0 Taxus epithet baccata
## 6
        1.9 1.8
## 7
                   4.5 Taxus epithet baccata
        1.1
## 8
             0.5
                    2.3 Taxus epithet baccata
## 9
        3.5
             2.0
                    7.5 Taxus epithet baccata
## 10
        2.9
             2.7
                    3.2 Taxus epithet baccata
```

Extracting/accessing values from vectors and data frames

One common way to extract or access vectors crom column in a data frame is the '\$'

: int NA ...

```
surveys$record_id -> record_id
```

Another way is with the square brackets '[]'

```
surveys[1:10, "hindfoot_length"]
```

```
## [1] 32 33 37 36 35 14 NA 37 34 20
```

If I want all the values from the rows of column hindfoot length:

```
surveys[, "hindfoot_length"] -> hindfoot_length
```

Another way is using double square brackets

```
surveys[["record_id"]] %>%
head()
```

```
## [1] 1 2 3 4 5 6
```

\$ weight

```
surveys$weight -> surveys_weight
surveys[, "month"] -> surveys_month
surveys[, "hindfoot_length"]
```

```
## [15433] 37 17 37 20 17 16 37 16 22 20 37 36 37 21 22 37 35 21 15 17 35 20 18 15
## [15457] 16 19 36 20 NA 20 37 16 37 21 21 18 36 21 37 17 16 NA NA 37 35 18 37 37
## [15481] 17 37 20 36 20 17 NA NA 37 21 20 18 22 22 17 20 21 17 18 30 33 17 16 NA
## [15505] 17 31 NA NA NA NA 16 21 17 36 19 18 17 17 36 37 21 21 36 15 37 20 21 18
## [15529] 39 21 49 22 19 37 36 19 17 17 20 21 36 37 17 22 21 18 21 36 52 36 37 38
## [15553] 37 20 22 17 17 17 18 20 17 17 22 17 37 29 36 28 40 16 17 37 17 20 19 36
## [15577] 36 21 19 36 18 19 17 17 17 18 21 NA 33 21 NA 19 34 53 17 17 17 19 18 36
## [15601] 36 18 21 36 17 21 NA 40 36 NA 37 17 19 21 17 17 21 21 21 37 19 17 37 NA
## [15625] 20 22 17 20 18 36 17 36 28 17 36 21 16 21 32 35 37 17 21 36 31 21 37 21
## [15649] 21 22 18 20 16 37 18 NA 36 37 37 22 21 22 21 16 18 19 22 35 21 21 16 21
## [15673] 18 37 37 36 37 16 33 21 21 17 21 33 17 34 20 18 17 17 21 21 17 17 17 21
## [15697] 17 16 36 52 18 21 15 22 21 21 20 20 31 52 17 36 17 17 21 17 21 17 52 21
## [15721] 21 17 17 17 21 37 37 17 28 21 17 17 22 36 17 21 17 NA 17 17 21 17 17 21
## [15745] 20 17 17 31 17 21 17 21 37 22 36 17 17 17 17 31 17 32 22 36 24 21 NA 21
## [15769] 17 36 37 21 31 20 17 21 18 22 21 33 22 17 17 NA 17 37 31 36 37 31 37 38
## [15793] 21 17 17 53 36 17 17 17 21 33 NA 37 17 37 17 17 21 17 36 52 21 21 37 17
## [15817] NA 37 37 37 16 NA 36 17 17 17 17 36 21 37 37 17 17 31 21 16 37 37 31 22
## [15841] 22 22 37 20 33 32 29 36 21 16 52 17 21 21 18 32 36 34 18 38 17 21 37 NA
## [15865] 17 23 38 25 37 53 17 36 37 17 16 36 NA 20 37 NA 17 21 16 36 22 37 17
## [15889] 19 23 37 17 17 17 37 23 20 21 17 21 NA 35 17 22 17 21 35 16 18 16 20 29
## [15913] 33 36 37 22 16 17 20 17 17 32 20 31 38 15 16 16 17 21 16 17 21 16 NA 16
## [15937] 16 31 16 16 17 17 53 36 27 17 37 37 38 NA 16 21 17 17 16 22 17 17 17 14
## [15961] 37 20 21 16 38 22 50 21 22 36 17 17 21 NA 37 16 35 22 17 17 33 22 36 21
## [15985] 34 20 32 32 21 37 18 37 38 22 54 20 17 37 22 50 NA NA 21 17 37 36 27 19
## [16009] 17 22 19 22 22 NA 37 36 17 22 37 33 21 21 37 37 22 17 30 16 37 22 17 17
## [16033] 33 22 17 27 37 36 21 38 21 33 22 24 29 23 17 22 36 31 36 21 18 35 17 54
## [16057] 37 36 37 33 NA 36 22 17 17 21 17 21 22 16 36 22 17 37 37 21 37 37 17 17
## [16081] 17 37 21 37 37 39 37 30 17 17 37 17 36 15 20 29 18 NA 33 20 NA 36 18 17
## [16105] 17 20 22 16 29 21 33 17 38 16 15 31 17 36 17 32 NA 20 37 17 34 16 21 NA
## [16129] 54 16 17 35 16 35 36 16 15 20 27 20 22 16 37 16 17 21 20 20 20 20 34 28
## [16153] 47 16 16 37 17 32 16 NA 36 37 NA 33 15 21 29 36 31 53 17 NA 37 21 NA 21
## [16177] 20 18 17 17 36 36 22 NA 16 37 17 NA 17 36 36 33 37 36 19 37 17 24 17 21
## [16201] 50 19 39 36 20 36 22 37 36 17 21 20 36 17 NA NA NA NA 19 NA NA NA NA NA NA
## [16249] NA NA NA NA NA 37 NA NA NA NA NA NA NA NA NA 18 NA NA NA NA NA NA NA NA NA
## [16321] NA NA NA NA 21 21 21 22 20 37 NA 19 23 NA 32 18 34 16 36 33 49 17 37 35
## [16345] 17 NA 36 38 39 32 21 37 23 19 21 20 NA 25 22 16 21 34 18 35 36 16 20 36
## [16369] 33 20 17 37 NA 36 21 36 37 37 16 35 37 17 37 37 36 NA 17 23 36 37 21 17
## [16393] 22 38 37 37 22 34 36 24 38 36 21 NA 11 39 33 34 36 17 18 36 37 36 34 NA
## [16417] 22 22 22 36 24 16 34 21 16 31 24 22 35 21 37 40 20 21 35 22 22 NA 21 36
## [16441] 52 37 37 22 19 33 22 35 20 22 29 NA NA NA 35 36 19 37 36 37 21 34 38 21
## [16465] 37 37 23 36 39 38 32 38 22 33 19 36 33 21 37 36 NA 22 37 20 37 36 37 NA
## [16489] NA 33 37 35 21 36 36 NA 37 21 21 37 21 20 21 37 37 20 37 21 21 37 34 22
## [16513] 32 21 48 26 36 37 18 21 36 36 16 22 NA 32 16 16 37 NA 37 29 37 37 18 37
## [16537] 21 21 NA 37 23 36 21 16 36 31 22 22 37 20 21 16 36 21 21 36 NA 37 20 21
## [16561] 22 15 15 NA 37 NA 16 15 36 36 20 NA 21 21 37 17 37 37 37 54 32 36 15 37
## [16585] 36 21 37 21 21 16 23 17 15 15 37 17 20 13 12 21 15 20 15 NA 21 32 17 17
## [16609] 17 22 NA 37 23 17 22 17 37 NA 34 21 18 21 16 36 20 33 17 21 26 14 37 16
## [16633] 15 NA 50 15 37 17 16 22 16 NA 21 NA 35 17 21 38 22 37 35 18 21 17 36 22
## [16657] 22 23 27 37 36 17 36 36 16 36 36 17 27 21 38 20 35 17 20 21 20 NA 22 37
## [16681] 20 22 36 17 16 37 19 NA 35 22 NA 16 22 38 37 22 37 35 27 21 17 38 51 22
## [16705] 17 17 20 20 21 38 15 38 36 36 37 17 35 20 16 22 21 37 37 29 37 20 37 17
```

```
## [19321] 16 38 20 36 20 37 19 15 16 37 20 20 39 37 16 15 15 35 21 15 20 17 17 17
## [19345] 36 35 15 NA 17 NA 17 17 37 16 16 16 16 16 20 NA 17 15 36 35 NA 17 26 15
## [19369] 21 16 35 16 21 36 16 19 19 36 15 13 16 16 17 15 16 NA 17 16 16 36 36 37
## [19393] 16 20 16 16 17 16 NA 21 16 37 16 19 16 16 36 16 12 NA 20 33 NA 21 17 36
## [19417] NA 28 16 20 36 15 32 NA 37 21 36 20 19 NA 36 36 17 17 16 20 19 20 20 20
## [19441] 21 NA 37 18 16 35 36 17 15 17 38 16 45 16 15 16 35 17 36 35 25 NA 20 16
## [19465] 16 18 39 37 21 21 36 24 15 13 20 15 16 35 16 16 18 16 21 21 35 22 39 36
## [19489] NA 35 16 NA 15 15 15 16 15 36 13 35 36 18 35 35 16 37 37 37 20 37 35 16
## [19513] 20 14 17 35 15 NA 17 37 16 36 36 17 37 15 17 39 36 19 38 21 21 34 15 16
## [19537] 17 NA 36 19 37 16 13 14 35 22 NA 14 16 17 35 35 35 NA 31 15 37 36 12 15
## [19561] 35 19 18 37 36 34 6 NA 37 36 32 18 21 NA 14 19 17 16 14 20 13 17 39 13
## [19585] 21 17 38 NA 16 24 36 NA 32 17 20 20 NA 16 36 17 35 34 36 NA 17 35 31 33
## [19609] 14 32 15 32 15 16 36 38 34 35 18 38 16 38 35 22 38 19 17 36 15 20 20 NA
## [19633] 24 20 NA NA 17 20 21 34 20 20 36 16 36 21 35 14 16 37 36 16 15 16 26 36
## [19657] 20 21 36 36 20 49 37 21 36 17 37 36 NA 20 20 36 20 37 NA 16 15 NA 18 38
## [19681] 35 NA 36 37 35 22 36 22 36 22 21 20 38 15 22 36 36 12 26 21 21 17 16 38
## [19705] 36 35 17 36 17 NA NA 37 37 NA 20 40 37 17 NA 37 36 36 21 35 35 NA 37 21
## [19729] 37 36 22 25 25 39 17 37 37 20 21 20 17 17 17 25 NA NA 20 35 38 17 NA NA
## [19753] 14 17 14 21 36 21 36 37 16 18 23 14 16 37 21 21 37 17 17 16 17 16 14 36
## [19777] 17 37 37 21 35 21 25 14 37 35 19 16 36 16 16 49 17 36 16 35 20 16 15 19
## [19801] 16 36 37 35 17 36 37 16 36 22 16 16 36 38 16 35 NA 19 36 14 37 35 36 16
## [19825] 20 20 25 39 17 20 NA NA 35 NA 22 20 17 15 17 34 35 21 37 17 15 35 35 17
## [19849] 32 17 16 17 NA 37 37 22 26 17 21 17 36 18 35 37 37 37 35 37 16 35 21 15
## [19873] 37 16 16 37 NA 19 36 35 36 36 37 48 46 21 20 34 17 17 NA 21 36 36 21 36
## [19897] 37 32 27 37 15 37 26 36 22 22 38 17 38 37 14 36 20 23 NA 39 25 34 34 36
## [19921] 34 39 16 37 34 18 37 NA 39 22 35 22 15 22 36 38 34 37 NA NA 22 33 21 36
## [19945] 38 35 22 15 21 21 36 NA 36 37 18 21 17 21 50 23 30 39 35 35 NA 36 35 23
## [19969] 26 18 NA 24 37 37 19 23 15 27 33 36 37 NA 21 36 36 21 22 36 NA 37 38 37
## [19993] 36 21 37 35 14 31 36 35 23 37 38 37 NA NA NA NA 35 36 21 33 37 21 21 36
## [20017] 35 17 20 19 36 36 NA 23 50 NA 21 21 22 33 39 20 36 37 NA 19 NA 36 36 36
## [20041] 22 34 16 35 NA NA 26 14 36 38 30 20 17 29 29 51 NA NA 36 15 33 34 37 37
## [20065] 36 36 36 39 17 34 35 20 37 37 34 22 16 36 25 35 NA NA 37 16 17 21 22 22
## [20089] 21 36 21 16 21 21 36 47 16 20 36 22 34 21 15 NA 22 21 34 17 33 32 50 17
## [20113] 36 21 17 NA 21 18 22 33 35 NA 21 33 22 35 34 21 31 34 20 34 38 17 35 37
## [20137] 21 21 21 22 52 35 15 20 20 39 21 34 36 16 36 35 20 37 33 18 37 23 19 39
## [20161] 38 37 35 23 NA NA 20 22 21 22 15 21 25 21 35 21 36 21 16 36 16 35 NA NA
## [20185] 20 35 18 22 36 21 36 21 30 22 21 38 21 22 39 15 33 22 36 21 22 23 21 21
## [20209] 17 16 36 34 39 35 17 21 22 34 15 NA NA 36 22 NA 36 22 36 37 17 37 36 21
## [20233] 35 20 21 34 37 34 17 NA NA 25 20 16 14 34 22 34 14 20 20 36 19 21 19 37
## [20257] 33 33 21 15 19 23 16 20 34 21 25 24 34 22 21 21 36 NA 35 22 47 30 14 NA
## [20281] 15 21 35 20 21 NA 36 20 20 33 21 19 50 35 15 NA 36 35 NA 21 20 20 NA 17
## [20305] 35 36 22 20 36 20 36 NA 21 35 35 20 21 38 37 33 36 21 21 21 35 20 NA NA
## [20329] 16 23 NA NA 21 35 NA 16 15 31 31 15 16 36 21 21 15 NA 35 NA NA 35 50 34
## [20353] 35 20 NA NA 20 15 33 NA 19 NA 20 32 22 33 11 19 34 18 15 NA 37 16 35 36
## [20377] NA 22 39 18 17 15 19 22 22 16 17 17 25 35 17 49 NA NA 18 20 17 37 NA 22
## [20401] 32 15 14 37 NA 36 NA 20 NA 37 36 37 35 35 22 16 17 36 NA 18 37 NA 36 34
## [20425] 20 21 36 16 16 17 36 NA 21 16 NA 36 31 16 16 17 20 14 36 19 17 NA 34 16
## [20449] 16 36 18 15 NA 36 17 20 36 NA 36 NA NA 21 35 16 NA 33 15 34 33 35 NA 36
## [20473] 15 36 12 17 21 18 20 15 50 37 17 35 37 11 34 35 34 NA 36 37 15 15 15 35
## [20497] NA 14 36 34 15 15 21 19 35 35 15 16 32 34 NA 16 12 36 NA 34 36 19 NA 37
## [20521] 15 NA 16 36 16 16 31 37 14 35 16 17 NA 20 NA 47 21 35 36 36 34 17 NA NA
## [20545] NA 16 NA NA NA 19 37 38 35 32 16 NA 37 35 51 37 35 9 17 NA 35 35 36 35
## [20569] 35 17 36 NA NA NA NA 15 16 16 16 16 31 36 19 31 16 NA 37 NA 16 11 15 37
## [20593] 35 NA 19 15 NA 36 16 37 16 NA 36 34 17 20 20 36 50 37 20 NA 35 35 34 13
```

```
## [23209] 23 37 NA NA NA NA 16 36 36 37 20 36 16 34 37 39 40 27 39 21 16 36 36 26
## [23233] 38 35 37 38 35 38 29 15 21 36 36 16 36 20 36 22 36 15 17 35 36 20 35 12
## [23257] 36 20 39 20 16 21 39 38 39 16 20 37 23 35 16 36 37 NA NA 17 39 38 16 16
## [23281] 37 37 15 17 15 17 24 16 16 16 15 36 36 16 36 38 NA 33 33 36 38 38 37 18
## [23305] 37 38 39 38 36 38 37 36 21 36 38 36 15 35 38 37 37 36 37 38 36 23 38 38
## [23329] 36 15 39 34 34 17 39 16 38 38 37 19 38 35 16 21 37 38 18 36 37 24 38 16
## [23353] 22 39 18 NA 35 36 21 37 38 38 37 35 34 18 26 40 17 17 20 20 26 16 37 35
## [23377] 17 15 20 14 16 37 36 35 34 38 21 35 36 34 35 21 22 21 20 20 17 21 20 35
## [23401] 38 17 35 20 36 17 17 38 24 21 NA 19 23 37 39 16 38 21 21 24 16 37 16 37
## [23425] 22 37 38 35 16 36 21 36 23 22 NA 16 36 37 16 39 38 21 38 38 23 16 38 17
## [23449] 37 16 35 34 36 37 38 36 37 17 17 16 38 17 17 35 17 38 16 37 16 17 35 36
## [23473] 37 16 22 37 16 16 34 38 37 23 37 16 37 37 15 35 16 39 15 21 35 NA NA 36
## [23497] 16 36 37 34 23 16 18 20 16 23 15 37 37 37 16 17 21 39 17 20 NA 21 36 16
## [23521] 36 37 20 21 16 16 36 19 17 23 16 17 16 24 30 45 NA 23 23 16 17 16 21 37
## [23545] 16 20 20 40 38 36 24 37 23 22 22 NA 16 17 20 16 34 17 17 20 37 18 36 22
## [23569] 16 21 16 20 21 36 37 37 NA 12 21 23 17 NA 19 33 18 23 17 24 36 17 17 17
## [23593] NA NA 23 24 24 20 17 24 17 17 35 21 20 16 36 19 18 17 38 35 NA 22 18 16
## [23617] 21 22 37 16 37 39 22 37 24 37 37 38 34 19 38 36 18 22 39 24 36 36 16 23
## [23641] 36 34 22 NA 37 21 37 23 21 34 17 17 38 16 37 15 15 21 17 20 17 38 34 17
## [23665] 21 15 24 16 17 37 19 23 37 17 16 23 NA 16 18 18 36 35 24 16 17 37 40 16
## [23689] 37 15 18 24 37 16 24 17 21 37 21 18 38 15 36 17 38 37 25 22 17 21 24 16
## [23713] 17 NA 37 19 17 24 20 34 17 18 17 24 15 23 15 22 20 20 16 22 20 31 20 22
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