log_reg.R

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2019-11-15

```
#### Logistic Regression #####
#install.packages("cowplot",
lib="/Library/Frameworks/R.framework/Versions/3.5/Resources/library")
library(cowplot)

##
## ************************************************************

## Note: As of version 1.0.0, cowplot does not change the

##   default ggplot2 theme anymore. To recover the previous

##   behavior, execute:
##   theme_set(theme_cowplot())

## ************************************************************

library(dplyr)

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

library(ggplot2)
data <- read.csv("C:/Users/saiprasad/Desktop/Fall 2019/Multi
analysis/MVA/Project/Dataset/HCV-EGY-Data.csv")
attach(data)
Survivorship = data$Survivorship <- if_else( RNA.EOT>= 400000 , 'NC','C')
cbind(data.frame(Survivorship),data)

##      Survivorship Age Gender BMI Fever Nausea.Vomting Headache Diarrhea
## 1               C  56      1  35     2              1        1        1
## 2               C  46      1  29     1              2        2        1
## 3              NC  57      1  33     2              2        2        2
## 4              NC  49      2  33     1              2        1        2
## 5               C  59      1  32     1              1        2        1
## 6               C  58      2  22     2              2        2        1
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## 7     C  42  2  26  1  1  2  2
## 8     C  48  2  30  1  1  2  2
## 9     C  44  1  23  1  1  2  2
## 10    C  45  1  30  2  1  2  2
## 11   NC  37  2  24  2  1  2  1
## 12    C  36  1  22  2  2  1  1
## 13    C  45  2  25  2  1  1  1
## 14    C  34  1  22  1  2  1  1
## 15   NC  40  2  32  2  2  2  1
## 16   NC  58  1  34  2  1  1  1
## 17    C  61  1  35  1  2  2  2
## 18    C  55  2  24  2  1  2  2
## 19   NC  56  1  27  1  2  2  2
## 20   NC  35  2  23  2  2  1  1
## 21   NC  57  2  23  1  1  2  2
## 22    C  33  1  25  2  1  2  2
## 23    C  41  1  23  1  2  2  2
## 24    C  39  2  29  1  2  1  2
## 25    C  33  2  24  1  2  2  2
## 26    C  43  2  34  2  2  2  1
## 27   NC  51  1  34  2  1  2  2
## 28   NC  39  2  33  2  1  2  1
## 29    C  57  2  26  1  2  2  1
## 30    C  47  2  29  1  1  2  1
## 31    C  55  2  33  1  2  2  1
## 32    C  58  2  35  2  2  2  2
## 33   NC  47  2  25  2  1  2  2
## 34    C  61  1  33  1  2  2  2
## 35   NC  37  1  27  2  2  1  2
## 36   NC  41  1  29  1  2  1  1
## 37    C  60  2  32  2  2  1  2
## 38    C  54  1  29  1  1  1  2
## 39    C  40  2  28  2  1  2  1
## 40    C  32  1  31  1  2  1  1
## 41   NC  58  2  33  1  2  2  2
## 42    C  37  2  23  2  2  1  1
## 43    C  58  1  23  1  1  1  2
## 44   NC  36  1  23  2  2  1  2
## 45    C  47  2  35  1  2  2  1
## 46    C  50  1  33  2  2  1  1
## 47    C  44  1  31  1  1  1  1
## 48   NC  43  1  33  1  1  2  2
## 49   NC  54  1  33  2  1  1  2
## 50   NC  59  2  26  2  1  1  1
## 51    C  33  2  31  1  1  1  2
## 52    C  56  2  23  1  1  1  2
## 53   NC  41  1  33  2  1  1  1
## 54   NC  59  1  32  2  1  1  1
## 55    C  47  1  27  2  2  1  1
## 56    C  50  2  34  1  1  1  2
```

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

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## 207              C  58      2  25      1                1          1          2
## 208              C  35      2  33      1                2          2          1
## 209             NC  56      1  34      1                2          2          1
## 210             NC  61      1  34      2                1          1          1
## 211              C  58      1  29      2                2          1          1
## 212             NC  43      2  22      2                2          1          1
## 213             NC  51      2  34      1                2          1          1
## 214              C  53      2  24      1                2          1          1
## 215              C  46      2  24      2                1          1          1
## 216              C  32      2  35      1                1          1          1
## 217              C  41      1  33      2                2          2          2
## 218              C  37      2  34      1                2          2          1
## 219             NC  33      1  30      2                2          2          2
## 220              C  35      2  35      1                1          2          1
## 221              C  33      2  27      2                2          1          2
## 222              C  43      2  27      2                2          2          2
## 223             NC  48      1  30      1                1          1          1
## 224             NC  58      1  35      2                2          2          2
## 225              C  61      2  27      1                1          2          2
## 226              C  38      2  25      1                1          2          1
## 227              C  38      1  29      2                2          1          2
## 228              C  35      1  26      2                2          1          2
## 229              C  40      1  24      2                1          1          1
## 230             NC  43      1  30      2                2          1          2
## 231              C  45      2  30      2                2          1          2
## 232              C  56      1  26      1                1          2          1
## 233              C  58      2  26      1                1          1          2
## 234             NC  42      2  27      2                1          1          1
## 235              C  55      1  31      1                1          2          2
## 236              C  49      1  22      2                1          2          2
## 237              C  50      2  30      2                2          1          2
## 238              C  51      1  30      1                2          1          1
## 239              C  54      2  35      1                2          1          2
## 240              C  38      1  24      2                1          2          2
## 241              C  39      1  32      1                1          1          1
## 242              C  55      2  35      1                2          1          2
## 243              C  49      1  30      2                1          2          1
## 244              C  55      2  26      2                2          2          2
## 245              C  59      2  31      2                2          2          2
## 246              C  57      1  24      2                2          1          2
## 247             NC  45      1  34      2                1          1          1
## 248              C  41      1  31      2                2          2          2
## 249             NC  38      2  31      2                2          1          1
## 250              C  48      2  28      2                1          1          1
## 251             NC  59      2  27      1                1          2          1
## 252              C  34      2  34      2                2          2          2
## 253              C  37      2  31      2                2          1          1
## 254              C  38      1  27      1                2          2          1
## 255              C  32      2  30      1                2          1          2
## 256              C  39      1  29      1                1          1          1
```

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## 257              NC  57      1  31      1                1          2          1
## 258               C  37      2  34      1                1          1          1
## 259               C  54      1  26      2                1          2          2
## 260               C  52      2  31      2                1          1          2
## 261              NC  32      1  29      2                2          1          2
## 262              NC  55      1  27      1                1          1          1
## 263              NC  50      2  25      1                1          2          1
## 264               C  36      2  27      1                1          1          2
## 265               C  49      2  24      2                1          2          2
## 266               C  57      2  29      1                2          1          1
## 267              NC  42      2  27      1                2          2          2
## 268               C  49      2  22      1                1          1          2
## 269               C  49      2  31      1                1          1          2
## 270               C  53      2  31      2                1          1          2
## 271              NC  46      2  25      2                1          1          2
## 272              NC  58      2  23      1                2          1          2
## 273              NC  46      1  28      2                1          1          2
## 274               C  45      1  32      2                1          2          1
## 275              NC  44      1  32      1                1          1          2
## 276              NC  58      2  35      2                2          1          1
## 277              NC  47      1  30      1                1          2          1
## 278               C  38      2  34      2                1          1          1
## 279               C  46      1  22      1                2          1          1
## 280              NC  36      2  34      2                1          2          1
## 281               C  33      2  23      1                1          1          1
## 282               C  52      1  28      2                2          1          2
## 283               C  58      2  22      1                1          1          1
## 284              NC  42      2  31      2                1          1          1
## 285               C  59      1  28      1                2          2          1
## 286               C  53      2  31      2                2          2          2
## 287               C  40      1  31      2                2          1          2
## 288              NC  48      1  30      1                2          2          1
## 289              NC  44      1  31      1                2          2          2
## 290              NC  46      2  28      1                1          1          1
## 291               C  32      1  31      2                2          2          1
## 292               C  44      2  31      2                2          2          2
## 293               C  33      2  31      1                1          2          1
## 294              NC  33      1  28      2                2          1          2
## 295              NC  47      1  29      2                2          2          1
## 296               C  57      2  23      2                2          1          1
## 297              NC  54      2  24      1                2          1          1
## 298               C  43      2  26      2                1          1          1
## 299               C  39      1  27      1                2          2          1
## 300              NC  47      2  28      1                1          2          2
## 301               C  52      1  26      1                2          2          1
## 302               C  38      1  24      2                1          1          1
## 303               C  60      1  22      1                2          1          1
## 304               C  34      1  29      2                2          2          1
## 305               C  40      2  30      1                1          2          1
## 306              NC  33      2  27      2                1          1          1
```

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## 307          NC  60     2  32     2              1         2         2
## 308           C  43     2  26     1              2         1         2
## 309          NC  39     1  35     1              1         2         2
## 310          NC  34     1  28     1              2         2         2
## 311          NC  56     2  35     2              1         1         1
## 312          NC  45     2  26     1              2         2         2
## 313          NC  54     1  33     2              1         1         1
## 314           C  35     1  23     2              1         1         1
## 315          NC  36     2  24     1              1         2         2
## 316           C  37     1  35     2              1         1         1
## 317          NC  56     2  32     2              2         2         1
## 318           C  41     2  34     2              1         2         1
## 319           C  38     1  25     2              2         2         2
## 320          NC  50     1  27     2              2         1         1
## 321          NC  61     2  30     2              2         1         1
## 322           C  58     1  35     1              1         2         2
## 323           C  57     2  24     1              1         1         2
## 324           C  39     1  23     1              1         2         2
## 325           C  58     1  26     2              1         2         2
## 326          NC  44     2  32     2              1         2         2
## 327          NC  53     1  27     2              1         2         1
## 328          NC  58     2  31     2              2         2         1
## 329           C  57     1  32     2              2         2         2
## 330          NC  46     1  24     1              1         2         2
## 331           C  44     1  34     2              2         2         2
## 332           C  56     1  30     1              2         2         2
## 333           C  57     2  30     2              1         2         1
## 334           C  36     1  31     2              2         1         2
## 335           C  51     2  23     2              1         2         2
## 336          NC  38     1  32     2              1         1         2
## 337          NC  52     2  31     1              2         2         2
## 338           C  58     2  24     1              1         1         2
## 339          NC  43     1  23     2              2         1         2
## 340           C  36     1  35     1              1         2         1
## 341           C  50     2  25     2              2         2         2
## 342           C  35     1  22     2              1         2         1
## 343          NC  38     2  30     1              2         2         2
## 344           C  35     1  25     2              1         1         2
## 345           C  59     2  24     2              1         2         2
## 346           C  51     2  34     2              1         2         2
## 347           C  37     1  34     1              2         1         2
## 348           C  56     2  34     1              1         2         1
## 349           C  49     1  33     1              1         1         1
## 350          NC  59     2  25     1              1         2         2
## 351          NC  59     1  23     2              2         2         2
## 352          NC  51     2  35     2              2         2         1
## 353           C  51     2  32     1              1         2         2
## 354          NC  58     2  34     1              2         2         2
## 355           C  39     2  28     2              1         1         1
## 356           C  39     1  35     2              1         2         2
```

```
## 357          NC  39    2  23    1          2    2    1
## 358          NC  47    2  35    1          2    1    1
## 359           C  47    2  25    2          1    1    2
## 360           C  52    2  23    2          1    1    2
## 361           C  39    2  32    2          2    1    2
## 362          NC  54    1  30    1          2    1    2
## 363           C  36    2  29    2          1    1    1
## 364          NC  48    2  26    1          2    1    1
## 365          NC  56    2  32    1          1    1    2
## 366           C  33    1  35    2          1    1    1
## 367           C  57    1  26    1          1    1    1
## 368           C  38    1  22    2          1    2    1
## 369          NC  32    2  22    2          1    1    1
## 370           C  52    1  34    1          2    2    2
## 371           C  49    2  30    2          1    2    2
## 372           C  40    2  24    2          2    2    2
## 373           C  54    1  25    2          1    2    2
## 374           C  48    2  30    2          1    1    2
## 375           C  39    1  23    1          2    2    1
## 376           C  44    1  30    1          2    2    2
## 377           C  41    2  30    2          1    1    1
## 378           C  39    1  31    2          1    1    1
## 379          NC  56    2  25    2          2    2    2
## 380           C  56    2  34    1          1    1    2
## 381           C  32    2  24    1          1    1    2
## 382           C  48    1  24    2          2    1    1
## 383          NC  58    2  23    1          1    2    2
## 384          NC  33    2  35    2          2    1    2
## 385           C  55    2  28    1          1    1    1
## 386           C  57    1  29    1          1    2    2
## 387           C  45    2  25    1          2    1    1
## 388           C  40    2  32    1          2    1    1
## 389           C  56    2  30    2          2    2    1
## 390           C  33    2  29    2          1    1    1
## 391          NC  56    2  25    2          1    2    1
## 392          NC  41    2  23    1          1    2    2
## 393          NC  47    2  28    1          1    1    2
## 394           C  42    2  30    2          1    2    2
## 395           C  59    1  22    1          1    2    2
## 396           C  44    1  28    2          1    1    1
## 397          NC  49    2  23    1          1    1    2
## 398          NC  42    2  29    2          2    2    1
## 399           C  47    1  23    2          2    2    2
## 400           C  32    1  29    2          2    2    1
## 401           C  47    1  34    1          1    1    1
## 402           C  52    1  28    1          1    2    1
## 403           C  59    2  29    2          2    2    1
## 404           C  57    1  31    2          1    1    1
## 405           C  58    1  34    1          1    1    2
## 406           C  51    2  28    2          1    2    2
```

```
## 407   C  51  2  33  1  2  2  2
## 408   C  54  1  25  2  1  1  2
## 409  NC  49  1  33  2  1  1  2
## 410  NC  40  2  27  2  2  1  2
## 411   C  51  1  24  1  1  1  2
## 412   C  37  1  29  2  1  2  2
## 413   C  39  1  34  2  1  2  2
## 414   C  34  2  33  2  2  2  2
## 415   C  34  2  33  2  2  1  2
## 416  NC  35  2  32  2  1  1  2
## 417  NC  44  2  24  2  1  1  1
## 418  NC  44  1  33  2  2  1  2
## 419   C  32  2  22  1  2  2  2
## 420  NC  42  2  29  2  2  1  1
## 421  NC  38  1  23  1  1  2  1
## 422  NC  61  2  27  1  1  2  2
## 423   C  35  2  31  1  2  2  1
## 424  NC  54  2  28  1  2  1  2
## 425  NC  52  1  24  2  1  2  1
## 426   C  56  1  26  1  2  1  1
## 427   C  40  1  33  2  2  2  1
## 428   C  42  1  31  1  1  2  2
## 429   C  38  2  34  1  2  1  2
## 430   C  51  2  27  2  1  2  1
## 431  NC  55  2  30  1  1  1  2
## 432   C  33  2  27  2  2  2  1
## 433   C  54  1  35  1  1  2  1
## 434   C  49  2  35  2  1  1  1
## 435   C  51  2  27  1  1  2  2
## 436   C  44  2  24  1  2  1  1
## 437   C  58  2  31  2  2  2  1
## 438   C  45  2  25  1  2  2  1
## 439   C  59  1  23  2  1  2  1
## 440  NC  49  1  24  2  1  1  2
## 441   C  42  1  28  2  1  2  2
## 442  NC  53  2  26  2  2  1  2
## 443   C  47  1  27  1  1  1  1
## 444  NC  37  2  32  1  2  2  2
## 445   C  33  2  26  2  1  1  1
## 446   C  40  1  32  1  2  1  2
## 447  NC  48  1  25  1  2  2  1
## 448  NC  49  1  24  1  2  2  1
## 449  NC  34  1  25  1  1  2  1
## 450  NC  35  1  32  2  2  2  1
## 451  NC  34  2  35  2  1  1  2
## 452  NC  61  2  26  2  1  2  2
## 453   C  38  1  28  2  1  1  2
## 454   C  59  2  25  2  2  1  1
## 455   C  53  1  34  1  2  1  2
## 456   C  44  1  22  2  2  1  2
```

```
## 457              C  59      2  23      2              1         2         1
## 458              C  33      2  34      1              1         2         1
## 459              C  34      1  30      2              1         1         2
## 460              C  35      1  31      1              1         1         2
## 461              C  56      1  30      1              1         2         1
## 462              C  44      2  34      1              2         2         2
## 463              C  43      1  24      2              2         1         1
## 464             NC  36      2  28      1              1         2         2
## 465             NC  56      1  31      1              1         1         2
## 466              C  58      1  30      2              1         2         2
## 467             NC  39      2  35      1              1         2         1
## 468             NC  38      1  32      2              1         2         2
## 469              C  33      1  35      1              2         1         2
## 470             NC  51      2  31      1              1         2         1
## 471              C  42      2  34      2              1         2         2
## 472              C  45      1  30      2              1         2         2
## 473             NC  38      1  29      1              1         2         2
## 474             NC  57      1  28      2              1         2         1
## 475              C  41      1  31      2              1         1         2
## 476             NC  57      2  22      2              2         2         2
## 477              C  45      2  32      2              1         2         1
## 478              C  33      2  25      1              1         2         2
## 479             NC  59      1  28      1              2         1         2
## 480              C  60      2  22      1              2         1         2
## 481              C  61      1  25      2              2         2         1
## 482             NC  46      2  33      2              2         1         2
## 483             NC  35      2  32      1              1         2         2
## 484              C  52      2  34      2              2         1         1
## 485             NC  37      2  26      1              2         2         2
## 486             NC  49      1  33      1              2         2         2
## 487             NC  44      2  25      1              2         1         2
## 488             NC  58      1  24      2              1         1         2
## 489             NC  41      1  29      2              2         1         2
## 490              C  47      1  24      1              1         1         1
## 491              C  56      1  27      2              1         1         1
## 492             NC  40      2  33      2              2         1         1
## 493              C  56      1  28      2              1         1         2
## 494              C  58      2  25      2              1         2         1
## 495              C  56      1  26      2              2         1         2
## 496              C  50      1  31      1              1         1         2
## 497              C  37      1  31      1              1         2         1
## 498             NC  43      2  22      2              2         2         1
## 499              C  46      1  29      2              2         2         1
## 500             NC  41      1  34      1              2         1         2
## 501             NC  37      1  23      1              2         2         1
## 502             NC  61      2  27      2              2         2         2
## 503              C  38      1  27      1              2         2         1
## 504              C  47      2  32      2              2         1         2
## 505             NC  49      1  34      1              2         1         1
## 506             NC  38      2  28      2              2         2         1
```

```
## 507              C  34      2  31      1                2         1         1
## 508             NC  43      1  26      2                2         1         2
## 509             NC  53      1  29      1                2         2         2
## 510             NC  60      2  30      1                1         2         2
## 511              C  53      2  27      2                1         1         1
## 512              C  38      1  23      1                2         1         1
## 513              C  36      2  31      1                2         2         2
## 514              C  36      1  28      1                2         1         1
## 515             NC  56      1  24      2                2         1         2
## 516             NC  60      2  33      1                1         2         2
## 517             NC  56      2  27      1                1         1         2
## 518              C  52      2  32      1                2         1         2
## 519              C  38      2  23      1                2         1         1
## 520              C  34      1  23      1                2         2         1
## 521              C  34      2  32      2                1         2         2
## 522             NC  53      1  30      2                2         2         2
## 523             NC  44      2  27      1                2         2         2
## 524             NC  47      2  33      1                1         1         1
## 525              C  48      1  22      2                2         1         2
## 526              C  37      1  31      1                1         1         1
## 527              C  61      1  31      2                1         1         2
## 528              C  52      2  25      2                1         1         2
## 529              C  49      2  24      1                1         2         1
## 530              C  34      2  27      2                1         2         1
## 531              C  59      2  25      2                2         2         1
## 532              C  40      2  28      1                1         1         2
## 533              C  33      2  24      2                1         1         1
## 534             NC  46      1  28      1                1         1         1
## 535              C  60      2  32      1                2         1         2
## 536              C  39      1  26      1                1         1         1
## 537             NC  34      2  24      1                2         1         2
## 538              C  49      2  24      2                1         1         2
## 539             NC  45      2  22      1                1         2         2
## 540             NC  37      2  34      1                1         1         2
## 541             NC  43      2  33      1                1         1         1
## 542             NC  35      2  32      1                1         1         1
## 543              C  38      1  22      2                2         2         1
## 544             NC  58      1  31      2                2         2         1
## 545              C  61      2  27      2                2         2         2
## 546              C  37      1  34      2                1         2         1
## 547             NC  36      1  33      2                1         2         2
## 548             NC  47      1  29      1                2         1         1
## 549              C  60      2  28      2                2         2         2
## 550              C  35      2  25      2                2         2         2
## 551              C  40      2  30      1                2         2         1
## 552              C  46      1  22      1                1         1         1
## 553              C  58      1  23      1                1         2         2
## 554             NC  33      1  26      2                2         1         2
## 555              C  37      1  33      1                2         1         2
## 556              C  59      2  33      1                2         1         2
```

```
## 557              C  32      2  26      1              2      2      2
## 558              C  56      2  25      1              2      1      2
## 559              C  34      1  25      1              2      1      1
## 560              C  60      2  29      1              1      1      2
## 561              C  38      1  24      2              2      2      1
## 562              C  36      2  29      1              1      1      1
## 563              C  53      1  33      1              2      2      1
## 564              C  53      2  24      2              2      2      2
## 565              C  55      1  28      1              1      1      2
## 566              C  44      1  34      1              2      2      2
## 567              C  34      2  24      2              1      2      2
## 568              C  41      2  29      1              1      2      1
## 569              C  55      1  28      2              1      2      1
## 570              C  43      2  27      2              1      2      2
## 571              C  58      1  25      2              1      2      1
## 572              C  54      1  26      2              1      2      2
## 573              C  56      2  29      1              1      2      2
## 574             NC  33      1  35      2              1      1      2
## 575              C  37      1  25      1              1      2      1
## 576              C  38      1  28      1              1      2      1
## 577              C  39      1  32      1              2      1      1
## 578              C  59      2  22      2              2      2      2
## 579              C  52      2  24      2              2      1      1
## 580             NC  46      2  34      1              2      2      2
## 581             NC  32      1  32      1              2      1      2
## 582              C  37      1  29      2              1      2      1
## 583              C  44      1  27      2              1      1      2
## 584              C  51      2  27      1              2      1      2
## 585             NC  45      2  27      2              2      1      1
## 586              C  53      1  26      2              1      1      2
## 587              C  60      1  22      1              1      2      2
## 588              C  54      1  33      1              1      2      2
## 589             NC  54      2  34      1              2      1      1
## 590              C  39      1  23      2              1      2      2
## 591              C  48      1  24      1              2      1      2
## 592              C  44      2  34      2              2      1      2
## 593              C  61      2  24      2              2      2      2
## 594             NC  41      1  35      2              1      2      1
## 595              C  52      2  28      1              2      2      1
## 596              C  45      1  35      2              2      1      2
## 597              C  57      1  34      1              2      1      1
## 598             NC  34      1  23      2              2      2      1
## 599              C  32      2  30      2              1      2      1
## 600              C  50      1  29      1              2      1      2
## 601              C  41      1  34      2              2      2      2
## 602             NC  44      2  33      2              1      1      1
## 603              C  59      1  24      2              2      1      1
## 604             NC  34      2  35      1              2      2      2
## 605              C  53      2  31      1              1      1      1
## 606              C  35      1  27      2              2      2      2
```

```
## 607              C  47      1  31      1              1          1          1
## 608              C  51      2  30      2              2          1          1
## 609              C  58      1  22      2              1          1          2
## 610              C  58      1  35      2              2          1          2
## 611              C  46      2  34      1              2          1          1
## 612             NC  36      2  34      2              1          2          2
## 613              C  42      1  31      1              1          1          2
## 614              C  38      1  35      2              2          2          1
## 615             NC  43      2  27      2              2          2          1
## 616             NC  34      2  31      1              2          2          1
## 617              C  45      1  27      1              1          2          2
## 618              C  32      1  25      1              1          1          1
## 619              C  47      2  33      1              1          1          1
## 620             NC  43      2  33      1              2          2          2
## 621              C  41      2  27      2              2          2          1
## 622             NC  57      2  25      2              1          1          1
## 623             NC  52      2  23      1              1          1          1
## 624              C  45      1  34      1              2          1          2
## 625              C  46      2  35      2              2          2          1
## 626             NC  42      1  29      1              1          1          2
## 627              C  44      2  27      2              1          1          2
## 628              C  53      1  35      1              1          2          2
## 629             NC  35      2  34      1              1          2          1
## 630             NC  32      1  31      1              2          1          2
## 631              C  35      2  35      2              2          2          2
## 632              C  59      1  34      2              2          2          2
## 633              C  43      2  24      2              2          2          2
## 634             NC  49      2  33      2              1          1          2
## 635             NC  56      1  22      2              2          2          1
## 636             NC  41      2  32      2              1          1          1
## 637              C  33      1  25      2              2          2          1
## 638              C  60      2  31      2              1          1          2
## 639              C  37      2  30      1              2          2          2
## 640              C  49      1  24      1              1          2          2
## 641              C  44      1  31      2              1          2          1
## 642              C  57      2  24      1              2          1          2
## 643              C  51      2  34      1              1          2          1
## 644              C  58      1  28      2              2          1          2
## 645              C  57      1  32      2              1          1          2
## 646              C  45      2  24      2              2          1          2
## 647             NC  57      2  25      2              2          1          1
## 648             NC  37      1  33      1              2          2          1
## 649              C  48      2  31      1              1          1          1
## 650             NC  54      2  34      2              2          2          1
## 651             NC  42      1  25      1              2          2          1
## 652             NC  49      1  22      2              1          1          1
## 653             NC  52      2  24      1              2          1          1
## 654              C  59      1  27      1              2          1          1
## 655              C  61      2  34      2              1          1          1
## 656              C  37      2  31      1              1          1          1
```

```
## 657              C  52      1  22      2              1          1          1
## 658              C  60      2  28      1              1          2          2
## 659              C  60      2  32      2              1          2          2
## 660             NC  54      1  31      1              2          2          2
## 661             NC  34      1  24      2              1          1          1
## 662             NC  51      1  34      2              2          2          2
## 663             NC  41      2  22      1              2          1          2
## 664              C  45      2  34      2              1          1          2
## 665              C  47      1  22      1              2          1          1
## 666              C  34      2  33      1              2          1          1
## 667              C  39      1  33      2              2          1          1
## 668              C  42      1  35      2              1          2          1
## 669              C  38      2  31      1              2          1          1
## 670             NC  39      1  28      1              2          2          1
## 671              C  46      2  23      2              2          2          1
## 672              C  43      1  25      1              2          1          1
## 673             NC  50      1  24      1              1          1          1
## 674              C  44      1  28      2              1          1          1
## 675              C  52      2  22      1              1          1          2
## 676              C  36      2  22      2              1          2          2
## 677              C  33      2  31      1              2          1          1
## 678             NC  33      1  26      1              2          2          2
## 679              C  41      2  30      2              1          1          2
## 680             NC  51      1  25      1              1          1          1
## 681             NC  57      2  30      1              1          1          1
## 682             NC  35      1  33      2              1          1          1
## 683              C  49      2  28      2              1          2          2
## 684             NC  56      1  30      2              2          2          2
## 685              C  32      1  31      1              1          2          2
## 686             NC  42      2  30      1              2          2          1
## 687              C  35      1  24      2              1          1          2
## 688             NC  38      1  34      2              2          1          1
## 689             NC  38      1  29      1              1          1          2
## 690             NC  54      1  22      1              2          1          1
## 691              C  41      1  34      2              1          2          2
## 692             NC  45      2  24      1              2          1          2
## 693              C  51      2  29      2              1          1          1
## 694              C  55      1  31      2              1          2          2
## 695              C  50      2  35      1              2          1          2
## 696              C  54      2  25      1              2          2          1
## 697              C  32      1  30      2              2          1          2
## 698              C  56      2  34      1              1          2          1
## 699              C  48      2  35      1              2          1          2
## 700              C  37      2  27      2              2          1          1
## 701              C  45      2  25      2              1          2          2
## 702              C  57      1  29      1              1          2          2
## 703              C  45      1  29      1              1          2          2
## 704              C  46      2  27      2              1          2          2
## 705             NC  33      2  35      1              2          1          1
## 706             NC  49      2  22      2              2          2          2
```

```
## 707          NC  56      2  34      1              2          2          1
## 708           C  32      1  31      1              1          1          1
## 709          NC  42      1  33      1              1          1          2
## 710           C  48      1  34      2              2          1          1
## 711           C  48      1  24      2              2          1          2
## 712          NC  60      2  33      1              1          2          1
## 713           C  47      2  32      1              2          1          2
## 714          NC  49      1  22      2              1          2          2
## 715           C  34      2  33      2              1          2          1
## 716          NC  33      2  23      1              2          2          2
## 717           C  53      1  35      1              2          2          1
## 718           C  61      2  24      1              2          2          2
## 719           C  32      1  29      1              2          2          1
## 720           C  42      1  25      1              1          1          1
## 721           C  53      1  27      1              2          2          2
## 722           C  51      2  35      2              1          1          2
## 723          NC  55      2  35      2              1          1          2
## 724           C  44      2  32      2              2          1          2
## 725          NC  52      2  34      2              2          2          2
## 726           C  54      1  26      1              1          1          1
## 727           C  32      1  24      1              2          1          2
## 728           C  58      1  31      1              1          2          1
## 729           C  41      1  32      1              1          1          2
## 730          NC  59      1  31      2              1          2          2
## 731           C  56      1  31      1              1          1          2
## 732           C  32      2  32      1              1          1          2
## 733           C  44      2  26      2              2          1          2
## 734           C  61      2  24      1              1          1          1
## 735           C  54      2  26      2              1          1          2
## 736           C  34      1  22      2              1          1          2
## 737           C  44      2  23      2              2          1          1
## 738          NC  54      2  30      1              2          2          1
## 739           C  48      2  34      2              2          1          2
## 740           C  55      2  35      1              1          2          2
## 741           C  39      1  32      1              1          1          1
## 742           C  41      1  30      1              2          2          1
## 743          NC  59      2  27      2              1          1          1
## 744           C  34      1  29      1              1          1          2
## 745          NC  48      2  27      1              1          1          2
## 746           C  39      1  23      2              1          1          2
## 747           C  32      2  26      2              1          2          1
## 748           C  53      1  33      2              1          1          1
## 749           C  55      1  33      1              2          2          2
## 750           C  54      1  33      2              2          1          1
## 751           C  38      1  35      2              1          2          1
## 752           C  53      2  22      2              2          1          2
## 753          NC  50      2  29      1              1          1          2
## 754           C  42      2  28      2              2          2          1
## 755          NC  58      2  23      1              1          2          2
## 756          NC  40      1  32      2              1          1          2
```

```
## 757              C  43      2  26      1                1         2         2
## 758             NC  47      1  30      2                1         2         2
## 759              C  56      1  25      2                2         2         2
## 760             NC  57      1  22      2                2         2         1
## 761             NC  41      1  35      2                1         2         1
## 762              C  53      1  34      2                2         1         2
## 763              C  53      2  25      2                2         1         2
## 764              C  61      1  26      1                2         1         1
## 765              C  36      1  34      2                1         1         2
## 766              C  53      1  29      2                2         2         2
## 767              C  44      2  28      1                1         2         1
## 768              C  50      1  28      1                1         2         1
## 769              C  49      1  35      1                2         2         1
## 770              C  59      2  33      1                1         1         1
## 771              C  50      1  33      1                1         1         1
## 772              C  53      1  34      1                2         2         1
## 773              C  43      2  27      2                2         1         1
## 774              C  47      1  30      2                2         2         1
## 775              C  42      2  34      2                1         1         1
## 776              C  55      1  29      2                1         2         2
## 777              C  60      1  27      1                2         2         2
## 778              C  36      2  28      2                1         1         2
## 779             NC  46      2  24      1                2         2         1
## 780              C  55      2  32      1                2         1         2
## 781              C  34      2  23      1                1         1         1
## 782             NC  52      1  29      2                2         2         2
## 783             NC  43      1  35      1                2         1         1
## 784             NC  36      2  24      2                1         2         2
## 785             NC  60      2  32      2                2         1         1
## 786             NC  37      2  25      2                1         2         2
## 787              C  34      2  24      2                1         2         1
## 788              C  35      1  30      2                2         2         2
## 789              C  45      2  35      2                1         1         2
## 790             NC  36      1  33      2                1         1         1
## 791             NC  56      1  30      2                2         2         2
## 792             NC  41      2  28      1                2         2         1
## 793              C  38      1  34      1                2         1         1
## 794              C  54      2  24      1                2         1         1
## 795             NC  61      1  27      2                2         1         1
## 796              C  57      2  35      1                1         2         2
## 797             NC  38      1  28      1                2         1         1
## 798              C  59      1  27      2                2         2         1
## 799             NC  40      1  27      2                2         1         2
## 800             NC  32      1  31      1                1         1         2
## 801             NC  42      2  33      2                2         2         2
## 802              C  33      2  30      1                1         2         1
## 803              C  37      1  33      1                2         2         1
## 804              C  45      1  23      1                2         2         2
## 805              C  38      1  35      1                2         1         2
## 806              C  35      1  34      1                2         1         2
```

```
## 807              C  40      2  34      2                2        2        2
## 808              C  50      2  32      2                1        1        1
## 809              C  35      1  24      1                1        1        2
## 810              C  38      2  25      2                1        1        2
## 811              C  47      1  34      1                1        2        2
## 812              C  42      2  28      1                1        1        1
## 813              C  43      2  35      2                2        1        1
## 814              C  43      1  33      1                2        1        2
## 815              C  42      2  35      1                2        1        1
## 816             NC  57      2  30      1                2        2        1
## 817              C  53      2  28      2                1        2        2
## 818             NC  39      2  22      2                2        2        1
## 819              C  46      2  25      2                2        1        2
## 820              C  41      2  27      2                1        2        2
## 821             NC  53      1  29      2                1        1        1
## 822              C  50      1  33      2                2        2        2
## 823              C  35      2  34      2                1        1        2
## 824              C  45      1  33      2                2        2        1
## 825             NC  47      1  24      1                1        1        2
## 826              C  41      2  30      1                2        1        1
## 827              C  59      1  29      2                2        2        2
## 828             NC  37      1  22      2                2        2        1
## 829              C  34      2  26      2                2        1        1
## 830              C  34      2  31      2                1        1        1
## 831              C  43      1  30      1                1        2        2
## 832             NC  51      2  32      1                2        2        1
## 833              C  34      1  26      2                2        2        1
## 834              C  57      2  24      2                2        1        2
## 835              C  32      2  24      1                2        1        1
## 836              C  34      2  28      2                2        1        2
## 837              C  41      2  28      2                2        2        1
## 838              C  40      2  33      1                1        1        1
## 839             NC  60      1  32      1                2        1        2
## 840              C  51      2  25      1                2        1        2
## 841              C  44      2  25      1                2        2        2
## 842              C  37      1  30      1                1        1        1
## 843             NC  36      2  23      1                2        1        2
## 844              C  40      2  31      1                2        1        1
## 845             NC  39      2  33      2                1        1        2
## 846              C  50      2  35      1                2        2        1
## 847             NC  32      2  30      2                2        1        2
## 848              C  36      1  24      2                1        2        1
## 849             NC  32      2  35      2                2        2        1
## 850              C  47      1  22      2                1        1        1
## 851              C  55      1  29      1                1        2        2
## 852             NC  47      2  22      1                1        1        1
## 853              C  59      2  28      1                1        1        2
## 854              C  51      1  35      2                2        1        2
## 855              C  61      2  22      1                2        2        2
## 856             NC  36      1  30      2                2        2        1
```

```
## 857    C  36    1  24    2    2    1    2
## 858    C  59    2  31    1    1    2    1
## 859    C  38    1  33    1    2    2    1
## 860    C  52    1  35    1    1    2    2
## 861    C  52    2  28    2    2    2    1
## 862    C  55    2  33    2    1    1    1
## 863   NC  49    1  22    1    2    2    2
## 864    C  33    1  30    1    2    2    1
## 865    C  61    1  24    2    1    1    1
## 866    C  48    2  27    2    1    2    2
## 867    C  40    1  25    1    1    1    1
## 868    C  33    1  29    2    1    1    1
## 869    C  60    1  27    1    1    2    1
## 870   NC  59    2  25    1    1    1    1
## 871    C  60    2  28    1    2    1    1
## 872   NC  36    2  27    1    1    2    2
## 873   NC  32    2  29    2    1    1    1
## 874   NC  56    2  26    2    1    1    1
## 875    C  61    1  25    2    2    1    1
## 876    C  38    1  26    1    2    1    2
## 877    C  42    2  22    1    1    1    1
## 878    C  42    2  24    1    2    1    2
## 879    C  54    1  22    1    2    2    2
## 880    C  50    1  22    1    1    1    1
## 881    C  61    1  28    2    2    2    2
## 882    C  49    1  24    1    1    1    2
## 883   NC  49    2  34    1    2    1    1
## 884   NC  56    1  30    1    2    1    1
## 885    C  58    1  25    1    2    1    2
## 886    C  34    1  26    2    2    2    2
## 887    C  34    2  22    2    1    2    1
## 888    C  43    1  33    1    1    2    2
## 889    C  34    1  26    1    2    1    2
## 890   NC  37    1  30    2    1    2    1
## 891    C  34    1  33    1    1    2    2
## 892    C  50    2  23    1    1    1    2
## 893    C  46    1  31    1    1    2    1
## 894   NC  34    1  35    1    1    1    1
## 895   NC  52    2  28    2    1    2    1
## 896   NC  49    2  29    2    2    1    2
## 897    C  33    1  22    2    1    2    1
## 898   NC  40    1  28    2    2    2    1
## 899    C  45    1  22    1    2    2    2
## 900    C  59    1  32    2    1    2    1
## 901   NC  49    2  29    1    2    1    1
## 902   NC  48    1  29    2    1    2    2
## 903    C  32    1  26    1    2    1    1
## 904    C  53    1  31    1    1    2    1
## 905   NC  36    1  24    1    2    1    1
## 906   NC  44    1  33    2    1    2    1
```

```
## 907    C  57  1  23  1  2  1  1
## 908    C  51  2  32  2  2  2  2
## 909   NC  58  1  28  2  2  1  1
## 910    C  53  1  25  1  2  1  2
## 911    C  33  2  27  2  1  1  1
## 912    C  48  2  34  2  2  1  2
## 913    C  50  1  25  1  1  1  1
## 914    C  45  2  29  2  1  2  2
## 915    C  60  1  35  2  1  2  2
## 916    C  47  2  35  1  1  1  1
## 917    C  56  2  34  1  1  1  2
## 918    C  35  2  33  1  1  2  2
## 919    C  53  1  33  2  2  2  1
## 920    C  60  1  25  1  2  1  1
## 921   NC  33  2  28  2  2  2  2
## 922    C  32  1  31  1  1  1  1
## 923   NC  43  1  25  1  1  2  2
## 924    C  56  1  22  2  2  2  1
## 925    C  46  1  23  2  2  2  1
## 926   NC  42  1  33  1  1  2  2
## 927    C  49  1  25  1  1  2  2
## 928   NC  38  1  28  2  2  1  1
## 929   NC  33  2  34  2  1  2  1
## 930   NC  43  1  23  2  1  1  1
## 931    C  39  1  28  2  2  1  1
## 932   NC  45  2  31  2  2  2  2
## 933    C  60  1  25  2  1  2  1
## 934    C  43  2  23  2  2  2  1
## 935    C  34  1  33  2  1  2  1
## 936    C  50  1  26  1  2  2  2
## 937    C  39  1  33  1  2  2  2
## 938    C  50  2  31  1  2  1  2
## 939    C  51  2  32  1  2  2  2
## 940   NC  45  1  27  2  1  1  2
## 941   NC  47  2  32  2  1  1  1
## 942    C  49  1  35  1  2  2  1
## 943    C  43  1  28  2  2  1  2
## 944    C  44  2  30  1  2  1  1
## 945    C  61  2  23  2  2  1  2
## 946    C  46  1  32  2  2  1  1
## 947    C  60  1  33  2  1  1  1
## 948    C  48  2  29  1  2  2  1
## 949    C  55  1  30  2  2  1  2
## 950    C  41  1  31  1  2  1  2
## 951    C  53  2  26  2  1  2  1
## 952    C  43  2  22  2  2  1  1
## 953    C  45  2  30  1  1  1  2
## 954    C  32  1  33  2  1  2  1
## 955    C  45  2  35  2  1  2  2
## 956    C  54  2  27  1  2  1  2
```

```
## 957              C  53      2  27      1                1        2        2
## 958              C  39      2  22      2                1        2        1
## 959              C  55      1  35      1                1        2        1
## 960             NC  36      2  22      1                2        1        1
## 961             NC  59      1  32      2                1        1        1
## 962             NC  35      1  25      2                1        2        1
## 963              C  39      1  28      2                2        2        1
## 964              C  37      1  24      1                1        1        2
## 965             NC  40      2  33      2                1        2        2
## 966             NC  51      2  22      2                2        2        2
## 967              C  47      1  24      1                1        1        2
## 968             NC  37      1  32      2                2        2        1
## 969             NC  54      1  34      2                1        1        2
## 970             NC  41      1  32      2                2        2        2
## 971              C  54      2  29      1                2        2        1
## 972              C  50      1  29      1                1        2        1
## 973              C  39      2  22      2                1        2        2
## 974              C  33      2  26      2                1        1        2
## 975             NC  37      2  25      2                1        2        1
## 976              C  56      2  30      1                2        2        1
## 977              C  47      1  29      2                1        1        2
## 978              C  55      2  31      2                2        2        2
## 979              C  60      1  27      2                2        1        2
## 980             NC  56      2  27      1                2        1        2
## 981              C  54      2  23      2                1        2        1
## 982             NC  40      2  29      2                1        2        2
## 983              C  37      2  33      2                1        1        1
## 984             NC  32      1  25      1                1        1        2
## 985             NC  53      2  32      2                1        1        2
## 986             NC  61      1  22      1                1        2        2
## 987              C  53      2  26      2                2        2        1
## 988             NC  50      1  33      2                1        1        1
## 989             NC  55      1  22      1                2        2        2
## 990              C  37      1  23      1                2        2        2
## 991              C  35      1  35      1                2        2        1
## 992              C  60      1  29      1                1        2        2
## 993              C  35      1  35      2                2        1        1
## 994             NC  49      1  33      2                2        1        1
## 995              C  42      1  23      2                1        2        1
## 996              C  57      2  26      1                2        1        2
## 997              C  54      1  22      2                1        2        2
## 998              C  40      2  33      2                2        2        1
## 999             NC  51      2  28      2                2        2        1
## 1000            NC  50      1  29      2                2        2        2
## 1001            NC  59      1  35      1                1        2        2
## 1002            NC  60      2  22      2                1        2        2
## 1003             C  38      1  32      2                2        2        2
## 1004             C  36      2  23      1                1        2        1
## 1005             C  56      1  34      1                2        1        2
## 1006             C  46      2  32      1                2        2        1
```

```
## 1007          NC  42      1  27     1              1         2         2
## 1008           C  45      1  28     2              1         2         1
## 1009           C  60      2  28     2              1         1         1
## 1010          NC  55      1  35     2              1         2         1
## 1011           C  51      1  24     1              2         2         2
## 1012           C  38      1  33     2              2         2         2
## 1013          NC  47      2  31     1              1         1         2
## 1014           C  36      1  22     2              2         2         2
## 1015          NC  51      2  29     2              2         2         1
## 1016           C  48      2  23     1              1         2         2
## 1017           C  50      2  26     2              2         2         2
## 1018           C  57      2  34     2              1         2         1
## 1019          NC  57      2  29     2              1         1         2
## 1020          NC  37      2  33     1              1         1         1
## 1021          NC  56      1  23     1              2         2         2
## 1022           C  47      1  31     1              1         1         2
## 1023          NC  49      2  30     2              1         1         1
## 1024           C  43      1  24     1              2         1         1
## 1025           C  55      1  29     2              1         1         1
## 1026          NC  60      2  32     1              2         1         2
## 1027           C  52      1  28     2              2         2         2
## 1028           C  44      2  30     2              2         2         1
## 1029           C  35      2  25     2              2         2         1
## 1030          NC  50      2  22     1              2         1         1
## 1031           C  52      2  30     1              1         1         2
## 1032          NC  40      1  28     1              1         2         2
## 1033           C  56      2  32     2              1         2         2
## 1034          NC  32      2  35     2              2         2         2
## 1035           C  51      2  34     2              1         2         2
## 1036           C  39      1  27     1              1         2         2
## 1037          NC  35      1  35     2              2         2         2
## 1038           C  52      1  26     1              1         2         1
## 1039           C  52      1  33     1              2         1         2
## 1040           C  54      1  31     1              2         2         2
## 1041           C  32      2  27     2              1         1         1
## 1042           C  33      2  31     1              1         1         1
## 1043           C  52      1  35     2              1         1         1
## 1044           C  39      2  29     2              2         2         2
## 1045           C  33      2  31     1              1         2         2
## 1046           C  54      1  30     2              1         2         2
## 1047           C  49      1  31     2              1         1         1
## 1048           C  51      1  35     1              2         2         2
## 1049           C  38      2  28     2              2         2         1
## 1050          NC  56      1  30     2              1         1         1
## 1051          NC  35      1  29     2              1         2         2
## 1052           C  48      1  30     2              2         2         1
## 1053          NC  52      1  33     1              2         2         2
## 1054          NC  53      1  23     2              2         2         1
## 1055           C  55      2  33     1              1         1         1
## 1056          NC  46      2  33     1              1         1         1
```

```
## 1057          C  40      1  27     1              1         1         2
## 1058          C  59      1  35     1              1         1         2
## 1059          C  55      1  22     2              2         2         1
## 1060          C  36      1  29     1              2         1         1
## 1061          C  52      1  30     2              1         2         1
## 1062         NC  47      2  22     2              1         2         1
## 1063         NC  47      2  24     1              1         2         2
## 1064         NC  50      1  23     2              1         1         2
## 1065          C  59      2  23     1              2         2         1
## 1066         NC  55      2  24     1              2         1         1
## 1067          C  33      1  22     2              1         2         2
## 1068         NC  57      2  23     1              1         1         2
## 1069          C  60      1  30     1              2         2         2
## 1070          C  36      1  22     1              2         1         2
## 1071         NC  59      2  27     2              2         1         1
## 1072          C  36      2  24     1              1         2         2
## 1073          C  51      2  29     2              2         2         2
## 1074          C  38      2  23     1              2         1         1
## 1075          C  43      1  29     2              2         1         1
## 1076          C  57      1  32     1              2         1         2
## 1077         NC  35      2  31     2              2         1         1
## 1078          C  50      1  29     2              1         1         1
## 1079         NC  34      1  27     1              2         1         1
## 1080         NC  57      2  24     2              2         1         1
## 1081         NC  54      1  29     1              2         1         2
## 1082          C  53      1  27     2              1         2         2
## 1083         NC  56      2  25     1              1         1         2
## 1084          C  35      1  24     2              2         1         2
## 1085         NC  37      2  22     1              2         2         2
## 1086         NC  33      2  32     2              1         1         1
## 1087          C  41      1  27     2              1         1         2
## 1088          C  53      1  29     2              1         1         1
## 1089          C  33      2  31     1              2         1         1
## 1090          C  39      1  24     2              2         1         1
## 1091          C  32      2  29     1              1         2         1
## 1092         NC  32      1  33     2              2         2         1
## 1093         NC  52      2  22     2              2         2         2
## 1094         NC  57      2  26     1              1         1         2
## 1095         NC  40      2  35     2              1         1         1
## 1096          C  61      2  22     2              1         1         1
## 1097          C  47      1  28     1              2         1         1
## 1098         NC  39      2  23     2              1         1         2
## 1099         NC  33      1  29     1              2         1         1
## 1100          C  37      1  28     1              1         2         1
## 1101          C  36      1  30     2              2         1         1
## 1102         NC  55      1  24     1              1         1         1
## 1103          C  50      2  23     2              2         1         2
## 1104         NC  38      2  32     1              1         1         1
## 1105         NC  48      1  24     1              1         2         1
## 1106          C  46      2  24     1              1         2         1
```

```
## 1107           C  51      1  27      2              1        2        1
## 1108           C  38      1  25      2              2        2        2
## 1109           C  35      2  22      2              2        2        1
## 1110           C  55      1  26      2              1        1        1
## 1111          NC  49      1  22      1              1        2        1
## 1112           C  53      1  28      2              1        1        2
## 1113           C  56      1  28      1              1        1        2
## 1114          NC  51      1  29      1              2        2        2
## 1115           C  39      1  24      1              1        2        2
## 1116           C  61      1  34      1              2        1        2
## 1117           C  61      2  24      1              2        2        1
## 1118           C  34      2  27      1              1        1        2
## 1119          NC  44      2  31      1              1        2        2
## 1120           C  45      1  35      2              1        1        1
## 1121          NC  52      2  32      2              2        2        2
## 1122          NC  58      1  31      2              2        2        2
## 1123          NC  32      1  34      1              2        2        1
## 1124          NC  44      1  28      1              2        1        1
## 1125          NC  45      1  28      2              2        2        1
## 1126           C  59      1  34      1              1        2        2
## 1127           C  51      1  35      2              1        2        1
## 1128          NC  41      2  23      1              1        2        2
## 1129           C  52      1  23      2              2        2        1
## 1130           C  47      1  26      1              1        2        1
## 1131           C  42      2  32      2              1        1        2
## 1132           C  58      2  23      2              2        1        2
## 1133          NC  56      1  25      1              2        1        1
## 1134           C  60      1  22      2              2        2        2
## 1135          NC  53      2  25      2              2        2        1
## 1136          NC  49      2  25      2              2        1        2
## 1137          NC  54      2  27      1              2        1        1
## 1138          NC  32      2  28      2              2        1        1
## 1139           C  45      1  26      2              2        1        1
## 1140          NC  39      1  32      1              1        2        2
## 1141           C  36      1  28      1              2        2        1
## 1142          NC  32      2  35      1              2        1        2
## 1143           C  38      2  23      2              1        2        2
## 1144           C  41      2  22      2              2        2        1
## 1145           C  60      2  30      1              1        1        2
## 1146           C  55      1  29      1              2        2        1
## 1147           C  51      2  31      2              1        1        1
## 1148          NC  49      2  23      1              1        2        2
## 1149           C  40      1  23      2              2        1        1
## 1150          NC  36      2  24      1              2        1        2
## 1151           C  61      1  27      2              2        2        2
## 1152          NC  53      1  26      2              1        2        2
## 1153           C  36      1  23      2              1        2        2
## 1154           C  61      1  24      2              1        2        1
## 1155           C  57      2  35      1              1        1        1
## 1156           C  57      2  24      2              2        1        1
```

```
## 1157           C  43      1  26      2              2         1         1
## 1158           C  40      2  34      2              1         1         2
## 1159           C  54      1  32      2              1         2         1
## 1160          NC  39      2  26      2              1         1         2
## 1161          NC  43      1  27      1              2         1         2
## 1162           C  38      2  30      1              2         1         2
## 1163           C  44      2  28      2              1         1         1
## 1164          NC  33      1  26      1              2         2         2
## 1165          NC  55      1  25      1              1         1         1
## 1166          NC  43      1  35      1              2         1         1
## 1167          NC  60      2  23      1              1         2         1
## 1168           C  43      2  24      2              1         2         1
## 1169          NC  48      2  27      1              1         2         2
## 1170           C  59      1  23      2              2         2         2
## 1171           C  35      2  30      2              2         2         2
## 1172           C  32      2  28      1              1         1         1
## 1173          NC  43      2  28      2              2         2         1
## 1174          NC  41      2  24      2              1         2         2
## 1175           C  36      1  31      2              2         2         1
## 1176           C  58      1  35      1              1         1         1
## 1177           C  43      2  28      2              2         1         2
## 1178           C  48      2  31      2              2         2         2
## 1179          NC  52      1  27      1              2         2         1
## 1180          NC  42      2  33      1              1         1         2
## 1181           C  60      1  33      2              1         1         1
## 1182           C  34      1  34      1              1         1         1
## 1183           C  58      2  25      2              2         2         1
## 1184          NC  35      2  23      2              1         1         1
## 1185          NC  42      2  26      1              1         2         2
## 1186          NC  47      1  23      1              1         2         1
## 1187          NC  56      1  32      2              1         1         1
## 1188          NC  40      1  27      1              1         1         2
## 1189          NC  55      2  34      1              1         2         1
## 1190          NC  33      1  31      2              1         1         1
## 1191          NC  37      2  30      2              2         2         1
## 1192           C  41      1  28      1              2         2         1
## 1193           C  54      1  27      1              2         2         2
## 1194           C  36      2  29      2              2         1         2
## 1195           C  41      2  34      2              2         1         2
## 1196           C  57      2  33      2              2         1         2
## 1197          NC  44      1  31      1              1         1         1
## 1198           C  55      1  30      2              2         2         2
## 1199           C  57      2  31      2              2         2         2
## 1200           C  57      2  28      2              2         2         1
## 1201           C  53      1  22      1              2         2         1
## 1202          NC  35      1  29      2              2         1         2
## 1203          NC  36      2  32      1              2         2         2
## 1204          NC  44      2  32      2              2         1         2
## 1205          NC  46      1  24      2              2         1         1
## 1206           C  51      1  35      1              1         2         1
```

```
## 1207          NC  38      1  22      2               1         2         1
## 1208          NC  51      2  30      2               1         2         1
## 1209           C  58      1  35      1               1         1         2
## 1210           C  33      2  28      1               1         2         2
## 1211           C  54      2  24      2               1         2         1
## 1212           C  60      1  22      1               1         1         2
## 1213           C  36      2  34      2               2         2         1
## 1214           C  39      2  22      1               2         2         1
## 1215           C  41      1  29      1               2         2         1
## 1216           C  38      1  22      1               1         1         2
## 1217           C  33      2  24      2               1         2         1
## 1218          NC  54      1  24      2               2         2         1
## 1219          NC  35      2  25      2               2         1         2
## 1220          NC  44      1  30      2               2         1         1
## 1221           C  33      2  31      2               1         1         1
## 1222          NC  33      2  31      2               2         1         1
## 1223           C  41      2  34      2               2         2         1
## 1224           C  48      1  25      2               1         2         1
## 1225           C  57      2  30      2               1         1         2
## 1226          NC  47      1  30      1               2         1         2
## 1227          NC  35      1  33      1               1         1         1
## 1228          NC  32      1  25      2               1         1         1
## 1229           C  54      2  24      2               1         2         1
## 1230           C  40      2  26      1               2         1         2
## 1231          NC  54      1  29      2               1         1         1
## 1232          NC  36      2  35      1               1         2         1
## 1233           C  60      2  33      2               1         1         1
## 1234           C  54      1  31      1               2         1         1
## 1235           C  40      1  28      1               2         2         2
## 1236           C  41      1  30      2               1         1         2
## 1237           C  52      1  27      2               2         2         2
## 1238           C  56      2  26      2               2         1         1
## 1239           C  59      2  28      2               1         1         1
## 1240          NC  36      1  25      2               2         1         1
## 1241           C  38      2  33      1               1         1         2
## 1242          NC  46      2  34      2               1         2         1
## 1243          NC  34      2  29      2               1         1         2
## 1244           C  48      1  27      2               2         1         2
## 1245           C  53      2  23      2               2         2         2
## 1246           C  59      2  30      2               2         1         2
## 1247           C  49      2  34      1               2         1         2
## 1248           C  58      2  34      2               1         1         1
## 1249           C  53      2  35      2               1         2         1
## 1250          NC  42      2  24      1               1         1         1
## 1251           C  43      1  31      2               2         2         2
## 1252          NC  42      1  27      1               1         1         2
## 1253           C  36      2  22      2               1         2         1
## 1254          NC  45      2  24      1               1         1         2
## 1255           C  55      2  26      2               2         1         1
## 1256          NC  39      2  34      1               2         2         2
```

```
## 1257          NC  45      1  27      1               1          1          1
## 1258           C  60      2  35      1               2          1          2
## 1259           C  37      2  22      2               1          1          2
## 1260           C  61      2  24      1               2          1          1
## 1261           C  46      2  29      2               1          1          1
## 1262          NC  50      2  34      1               2          1          1
## 1263          NC  36      2  32      1               2          2          2
## 1264           C  46      1  23      2               2          2          1
## 1265           C  43      2  32      2               2          2          2
## 1266           C  55      2  26      2               1          1          2
## 1267           C  52      2  22      1               2          1          2
## 1268          NC  56      2  30      2               1          1          1
## 1269           C  54      1  32      1               1          1          1
## 1270          NC  56      1  28      2               1          1          1
## 1271           C  46      1  26      1               2          2          2
## 1272           C  47      1  25      2               1          2          1
## 1273          NC  43      1  30      1               2          1          1
## 1274          NC  41      1  28      1               1          2          1
## 1275           C  51      1  23      2               1          2          2
## 1276          NC  43      1  24      1               2          1          2
## 1277          NC  39      2  22      2               1          2          2
## 1278          NC  53      1  35      2               2          2          2
## 1279           C  33      2  23      1               1          2          2
## 1280           C  61      1  34      1               1          2          2
## 1281          NC  33      2  27      2               1          2          1
## 1282          NC  47      2  35      1               1          1          1
## 1283          NC  44      2  35      2               1          2          1
## 1284          NC  46      1  24      2               1          2          1
## 1285          NC  45      1  24      2               2          1          2
## 1286           C  49      1  30      1               2          2          1
## 1287          NC  39      2  31      2               2          2          2
## 1288           C  34      1  28      1               2          2          2
## 1289           C  33      1  28      2               2          1          2
## 1290          NC  35      1  34      2               2          1          2
## 1291           C  58      2  33      1               1          2          1
## 1292           C  61      1  31      1               2          1          1
## 1293           C  56      2  23      1               1          2          1
## 1294           C  32      2  33      2               2          1          1
## 1295           C  42      1  28      2               2          2          1
## 1296           C  47      1  23      2               2          1          2
## 1297           C  56      1  28      2               1          2          2
## 1298           C  54      1  34      2               2          2          1
## 1299           C  46      2  28      2               2          2          2
## 1300          NC  50      1  34      1               1          2          1
## 1301          NC  39      2  29      1               1          2          2
## 1302           C  37      2  33      2               2          2          2
## 1303           C  41      2  33      1               2          1          2
## 1304          NC  38      1  24      2               2          2          2
## 1305           C  49      1  23      2               2          1          2
## 1306          NC  37      1  31      1               2          1          2
```

```
## 1307            C  44      1  26      1               1         2         2
## 1308            C  48      2  35      1               2         1         1
## 1309           NC  36      1  33      1               1         2         1
## 1310            C  43      1  32      1               1         2         1
## 1311           NC  43      2  25      1               2         2         1
## 1312            C  48      1  26      2               2         1         2
## 1313            C  41      2  26      1               1         1         1
## 1314            C  42      1  28      1               1         2         2
## 1315            C  48      1  32      2               2         2         1
## 1316            C  49      1  29      1               1         2         1
## 1317            C  44      1  23      1               2         1         1
## 1318            C  35      1  35      2               1         2         1
## 1319           NC  48      1  24      1               1         1         2
## 1320            C  41      2  34      2               1         1         2
## 1321           NC  47      1  28      2               2         1         2
## 1322            C  44      1  27      1               2         2         2
## 1323           NC  47      2  22      2               2         1         2
## 1324            C  48      2  30      1               1         1         2
## 1325            C  60      1  24      1               1         1         1
## 1326           NC  53      2  34      2               1         2         2
## 1327            C  39      2  32      2               2         1         2
## 1328           NC  58      2  32      1               1         1         1
## 1329           NC  49      1  27      1               1         1         1
## 1330            C  55      2  23      2               1         1         2
## 1331            C  47      1  28      2               2         2         1
## 1332            C  60      1  29      1               2         1         2
## 1333            C  37      1  22      2               1         1         2
## 1334            C  55      1  23      2               2         2         1
## 1335            C  52      1  33      1               2         1         1
## 1336            C  61      2  27      1               1         1         2
## 1337            C  35      2  35      2               1         1         1
## 1338            C  39      1  31      2               2         2         1
## 1339           NC  36      1  31      2               1         2         1
## 1340            C  36      2  24      2               1         1         2
## 1341           NC  32      2  25      1               1         2         2
## 1342            C  57      2  30      1               1         2         1
## 1343            C  61      1  28      1               2         2         1
## 1344           NC  56      2  24      2               2         1         2
## 1345           NC  42      2  35      1               2         2         2
## 1346            C  50      1  32      1               2         1         1
## 1347            C  59      2  35      2               2         2         1
## 1348            C  41      2  30      2               2         2         1
## 1349            C  35      1  27      2               1         2         1
## 1350            C  42      1  25      1               2         1         2
## 1351            C  58      1  25      2               1         1         2
## 1352            C  43      2  24      1               2         2         1
## 1353           NC  41      1  22      2               2         2         1
## 1354           NC  34      1  35      1               2         1         1
## 1355            C  51      1  22      1               2         2         1
## 1356            C  36      1  29      2               1         1         1
```

```
## 1357            C  42      1  34     1              2         1         1
## 1358            C  51      1  28     1              1         1         2
## 1359           NC  46      1  32     1              2         2         2
## 1360            C  35      1  23     2              1         2         1
## 1361            C  36      2  34     1              2         2         1
## 1362           NC  32      1  24     2              2         1         2
## 1363            C  40      2  26     2              1         2         2
## 1364           NC  47      1  23     2              2         1         1
## 1365           NC  60      2  22     2              1         1         1
## 1366            C  52      1  27     1              1         1         2
## 1367            C  50      1  30     1              1         2         1
## 1368            C  58      1  33     1              2         1         1
## 1369            C  47      2  34     2              2         2         2
## 1370            C  32      1  26     1              2         1         1
## 1371            C  61      2  32     2              2         2         1
## 1372            C  49      1  34     1              2         1         2
## 1373            C  43      1  26     1              1         2         1
## 1374            C  46      1  27     1              1         1         2
## 1375            C  56      1  34     2              1         2         2
## 1376            C  59      1  28     1              2         1         1
## 1377            C  46      1  27     2              1         2         2
## 1378           NC  52      2  25     1              2         1         1
## 1379           NC  33      1  24     1              1         1         2
## 1380           NC  53      1  31     2              2         1         2
## 1381            C  44      1  29     1              2         2         2
## 1382            C  55      1  34     1              2         2         1
## 1383            C  42      1  26     2              2         1         1
## 1384            C  52      1  29     2              1         1         2
## 1385            C  55      2  26     1              2         2         2
##      Fatigue...generalized.bone.ache Jaundice Epigastric.pain   WBC
## 1                                  2        2               2  7425
## 2                                  2        2               1 12101
## 3                                  1        1               1  4178
## 4                                  1        2               1  6490
## 5                                  2        2               2  3661
## 6                                  2        2               1 11785
## 7                                  2        2               2 11620
## 8                                  1        1               2  7335
## 9                                  2        1               2 10480
## 10                                 1        1               2  6681
## 11                                 2        2               1  4437
## 12                                 1        1               1  6052
## 13                                 2        1               2  9279
## 14                                 2        2               1  5638
## 15                                 2        1               1 11507
## 16                                 2        1               1  8035
## 17                                 1        1               2 10843
## 18                                 2        2               2  8476
## 19                                 2        2               2  6599
## 20                                 1        1               2  4845
```

```
## 21                1        1                1  5925
## 22                2        2                2  9952
## 23                2        1                2  7961
## 24                1        1                2  7136
## 25                2        1                2  6057
## 26                1        1                1  6648
## 27                1        1                2 11032
## 28                1        1                2  5234
## 29                1        1                2  6038
## 30                2        1                2  5846
## 31                2        1                2  5383
## 32                1        1                1  7378
## 33                2        1                2  7486
## 34                1        1                1 11770
## 35                2        2                2  6441
## 36                2        1                2 10304
## 37                2        2                1  7365
## 38                2        1                1 10704
## 39                1        1                1  3009
## 40                1        1                2  9956
## 41                1        2                2  6627
## 42                2        2                1 10393
## 43                1        1                2 10236
## 44                2        2                2  4387
## 45                2        2                2 11924
## 46                2        1                2 10140
## 47                2        1                2  3470
## 48                2        1                2  5420
## 49                1        2                1  6963
## 50                1        1                2  6249
## 51                1        2                1  5094
## 52                2        2                2  4797
## 53                2        2                2  5041
## 54                1        2                2  6901
## 55                1        1                1  7256
## 56                2        1                1  8219
## 57                1        1                1  4418
## 58                1        1                2  6358
## 59                2        1                2  8669
## 60                1        1                2  9435
## 61                2        2                2 11144
## 62                1        2                2  5060
## 63                1        1                1  7766
## 64                2        1                2 10879
## 65                1        2                2 11490
## 66                1        1                1  4082
## 67                2        2                1  5078
## 68                1        2                2  4580
## 69                2        1                2  7983
## 70                2        2                2  5500
```

```
## 71                                1         2                 1  3956
## 72                                1         1                 2  9532
## 73                                2         1                 1  3555
## 74                                2         2                 2  4316
## 75                                2         2                 2  7045
## 76                                1         1                 2  7940
## 77                                1         2                 2 11994
## 78                                2         1                 2  8870
## 79                                1         2                 1  4250
## 80                                1         1                 2  8702
## 81                                2         2                 1  5510
## 82                                1         1                 2 10654
## 83                                2         1                 2  9255
## 84                                1         2                 2  5843
## 85                                1         2                 2 11611
## 86                                2         1                 2  6227
## 87                                1         2                 1  6798
## 88                                2         1                 2  6622
## 89                                2         1                 2 10339
## 90                                2         1                 1  6038
## 91                                2         2                 1  6028
## 92                                2         2                 2 10393
## 93                                1         2                 1 11110
## 94                                1         2                 2  3739
## 95                                1         1                 2  7255
## 96                                1         2                 1 10303
## 97                                1         1                 1  7030
## 98                                2         1                 2  6292
## 99                                2         2                 1 11688
## 100                               2         1                 2  8839
## 101                               1         1                 1  3101
## 102                               1         2                 2 11489
## 103                               1         2                 1  5495
## 104                               1         2                 1  4151
## 105                               1         1                 1  5463
## 106                               2         1                 1  3782
## 107                               2         1                 1  6004
## 108                               2         1                 1  8189
## 109                               2         1                 1  9179
## 110                               1         2                 1 10847
## 111                               1         1                 1  3153
## 112                               2         1                 2  7947
## 113                               1         1                 2 12008
## 114                               1         2                 2  3684
## 115                               2         2                 2 12027
## 116                               2         2                 1  6587
## 117                               1         2                 1 11385
## 118                               2         1                 2  8258
## 119                               2         1                 2  4446
## 120                               2         2                 1  6676
```

```
## 121                1        1                1  3029
## 122                1        2                2 11154
## 123                2        2                1  5328
## 124                2        2                1  7864
## 125                2        2                1  9743
## 126                1        1                1 12094
## 127                2        2                2  7620
## 128                2        1                1 11101
## 129                2        1                2  9577
## 130                1        2                1  3177
## 131                2        2                1  3299
## 132                2        2                2  6513
## 133                1        2                2  5734
## 134                2        1                1  8538
## 135                1        1                2  4009
## 136                1        1                1  8781
## 137                1        1                1  9446
## 138                2        2                2  3260
## 139                1        1                2 10704
## 140                2        1                1  9369
## 141                1        2                2  5628
## 142                2        1                2  5616
## 143                1        1                1  3981
## 144                1        2                2  5162
## 145                1        2                2  8846
## 146                2        1                1  5536
## 147                1        2                1 10592
## 148                2        2                2  7537
## 149                1        2                2  3104
## 150                2        2                1  7102
## 151                2        2                1 11022
## 152                1        2                1 10171
## 153                2        2                1  5300
## 154                2        2                1  7760
## 155                1        2                1  9568
## 156                2        1                1  5905
## 157                1        2                2  3178
## 158                1        1                1  8201
## 159                2        2                1  4249
## 160                2        1                2 10386
## 161                2        1                1  8889
## 162                2        1                1  4637
## 163                1        2                1 11951
## 164                1        1                1 10104
## 165                2        1                2  5828
## 166                2        1                1  6931
## 167                1        2                2 10180
## 168                1        2                2  5596
## 169                1        2                2  9460
## 170                2        2                1  4908
```

```
## 171                2         1         1  9327
## 172                1         2         1  9852
## 173                2         2         1  6770
## 174                2         1         1  9158
## 175                2         1         1  9479
## 176                1         1         2  8498
## 177                2         2         2  7671
## 178                1         1         2 10267
## 179                2         2         1 10473
## 180                2         1         2  9012
## 181                2         2         1 11297
## 182                1         1         2  7507
## 183                1         1         1 10244
## 184                1         2         2  8848
## 185                1         2         1 11163
## 186                1         2         1  5859
## 187                1         1         1 11235
## 188                2         2         1  9075
## 189                1         2         2  4642
## 190                2         1         2  7850
## 191                1         2         2 10762
## 192                1         1         1  5956
## 193                2         2         1  8868
## 194                1         2         1  5278
## 195                2         2         1  6848
## 196                2         1         2 10074
## 197                2         2         2  6996
## 198                2         1         2  6102
## 199                1         1         2  5511
## 200                1         1         2  5994
## 201                1         1         1 11677
## 202                2         2         1  3788
## 203                1         2         1  5537
## 204                2         2         2  4043
## 205                2         2         2  6195
## 206                2         2         2 11797
## 207                2         2         1  8058
## 208                2         1         2 10501
## 209                2         2         1  3783
## 210                1         2         1  5779
## 211                2         2         1  4565
## 212                2         2         2 11329
## 213                1         2         2 10176
## 214                1         1         2  7518
## 215                2         1         1  3010
## 216                1         1         1  6524
## 217                1         1         1  6891
## 218                2         2         2 12088
## 219                2         1         2 10665
## 220                2         1         2 11788
```

```
## 221   1   1   1  7666
## 222   2   2   1  9032
## 223   2   2   1  5846
## 224   2   2   2  7589
## 225   1   1   1  5886
## 226   2   2   1 10102
## 227   2   1   1  6742
## 228   1   2   2  8093
## 229   1   2   2 10816
## 230   2   1   1 10344
## 231   1   1   2 10540
## 232   2   1   2  5478
## 233   2   2   1  6539
## 234   2   2   1 11854
## 235   1   1   2  6055
## 236   2   2   1  4793
## 237   2   1   2  9268
## 238   1   1   1 10440
## 239   1   1   2  8384
## 240   1   2   2  5106
## 241   2   1   2  5732
## 242   2   1   1  5210
## 243   1   2   1  9152
## 244   1   2   1  8152
## 245   1   2   1  4815
## 246   2   1   2 10780
## 247   2   1   1  8371
## 248   1   2   2  7031
## 249   1   1   2  3470
## 250   2   1   1  4691
## 251   1   2   2  9313
## 252   1   2   1  8195
## 253   1   2   1  6293
## 254   1   2   2 11642
## 255   2   1   1 10015
## 256   1   2   1  5034
## 257   1   1   2  5850
## 258   2   1   2  7769
## 259   2   2   2  3111
## 260   2   1   2  6963
## 261   2   1   1  3414
## 262   2   2   1 10339
## 263   1   2   2  9447
## 264   1   2   2  4643
## 265   2   2   1  6908
## 266   2   1   1 11265
## 267   2   2   1 10522
## 268   1   1   1  4265
## 269   1   2   2  4329
## 270   1   2   2  6627
```

```
## 271                2        2                1  3315
## 272                2        2                1  6917
## 273                2        1                1  3382
## 274                1        1                1  7656
## 275                2        1                1 11026
## 276                2        2                1  9474
## 277                2        2                2  5195
## 278                2        2                1  4639
## 279                1        1                2 12067
## 280                2        1                1  4426
## 281                1        2                1  7514
## 282                1        2                2 11065
## 283                2        1                1  5315
## 284                1        2                1  4330
## 285                2        1                1  8441
## 286                2        2                1  2991
## 287                2        1                2  9652
## 288                1        2                1 11227
## 289                2        2                2  7081
## 290                2        1                1  9958
## 291                2        1                2  4161
## 292                1        2                2 11946
## 293                2        2                1  8148
## 294                2        1                2  3430
## 295                2        1                2  4595
## 296                1        2                2  5088
## 297                1        1                1  6445
## 298                1        2                2 10272
## 299                2        1                1  3628
## 300                1        1                1 10022
## 301                2        2                2  9109
## 302                2        2                2  6862
## 303                2        2                1  9046
## 304                1        1                2  8939
## 305                2        2                2 11195
## 306                2        1                1  6761
## 307                2        1                1  8063
## 308                2        1                2  3050
## 309                1        1                1 11648
## 310                1        1                2  4352
## 311                1        2                1  8535
## 312                2        1                2 11961
## 313                1        2                2  3568
## 314                1        1                2  5231
## 315                1        1                1  9557
## 316                2        1                2  5200
## 317                1        2                2  5959
## 318                1        2                1  9427
## 319                1        1                2 10974
## 320                1        1                1  7479
```

```
## 321                2        1                2  3705
## 322                2        2                1 10955
## 323                2        2                1  8150
## 324                2        1                2  7018
## 325                2        2                2  3808
## 326                1        2                2  7056
## 327                2        2                2  9520
## 328                1        2                2  7614
## 329                1        1                2  4081
## 330                1        2                1 10219
## 331                1        1                2  4248
## 332                1        1                2 10452
## 333                1        1                2 10013
## 334                2        2                2  6983
## 335                1        2                1  6244
## 336                2        1                1  6410
## 337                2        2                1  4381
## 338                1        2                2 10713
## 339                1        2                1  6486
## 340                2        2                1  9298
## 341                1        1                2 11689
## 342                1        1                1  8398
## 343                1        2                1  8715
## 344                2        2                1 11261
## 345                2        1                2 11641
## 346                2        2                1  8169
## 347                2        1                1  9320
## 348                2        1                1  4135
## 349                1        1                2 10788
## 350                2        1                2  4343
## 351                2        2                2  5102
## 352                1        1                2  9487
## 353                2        2                2  9561
## 354                2        2                1  4222
## 355                2        1                2  6361
## 356                2        2                2  6340
## 357                2        2                1  9216
## 358                1        1                1 10648
## 359                1        2                2  7732
## 360                2        2                2  3570
## 361                1        1                1  3426
## 362                2        1                1 11277
## 363                1        2                1  7421
## 364                1        1                2  6297
## 365                1        1                1  3978
## 366                2        1                2  6174
## 367                2        2                2 11117
## 368                1        2                1  4688
## 369                2        2                1  3205
## 370                2        1                1  9800
```

```
## 371                                2         1                2 11300
## 372                                1         1                1 10815
## 373                                2         1                2  6497
## 374                                1         1                1 10773
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## 377                                2         2                2 10244
## 378                                2         2                1  8088
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## 383                                1         2                2  8354
## 384                                1         2                1  7970
## 385                                2         2                1 11446
## 386                                2         1                2 10366
## 387                                1         1                2  6578
## 388                                2         1                2  7723
## 389                                2         1                1  5974
## 390                                2         2                1 11852
## 391                                2         1                1  4974
## 392                                1         2                1  4964
## 393                                2         1                2  5329
## 394                                2         2                1 11355
## 395                                1         2                1 10685
## 396                                2         1                1  7994
## 397                                1         2                2  6139
## 398                                1         1                1  5007
## 399                                1         1                1 11983
## 400                                1         2                1 11171
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## 402                                1         1                1 10080
## 403                                2         1                1  9875
## 404                                1         1                2 11834
## 405                                1         2                1  3189
## 406                                2         1                1  6448
## 407                                1         1                1  8693
## 408                                2         1                2 11677
## 409                                1         1                1  7600
## 410                                2         2                2 10614
## 411                                1         2                1  7283
## 412                                1         2                2  9159
## 413                                2         1                2  4084
## 414                                1         1                1  9808
## 415                                1         1                2  4517
## 416                                2         2                2 11879
## 417                                2         2                2  6699
## 418                                1         1                1  7089
## 419                                1         2                1  4138
## 420                                1         2                1  3065
```

```
## 421 2 2 2  9397
## 422 1 2 2  9459
## 423 2 2 1 10817
## 424 1 1 1  3902
## 425 2 2 2 11846
## 426 1 2 1  7283
## 427 2 2 1  6214
## 428 2 1 2  7935
## 429 1 1 1  5068
## 430 2 1 1  5778
## 431 2 2 2  8429
## 432 1 1 2 11265
## 433 2 2 2  7127
## 434 2 1 1  5501
## 435 2 2 2  3408
## 436 1 2 1  8778
## 437 1 2 1  9381
## 438 1 1 1  8228
## 439 2 2 1  5367
## 440 1 1 1  3391
## 441 2 1 1  5715
## 442 2 1 2  9203
## 443 2 1 1  4391
## 444 1 1 2  7345
## 445 1 1 1  9224
## 446 2 1 1  9645
## 447 2 2 2  7934
## 448 2 1 2 11827
## 449 1 2 1  6596
## 450 1 2 1  7302
## 451 2 2 2  9974
## 452 2 1 2  9315
## 453 2 2 2  4937
## 454 2 1 1  7716
## 455 2 1 2  4299
## 456 2 1 1  7254
## 457 1 2 2  5121
## 458 1 1 1  7391
## 459 1 1 2 11706
## 460 2 1 2  9717
## 461 1 2 2 11474
## 462 1 2 2  5996
## 463 1 2 2  7146
## 464 1 2 2 10455
## 465 1 1 2 11117
## 466 1 1 1  7010
## 467 2 1 2  4190
## 468 1 2 1  8681
## 469 2 1 2 11793
## 470 2 2 1 11175
```

```
## 471 2 1 2  3721
## 472 2 2 2 10042
## 473 2 1 2  3199
## 474 2 1 1  3422
## 475 1 1 2 11023
## 476 1 2 2  9817
## 477 1 2 2  6530
## 478 1 1 1  9107
## 479 1 2 1 10338
## 480 2 2 1  9629
## 481 2 1 1  5544
## 482 2 1 1 11876
## 483 2 1 2  7986
## 484 2 1 2 10532
## 485 2 1 1  5433
## 486 1 2 2  4694
## 487 2 1 1 11256
## 488 2 2 2  9767
## 489 1 2 1 10624
## 490 1 2 2  9902
## 491 1 2 1  3252
## 492 2 2 2  4968
## 493 2 2 1  8877
## 494 2 1 2  3271
## 495 1 2 1 10935
## 496 2 1 2  5718
## 497 1 2 2 11638
## 498 2 2 1 10113
## 499 1 1 1  7794
## 500 2 2 2  4303
## 501 2 1 2 11836
## 502 2 1 1  4909
## 503 2 1 2 11472
## 504 2 2 2 11523
## 505 2 1 2  9486
## 506 2 2 2 10390
## 507 1 2 2  5307
## 508 1 1 1  8485
## 509 1 2 1 10262
## 510 2 2 1  3271
## 511 1 2 2 12022
## 512 1 1 1  4522
## 513 2 1 2  7275
## 514 1 1 1 10253
## 515 1 2 2  5878
## 516 1 1 2 11643
## 517 2 2 2 10338
## 518 1 2 2 10280
## 519 2 2 2 10698
## 520 2 2 2  5941
```

```
## 521                1        1                1  7644
## 522                2        1                2 10952
## 523                1        1                2  5497
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## 525                1        2                1  6869
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## 527                1        1                2  9992
## 528                1        1                1  4795
## 529                2        2                2  3110
## 530                2        1                1 10306
## 531                1        2                1  4023
## 532                2        2                1  6227
## 533                2        2                2  8777
## 534                1        1                1  6416
## 535                1        1                2 10792
## 536                1        2                1  9079
## 537                2        1                2  6629
## 538                2        2                2  5558
## 539                2        1                2  8567
## 540                1        2                2  4082
## 541                2        2                1  9592
## 542                2        1                1  4621
## 543                1        2                2  9710
## 544                1        1                1  9023
## 545                1        1                2  7721
## 546                1        2                1 10692
## 547                2        1                2  6211
## 548                1        2                2  3291
## 549                1        1                2  3695
## 550                1        2                1 11744
## 551                2        2                1  7580
## 552                2        2                2  4176
## 553                1        1                2  6205
## 554                2        2                1  5775
## 555                1        2                1 10828
## 556                1        1                1  5602
## 557                1        2                2  5466
## 558                2        2                1  6984
## 559                2        2                2 11938
## 560                1        1                2 11282
## 561                2        1                2  4337
## 562                2        1                2 11672
## 563                1        2                2  8367
## 564                2        2                1  4298
## 565                1        2                1  3414
## 566                1        1                1  3966
## 567                2        1                1  9430
## 568                1        2                1  8690
## 569                1        2                1  4546
## 570                2        2                2 11648
```

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## 571                1        2                2 10214
## 572                2        2                2 11481
## 573                2        2                2 11602
## 574                1        1                2  3485
## 575                2        2                2  4925
## 576                2        1                2  3247
## 577                2        1                1  7521
## 578                2        2                1  8974
## 579                1        1                1  7086
## 580                2        1                2 11039
## 581                2        2                2  9107
## 582                1        2                1  5413
## 583                1        1                1  7558
## 584                1        2                1  6723
## 585                2        2                1  7710
## 586                2        2                1 10404
## 587                1        2                1 10266
## 588                2        2                1  3880
## 589                2        2                2  7339
## 590                1        1                2  2995
## 591                2        1                2 10310
## 592                2        1                2 11989
## 593                1        1                2  3775
## 594                2        2                1 10391
## 595                2        2                1  4558
## 596                1        2                2  4279
## 597                2        1                2  4037
## 598                1        2                2  3594
## 599                1        1                1 12049
## 600                2        1                1  6723
## 601                2        2                1  7376
## 602                2        1                2  7527
## 603                1        2                2  4333
## 604                2        2                1  3466
## 605                2        2                2  4498
## 606                1        2                1  3697
## 607                1        1                1  5542
## 608                2        1                1 10027
## 609                1        1                2  8582
## 610                1        2                2  4972
## 611                1        1                1  5111
## 612                2        1                2 10070
## 613                1        1                2 10209
## 614                1        1                2  3272
## 615                2        2                1  3146
## 616                2        2                2 10165
## 617                1        2                2  4351
## 618                2        1                2  3589
## 619                2        1                2  8399
## 620                1        2                2  5726
```

```
## 621                1        1                1  4961
## 622                1        2                1 10059
## 623                1        2                2 10034
## 624                2        1                1  3061
## 625                2        2                1  7369
## 626                2        1                1  7901
## 627                1        1                2  7950
## 628                1        1                2 12082
## 629                2        2                1  7304
## 630                2        1                2  4932
## 631                1        1                2 12078
## 632                2        2                2  5219
## 633                2        1                2  9460
## 634                1        2                2  3463
## 635                1        2                2 10315
## 636                2        2                2 11786
## 637                2        2                1  5172
## 638                2        1                1  5834
## 639                1        1                2 11360
## 640                2        1                1  8197
## 641                2        2                2  3786
## 642                1        1                2  3263
## 643                1        1                1  9763
## 644                2        1                1  6299
## 645                1        2                2 10197
## 646                1        1                2  5361
## 647                2        2                2  7738
## 648                2        2                2  8161
## 649                1        1                1  8141
## 650                1        1                2  7758
## 651                2        1                2  4119
## 652                1        1                1  3271
## 653                2        2                1  6509
## 654                2        2                2  6158
## 655                2        2                2  9591
## 656                1        1                2  9255
## 657                1        1                2  6617
## 658                1        1                1  8086
## 659                2        1                1  3511
## 660                2        1                1 11161
## 661                1        1                1  8763
## 662                2        2                1  6666
## 663                1        1                2  4082
## 664                2        1                2 11230
## 665                1        1                1 11841
## 666                1        1                2  9270
## 667                2        1                2  4589
## 668                2        2                2 11656
## 669                2        2                1  8737
## 670                2        2                1 10957
```

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## 671   1   2   1 11093
## 672   2   1   1  3160
## 673   2   1   1  5467
## 674   1   2   2  6908
## 675   1   2   2  5322
## 676   2   1   2 10347
## 677   1   2   1 11566
## 678   2   2   2 10942
## 679   2   2   2  9848
## 680   1   1   2  5598
## 681   1   1   2  9288
## 682   1   1   1  8146
## 683   1   2   2 10116
## 684   2   1   2  4013
## 685   1   2   2  9342
## 686   2   2   1 10104
## 687   1   1   1  3696
## 688   1   2   1  5196
## 689   1   1   2  3619
## 690   1   1   2  7635
## 691   1   2   1  4636
## 692   2   2   2  6011
## 693   1   2   2  6527
## 694   1   1   2  5151
## 695   1   2   2  7523
## 696   2   1   1 11071
## 697   2   1   2  4570
## 698   1   1   2  4706
## 699   1   2   2  9637
## 700   1   1   1  9136
## 701   1   2   1  4176
## 702   1   1   2  8412
## 703   2   2   2  8978
## 704   1   1   1  8552
## 705   2   1   1  3203
## 706   2   2   2  4385
## 707   1   2   2  6266
## 708   2   1   1  4670
## 709   1   1   2  7255
## 710   1   2   1  4575
## 711   1   2   1 11692
## 712   1   1   2  7665
## 713   1   2   2  9792
## 714   2   2   2 10965
## 715   1   1   1 10824
## 716   2   2   2  5356
## 717   2   1   2  3105
## 718   2   2   1 11204
## 719   2   2   2  6497
## 720   2   2   1  3043
```

```
## 721                                2         1                2 11047
## 722                                2         1                2  6916
## 723                                2         1                2  4830
## 724                                2         1                1  4114
## 725                                1         1                1  7231
## 726                                2         2                1  4433
## 727                                2         1                2 10748
## 728                                2         1                2 10686
## 729                                2         2                2  6006
## 730                                1         2                1  3355
## 731                                2         2                1 12047
## 732                                1         1                2  3138
## 733                                2         2                1 10497
## 734                                2         1                2 11484
## 735                                2         1                1  8085
## 736                                1         2                2 11950
## 737                                1         1                1  5968
## 738                                2         2                2  4400
## 739                                2         1                1  5524
## 740                                2         2                1  4158
## 741                                1         1                1 10537
## 742                                2         2                2  8308
## 743                                2         1                1  6225
## 744                                1         2                1 11209
## 745                                1         2                1  4611
## 746                                2         1                2  3555
## 747                                2         2                1  4704
## 748                                1         1                2  7907
## 749                                1         1                1 11590
## 750                                1         1                1 10620
## 751                                1         1                1  4099
## 752                                1         1                2  5662
## 753                                2         1                2  8808
## 754                                2         1                2  4889
## 755                                1         1                1  4602
## 756                                1         2                2  9293
## 757                                1         1                1  6914
## 758                                2         1                2 10312
## 759                                2         1                2  8429
## 760                                2         1                1  5349
## 761                                2         2                1  4084
## 762                                1         1                1  9351
## 763                                1         1                2 10501
## 764                                1         2                1  4415
## 765                                2         2                1  5765
## 766                                1         2                2  4164
## 767                                1         2                1  5014
## 768                                1         2                1  6692
## 769                                1         1                1  4490
## 770                                2         1                2  9143
```

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## 771                1        2                2  7082
## 772                2        1                1  9591
## 773                2        1                1  5126
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## 775                1        1                1 11164
## 776                2        1                2  7481
## 777                2        1                1 10699
## 778                2        1                1  7999
## 779                2        1                1  3222
## 780                2        2                2  3692
## 781                2        1                2  9223
## 782                1        1                1 10301
## 783                1        2                2  9683
## 784                2        1                2  7664
## 785                1        1                2  3289
## 786                1        2                1  5421
## 787                1        1                1  4173
## 788                1        1                1  8218
## 789                1        2                1 10655
## 790                1        1                2  8438
## 791                2        2                2  4814
## 792                2        2                1  6346
## 793                1        1                2  9294
## 794                1        1                1  3753
## 795                1        1                1 11328
## 796                1        1                1 11246
## 797                2        1                1  4283
## 798                1        2                2  8721
## 799                2        1                2  5117
## 800                1        2                2  7731
## 801                1        1                2  8837
## 802                2        2                2  8067
## 803                1        2                2  6146
## 804                1        2                2  8963
## 805                1        2                1  6987
## 806                1        1                1  3414
## 807                1        2                2  4993
## 808                1        2                1  5409
## 809                2        1                2  7142
## 810                2        2                2  9361
## 811                1        1                1  4751
## 812                2        2                1  3131
## 813                2        2                1  3952
## 814                1        2                1  4192
## 815                1        1                1 11467
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## 819                2        2                1  7582
## 820                2        2                2  4788
```

```
## 821                                2         1                1  8892
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## 824                                2         1                2  6115
## 825                                2         2                1  9630
## 826                                1         1                1  6132
## 827                                1         1                2  8107
## 828                                1         2                2  5634
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## 832                                2         2                1  5950
## 833                                2         2                2  6220
## 834                                1         1                1 10418
## 835                                2         1                2  8066
## 836                                1         2                2  8447
## 837                                2         1                2  9878
## 838                                2         1                2  7608
## 839                                2         2                2 11135
## 840                                1         2                2 11551
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## 842                                1         2                2  4744
## 843                                1         2                1  7224
## 844                                1         2                2  9579
## 845                                2         1                2  3884
## 846                                2         1                1  8202
## 847                                2         2                1  5030
## 848                                1         1                1  5683
## 849                                1         1                1 10240
## 850                                1         1                1  7693
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## 852                                2         1                2 11198
## 853                                1         1                2 10741
## 854                                1         2                2  8795
## 855                                1         2                1 11959
## 856                                1         2                2  9495
## 857                                1         2                2  9885
## 858                                2         2                1 10792
## 859                                2         2                1  9137
## 860                                1         1                2  6490
## 861                                2         1                2  8294
## 862                                2         1                1  7658
## 863                                1         1                1  4895
## 864                                1         2                2  6813
## 865                                1         1                1  3134
## 866                                2         2                1  7089
## 867                                2         1                2  3949
## 868                                1         2                1 10923
## 869                                1         2                1  6133
## 870                                1         1                2  3753
```

```
## 871                2        2                2 11161
## 872                2        1                2  3214
## 873                1        2                2 11362
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## 876                1        2                2  5264
## 877                1        2                1  4436
## 878                2        1                2 10381
## 879                1        1                2  9662
## 880                2        2                2  9186
## 881                1        1                1  3497
## 882                1        1                1 11895
## 883                1        1                1 10572
## 884                2        2                1  4818
## 885                2        2                2  6632
## 886                1        2                2  8234
## 887                1        2                2  3486
## 888                2        1                2  3421
## 889                2        1                2  9403
## 890                1        2                2  7327
## 891                2        1                2  3358
## 892                2        2                2  6567
## 893                1        1                1 11097
## 894                2        2                1 11842
## 895                2        1                1  9058
## 896                2        2                2  7476
## 897                1        2                2  5961
## 898                1        2                2  7716
## 899                1        2                1  3256
## 900                1        1                2  5906
## 901                2        1                2  9708
## 902                1        1                1  6252
## 903                1        2                1  6170
## 904                1        1                1  4149
## 905                2        2                2 10552
## 906                1        2                2  8187
## 907                1        2                1  5220
## 908                1        1                2  3338
## 909                1        1                2  5118
## 910                1        1                1  5441
## 911                1        1                1  4940
## 912                2        2                1  8613
## 913                1        1                2  7426
## 914                1        1                2  6569
## 915                2        1                1  5879
## 916                1        1                1  5880
## 917                2        1                1  6189
## 918                2        2                1 12093
## 919                1        1                2  5063
## 920                2        2                1 10965
```

```
## 921                                2         2                1  9453
## 922                                2         2                2  3465
## 923                                2         1                2 10617
## 924                                1         2                1 11963
## 925                                1         1                1  8868
## 926                                1         2                2  7140
## 927                                1         2                1  7937
## 928                                1         2                1  3521
## 929                                1         2                2  3840
## 930                                1         1                2  7096
## 931                                2         1                1  4853
## 932                                2         1                1  7352
## 933                                1         1                2  8574
## 934                                1         2                1  8569
## 935                                1         2                2  7498
## 936                                1         1                2  7519
## 937                                1         1                1  6799
## 938                                1         2                2  6067
## 939                                1         1                1  3425
## 940                                2         2                1 11015
## 941                                2         2                2 10366
## 942                                2         2                1  4207
## 943                                1         1                2  6356
## 944                                1         2                2  7130
## 945                                1         2                1  7666
## 946                                2         1                2  3115
## 947                                2         2                1 11530
## 948                                2         1                2 11561
## 949                                1         1                2  5429
## 950                                2         1                1  3129
## 951                                1         1                2  5869
## 952                                2         1                1 10889
## 953                                1         2                1  4663
## 954                                1         1                1  4590
## 955                                2         1                2  6560
## 956                                2         2                1 10968
## 957                                2         2                2  3255
## 958                                2         2                2  5857
## 959                                2         2                1  3073
## 960                                1         2                1  7101
## 961                                1         2                2  8540
## 962                                2         2                2  8593
## 963                                2         1                2  6818
## 964                                1         1                2 11664
## 965                                1         2                2 10564
## 966                                1         2                2  5779
## 967                                2         1                2 11477
## 968                                1         2                1 10567
## 969                                1         2                1 11130
## 970                                1         1                2  9608
```

```
## 971    1    1    1  3609
## 972    1    2    1  4120
## 973    2    2    2  5290
## 974    2    2    1  8869
## 975    1    2    2  6447
## 976    2    2    2  8185
## 977    1    2    1  9336
## 978    1    1    1  3289
## 979    1    2    1  9647
## 980    2    2    1  5291
## 981    2    2    2 10956
## 982    2    2    2  6341
## 983    2    1    2  8207
## 984    2    2    2  5355
## 985    1    2    2  4072
## 986    1    2    1  4678
## 987    2    2    1  4812
## 988    2    2    2  9016
## 989    1    2    2  5208
## 990    2    2    1 10407
## 991    2    1    1  7162
## 992    2    1    2  3528
## 993    2    2    1  5415
## 994    2    1    1  4243
## 995    2    1    2  9402
## 996    1    1    1  3586
## 997    2    2    2  9438
## 998    1    1    2 10286
## 999    2    2    2  3826
## 1000   2    1    2  5964
## 1001   1    1    1  4520
## 1002   1    2    2  7234
## 1003   1    2    1  6658
## 1004   2    1    2  4206
## 1005   1    1    1  6652
## 1006   2    1    1  8755
## 1007   1    2    1  9388
## 1008   1    2    1  5144
## 1009   1    2    2 11930
## 1010   2    1    1  3235
## 1011   2    1    2  3965
## 1012   2    1    2  4802
## 1013   2    1    2 11728
## 1014   1    2    2 10081
## 1015   1    1    1 10231
## 1016   1    1    1  7867
## 1017   2    1    1  8881
## 1018   2    2    1  6846
## 1019   2    1    1  4660
## 1020   1    2    2 11201
```

```
## 1021                1        1                1  9587
## 1022                1        1                1  5663
## 1023                1        1                2 11401
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## 1025                1        2                2  6954
## 1026                1        2                2 11837
## 1027                1        2                1 11158
## 1028                1        1                2  9956
## 1029                1        1                2  7935
## 1030                2        1                2  5993
## 1031                1        2                1 11905
## 1032                1        1                1 11921
## 1033                2        2                1  3403
## 1034                2        1                1  4236
## 1035                1        1                2  9151
## 1036                1        1                2 12064
## 1037                2        1                2  6710
## 1038                1        1                1  5732
## 1039                2        1                1  4042
## 1040                1        1                2  9693
## 1041                2        1                2  4734
## 1042                2        2                1  8920
## 1043                1        1                1  3416
## 1044                1        1                1  3056
## 1045                2        2                1  7807
## 1046                2        1                2  7990
## 1047                2        2                2  9201
## 1048                1        2                1  6127
## 1049                1        2                1 10718
## 1050                1        1                1  9732
## 1051                1        2                2  4848
## 1052                2        1                1  7079
## 1053                1        2                2  8534
## 1054                2        2                1  8289
## 1055                2        1                1  9825
## 1056                1        2                2 11610
## 1057                1        2                2  8297
## 1058                2        1                2  4871
## 1059                1        1                2  7348
## 1060                1        1                1  9850
## 1061                1        2                2  6638
## 1062                2        1                2  5047
## 1063                2        1                1  4253
## 1064                1        2                1  4272
## 1065                2        1                1  8926
## 1066                2        1                2  5711
## 1067                2        2                1  4618
## 1068                2        2                2  7346
## 1069                2        2                1 10517
## 1070                1        1                1  5419
```

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## 1071                2        2                1  3108
## 1072                2        1                1  9567
## 1073                2        1                2 10110
## 1074                2        2                1  8255
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## 1077                2        2                1  4919
## 1078                1        2                1  6728
## 1079                2        1                1  7009
## 1080                1        2                2  9238
## 1081                2        1                2 10412
## 1082                1        2                2  5247
## 1083                1        2                1 10534
## 1084                1        1                1  3340
## 1085                1        2                1  7109
## 1086                2        2                1  8952
## 1087                1        1                2  7685
## 1088                1        1                1 11530
## 1089                1        2                1  8869
## 1090                2        2                2  8901
## 1091                1        1                1  8863
## 1092                1        2                2 11135
## 1093                2        1                2  4229
## 1094                2        2                2  6571
## 1095                1        1                2 11232
## 1096                2        1                1  5845
## 1097                2        2                1  4075
## 1098                2        1                1 10915
## 1099                2        2                2  5312
## 1100                1        2                1  5162
## 1101                2        1                1 11669
## 1102                2        2                2 10678
## 1103                2        2                1 11612
## 1104                1        1                1 10620
## 1105                1        1                2 10520
## 1106                2        2                1  9315
## 1107                1        1                1  6042
## 1108                2        1                2  6731
## 1109                1        2                1 11292
## 1110                2        1                2  8644
## 1111                2        2                2  8873
## 1112                1        1                1  6006
## 1113                1        1                2 11705
## 1114                2        2                1  5984
## 1115                1        2                1  6045
## 1116                1        2                1  4046
## 1117                2        2                1  4753
## 1118                2        1                1  7977
## 1119                2        1                2  4752
## 1120                1        1                1 10268
```

```
## 1121                2        1                2  8929
## 1122                1        2                2  8694
## 1123                1        2                1  8716
## 1124                1        1                1 10765
## 1125                2        2                2  9145
## 1126                1        2                2  3258
## 1127                2        1                1 10880
## 1128                1        1                1  4878
## 1129                1        2                1  7781
## 1130                2        1                2  9886
## 1131                2        2                1 11547
## 1132                1        2                2  5555
## 1133                2        2                1  6820
## 1134                2        1                2  8267
## 1135                1        2                1  6792
## 1136                2        2                1  8240
## 1137                1        2                2  5494
## 1138                2        1                1  7908
## 1139                2        1                1 10233
## 1140                1        2                1  3542
## 1141                1        2                2  9422
## 1142                2        2                1  5837
## 1143                2        2                1  6071
## 1144                2        2                1  7579
## 1145                2        1                1  8112
## 1146                1        2                2 11065
## 1147                2        2                2 11988
## 1148                2        2                1 11390
## 1149                2        1                1  6364
## 1150                1        2                1  7699
## 1151                2        2                1  8258
## 1152                1        1                1  7909
## 1153                1        1                2  8408
## 1154                1        1                2  3557
## 1155                1        1                2  5524
## 1156                1        2                2 12061
## 1157                2        2                1  7923
## 1158                1        1                2  8489
## 1159                2        2                1  8524
## 1160                2        2                1  3353
## 1161                2        2                1  3665
## 1162                1        2                2  9700
## 1163                2        2                1 10680
## 1164                1        1                1  9068
## 1165                1        2                2  3339
## 1166                2        1                2  3361
## 1167                1        1                2 11438
## 1168                1        1                2  6620
## 1169                2        1                1  7039
## 1170                2        2                2  3001
```

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## 1171                2         2                2  4720
## 1172                1         2                2  7320
## 1173                2         1                1  3060
## 1174                1         1                1  3844
## 1175                2         2                1  6543
## 1176                2         1                2 10312
## 1177                2         1                2  8540
## 1178                2         2                1 10744
## 1179                2         2                1  7856
## 1180                1         2                2 10498
## 1181                2         1                2  8314
## 1182                2         2                2  7096
## 1183                2         2                2 11637
## 1184                2         1                2 11307
## 1185                1         2                1  8021
## 1186                2         2                1 10224
## 1187                1         2                1 11030
## 1188                1         2                1  7806
## 1189                1         2                1  8771
## 1190                1         2                1  3659
## 1191                2         2                1  9262
## 1192                1         1                1  3797
## 1193                1         2                1  7823
## 1194                1         2                1  8306
## 1195                1         1                1  5716
## 1196                1         2                2  7251
## 1197                2         2                2 11028
## 1198                1         2                1 10764
## 1199                2         2                2  5400
## 1200                1         2                2  3848
## 1201                2         1                2  9983
## 1202                2         2                1  5315
## 1203                2         2                2  3938
## 1204                1         1                2 10778
## 1205                1         1                1 11773
## 1206                2         2                2 11149
## 1207                2         1                2  3951
## 1208                2         2                1  6494
## 1209                1         2                2 10481
## 1210                2         1                2 11530
## 1211                1         1                2 11933
## 1212                1         2                2 11211
## 1213                1         2                1  4976
## 1214                1         2                2  7818
## 1215                1         1                1 12024
## 1216                1         2                1  6624
## 1217                2         2                2  3537
## 1218                1         2                2  4207
## 1219                2         2                1  5202
## 1220                1         2                1 11203
```

```
## 1221                2        2                2  5351
## 1222                1        1                2  6326
## 1223                1        1                1 10950
## 1224                2        2                2  7470
## 1225                2        2                1 11244
## 1226                1        1                1  7106
## 1227                2        1                2  9726
## 1228                1        1                2 11905
## 1229                1        2                1  8751
## 1230                1        2                2 11927
## 1231                2        2                2  3486
## 1232                2        1                2  6624
## 1233                2        2                1 10181
## 1234                1        2                1 11727
## 1235                2        1                2  4277
## 1236                1        1                2  3490
## 1237                1        1                2  3953
## 1238                1        1                1  3604
## 1239                1        1                1  3723
## 1240                1        1                2  6477
## 1241                1        1                1 11947
## 1242                1        1                2  8872
## 1243                2        1                1  8457
## 1244                1        2                2 10098
## 1245                2        1                1  6645
## 1246                2        2                2  4254
## 1247                2        2                1 11795
## 1248                1        2                2  7110
## 1249                2        1                1  9696
## 1250                2        1                2  9313
## 1251                1        1                2  3020
## 1252                2        2                1  7051
## 1253                2        2                2  6673
## 1254                2        2                2  3865
## 1255                2        2                2  8594
## 1256                1        1                1  5723
## 1257                2        1                2  6563
## 1258                1        1                1  7577
## 1259                2        1                1  6074
## 1260                1        2                1  4551
## 1261                1        2                2  4534
## 1262                1        1                1  5428
## 1263                2        1                2  7993
## 1264                1        2                1 10784
## 1265                1        2                1  6767
## 1266                2        1                2  9297
## 1267                2        1                2 10987
## 1268                1        1                1 10834
## 1269                2        2                2  5358
## 1270                1        2                2  9678
```

```
## 1271                1        2                1  5786
## 1272                2        2                1  8371
## 1273                1        1                1  7458
## 1274                1        1                2  7726
## 1275                1        1                1  4733
## 1276                1        2                2  9442
## 1277                1        2                2  5035
## 1278                1        1                1  3240
## 1279                1        1                1  4155
## 1280                1        1                2 11967
## 1281                2        2                2  4324
## 1282                2        1                2  7071
## 1283                2        1                2  5016
## 1284                2        2                1  5506
## 1285                1        2                1  5439
## 1286                2        1                2  7931
## 1287                2        2                2 10136
## 1288                2        1                1 10099
## 1289                1        1                1  7987
## 1290                1        2                1 10182
## 1291                2        2                1 11214
## 1292                2        2                2  6716
## 1293                1        1                2  6757
## 1294                2        2                2  5021
## 1295                1        2                2  9113
## 1296                2        1                2 11465
## 1297                2        2                2  6691
## 1298                1        1                1  8943
## 1299                1        1                2  3526
## 1300                2        2                2  7556
## 1301                2        1                1  9322
## 1302                2        2                2  6489
## 1303                2        2                2  7820
## 1304                1        1                1  6498
## 1305                2        1                1  4542
## 1306                2        1                2  8913
## 1307                2        1                2  8446
## 1308                1        1                2 11163
## 1309                2        2                2  4884
## 1310                1        2                2  9573
## 1311                1        1                1  6583
## 1312                2        1                1  3976
## 1313                1        2                1 11518
## 1314                2        1                2  3462
## 1315                2        1                1  4796
## 1316                1        2                2  6928
## 1317                1        2                2  3377
## 1318                1        1                2 10912
## 1319                2        2                2  8934
## 1320                2        2                1 11777
```

```
## 1321                2         1                1  9660
## 1322                1         2                2  6430
## 1323                2         2                1  3007
## 1324                1         1                1  6600
## 1325                2         2                2  6746
## 1326                1         1                2  3493
## 1327                2         1                1  5842
## 1328                2         1                1  6421
## 1329                1         1                2  4172
## 1330                2         2                1  8439
## 1331                2         1                1  3496
## 1332                1         2                1  6859
## 1333                1         1                1  7794
## 1334                1         2                1  9612
## 1335                2         1                1 10785
## 1336                2         2                2 11238
## 1337                1         2                2  6038
## 1338                2         2                1  6895
## 1339                1         2                1  7266
## 1340                2         1                1  3896
## 1341                1         1                2  3121
## 1342                2         1                2  4685
## 1343                1         1                2  5393
## 1344                2         2                1  4105
## 1345                1         2                1  4733
## 1346                2         2                1  6728
## 1347                2         1                2  7964
## 1348                1         1                2  5493
## 1349                2         2                1 11498
## 1350                1         1                2  8484
## 1351                2         1                2  4104
## 1352                1         2                2  7119
## 1353                2         2                2 10146
## 1354                1         1                2  9698
## 1355                1         2                1  6315
## 1356                2         1                2  6569
## 1357                2         2                2  9236
## 1358                1         2                1 11746
## 1359                1         2                1 10945
## 1360                1         1                2 10747
## 1361                2         1                2  8029
## 1362                1         2                1  3288
## 1363                1         1                1  8082
## 1364                2         1                1  5878
## 1365                2         1                1  6407
## 1366                1         2                1 10150
## 1367                2         2                2  8493
## 1368                2         2                2  7331
## 1369                1         1                2  3805
## 1370                1         1                1  8048
```

```
## 1371                                  1        1               2  5434
## 1372                                  2        1               2  7058
## 1373                                  1        1               1  6794
## 1374                                  1        2               1  9654
## 1375                                  1        1               1 11977
## 1376                                  2        2               1  9867
## 1377                                  1        2               1  3637
## 1378                                  1        1               1  7480
## 1379                                  2        2               1  7730
## 1380                                  2        2               1  4196
## 1381                                  1        1               1  7044
## 1382                                  1        1               1  6207
## 1383                                  1        2               1  4913
## 1384                                  2        2               1  7257
## 1385                                  1        2               1 11832
##          RBC HGB   Plat AST.1 ALT.1 ALT4 ALT.12 ALT.24 ALT.36 ALT.48
## 1    4248807  14 112132    99    84   52    109     81      5      5
## 2    4429425  10 129367    91   123   95     75    113     57    123
## 3    4621191  12 151522   113    49   95    107    116      5      5
## 4    4794631  10 146457    43    64  109     80     88     48     77
## 5    4606375  11 187684    99   104   67     48    120     94     90
## 6    3882456  15 131228    66   104  121     96     65     73    114
## 7    4747333  12 177261    78    57  113    118    107     84     80
## 8    4405941  11 216176   119   112   80    127     45     96     53
## 9    4608464  12 148889    93    83   55    102     97    122     39
## 10   4455329  12  98200    55    68   72    127     81    125     43
## 11   4265042  12 166027   103   124  111     74     53    123    101
## 12   4130219  13 144266    75    49   93     52     46     46     59
## 13   4116937  13 203003    97   101   66     53     95     55    104
## 14   4321603  14 141110   120    61   64     51     78     90    113
## 15   4165603  14 222874   127   122  106    105     88    111    111
## 16   4896464  11 149506   117    53   50     80    120     66     86
## 17   4165219  10 197640    86   105   70     86     83     87     47
## 18   4466885  14 163276    53   101   50     95    112     97     68
## 19   4448466  15 190642    53   124   62     76     57     46     93
## 20   4436025  10 111819   115   121   63    127     95    124     93
## 21   4031637  15 116558    86   109  118    119     55    103     84
## 22   4994729  10 109023    84    77   67     81    117     68     42
## 23   4595487  14  94733    45    92  103    104     40    115     93
## 24   4625248  10 211363    70   102   76     58    111     95     58
## 25   4300774  11 222135    62    91  116    128     41     70    106
## 26   4529290  15 109871    48   112   99     85     59     87     78
## 27   4052583  15  94503    41    54  128     64     71     89     87
## 28   4906158  12 190314    61   120  113     75     88    114     99
## 29   4763261  13 126721    51   118   98     42     93     53     83
## 30   4753531  15 104729   120    72  117    126     45     95     49
## 31   3999388  15 182262    96    49   59     88     62     58     81
## 32   3998925  10 201114    57   110  128     96     69    105     72
## 33   4599496  11 167354    94    64   54    122     64     64     96
## 34   4581099  13 125642    42    47   82    102     48     76     53
```

```
## 35   4075477  11 118742    42   118   67    111     48    107    101
## 36   4152639  14 120812   128   102   79     63     80     86    127
## 37   4023215  14 222471    52   126   67    126    126     41     54
## 38   4911615  10 171725    40    43   46     64    101     45     91
## 39   4354206  14  95604    69    58   62     50     60     84    114
## 40   3939529  14 196433    78    81   90     48     68     83    128
## 41   3889649  14 182897   106    69  127     99     47    103    111
## 42   4308638  11 184113    93    56   40    124    101     50     90
## 43   4797923  14 101512   127    92   94    113     96    126    108
## 44   4735873  14 177677    80    48   76    120     82    111    101
## 45   3902488  14  97785    88    89   47     48     63     57    114
## 46   4570417  10 209827   105   116  106    111     84    107     71
## 47   4212499  12 150344   114    68  127     47    117    128     53
## 48   4281958  10 186992   113    40   42     42     78    106     57
## 49   4972412  10 189400   125    48  118     59     70    105    110
## 50   4327627  12 138099   100   109  123     85     95     90     72
## 51   4679591  15 123295    84    71   62    117     82    116    105
## 52   4054154  14 175906    70    58  100    112     80     76    101
## 53   4143165  13 120871   115    93  109     48     56     76    100
## 54   4421722  12 212279    84    41   85     97     44     89    125
## 55   3939606  14 197798    55    84  124     59    113     44     67
## 56   4003477  14 217699    49    54  127     60     39    110     46
## 57   4651439  10 184013    82    75   53     75     95     96     44
## 58   4149153  15 120975    40    67   40    122     71    117    111
## 59   4616230  11 138648    75    46   56    120     84     91     56
## 60   4116304  13 130342    79    63  110     54     41    102     41
## 61   4844053  10 165099    73    73   60     82    107     79     42
## 62   4434372  13 138252    78    63   58    105    113     57     89
## 63   3961979  13 125625   109    89   42     60     42     72     55
## 64   4097792  15 163795   104   126  107     74    103     97    114
## 65   3878997  15 177809   121    65   71     44    100    128    110
## 66   4731084  13 219590    98    86   53    118    128    103    119
## 67   4656201  15 199042    89    98   44     59    124     41     45
## 68   4489031  14 170489    70   103   52     90    119     41     57
## 69   4872198  10 217563   106   127   94     89     98     80     61
## 70   3977714  14 203489   119    44   57    112    109    104     56
## 71   4316260  15 112273   107   127   98    116     91    114     76
## 72   4588105  15 162564    57    78  116    114     40     56     95
## 73   4602228  13 159896    92    61   66     80     83     80    106
## 74   4479247  12 151526    71   113   83     94     45     49    128
## 75   4622035  14 101254    95   127   57    124     87    120     75
## 76   4330272  15 151597    39   101   91    113     95    110     44
## 77   4194696  15 172915    79    62  104     58     94    115     89
## 78   4818572  14 135689   101    63   88     73    120     39    102
## 79   4470537  11 220661    83    55  127     55     46    110    121
## 80   4306848  14 223196   119   101   59    108     67     43     68
## 81   4680049  15 115867   108    63  100     51     96     86    101
## 82   4314617  11 113281    42   101   85     75     64    117    125
## 83   4752903  15 132694    66    69   96    109    114     95     50
## 84   4852636  12 103575    59   105  122     94    126     82     71
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## 85   4217730  10 125068    60    94   63     93     70     89     43
## 86   4503431  10 113199    65   128   81    106    126    103     78
## 87   3892146  12 151419   109    67   59     93    115    128     91
## 88   3954021  11 106309    95    61   93     97     86    119     39
## 89   4946479  14 161613    83   108  104    110     61     69     70
## 90   4057999  13 127765    48    45  122     52     71     95     63
## 91   3986814  12 212852   118    96  123     39     70     71     63
## 92   3861675  13 156095    85    70   42     63     72    128     79
## 93   4127397  10  99699    88   108  124    119    116    113     87
## 94   4008145  11 131295   113    51   74    115     88    102     93
## 95   4136958  12 142869   110   107   64    117     93     55     59
## 96   4830312  13 197486    68    81   62     93     61     99     43
## 97   4322008  10 219360   104    70   61     64    118     99     62
## 98   3944957  11 192455    51    47   69     46     77     79     42
## 99   4622950  13 103521    52    76  107    112    123     84    120
## 100  4372638  12 213687   105   128   69     64     50     77     64
## 101  4753125  10 206409    77    80   85    110     46     99    125
## 102  4542344  11 180872    97    96   75     86     58    104    111
## 103  3916999  13 166734   109    99   53     46     53     92    119
## 104  4358100  13 127465   110    86   97    112    108     87    128
## 105  4863975  11 164733   117    85   47     87    126     98    118
## 106  4944654  11 225389    70   100   56     45     97    126    101
## 107  4751440  13 189785    47   114   51     82    106     93    114
## 108  4302555  15 221984   106    68  124    127    101    121     39
## 109  4121374  14 220201    70   111   75     59     48    104     84
## 110  4766331  11 186633   114   102   45     62     65     42     66
## 111  4152861  11 209054    69    92   42    101    107     78    112
## 112  4232027  14 202185    64    64  102     63    108    125     94
## 113  4461091  13 205459   108    63   48     47    107     94     88
## 114  4261488  12 174553   106   122   95     53    126    111    108
## 115  4624822  13  97537   110   105   42     42     91     84    120
## 116  4270519  14 164140   107    39   39     83    103     52    103
## 117  4035603  13 171910    52    93   82     94     88     53    110
## 118  3967189  13 153780   109    68  122    101     97     50    118
## 119  4247913  15 187079    87   117  126    109    105     58    115
## 120  4057386  15 192554    75    41  119     91     58     41    122
## 121  4473562  13 217716   128    40  103     85    114     65     82
## 122  4341068  11 155605   117    64  120     56     52    106     53
## 123  4150332  10 189911    92   106  111     61     75    127     48
## 124  4711166  13 161317    40    61   88     64    120    106     49
## 125  4035033  11 222975   128   127   42     72    121    105     98
## 126  5018034  15 204596   123   127   44     78     72    125     73
## 127  4787266  15 222316    59    59   81     52    101     99     46
## 128  4133201  10 213350    82   115   74     78     44    116    124
## 129  4613449  12 137042   116    45   42    118    101     73    110
## 130  4706874  14 115724    97   122  108    103     93    111     91
## 131  3850422  12 204574    68    40   64     67     84     80     68
## 132  4686353  14 150033    78   126   64     80    125     95     59
## 133  3871675  12 135903   114    41   41    124    106     73     74
## 134  4030932  10 219621    50    68   84    119     75     48     76
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## 135  4511343  12 154247    78   125   88     48     81     75    123
## 136  4065063  13 176936    88    57  110     47     80    123     80
## 137  4551539  10 196565    83   119  125     54    122    126     62
## 138  3966645  14 156808    93   118  127     84     94     57     65
## 139  3904490  11 140997    62   110  117     78     83     81     47
## 140  4259591  14 111018   115    61   39    115     40     43     68
## 141  4685008  14 153657    42    73   58     54     47    100     80
## 142  4412655  13 166614    54    51   85     56     68    105     98
## 143  4963498  11 149698    93    87  118    118     92     95    128
## 144  4633099  10 214890    85   117   60    123    122     73     59
## 145  4383899  14 105645   127   115  104     59     42     73     50
## 146  4760400  12 148040    96    95   93     80    120    123     64
## 147  4601724  14 129472    41    58  120     58     41    114    104
## 148  4182026  12 122120    60    71   75     90     71    117    114
## 149  4163583  10 194984   128   122  114    115     96     66     56
## 150  4360235  14  97735   103   126  120     75     39     95    110
## 151  4048698  12 157581    43    85   61     43    112     95     72
## 152  5010655  12 222021    56    73   43    121     72    116     61
## 153  4808183  14 167031    66   124  119     80    113     89     78
## 154  3901541  12  94794   124    84   39     90    104     81     78
## 155  4621540  14 185645    93   123  123     86     42    114    114
## 156  4153369  10 208635    44   109  114     81     76     65     98
## 157  4127797  12 180182   127   128   98     44     67     54    108
## 158  4523001  11 163863    77    62  122    100    104     64     39
## 159  4527245  14 130738   120    41   75     90     46    109     72
## 160  4562544  11 181604    55   106   39     87     41     73     43
## 161  4553378  13 154821    96   125   96    110    127    123     92
## 162  4368190  15  94167   113   123   91     70    120     86     68
## 163  4679689  15 120161    66    77  114     62    128    117    123
## 164  4828742  12 131376    83   104  116    109     60     53     84
## 165  4782262  13 196623    90   119  117     57     77    115     99
## 166  4706596  12  93755   128   105   84    127     45     39     98
## 167  4853667  13 166407    86    73   39     39     47     60     96
## 168  4324296  10 160568   118   108   45     97    118     61     56
## 169  4930579  14 219575    61   128  126     55     70     85    123
## 170  4343675  15 209330    89    75  101    118     81     65    104
## 171  3938997  11 173434    57    39  122     60     53     64    107
## 172  4614988  13 220628    71    51  123    103    122     78    120
## 173  4673174  14 181210    57    78  127     49     91    101     63
## 174  4483772  12 155738    93    79  102     79     90     90     80
## 175  4997621  10 150714    40    85   56     67     47    102     60
## 176  4766748  14  98201    47    90   50     50    117     43     71
## 177  4019273  13 110154    46    47   47    117    115     74    124
## 178  4171468  11  94252    81    99   63     68    119     76     46
## 179  4537995  13 175333    74    52   74     43     49     79     79
## 180  4242616  10 125473   113    70   91     43    118     96     44
## 181  4044641  15 165374   122   115   96     97    117     72     65
## 182  4842331  10 179346   117   116  107    102     39     98     62
## 183  4876785  11 128030    67    52   49     57    104    111     60
## 184  3964906  11 212871   123   120  118     68     42     58    106
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## 185  4183592  12 110861    98   113    51     67     51     57    126
## 186  3857371  10 102771   124    88    48    101    127     77     66
## 187  3821231  10 136094    56    77   114     97    126     57    112
## 188  4746390  10 124479    67   104    93    108     94     52    106
## 189  4779175  10 159045    78    81    61     86     51     49     82
## 190  4694155  11 189845    61    97    49     88    112     75     73
## 191  4593035  13 112819    53    47    73    110     42     45     98
## 192  4197614  14 214565    52    89    64    115     82    104    100
## 193  4010824  15 183696    39   102   125     48     81     50    109
## 194  4931701  11 175746    40    86   115    122     39    108    108
## 195  4653695  14 135012    49    55    95     39    126     67     45
## 196  4025569  15 198432    54   127    81     68    101    110    125
## 197  4015138  13 118420    98   109    97     74     68    103     66
## 198  4404883  12 100862    90    52    58    126     39     87    128
## 199  3940425  15  97541    99    40    50     69    122     80     53
## 200  4044419  12 217018   112   115   119    123    106    119     97
## 201  4979484  13 113557    99   112   108    107     71     71     66
## 202  4333464  14 176048    90   101    45    122     84     73     81
## 203  4766961  11 210409    46   120    69     48     81     84     48
## 204  4669353  14 109331   124    39   127     56    126     51    120
## 205  4083545  10 208754   103   112    53     67     52     39    128
## 206  4757654  10 215749    53   116    41     60     88     49     44
## 207  4965747  13 109039    96    86    82    123     97    123     82
## 208  3844696  10 135467    69   110    45     97    120     72     48
## 209  4550405  15 150016    45    72    93    118    126     60     74
## 210  4349115  13 167928   107   127    48    125     44     77     77
## 211  4537003  12 186747    76   103   101     47     79     55     40
## 212  3951975  14 158680    90    78    86     96     43     64     86
## 213  3995156  14 138206    41    49   118     68    106     85    126
## 214  4492980  12 183155    98    51    89     92     42    104    101
## 215  4830356  14 199182    78    82    67    112     62    101     98
## 216  4591254  13 130036   127   120    47     91    100    104    109
## 217  4184650  12 204123    99    95    54     48     66     80     78
## 218  4024690  12 105173   100   100    68     79    108    125     50
## 219  4361113  14 209110    83    92    84     74     42     43     67
## 220  4533216  11 195413    82    67   103    123    122     50    122
## 221  4137761  12 110251   113    94    52     86    110     76     76
## 222  4676685  12  93242    89    48   119    117     67    103     58
## 223  4997222  13 155448    68   112    96     72    122    102     98
## 224  4677968  15 149067    71    71    67    105     51     67     83
## 225  4582863  13  97706   111    93    78     40     97     47     44
## 226  3899102  12 161399    99    92    67     52     59     60     76
## 227  3981364  15 118656    41    54   100     43    115     46     66
## 228  4144255  14 217810    95    75    73     93     43     90    127
## 229  4443767  15 101419    65    48    64    128     80     44    109
## 230  4401784  12 225228   127    80    66     41     49    108     42
## 231  4153369  10 219010    99    70    61     50     99     46    100
## 232  4030849  14 131136   117    42    52    119    124     62     78
## 233  4025356  15 191900    56    95   120    105     41     61     81
## 234  4506553  15 165628   104    76   114     76     80     52     44
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## 235  4379233  15 108039    77    58   69     99    118     96     78
## 236  4598134  15 206520   123    62  122     46     57    116     60
## 237  4242488  14 212116    54    68   54     86     56     88     71
## 238  3891419  14 128885    68    98  106     67     46    124     47
## 239  3897503  14 126190    42    65   54     70    114     58     85
## 240  5012914  14 188339    91   109   84     84     52    103     91
## 241  3969417  13 152999    66    77   99     42     58     89     39
## 242  4645662  12 110752   116    57   98    108    115     41     48
## 243  4750314  12 189630   110    59   79     99     76     96     91
## 244  5017591  15 196715   102   122   93     53     47     45    124
## 245  3895740  10 199063    93   101   68    115    125     70     44
## 246  4919224  10 159069   108   100   91     98     92     43    109
## 247  4822838  13  97151    86    88   48    119     78     87     90
## 248  4603100  10 126799    83   109  113     43    126    119    104
## 249  4718925  15 188741    53    77   88     41    122     47    123
## 250  4511138  13 131284    84   126  112     47     55    101     88
## 251  4201245  13 181300    68    95   93    103     55     49     86
## 252  4590360  11 162297   111   127   71     42     83    110    100
## 253  5008980  15 202847    68    63   80    122    107    109     64
## 254  4775721  15 205031    99    57   76     88     71    107     69
## 255  4591064  15 219920    88   114   47     89     52    102     84
## 256  3910766  12  96765   114   127  123     68     58     65     56
## 257  4340278  14 176808    75    80  110    114     49     46    104
## 258  4656389  15 115714    51   101   85     58     55     88     46
## 259  4885943  13 212363    60    89  125     92     94     92     59
## 260  4392559  12 119431   111    58   53    104     66    127    116
## 261  3906089  11 178359   111    78  101     76     68    109     78
## 262  4356651  11 135360    86    59   77     69    102     41     49
## 263  3882329  10 184844   128    72  120     43     87     73     88
## 264  4878190  12 192995    43   121   74     42     40     60     71
## 265  4680569  13 150894    87    41   79    122     74     94     52
## 266  4079407  13 220182   113    81   41     95     78     46    114
## 267  3980091  11 183642    95    68   61    116     52     39     95
## 268  4133045  10 222555    83    47  125     73    122    120     67
## 269  4617224  15 108367   104    82  118     86     70     93     71
## 270  4358654  11 104641   115    50   86    117    121    105     80
## 271  4764655  11 156386    96    98  120     65    124    112    128
## 272  4001067  13 197011    86    71  125    114     65    108     70
## 273  4597818  10 169421    96   113   50    113     63     76     46
## 274  4631847  15 112473    67    82   61    100     63     44     80
## 275  4275163  15 120046   100   109   87     44    100     57    123
## 276  4400232  11 125385    56    49  108     80    101     92     97
## 277  4587298  12 176769   113   121  113    102    107    126    117
## 278  4747682  14 102811    59   115   59    111     52     81    107
## 279  4361814  13 131531   120    79   83    100    122     43     73
## 280  4018659  13 152237    55    93   74     85    126     64     95
## 281  4097706  12 161937    54    55  113     81     69     42    105
## 282  4002769  15 148857   128   128  100     71     51     66    120
## 283  4940743  13 183372    63    80   53     64    104     62    105
## 284  4853740  14 116873   126    71   83     48     79     43    111
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## 285  4002375  10 111481    65    70   62    120    108     40     50
## 286  4931105  14 164118    78   105  128     50    105    122     57
## 287  3831977  14 106999   101    52   64     88     66     76     78
## 288  4709031  12  93301    94    82  114     47    116     89     88
## 289  4897142  11 114599    86    87   51     80    123     67    107
## 290  4315483  14 109967    90    92   40     98     97    116    106
## 291  4039919  11 214425   105    45  105     68    128    128     82
## 292  4734198  12 167306    95   120   78     40     68     76     82
## 293  4566057  15 144324   125    55  109     84    107     57     84
## 294  4769697  14 149404    62    49  101     85    125     80     58
## 295  4876601  15 206801   101    45   93    124     61     93    107
## 296  3960875  12 221265    62    61   61    121    115     54    103
## 297  4056566  15 188476    69    67  115    114    113    115     89
## 298  4762129  10 100023   101    68   98     46     49    117     41
## 299  5006063  10 175489    90   106   98    128     63     95    128
## 300  3948742  13 128781    47    48  102     95     81     85    127
## 301  4737928  10 194538    48    81   70     39     59    100     59
## 302  4461632  15 184868    91   104   52    104     85     92     75
## 303  4774366  10 222051    71    68   51     82    104     89    101
## 304  4523904  11 179831   118   123  113     54     97     59    123
## 305  4074867  15 130827   119    95  119     73    114    108     80
## 306  4713255  10 103368    82    91  117     99     72     81    110
## 307  3959512  11  93948    59    46   44    121    112     65     49
## 308  4492698  11  95561    84   104  114     82     50    104    110
## 309  4758353  12 190574    97   105  116     41     72     47    124
## 310  4035850  12 203758    96    84  128     59     68     92    115
## 311  4842528  11 184346    91    74   87    106     86    112     43
## 312  4105398  11 126058    63   121   71     56     77    128     55
## 313  4226945  14 176380    56    99   47     65     88     59    115
## 314  4363217  12 199307   114   105   64    112     56     98    112
## 315  4778726  13 143830    44   120   60     53    116     39    111
## 316  3852147  12  96690    56    80   82     47     75     46     39
## 317  3823835  13 206072   121    74  115     75     43     95    119
## 318  4695086  13 141416   108    79   75     88     73     78    107
## 319  4244596  12 156370   102    74   88    111     92     59     96
## 320  4493135  15 181352    43   105  116    102    117     47     94
## 321  4352975  13 195465    66   117   55    115     84     59     73
## 322  4700801  11 132025    56   121  128     95     99    110     73
## 323  4537883  15 200350    85    77   61     87    101     49     40
## 324  4795712  11 195680    75    71  119    101    101    118     58
## 325  4540738  13 187357    71    82   91     66     47    114     86
## 326  4930753  12  97894   123    83   72     49    110    108     40
## 327  4266558  12 126763    75   123  120     81     57     47     91
## 328  4747742  15 221991   112    76   41    106    100    122    116
## 329  4515597  14 153799    46    43  128     92     84    105    104
## 330  4085732  12 169813   102    86   85     88     56     49    121
## 331  4040658  11 104962   104   126  121     53     90     81     69
## 332  4945416  14 102905    66    53   88     84     77     70    104
## 333  4015728  15 151167   121    79  116     92     70    101     89
## 334  3869809  15 216267   101    86   89    101     57     98     43
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## 335  3998064  14 128692    84   112  127     90     82     53    125
## 336  3924863  12 132783    60   115   69    116     78    103    112
## 337  4681537  15 176056    93    59  117    108    125     71     92
## 338  4642662  10 148097    64    62   67     93     41    112    114
## 339  4698346  11 176285    69    88   88    124     67    119     71
## 340  4361799  14 109757   101    94   55    103    107     47    127
## 341  4144610  11 162680   112    64   73     40    115     92    125
## 342  4174646  12 191643    96    60  120     90     67     60     41
## 343  4725627  12 200905   119   122   44     72     51    127     72
## 344  4220383  12 146803    97   118  110     41     73     82    117
## 345  4075431  11 140704   105   103   98     73     73    108    123
## 346  4712432  15 165780    41   105   97     82     92     48     50
## 347  5001519  10 200569    54    50   44    118     75     72    115
## 348  4752966  15 113916    95    62   49     47     60     82    101
## 349  4226383  14 104780    51    84   85    115    127     85     56
## 350  4712927  12  94765    82    56   90     52     45     89     75
## 351  4575419  12 110433    41    83   86    109     82     89     67
## 352  4530224  14 126543    63    72   97     54     90     83     64
## 353  4963502  13 102049    97   108  114     39     80    115     96
## 354  4399047  13 163145   102    55   40     58    123     82     59
## 355  4123271  15 108400   123    48   80     71     40     86     91
## 356  4276239  11 213577    84    49   88    117    104    127     47
## 357  4256014  11 217429    64    78  104     45     92     89    119
## 358  4775604  14 222418    45    67  115     84    111     64     62
## 359  4920879  10 124526    98   126   93     50     41     85     81
## 360  4775156  11 146226    67    52   99     68     72     60     42
## 361  4283351  14 198709    61   121   95     43     62     63    128
## 362  4660354  12 182047    86    83   69     62     43     63     74
## 363  4862376  14 104076    63    81  103    117     50    121     69
## 364  4224963  15 107234   103    82   56     92    127     62     56
## 365  4265969  11 215277    59   124   50     59     74     68    105
## 366  4649554  14 123260    51   125   48     58     79    125    123
## 367  4682213  11 147665   118    93   65     84     68    114     83
## 368  4369295  10  95846    62   109  106    117     73     40     80
## 369  4930045  10 209664   124    87   52     75    100    103    120
## 370  4737638  13 205427    75   113   98     63    122    125     99
## 371  4828227  11 183490   107   102   82    117    104     64     54
## 372  4516593  11 176105   100    99   90    107    104     90     39
## 373  4624449  12 165170    68   104  118     89     44     53    128
## 374  4484538  15 185153   103   121   39     77     82     45    126
## 375  4634174  14 180027    84    84   84     44    109     51     90
## 376  4962886  11 199421    71    87  110     59     46     81     78
## 377  4264562  15 153920    45    95   43     81    124     63     80
## 378  4222342  15 108599    59    87   62    101     90     39     40
## 379  4747096  13 211312    96    61   67     97    112    127     57
## 380  4875799  14 217530   117    71  104    103     49     94     50
## 381  4082556  12 197434   115    75   68     45    118     48     68
## 382  4897095  15 125236    67    53   76    125     74     48     70
## 383  4462038  12 147519    76    75  116    108     94     51     49
## 384  3843878  14 101261    42   116   79     49    126    108    125
```

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## 385  4279297  12 159150   109    97  123    128    124     89     75
## 386  4335281  13 154631    44   126   46     57     76     43     58
## 387  4155390  12 159529    77    65   65     73     96    128     90
## 388  4860218  14 108195    62   124   57    118    115     46     53
## 389  4686526  13 163302    92    84   51     87     43    120    107
## 390  4638244  15 105121    67    62  110    123     96     60     73
## 391  4462321  15 123958    85   104   69     77     61     80     69
## 392  4360420  10 215054    98    81  119     58    111     72     74
## 393  3992520  12 127572    98   112  115     65     97     93    106
## 394  4496695  14  96452    59    86   45     79     98    113    108
## 395  4341926  10 142858    95    42   46    119     69     73     46
## 396  4593420  12 167804    57    42   80     82     89     68    114
## 397  4115712  14 117174    71   106  115    101     94    105     91
## 398  4178124  11 214241    64    99   46     65     84     84     42
## 399  4847991  10 130284    55    99  125    127    104     51     65
## 400  3898575  14 119227    39    96  111     99     75     76    105
## 401  4679641  15 161236   125    78   72    115    118     84     64
## 402  4994056  11 188334    88    41  120     99    108     51    107
## 403  3834099  13 186850    67   106   40     93     51     47    110
## 404  4763214  10  95191   108   126   64     63    119     51    116
## 405  4400982  13 132792   128    63  100     49    122     68    128
## 406  3921586  12 105382    51    73   60     43     69     87     70
## 407  4334891  11 197637    87    55   50     79    125     87     43
## 408  4413566  15 163217    64    79   63     41     42     57     88
## 409  4744693  13 205688    61   126   57     51     66     83    128
## 410  4010770  15 100088    76    67  127     59    123     91     71
## 411  4486450  12  98457    55    70   99    113     79     68    100
## 412  4744028  12 188374   122   128   97    114    102     69    104
## 413  4959712  13 131756    63   117   65     86     49     85     95
## 414  4104366  14 199309    62    86   41     58    125     51     50
## 415  4795959  12 212935   121    61   49     46    125     75    105
## 416  4245364  12 200317    98    39   56     78     58     78     94
## 417  4620048  10 207943    52   126   71     67     49    125     91
## 418  4030882  14 171378    75    79  120    125     57     53     97
## 419  4449005  10 109164    71    54  119     79    101     44    127
## 420  4014324  15 182702    52    97   58    103     55    110     53
## 421  4693861  15 169257   128    60  124     77     99     99     44
## 422  4101378  13 168132    49    48   99    118     78     67     72
## 423  3821444  10 167031    67   110   65     74     62     54    116
## 424  4794748  14 209965    79   121   90     49    101    125     71
## 425  3908274  11 115504    54    55   44     61     57     67     79
## 426  4460732  11 131744    80    50   91     39    115    109    101
## 427  3889070  10 190629    54    63   87     75    117     70    120
## 428  3924294  13 152878    74    55   73     45    103     50    122
## 429  4532828  11 186671   119   108   79     80     88     79     64
## 430  3988575  11 186166   119   110   79     92     59     97    121
## 431  4214907  11 123837    94    48   89     63     63     47    123
## 432  4617482  12 129470    93    81   83     85    109     78     86
## 433  4541317  14 144574   124    70   75    105     76     44    125
## 434  4500189  15 190984    45    49  118     91    115     55     62
```

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## 435  3952014  10 114735    83    77  128     98    115     87    110
## 436  4764936  15 214793    82    62   85     40     43    125     41
## 437  4508050  13 143134    66    84   88    116     41     95     86
## 438  4286411  11 190675    59    84   81     62     93     39     58
## 439  4829331  13 196735    44    99   66     73     66     83     79
## 440  4292911  10 120191    47    81  128    108     73    127    106
## 441  3974401  10 176965    73    80  128     50     70     58    123
## 442  4526584  13 226259   113   108   71     97    115    128     78
## 443  4996208  11  93786    89    86   91    104     42     76    123
## 444  4211274  10 202104    62    65  120     87    105    111     98
## 445  4174901  15 136526   103    67  104    103     75     53    122
## 446  4922858  14 171427    51    61   41     50    119    123     74
## 447  4778989  10 184414    50    92   44     80     62     64    107
## 448  4844461  10 123481    65    82  120     50     61    106     40
## 449  4814369  13 115611    76    92   57     89    115     44     85
## 450  4173775  12 168282    61    45   81     95    102    124     56
## 451  4426188  11 134399    62    69   69    102     51    127    101
## 452  4715347  15 125366    61    44   85    110     66    100     79
## 453  4677001  12 157697    90    53  103     56     66    106    121
## 454  4754510  11 135805    91    73   72     93     96     76    113
## 455  4067565  13 153733   107    67   63     63     91     99     61
## 456  4432153  12 131637    83   126   75     88     84     49     51
## 457  3858981  14 124945    87    93   40     94     39    120    117
## 458  4005663  10 183250    43    88   78     89     96      5      5
## 459  4367351  11 143639    54    78   83     68    106     86     85
## 460  4059834  15 118828    77    78   80     53     66     57    105
## 461  3834664  11 223137    42    72   44    108     39     80     86
## 462  4487234  11 165073    64    70  121    118     53     98     46
## 463  4413316  10 219963   110    50   49     61    106     86     43
## 464  4349483  13  95938    51   113  126    122     71    105     91
## 465  4380754  13 116249    66    57   63     43     77     58     89
## 466  4758398  11 215077   113    59   78     70    105     43     94
## 467  4858422  13 189224    53    50   50    118     65    123     39
## 468  4902831  13 215445    89    93  125     67     70    106     39
## 469  4795785  13 196161    91   125   78     43     64     45    101
## 470  4115067  11 209818   117    75  118    104    103     52    113
## 471  4733957  15 211245   109    91   65     60     69     39     39
## 472  4396919  14 162735    80   121  113     54     83    113     93
## 473  4412011  11 141043    56    61  117    120     43     69     68
## 474  4437775  11 221380    45    71   41    120    120     98    107
## 475  4227160  11 215535    52    78   72     90     82     85     62
## 476  4900120  14 190493    52   108   50     63    107    100    102
## 477  4983006  10 108574    76    96  120    122     78     84     73
## 478  4331628  13 106932    73    45   58    121     83     58    126
## 479  4089557  10 204436   101    46   41    103     97     53    107
## 480  4074879  11 226428    81   110   56     71    103     68     58
## 481  4263558  15 184850   116    65   77     58    105    107     99
## 482  4679901  12 200530    42    86  116     86    120     49     44
## 483  4568742  10 152535    51    88   74    118     58    113    128
## 484  3836618  12 148115   112    76  109    127     72     58     52
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## 485  4511682  14 226129    79   128  118     46    104     61     61
## 486  4836276  15 200394    89    57   59     39     43    102     72
## 487  4742632  15 149356    63   128  120     80     68    126     48
## 488  4697603  13 224572    98   112  114    110    105    111     86
## 489  4669855  13 156632    93    95   53     42     83     87     95
## 490  4418442  12 208424   108    85   43     98     41     96    100
## 491  4916421  15 186598    44    79   40    128    104     65     61
## 492  4382530  12 155378   118   101   61     59    112    124     45
## 493  3818313  11 134458    52   112  110    123     62    101    124
## 494  4781106  13 177934   108   123   48     94    118     92    106
## 495  4688194  10 169395   115    58   61     95     73    104     41
## 496  4222948  10  97180   108    59  111     70     49     67    102
## 497  4526530  12 101536    69    86   64     87     41     69     77
## 498  4891054  14 196575    60   124  116    125     64     88     75
## 499  4671730  10 194572   101    61   90     68     64     80     96
## 500  3830006  15 198928    66    65  102     98     43     64     48
## 501  3823762  15 160631    65   119   98    101     40    122     73
## 502  4893839  12 177148    62    39   81     72     75    102     90
## 503  4174814  11 222739   123   125   42     84     97    106     42
## 504  4547371  10 101203    81   112   67    113    114     87     56
## 505  3879678  11 163943   102    69  124     74    114     65     40
## 506  4629458  10 203934    89    96   84     63     77    109     58
## 507  4092045  15 179347   110   115   85    107    113     65     83
## 508  4525070  14 170619    66    40  107     67     49     87     67
## 509  4221114  13 201680   108    78  121     54    100     47     84
## 510  3898204  10 104362    47   123   80     42     63     98     52
## 511  4147274  10 111405    45    56  103     93     92     52    104
## 512  4424925  15 202008   114    75   54    120     52    119     65
## 513  4901257  15 128216   123    83   90    108     69     83     95
## 514  4257606  15 133259   108    40   60    116     46     68     78
## 515  4564217  13 107505    62   107  104    121     73    120     73
## 516  4881728  15 155921    66   118   43    114     79    128     83
## 517  4195004  13 143012   116    44   76     70     73    108     89
## 518  4998371  12 218554    43    77   51    103     44    119     58
## 519  4900348  12 191152    84    54   60    109    119    100     99
## 520  4372402  14 100594   126    61   54    128     73     79     41
## 521  3885505  12 133436    95   119   63     87     86     42    119
## 522  3950566  12 111722    68    67   41     63    112     77     95
## 523  4479610  15 119555   119    57   94    127    124     77    106
## 524  4103541  15 130725    44    87   55     84     41     82    119
## 525  4168106  12 208870    86    46   62    123     84     97    108
## 526  4008184  12 191898    69   102   53    121     94     74     98
## 527  3915155  11  98107   112    97   79     87     76     57     44
## 528  4534600  14 153655    53   121   75     57    126    120     40
## 529  4874241  11 186724    92   123   82     88     48     99     53
## 530  4361055  11 199307    94    56   87     68    119     70     73
## 531  4861445  12 114091    55   112   91     84     74     55    101
## 532  4742766  14 208108    47    43   72     90     75     68     80
## 533  3864072  13 154397   102    73   49     77     60     90    107
## 534  4348954  14 166501   117   102  124     47     94     62     57
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## 535  4173448  10 184030    89    41    71    100     59     58    107
## 536  4438011  11 139381    75    86    75     42     47    120    106
## 537  4060756  13 138189    71    67    48     49     66     94     42
## 538  4086105  10 110924    53   123    51     72     43     57     83
## 539  4328249  13 143623   121    97    56     68     86     51     60
## 540  4741776  10 206930   104   104    82     80     63     78    127
## 541  4300157  11 113820   107    64   112     71     82    114     79
## 542  4646359  11 151135    73    84   115    108     49     88     59
## 543  4868748  10 105734    88    73    45     43     41     84     93
## 544  4243083  13 197941    57    52    85     94     71     72     72
## 545  3835022  11 211897    48    72   112     49    101     57     61
## 546  3879617  15 185608    40   101    54     97     98    114     57
## 547  4157168  12 156184   123    63    58    105     65     70     86
## 548  4567452  10 151092    80    71    70     51     44     53     91
## 549  4790629  13 212007    68    39   108    109     57     45     47
## 550  4751380  11 142754   113    43    48     73     58    110     44
## 551  4445888  15 128363    56    56    81    119    126    109     55
## 552  5001181  15 165273   119   119    41     93     94    112     48
## 553  3816422  12 218079    39    78    60     54     98     53     78
## 554  4070443  10 196877   100    47   107     86    120    128    101
## 555  4834430  14 186684    45    48    90     63    112     43    103
## 556  4851709  12 137549    78   114    93     69    122     44     70
## 557  4377707  10 218636    80   107    66     62     88     62    102
## 558  4170689  12 186909    92    85    79     96     43     57     70
## 559  4119400  15 188807    62    50   101     62    114    119     71
## 560  4520559  10  93842    43   125   110     44    114    101    102
## 561  4291202  10 144290    58   101    61    120     83    116     80
## 562  4790593  11 107937   113    63   116    115     39     62    111
## 563  4636883  10 132883   128    67    90    107    102     67     93
## 564  3917330  10 180647    53    78    77    103    121     94     66
## 565  4181638  12 157064   105    92   118     98     51    113    127
## 566  4464879  15 158545   103    82   106    103    100     85     70
## 567  3928735  12 209650   117    56    68     66     41     49     72
## 568  4983657  11 114794    92    90    83    114     83     55     93
## 569  4869719  12 183970    56    68    89     74     49    117     56
## 570  4490714  11 100080    45    66    69     91     84     81     98
## 571  3875085  13 153216   118   127    45    107    125    101     70
## 572  4868830  11 139675   111   125   119    126     61    119    112
## 573  3855118  11 143321    91    73   128    108     72     86     87
## 574  4629128  10 146094   121   123    43    121    108    111     64
## 575  4128642  13 114267    79    71    91     82    110     74     59
## 576  4272180  12  98844   106   116   110     74     53     53    117
## 577  4323502  14 163309   121    44    63     48    127     79     45
## 578  4543927  15 173111    46    73    55    117     63     73    120
## 579  4301001  10 220553   111    64    92     66     54     45     93
## 580  4956297  10 136923   110    83   107     91     41     55     54
## 581  4865213  10 167052    53   100    51     82    113    116     52
## 582  4020535  14 219049    64   111   116     68    127     45     51
## 583  4573855  12 163145    58    49   125     44    107     95     92
## 584  4576112  14 140651   124   102   122     44    118     48    108
```

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## 585  4255697  13  96213    47    68   62    121    101     41    116
## 586  3993009  14 184002    92    68   65    105     96     52     78
## 587  4304965  11 202909    64   117   61     89     48    110     42
## 588  3944473  12 171378    76    99   48    103    110     81    126
## 589  4770454  15 159135    90    74   41    120    111     50     51
## 590  4852548  12 128198   125    73   92    111     75     42     83
## 591  4676558  11 128806    55   107   65     65     82     80     94
## 592  4832627  12 121236    55    77   85     50    116     54    108
## 593  3928739  14 159474   105   102   66     56     62    110     55
## 594  4866498  14 155330    43    64   76     55    114    104     40
## 595  4052813  13 139949    91   111   64    127    104    103     51
## 596  4796181  14 203108    99    90  118     71    105     64     84
## 597  4233780  15 190039    44    74   43    122    115     68     52
## 598  4172862  13 188501   116    44   74     60    101     95     60
## 599  4410971  13 132190   126    70  121     68    113     45     68
## 600  3958209  13 107427    98   105  106     63     79    114     74
## 601  3932014  15 149153    79    64   86    123     54    105     39
## 602  4303543  15 184419    39    96   44     98    101     49     50
## 603  4956331  11 150509    88    96   75    122     52    102     90
## 604  4326485  10 147725    99    91   78    107     79    125     74
## 605  4326171  10 142356    96    80  111    108    100     95     44
## 606  4016426  13 222450   101    43  124    117     90     57     63
## 607  4735335  11 122606   102    99   95     86     64    118     73
## 608  4865465  14 176671    91    61   48     56     57    101    125
## 609  4209835  15 114612    69    57   85     78     93    122     49
## 610  4132934  15 118505    88    90   86    120     58     64    121
## 611  5003402  15 107249    51    88   62    122     69    114    105
## 612  4247603  14 188230    55    44   99    115     87    103    122
## 613  4439447  13 103368    61    73  109    115    122    120    101
## 614  5002053  12 150213    92    44  116     67    107     66     96
## 615  4899819  10 223337   119    86   86     45     76     67     83
## 616  4747397  14 157916    84    94   62     97     39     67     71
## 617  3912659  11 161907    76    77   47    121     85    125     50
## 618  3926263  13 129124    69    99   79     89     87     46     49
## 619  5000542  12 182437   109    89  113    126     72     65     49
## 620  4792061  15 109340    62    75   44     46     97    122     51
## 621  4213278  11 220312    67   122  127    112     82    113     85
## 622  4249123  11 105653    44    57  105     61    114     86     94
## 623  4028134  14 193292    49    61  122     95     64    121    112
## 624  4303500  14 213190    82   127  118    127     43     76     61
## 625  4823392  15 121695   127    90  109     61     77     95     99
## 626  3962499  12 148257   120    98   76     70     74     88     64
## 627  5011007  10 198179    82    63   68     89     89     99     85
## 628  4721279  14 130908    39   126   47    120     78     73     70
## 629  4765707  14 129438    81    48  111     89     84     65     88
## 630  4363398  13 126714    52    81   46     59     57    121     97
## 631  3840198  12 160031   112    70  120     99     72     83    118
## 632  3956599  10 147291   128    71   89    121     70     91     79
## 633  4780832  10 210702    64    69   60     96     46     72    110
## 634  3962443  12 167190    91    48   90     93    128     63    102
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## 635  4237665  10 153380    54   109   64     72    112     48     91
## 636  4173625  11 143253   114    41   96    114     96    102    112
## 637  4817053  15 105837    98   118   78    104     71     63     66
## 638  4471566  14 169573    53    87   90    119     70    113     61
## 639  4874465  13 140297    89    89   63    120     70     51     54
## 640  4705610  13 172487    82    46  116     78     61     61     71
## 641  3892985  14 111072    71   108   70    105     71     49    100
## 642  4191832  11  94882   124    95   63     58     40    114    119
## 643  4674677  12 194510    89    80   81    114     44    100    116
## 644  4701915  12 154750   118    77   58    113     83    121    108
## 645  4430326  14 106803   126    61  114    118    118     72     58
## 646  4701383  12 161285    42   123   80     98     57     63     61
## 647  4499445  11 169626    93   104  124     82    113     54     63
## 648  3906321  14 147894   117    85   74    103    107    117     97
## 649  4551778  15 199959    40    91  103    113     47     75     62
## 650  5011388  12 175555   108   126   52     89     59     90     82
## 651  4724628  13 199651   112   119   57    114     89    117     76
## 652  4757897  15 122794    76    42   78     78    115    125    111
## 653  4142882  13 123988   112    81  110     71     41     96     41
## 654  4104537  14 106054    79    99   43     85    127     51    126
## 655  4102197  10 225941    86    71   40     60    112     82     49
## 656  4226557  12 220657    70    93   80     85    126     77     87
## 657  4596361  15 150874    65    47   99    117    103     51     66
## 658  4859750  10 195015   111    44   67     39    102    124    116
## 659  4146039  10 113211    96    63  122     85     74    118    115
## 660  4812232  11 176180    65   114  123    115    117    104     89
## 661  4397249  14 219897    85    93  100     91     82     82     52
## 662  4782939  12 160130    60   109   78     89     45    105     54
## 663  4286134  14  99930    72   107   41     52     99    114    121
## 664  3824632  12 222379    75   124   73    104    107     87     86
## 665  4914784  13 174436   110    89   50     93    110     47     47
## 666  4169770  12 144201   125   111   72    104    111     82     45
## 667  4724387  12 199530    78   112   57    109     93     68     51
## 668  4135975  11 134296    39    63   79    128     60    107     49
## 669  4468031  12 126179    55   127   45     60     42     92    114
## 670  4019035  13 223185    81    95   55     92    105    110    127
## 671  4483428  14 199402    93   126   56     89     81    125    100
## 672  4633627  15 147161   121    91  120     91     83    128     66
## 673  4980993  15 186805   111    40  118    125    126     56    100
## 674  4984251  13 102232   102    62   86     62     68    128     85
## 675  4586021  11 149943   124    54   98    126     93     89    100
## 676  4033250  13 198933    94    76   46     50     42    111     87
## 677  3989344  11 183563    82   126   55     96    102     75    111
## 678  4604716  14  95944    97   103   74     89    100     80     47
## 679  4450540  13 169589    87    46  106     44     86     89     90
## 680  4996904  15 199453    94    83   49     41     89     84     49
## 681  4611125  12 104125    52   118   53     85    115     58     78
## 682  4754111  15 205147    93    89   43    123     93     76    106
## 683  4814662  15 149869    75   108   57    118    117     81     71
## 684  4961625  14 188821   119   114  119     92    125    111     78
```

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## 685  4476159  13  96575   121    62  110     57    116     77     84
## 686  4128566  14 219196    88    80   84    127    109     75    107
## 687  4213649  11 121425    76    93   66    118     46    100     58
## 688  4519900  11 134800    72    95  104     58    118    116     41
## 689  4072225  14 222603    39   115   83    109    106     59     70
## 690  4744577  14 131388    85    79  110    126     69    107     67
## 691  4046684  13 103682   120   103  117    128     52    107    107
## 692  4514691  13 193974    59    72   53    115     79    128     89
## 693  4926510  15 153215    69    94   55    112    123     75     62
## 694  4838185  14 105615   108    50  102     76     98    102    100
## 695  4140662  11 215007    48   122   69     77     92    121    126
## 696  4817428  10 186493    50    39  104    128    102    108    105
## 697  4595837  13 143198    67   126   67     79     87     54     60
## 698  4479868  13 105010   110    98   81     44     74    105     68
## 699  3913011  13 190686   117    91  120    107     92    120     90
## 700  4744241  14 220198    56    49   39    108    110     64    109
## 701  3927123  10 114430    52   106   59     89     75     58     42
## 702  4236185  11 153397    46   113  101    102     90     60    103
## 703  4712430  13 119429   128   125  120     47     55     80    110
## 704  4564360  12 163899    66    41  117    126     64     63    109
## 705  4435457  12 206895    76   114  107    124    110     63    127
## 706  4455474  14 110855    74    64   43    102     43     50     73
## 707  4009689  15 218231    92    52   40     47     89     57    123
## 708  3934642  10 165581    42    69   82    113     77     42    120
## 709  4152939  12 223312    57   102   97     44     51    127     86
## 710  3818404  15 148304    48    77   77    100     50    121    105
## 711  4664006  13 170592   112   101   55     86    125    125    120
## 712  4390784  15 150257    51    60   61     82     79     67     83
## 713  3942444  11  94713    48    65   90    128     50     51     52
## 714  4780000  14 190428   124   107   73     81     65     51    120
## 715  3854457  13 211004    59    45  125     89    124    117     71
## 716  4752357  13 169098    44    60   42    114    125    114     63
## 717  4630531  14 139642    78   126   47     73     68    108     92
## 718  3928123  12 209870   111   101  117     63     97     93     84
## 719  4883746  12 207806    61    57   98     54     86    103    103
## 720  5000305  14 119978    55    41   45     89    126    119    124
## 721  4579551  13  93708    49    52   56    121     74    109    124
## 722  4541840  15 181514    43    79  117     45     47    128     47
## 723  4338205  10 169826   116    43  107    119     80    122     62
## 724  4865680  15 203358    44    89  127     53     87     43     44
## 725  4910766  12 182923   113    63   93     64     89    108     90
## 726  4700973  12 225182   124   122  125     75     57     39     46
## 727  4116590  10 113569    93    55  119     84    108     96     90
## 728  3832765  11 100951   124    48   81     99     66     42     99
## 729  3924503  14 150372   121   102   72    115     40     39     65
## 730  4591821  13 101497    69    95  114    127    120    111    124
## 731  3885478  12 170691    78   109   71    108     43     61     79
## 732  4963489  12 219913    49    94   87     92    107     48     96
## 733  4717226  12 222288   123    96   77     68    107     43    121
## 734  4519841  15 121656    88    40   66     53     95     88     55
```

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## 735  4079138  12 106662    39    58   54     74    101     43     67
## 736  4309574  12 137670    87   101  105    123     43     56     45
## 737  4646963  10 143397    58    59  108     66    114    109     51
## 738  4710249  11 138151    56    86   39    112    100     65     60
## 739  4076098  11 139155    94   118   78     39     73     66    125
## 740  4476246  11 186398    71    65   74     82     47    114     84
## 741  4579520  11 129160    89    61   81    122     45     40    128
## 742  4532298  11 159540   112   107   71    128     40     56     96
## 743  4622385  15 207082   109    64   90     84    123     56     99
## 744  3907038  14 145418    86   109   91     39     68     54     98
## 745  4042453  10 168536    76    83   96     89     46     90    109
## 746  4462322  12 179611    43   104   45    112     67    120     57
## 747  4912864  12 137062   122   104   95    102     55     53     52
## 748  4898857  14 189159    94   119   39     98     89     75    106
## 749  4844875  15 134856   112    53  114     93    118     75     52
## 750  4036992  12 191246    50    93  127    121    104     92    108
## 751  4746206  15 193758    42    63   57    108     72     43    125
## 752  4553103  14 179598    93   120   43    112    122     84     87
## 753  4349767  11 195697    63    50   68    114     70    103     89
## 754  4120854  13 183597    98   122   71     56     47     88     70
## 755  3886252  11 162964   112    89   86    116    113    123    123
## 756  4845491  12 140889   127    39   41     58     57     87    107
## 757  4368959  15 136177   120   122   44    116     92     62     70
## 758  4309060  11 205557    60    75  105     48     84     51     62
## 759  3928310  10 207865    92    74   95     57     98    122    106
## 760  4980035  14 209164   105    59   69    121     94    105    123
## 761  3822597  10  93785    57    83   58     69    111     82     50
## 762  4740445  12 182804   115    42   55     41    103    112    120
## 763  4871271  15 102952    67    93   51     79     77    106     92
## 764  4932450  15 134700   107   118   89     65     87     45    121
## 765  4094487  12  95975    79   106   42     82    114     65     48
## 766  3867490  12 102537    91   110   73     66     90    112    124
## 767  4542579  10 185343   105   119  108     89    115    104     70
## 768  4701615  15 118502   104   126  101     51     76     74     80
## 769  4573733  11 117709    41    48   90     85    126     55     69
## 770  4363173  11 225282    92    49   40     50    127     84     79
## 771  4717497  13 101546    93   117   90     56     60    113     78
## 772  4815699  11 116377    68   103   45     74    125     57     74
## 773  4194071  11 114518   122    86  128     53     55     97     60
## 774  4557994  11 149427    66    55   56    113    100    102    101
## 775  4418987  12 207239    89    65  107    105     74     41     61
## 776  3895241  13 161503    91    81  128     99     80     70     90
## 777  4977738  15 116254    60   124   50     59     97     86     68
## 778  4469165  14 181475    73    78   43    124     41    106    120
## 779  3845662  14 187063    90   124   65     73     76     74     76
## 780  3866293  15 116503   110    44   63    116    118    111     59
## 781  4194025  13 115822   111    41  100    116     90    113    119
## 782  4841479  15 130102    93    85   62     56     85    118     40
## 783  4967897  15 151724   106    62   92    128     48     64    126
## 784  4209635  12 122349    43    66  106    124    101    108     74
```

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## 785  4835289  12 158537   127    59   75     85     41     63     76
## 786  5015912  12 184014    66   116   88     86    123     60     43
## 787  4503658  15 155374    50    39   51     77     49     72     68
## 788  4041843  10 181453    89    54   73     87     50     99     77
## 789  4975424  15 194569    60    58  113     52     51     75    121
## 790  3869847  12 173658    74    72  117    103    110    113     69
## 791  4082391  12 135647    47   103   84     44    116    113    116
## 792  4998405  12 143573    46    71  103    117    107     55    105
## 793  4911927  15 103489    65    73   74     68     44     92    116
## 794  3983193  12  96653    65    68  117     44    126     45     41
## 795  3919434  15 215282    47   102  119     47     95     50     60
## 796  4194067  12 110184    60   128   65    105    101    105     93
## 797  4635285  10 166026    91    53   79     82    123    106     52
## 798  4161396  13 139927    71    39   92     76     57     88    124
## 799  4651944  14 196236    54   101   76     42     59     82    120
## 800  4208326  13 207658    57   109   58     56    101     50     61
## 801  4406546  13 209310    73    67  106     64     79    119     91
## 802  4415338  11 180207    70   120   81     75    110     76     96
## 803  4316898  13 128569    89   115   58     94     46    105     77
## 804  4209071  13 205100    70    56  109     46     40     72     94
## 805  4538025  13  98823   123    58   90     67    115    119    109
## 806  4595681  12 213733   114    68   92     60    113     59     49
## 807  4895264  10 100018   121    69  121     90     65    124     83
## 808  3833106  13  97925    54    49  118     55     53     68    101
## 809  5014890  15 107096    39    62  104     74    120    124     74
## 810  4599475  11 217119   114   127  124    122     66     39     69
## 811  4349410  14 218282    66   115   54     40    106     89     91
## 812  4012252  14 140111   117    61  105    117     68     88    126
## 813  4915537  14 172772    92    78   89     57    107     63     73
## 814  4604304  13 186449    74   128   81     70    103     39    112
## 815  4351440  10 199409   120   103   97     85     65     62    102
## 816  4513625  15  95819    50    54   95    121     90     98     44
## 817  4102546  13 171370    43   110   99     66    101     92     72
## 818  3828703  14 130292    51    79   43     56     60     41     62
## 819  4136828  15 176027   104    80   94     79     54     41     88
## 820  4412293  14 157979    96   109  128    116    112     74     52
## 821  4542543  12 106281    43    70  120     91     95    119     69
## 822  4664665  11 143421   100    55   88     42    122     50     51
## 823  4361743  15 152176   114    91  120     73    109    128     95
## 824  4224604  14 168505    62    65  102    100     64     48    118
## 825  4288885  10 141909    49   101   89     77     76     66     76
## 826  4799323  13 225559    56   121   58     91     75     47     99
## 827  4692211  15 176587    42    70   58     70     85    124     86
## 828  3833632  15 164790   122    68   71    110     83     61     43
## 829  4886433  10 166889   119    88   74    110     56     68     48
## 830  4134614  15 102576    45    89   65     86    119    102     61
## 831  3816997  10  95571    73    57  126     43     95     45    105
## 832  4264881  14 106664   114    57   76     81     83     85    126
## 833  4522563  11 164379    88   121   48     51     93     81     50
## 834  4812876  12 155107   106    60   43    111     56     57    101
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## 835  4466925  13 163897    40    63  120    103    122    112     91
## 836  4524729  13 199373   121    82  113     47     52     87     56
## 837  5003361  15 204647   122   102  111     70     63     79     41
## 838  4980554  15 187988    67    93   92     91     62    103     86
## 839  4471767  12 222566    63   107   89     97    122     55     68
## 840  4427047  11 168713   111    87  114     81    112    126     82
## 841  4158236  10 105441    62   109   56    107     92     50     82
## 842  4324337  13 138096    70    49  118    118     39    126     48
## 843  4459826  10 147910    77    55  128    106    104    110    120
## 844  4857660  14 181806   120    43  127     66    104    125     71
## 845  5013681  15 123634    47    50  100    118     40    107     45
## 846  5003094  15 152011   124    69  106    122     66     47     62
## 847  4357068  13 214651    85    51   53     83     93     75     86
## 848  4390465  15 218976    88   102   71     45     82    117    126
## 849  4953619  15 107047    65   126  117     51    109     85     39
## 850  3966341  15 131459    74    76   43    127     75     89    104
## 851  4780711  10 113191   117    78   61    111    113     81     58
## 852  3930878  10 216044    66    81   64     84     44     96    118
## 853  3827317  15 167141    57   103  115    120     95    125     82
## 854  4141988  12 163514    71    42   94    100    103    116    123
## 855  5015030  15 152542    42    39   64     95     80     71     81
## 856  4635605  12 186850    82   107   67    112    102     67    124
## 857  4622976  12 171369   122    59   53    128     55    101     81
## 858  4763964  15 153368   110    69  120     74     73    125     93
## 859  4714886  15 175972   105   110  100     63     99     86     56
## 860  4108168  10 218554   109   125  103     87    100     81    108
## 861  4743978  12 226464    86    46   96     83     57    113     59
## 862  4458604  10 140534   107    86   56     73     69    113     50
## 863  4474384  12 153871    44    78  122     57    100     39     87
## 864  4085197  13 168262    83    74   97     62     98     53    124
## 865  4739740  11 205803   119   104   56     67    119     43     56
## 866  4913107  15 189165    40   119   87     66    118     98    124
## 867  4208237  13 191270    84    41  112    109     81    115    107
## 868  4641445  15 214774    64   116  106    122     59    109     58
## 869  4378969  11 220166   100    66  125     96    118    110    112
## 870  3932150  15 145639    69    48   85     70     40     67     70
## 871  4696028  15 158976    44    93  111    116     67     43    109
## 872  4001656  12 126142    80    55   81     97     47    114     57
## 873  4381148  14 121785   121    76   99     85    124     83     81
## 874  4831177  13 145428    93    44   89     60     92    120     97
## 875  4992796  15 181076    88    76  103     48    102    112    114
## 876  3872290  11 142009   100    60  117    110    104    112     69
## 877  4389710  13 152995    83    58  111     93     76     95    110
## 878  4946109  11 123605    75    58  112     81    121    108     95
## 879  4806395  11 117687    52    64  127    106     48     70    128
## 880  3924095  13 114512    63   109   53    121     84     46     84
## 881  4111089  13 148577    85   122   88     43     88     96    122
## 882  4835618  15 217768    82    96   99     81     90    121    103
## 883  3861678  11 184435    61    59   48     71     46    109     92
## 884  4963363  11 166823    57   109   44     39     95    123     60
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## 885  4019850  14  99024    99    94  112    101    115     53     52
## 886  4536902  10  97915    84    79   56     87    101     66     79
## 887  4639679  14 195902    60    45   43    125     93    126     41
## 888  4584887  10 115150    61   101   47     89     79    111    101
## 889  4318574  14 221498    45   109   76    118    106     66     89
## 890  4153119  13 202238    82   103  109     78     58    118     48
## 891  4568250  15 166180   124    40   49     88     71    121     84
## 892  4781060  11 155310   127    83  113     99     79     78     91
## 893  3918585  14 119972    75    89  112     68    115    126     47
## 894  4715089  14 106941    73    78   55    106     80     93     69
## 895  4935858  10 120118    62   100   47     79    107    106     56
## 896  4190269  13 211175   112   100   67     44     80    119    128
## 897  3871824  10 141034    80    45   48    114     46     42    117
## 898  4251256  11 185226    43    68  114     70    108     95     95
## 899  4187208  10 120415    53    80  113     85    115    125    104
## 900  4765763  13 172049    74    98  115     73     74     67     64
## 901  3899932  15 163032    77    95   98     60    126     87     64
## 902  4520611  10 128569    95   103   57     59     88     96     72
## 903  4067681  14 148987    62   100  120     93     39     78     43
## 904  4808437  14 119762    96    51   98     51     78    116     43
## 905  4146260  12  96580    86   104   65    104    102     94     71
## 906  4154548  13 140473    47    84  101     60     50     53    126
## 907  3857937  11 137722    46    39   79    111     80     95     89
## 908  4774865  15 178865   126    55   71     40     74     84     52
## 909  4058695  15 149412    41   128  105     53    122     46     78
## 910  4307225  15 141877    68    97   89     72     72     56     64
## 911  4696100  15 186779    70    84   71     71    108    108    108
## 912  3827460  12 210109   118   112   53     49     99     68     74
## 913  4547848  12 113921   101    53   71    119    121     97     64
## 914  4563519  15 133792    66    39  101     60    118     90     48
## 915  3956003  14 104968    57    85  105     45     85     90    126
## 916  4908056  13 208455    48    63   91     39     57     63     81
## 917  4532416  14  97663    39    75  117     68     75     65     92
## 918  4958475  12 107384   119    41   80     78    120     46     39
## 919  4377126  12 128570    91   101  106     49     44     62    123
## 920  4660298  11 158558    53   118  112    114    122    117    107
## 921  4809945  11 223000    42   109   91     87     64    109     78
## 922  4230570  15 199426    77    74  111    121    106    128     76
## 923  4155959  14 208433    99    92   55    128    114     66     86
## 924  4554941  14 185263   108   124   49     57    105    120    119
## 925  4308505  10 159236    94   102   90    113     72    101    114
## 926  4275492  15 214727    44   116   89    124    102     86     99
## 927  4560429  12 154843    76    92   87     53     54     60     82
## 928  4225413  14 103794    60    43  126     55    127    116     75
## 929  4393271  15 105345   107   112   82    117    109     41     72
## 930  4810099  11 186846    76    49   64    113    116     91     89
## 931  3900189  12 106850    99    89  123    110    108     67     58
## 932  3835942  11 201399    41    41  124    126    102    120     52
## 933  4585713  14 210097    45    67  114     73     96    127     39
## 934  3898509  10 177995    96    85   83     81     66     69     94
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## 935  4187507  13 126990    63    39   40     60    127     95     40
## 936  4004770  14 120276   103    69  117     49    109     51     72
## 937  4047283  14 217955    42    65   40     40     79     77     69
## 938  4630835  13 177198    75   118   86     95     76     99    101
## 939  3898434  13 147897   125   124   93    123     47     81    116
## 940  4491715  13 219737    39    77   84     46     54     57     65
## 941  4464615  12 144117    46   114   46     58     51     49    108
## 942  4354506  12 130415    92    56  104     40     88     79    120
## 943  4514544  12 205705    60    87   85     75     69     87    123
## 944  4011210  12 136010    60   105   54     96     42     99     69
## 945  4070783  10 149190    79    60  108     68     92    116     98
## 946  4220659  13  99419   118    83   77     83    127    103     97
## 947  4773911  14 158409    65    58   59     84     40     62     67
## 948  3969883  13 212240    99   126  125     72     95     51    108
## 949  4696108  12 178301    67   107   94     50     71     98     62
## 950  4598722  15  96290    71    79  110     54     50     65     48
## 951  3992318  15 174996    55    95   75     83     66     75    126
## 952  4223816  12 184648   107   107   90     59    115    101     96
## 953  4931177  11 141813    99    70   71     63     98    103    102
## 954  4633037  12 146507    84   113   62     97     51     78     68
## 955  4081820  12 183130    86   121   53     64    114     87     87
## 956  4412165  14 172908    89    46   97     78    106     69     70
## 957  4256777  10 112791    51   119  124    113    102     94    102
## 958  4683300  12 124637   102    55   68     90     78    122    106
## 959  4417768  13 194553    91    81  115     96     87     90    120
## 960  4685105  10 114231    60   100  101     98    110    112     62
## 961  4179061  13 136945   124    99  115     70     52     39     76
## 962  3971507  11 154697    86   104   57     59     72     84     47
## 963  4047683  10 104055    78    81  115    107    110    125     51
## 964  4440492  15 145629    61    42   71    107    118     93     93
## 965  4878932  13 126507   103   126  122     64    115     40     62
## 966  4475274  14 131739    77    71  113     78     84    115     82
## 967  4183724  10 129449   119    77   56    107    124     72    117
## 968  4170819  13 177815    85   127  117     52     89     46     64
## 969  4335063  15 204787    93    64  107     85     49    106    122
## 970  3820864  15 146797   103   127  109    102     82     95     60
## 971  4198764  10 178879    94    92   71     66     50     41     53
## 972  4462721  10 173586    58    88  115     42    124     76    106
## 973  4096023  15 115587    79    86   59     75     60    104    102
## 974  4872346  10 135248    90    72   40     60     83     51    112
## 975  4049614  15 113152    79    78   82     39     60    128     79
## 976  4857663  13  93034    68    60   98     64    124     55    119
## 977  4644745  14 120190   107    96  127     39     78     40     47
## 978  3928958  11 135685    50    86  118    116    108    102     94
## 979  3860539  10 164865    46    96   71     80    100     88     53
## 980  4818713  11 110245    84    44  109     92     65    118    114
## 981  4555749  12 222240    72    60  122     98     82     82    101
## 982  3837487  10 127323    57   106   39     98     61    127     48
## 983  4265467  10  93603   120   107   56     80     68    128     61
## 984  4263573  14 198633   113    83   41     62    119     43    107
```

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## 985  4003029  11 146638   106    75  101    109     95    114    107
## 986  4662925  11 120931    75   107   64    102    120    100     45
## 987  4922987  13 201439    67    86   41     39     65    127    105
## 988  4041846  11 199856    64   117   44     51     99     40     94
## 989  3930038  10 161919   105   124   41     48     47    121    114
## 990  3920665  14 202697   111   105  117     89    101     49     44
## 991  4645175  15 150551   124   119   86     99     82     42    109
## 992  4129056  12 225723   117   123   95     62    120     98    114
## 993  4175460  10 185976    44   101   49    113    118    106    123
## 994  4601266  13 176861    50    79  101     42     49     46     72
## 995  4379778  13 116526   122    57  113     49    116    126     56
## 996  4811610  10 164686    41   126   53     66     76    100     97
## 997  4596398  11 196701    68    65   64     45    119     51    102
## 998  4952527  15 122382   108   113   66     81     49     81     42
## 999  3855199  10 201684   104    81  104    114    104     48     44
## 1000 4889670  10 179565    48    66   94     49    120    111     81
## 1001 3946551  12 225190   110    63  103    126    116     39     93
## 1002 4970449  13 163213    92    95  100     86     56     75     79
## 1003 4918700  14 129705    58    97   65     42    123    116    123
## 1004 4212813  14 176718    55    67  121    102     82    108     77
## 1005 4413983  15  94497   121   104   96     99     57     60     96
## 1006 3988868  15 197207    95    73   61    119    105     56    105
## 1007 4104168  11 151469    54   105   56     95    128     97    117
## 1008 3986007  14 117919    79    70  123     76     92     44     87
## 1009 3982076  10 105363   118   124   45     51     46     73     78
## 1010 4079242  15 225005    42    90   59     74     74    114     91
## 1011 4811510  11 217947    54   106   54    124     44     59    107
## 1012 4131917  11 182775    80   110  126     72    119     64     92
## 1013 4763038  14 190257   118    46   44     83     61     97    116
## 1014 4445570  15 202084    40   112  127     76    123    108     58
## 1015 4875045  13 101521    59    92   70    127    106     39    112
## 1016 4534788  14 184436   108    68  124    124     87     62     45
## 1017 4018039  11 142329   102    58  101    127     58     64    112
## 1018 4881645  12 210977    46    98   89     61     65     45     84
## 1019 4399071  15 115741   121   116  104    114     74     92     57
## 1020 4579170  15  93013    40    54  105    125    105     76     87
## 1021 4986234  15 154519    52    64  108     72    115     63     67
## 1022 4201267  12 140981    82    45  118     77     51    123     63
## 1023 4509818  13 141131    93    81  106     81     83     65    100
## 1024 3912881  15 152933    86    79  114    120    117     62     79
## 1025 4348005  10 156878    97    47   73     88     84     89     44
## 1026 4994786  15 178489    39    96   96     81     52     39     99
## 1027 4246818  13 219199    78    96  115    103     58    114     88
## 1028 4344883  11 172058    59   114   98    124    121    119    120
## 1029 4371383  14 186247   112    93  121     53     43    117     56
## 1030 4885669  10 174283    86    66  112    124     58     94    100
## 1031 4710576  15 204526   103    87   91    123     45     92     80
## 1032 4246720  14 174797   119    81   72     70     51    102     60
## 1033 4643701  15 112832   122    75  124     58     42     60     82
## 1034 4927162  13 181009    42   112   71     73     63    109     63
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## 1035 4011540  14 226071    48    83   69     85     69     51     57
## 1036 4842733  13 204409   123   128   45    106     42     41    119
## 1037 4259562  15 168544    41   102   68    110     61     41     50
## 1038 4315585  11 124165   103    41  126    110    118     40     98
## 1039 4905054  15 114281    95   122  108     87     97    125     72
## 1040 4139097  14 183058    91    54   94    121    108     47     49
## 1041 4265404  13 121094    94    60   74     52    108     40    115
## 1042 4444753  11 104272   124    39   76    121     81     74     84
## 1043 4147044  12 120113    82   118   97     70     89     55     83
## 1044 4877204  10 177699    54    99  122     88     67     72     61
## 1045 4365616  15 102399    58    67   40    126     53     99     86
## 1046 4076763  15 208535    94    50   83     63     86    107    103
## 1047 4986038  11  97174    80    39   66     80     54    119     83
## 1048 4608289  15 112643    68    55  125     91     53     84     89
## 1049 4912196  15 137680    99    49  115     43     80     65     72
## 1050 4194195  10 217055    74    69   66     96    107     99     77
## 1051 4460520  10 131478    71    53  104     46    112     58     51
## 1052 4431268  15 187653   110   113   62     53     81    117     75
## 1053 4531245  11  93875    86    64   57     79     86     55     76
## 1054 4433419  13 148321   109    87   77    112     65     80    106
## 1055 3973875  12 223137    85    39   64    117     54    120    124
## 1056 4803016  12 192638   122    86   79     60     64     83     71
## 1057 4739421  14 117648    94    57  123    118    111     54     60
## 1058 4753747  15 198843   123    56   42     71     90     96     58
## 1059 4653008  13 209743   121   105  121     68     73     50    124
## 1060 4610239  15 105557   102    60   54     66     97    114     61
## 1061 4194149  12 206086    56    79   74    100     75     64    116
## 1062 4736716  12 100970    64    71   86     94     79     72    125
## 1063 4093975  11 188362   120    63   59    120     88     94    112
## 1064 4236668  12 199249   126   113   52     47     87     67    112
## 1065 4631940  14 218674   110    98   64    112     90     70     69
## 1066 3999714  11 180628   104   121   80     91     75     72    110
## 1067 3861613  13 113578    89   105  127     75     81     87     78
## 1068 4404037  12 116402    71    39   86     39     61     69     70
## 1069 4180597  11 120135    55    71   97     62     88     69    113
## 1070 4959619  10  97667    73   120   51    116     81    114     41
## 1071 4812712  10  96009    93    52   57    100     98     85    126
## 1072 4538153  15 196107   128   120   72     72     39     68     75
## 1073 4338341  15 147391   103   102   63    101     85     70    102
## 1074 4797582  10 159348    51    54   51     90     98    110     46
## 1075 4938035  13 186424   110    84  106    116     53     93     84
## 1076 4849345  13 198687   115   117  116     57    122     89     90
## 1077 4908395  15 184654    56   128  128     79     58    121     42
## 1078 4286163  13 168846    67   109   63     65     56    101     80
## 1079 4138780  14 117759    58    65   43    110    104     44    115
## 1080 4017277  11 115336    90    79   96    105     73     59     69
## 1081 4946544  12 112572   109    74   89    100     64     47    112
## 1082 4448322  12 187423   127   119   87    116    114     67     64
## 1083 4249556  14 117342    52    93  116     76     58     54     65
## 1084 3820024  14 121333   111   111   46     88     53     82     92
```

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## 1085 5006446  11 126800    45   121  104    106     54     83     56
## 1086 5007092  10 171841    63    48   72     63    126    122     70
## 1087 4357935  13 156902   112   105  106     97     88     41     97
## 1088 3892205  15 105252    73   115  120     79     73     88     47
## 1089 4423447  10 141950    61   115   93    114     89    121    105
## 1090 4951656  14 167707   124    62   89     69    101    121     43
## 1091 4598915  13  95248    54    41  104    105     84     70    119
## 1092 4651798  13  97982   108    71  128     40     75    110    104
## 1093 4657725  12 141628    51    88   43     62     43    118     83
## 1094 3823056  13 103432    58    77   88     56    114     62    102
## 1095 4039301  11 133033    94    53   95     88    114     48     72
## 1096 4447730  12 132890    97    69   71     49     62     80    123
## 1097 4502561  11 160025    80    81   69     39     78     96    116
## 1098 4094571  14 120029    91    64  124     74    104     66     85
## 1099 4996672  15 120409   107   128   96     50    126     83     91
## 1100 4395700  11 136289   124   107  103     43     66    107    112
## 1101 3845025  10 165478   120    80   61     65     59     88     94
## 1102 4657522  12 111404   122   116   55     82     41     62     50
## 1103 4140704  15 206742    77    53   46     94    113     65     41
## 1104 4561390  14 166475    57    49  115     95    107    128     41
## 1105 4220108  12 186946    95    96  119    119     76     39     92
## 1106 4623350  10 216892   105   108  126     92     64     60     64
## 1107 4281333  10 212637    86    74   92     52     69     91     89
## 1108 4744840  12 158291    67   122   81     45    123    121     76
## 1109 4014444  10 114478    59   113   67     93    103     41     64
## 1110 4421034  14 120101    76   104   67     44     67     73     92
## 1111 4640710  13 162588    45    74  114    107    127     86     90
## 1112 3907022  10 160288    41    46  103     93    104    126    104
## 1113 4996370  10 185504    96    93  111     97     99    123     63
## 1114 4513256  15 186245    80   115   82     43     57    122    128
## 1115 4182711  11 150370   121   105   66    118     39     50     97
## 1116 4816128  15 197736    95   106   81     97    103     61     76
## 1117 3937154  13 164628   128    95  113    123    127     53     58
## 1118 4465187  14 219894   114    77   41     56     40     42     83
## 1119 4495640  10 139079    63   126  128     59    111     75     93
## 1120 3838933  11 165766    69    62   95     77     39     82    119
## 1121 4366253  14 184611    95   109   59     39     93     57     68
## 1122 4992982  14 115678   107    60   66     64     77     76     64
## 1123 4938569  15 211777    61    70   81     41    123     44     60
## 1124 5004660  14 147139   116    65   99    108     83     87    101
## 1125 4897269  10 183242    97    42   80     43     83     99     52
## 1126 4578453  12 200249    58    94  121     57    112     65     72
## 1127 4794772  15 121631   100    83   85    103     53     73    117
## 1128 4462788  12 125067    68    66  103     96     93     93     94
## 1129 3857032  13 139541    84    92  124    111     85     80     55
## 1130 4748482  11 186693    83   126   64     66     82     56    115
## 1131 4910221  11 150319   128   124   71     75     64     94     77
## 1132 4537946  14 162751   113   110  109    126     64     46     95
## 1133 4564151  15 125014    73    50   73     62     81     82     42
## 1134 4007346  10 110591   112   101   63     55     81     51    114
```

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## 1135 4466482  14 186980    40    86  105    116     99     72    125
## 1136 4116220  11 138179    40    65  122     79     41     98     88
## 1137 3909071  13 224067    78    82   80    110     65    114     98
## 1138 4338803  14 105099   103    78  110     75     81     68     55
## 1139 3919982  15 212209   111   124   40     71     61    112     63
## 1140 4513815  13 198925    67    96  109     47     52    110     85
## 1141 4896828  14 168733   103   123   78     49     61    103    121
## 1142 4228611  11 161886   128    63   82     42     54     73     86
## 1143 4640028  10 183314    83    78   41     88     40    111    126
## 1144 4175786  13 159041    56   124   96     84     75     62    102
## 1145 4724631  15 146988    46   123   52     95     54     90    109
## 1146 4277712  15  95034   111    91   75     77    120     46     52
## 1147 4322276  11 159891    59    55  125     48     70     46     79
## 1148 4459695  13 113824   124   100  100     52     89     79     53
## 1149 4421364  13 205117   102    76  117    120     45     65     98
## 1150 4891734  12 184363   105    52   40     58     65     71     78
## 1151 4402918  13 100315    43   118  119     91     54     96    114
## 1152 4372410  10 112028    50    42  113     44    107     39     81
## 1153 4576766  15 123994    52    85   81     90    127     55     54
## 1154 4582212  11 150833    80   124  115    124    117    112     83
## 1155 4120803  10 175767    50   113   42     51     41     70    121
## 1156 4798266  13 219750    76    94   81     89     56     99     60
## 1157 4437008  12 188598    49   112   43    127     61     83    121
## 1158 3888957  15 225117    61   117  109     41     83     62     98
## 1159 4659718  10 147148    41    77  123     81     42    104     98
## 1160 4156452  12 118513    85    66   72     84     84     79     61
## 1161 4243558  14 161546    68    51  104     85     96     66     91
## 1162 4270935  13 148499    77   114  105     88    128     66    118
## 1163 4398428  14 211047    50    93  105     53     69     78     56
## 1164 3858344  12 182187   121    52   79     84    112    107     50
## 1165 4902472  11  95754    67    94   71     51     47     45    124
## 1166 4394288  15 164705    75    44  108     88     95    103     78
## 1167 4635737  14 123783    67    44   87     73    122    103     62
## 1168 4312049  15 156075    39    88   54     85     49    101    116
## 1169 4891530  14 216984    44    67   94     50     90     62     56
## 1170 4405333  11 114307    66    91   82    116     63     53     44
## 1171 4331344  12 118648   100   110   60     58     58     95     76
## 1172 4821846  15 212693    44    64   62     75    118     93     80
## 1173 4528988  14 135460    91   126   65     88     39     96    110
## 1174 4359812  13 136738   113   118   67     72    114    116     57
## 1175 4725621  11 107524    48    82   63    101    106     50    111
## 1176 4523352  11 108365    58    77   70     96     82    122     96
## 1177 3865308  11  94335    64    42  123     57     81    110     97
## 1178 4139131  13 114983   127   126   83     72     42    116     71
## 1179 4250667  12 138862   102    84  123    115     77    108     69
## 1180 5014169  12 123434    69    41   75     97    128     67     81
## 1181 4277025  15 153701    55    62   67    126     93     76     86
## 1182 4374988  10  96846   118    84   77     95    113     47    113
## 1183 4438465  11 104326   107    92   61     73     43     92     50
## 1184 4919158  15 128932   124    55   91    119     75     89     43
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## 1185 3962246  10 104747    72    70  117    109     84     97     48
## 1186 4791160  13 201757    87    56   91    124     58     78     82
## 1187 3849855  12 138358    95    45   64    102     58     72    127
## 1188 3969677  11 121733    46    52   54     52     57     39    112
## 1189 4135436  12 146407    86    66   49     64    110     98     52
## 1190 3966756  10 124753   127    74  116     62     54     62     68
## 1191 4931293  13 219513    86    76  127     85     58     54     53
## 1192 4292702  11 207742    57    78   66     91     60    111    120
## 1193 3977880  15 216247   118   126  118     71    116     40     87
## 1194 4794196  10 206494    94   109   39    106    108     39     75
## 1195 4578944  12 175070    70   117   51     99     77     64     69
## 1196 4483155  15 180714    82   122   44     65    126     61     98
## 1197 5004447  14 222475   123    63   70     77     56     68     75
## 1198 4812258  11 139599   115   101   45     66     49    119    116
## 1199 4281346  13 132262   118    85   86     74     66     65    105
## 1200 4826640  10 131972    48   102   88     97    100    123    108
## 1201 4737084  15 123536   104    81   49     60     71    109     74
## 1202 4743064  11 155959    88    86  110    116     61     89    104
## 1203 3925154  13 188767   106   101  123     83     72     60     94
## 1204 4003027  11 195619    39    40   56     71     58     39     44
## 1205 4960079  13 128064    58    70  114     81     62     99    108
## 1206 4768862  11 144998   100    48   51    107     67    107     86
## 1207 4006560  12 162723    40    88  118     43     90    114     69
## 1208 4597788  10 131584   112    56   70     57     58     90     56
## 1209 5009673  12 165303   121   118  110     54     73     69     47
## 1210 4793503  11 101143   119    68   53    112     80    116    120
## 1211 4447705  13 121577    71    74   76    104    119     58    117
## 1212 4081103  10  98185    76   112   78     83     97    120    122
## 1213 4727270  14 212136   105   102   42     68     46     39     60
## 1214 4199133  14 151211    80    47   55     58     71     41     81
## 1215 4764803  11 112834    99    84   40     74     84     56    119
## 1216 3923171  13 130448    54    50   58    119     90     93     87
## 1217 4091459  15 112916    49    95   48     80     77     65    128
## 1218 4617520  13 194461    45    74   56    121    111     58     56
## 1219 4225541  14 204056    86   104  102     48     68     64    115
## 1220 4575107  12 202870    53    42  128    116     87     66     54
## 1221 3824090  14 139522   121    69   39     59     97    106     99
## 1222 4287252  10 156672    99    57   48     65     53     82     73
## 1223 4330757  11 105501    40   115  114    128    122     85     89
## 1224 5018451  14  96303    77   106   43     76     77    103    116
## 1225 4085673  13  96824    84    62   72     70     42     63    126
## 1226 4398250  14 145508    51    65   45     41     43     80     53
## 1227 4210312  14 107763    52    72   43    117     66     87     97
## 1228 4908249  12 223043   113    57  114     84     74     84    106
## 1229 4007829  15 101777    67   110   69     55     47     76    117
## 1230 4997691  10 204004    65   115   89    108     80    119     46
## 1231 4035892  10 203958   110    90   55     72     92     81    125
## 1232 3977743  13 144613    82    86   70     63     43     93    123
## 1233 4017924  15  93731    99    79  100     75    113    115     82
## 1234 4445542  15 156461    53   111   88     49     56     88     43
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## 1235 4553831  11 104272   116    91   75    104     96     64     60
## 1236 4932302  14 101236   120    87   69     39     72     49    109
## 1237 4491193  14  97842    86   115  119    117     53     73     94
## 1238 4615841  12 158507   113   121   66    105    124     64     50
## 1239 4908525  11 165661    96   115   82     59     56     42     95
## 1240 4442803  12 152773    87    68  118     92     95     63     82
## 1241 4669798  11 171615   108    43   70     47     39     41     47
## 1242 4921113  15 131510    86    86   82    112    118     86     93
## 1243 4361485  10 194747    56    50   96     54    104     86     53
## 1244 4252898  14 223813    51    57   96     46     65     63    119
## 1245 4958205  12  98996   115   105  126    103    126     66     75
## 1246 4313212  13 225512   101   128  101     60    128    107     77
## 1247 3907597  14 184386    56   116  106     49    115     72     68
## 1248 4478346  10 143055   114    93  116     95     97     53     46
## 1249 4842077  11 118448   110    63   87    119     84     44     84
## 1250 3855669  14 129179    55    92   83    120     92    105    121
## 1251 3993346  11 149775    41    51   64    103     54     73    117
## 1252 3985694  14 225816    55    41  120     91     92     59     82
## 1253 3853907  14 207921    55    72   84     53    115    101     84
## 1254 4647735  15 185818    63    44  104     52    108     61     69
## 1255 4551370  15 170031    97   121   44     72     71     98     98
## 1256 4657685  12 189448    45   124   84     54     60    113     79
## 1257 4926856  15 184409    46    69   58     86     95     70    104
## 1258 3964346  15 120180   102    60   66     51     72     90     69
## 1259 4525956  11  94912    85    75  112     43     94     46     93
## 1260 4391618  11 164221    61    52   89     91    103    108     94
## 1261 4971595  15 222065   121   106   78     71     92     48     93
## 1262 4054619  15 167881    66   127  119     80     71     45    110
## 1263 4842435  15 222091   109   128   90     69    117     89     42
## 1264 3904640  14 105531   104    62   84     53    101     81    123
## 1265 3910041  10 161673    50    43   62     59    114    115     42
## 1266 4199661  14 217410    92   111   46     56     47     54    114
## 1267 4097685  12 109276    58   127   45     47    118     90     88
## 1268 4163349  15 128061    47    42  107     96     82     55     92
## 1269 4782516  12 180915    72    80   54    109    106    101     62
## 1270 4874479  15 201699   105    51  117     47     47     79     70
## 1271 3842792  11 180073    86    69  120     51    103     88     43
## 1272 4043346  10 138340    52    96   88    128     76     94     88
## 1273 3879999  13 200378    78    52   55     46     52     48     89
## 1274 3982200  15 174958    65    77  124     82     58    108    128
## 1275 4386821  13 141448    43    53   63    107     50     40    120
## 1276 3828749  10 127837    83    55   46     60    110    112     91
## 1277 4191296  15 172580    73   122   39     78     85     63    114
## 1278 3909989  14 104800   122    40  106    102     56     56     61
## 1279 4829558  15 172540   101    90   68    104     92     66    104
## 1280 4631124  15 188530    74   112   65     88    123     95    111
## 1281 3955678  13 117556   126    91   39    124     54    119    126
## 1282 3863399  10 190523   107   102   81     46    101    102    103
## 1283 4702112  10 111782    73    73   92     90     67     84     44
## 1284 4014208  14 137519   122    45   49     39     81     87    107
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## 1285 4537507  12 111552    41   120   94    107     85     55     94
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## 1288 4817865  10 183608   127    71   53    107    120    127     47
## 1289 4322809  11 130395    78   111   51     70    103     51     72
## 1290 4710446  12 139330    98   121  111     40     94     55     75
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## 1292 4039472  13 195769    70    70   60     74     50     88    113
## 1293 4474107  10  99334    73    66   68     71     75     75     66
## 1294 4189653  15 189177    90   100   85     42     70     43     67
## 1295 3958860  10 143699    91    51   95     74     49    105     95
## 1296 4026923  10 125795    55    73  124     72     50     69     99
## 1297 4095002  13 104369    82   110   70     76    111     84     81
## 1298 4196848  14 141687    77    90  116    114     77     77    118
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## 1301 3833061  11 143999    49    72   98     51     59    118     62
## 1302 4026535  14 165557    51    62   71     89    128     45     80
## 1303 3817833  13 139767    94    80   71    116    127     42     55
## 1304 4374130  14 104980    73    65   45     53     41    122     43
## 1305 4670848  10 180843    75    90   45    116     42    119    101
## 1306 4110872  12 193061   108    90   79     42     44    105     99
## 1307 4537281  15 186470   104    49  121     95    114     82     87
## 1308 4663878  12 176646    64    93   85    121     76    128     78
## 1309 4056331  11 184148    44   108   46     81    113    122    117
## 1310 4710060  13 137820   121    70   98    122     41     60     89
## 1311 4472238  14 124937    81    68  121     56     92    121     49
## 1312 4816426  10 200124   106   109   43     96     49    114    108
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## 1315 4341289  15 104480   114    80   58     48     55     93     48
## 1316 4711988  14 206506    87    43  107     52     85     91     82
## 1317 4689710  12 194583    56    52   76     87    110     53     45
## 1318 3899032  14 154289   124    89   68     62     47     64    108
## 1319 4363667  13 153347    54   118  118     50     84    117    125
## 1320 4975896  11 225818    62    51   80     62     77     46     97
## 1321 4400525  15 108681    41   112   70     71     72     69     51
## 1322 4824919  12 117713    63    65   43     85     47     84     40
## 1323 3925873  15 143494    90    47   62     80     72     77     69
## 1324 4585909  11 223667    76    78   62     82     69    122     67
## 1325 4153880  14 184405    94    57   46    119    116     81     45
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## 1327 4488498  13 215142    94    90  109     82    121     47     49
## 1328 4422543  12 115100    94    97   72     86    116     95    124
## 1329 4569330  12 134921   105    91  100    107    107     70    124
## 1330 4749487  12 194449   120   125   76     87     95     90     65
## 1331 4954074  12 154235    41    39   57    102     94     66     59
## 1332 4494757  10 117195    61    88   59     40     76    113     52
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## 1334 4877762  13 188956    58    76  115    113    124    122     50
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## 1335 4507140  12 172601   100    51  108    101     59     83    107
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## 1339 4620136  12 173003    64   123  120     64     98    112    106
## 1340 4688988  12 135911    63    72   43     51     69     53    100
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## 1344 4773138  13 105605    85    43  107     60    119     69     63
## 1345 4645422  11 166544    59    89   53     99    105     62     45
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## 1348 4478141  15 125518   124   118  128     47     57    126     90
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## 1352 4578693  11 103955   115   107   79     91     90     60    121
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## 1356 4473172  11 214235    62    39   99     99    100     46     92
## 1357 4515915  13 198967    45    43   49     42    116    107     83
## 1358 4847007  10 174264    39    73   53     43     40     73     80
## 1359 4771633  15 152961   110    48  106     80     91     41     51
## 1360 4697095  12 215271    49    70   59     57    106     74     75
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## 1363 5007535  11 181521    66    54   51     90    120     91     68
## 1364 4599860  11 216885   128    58   71    121     99     50    103
## 1365 4024520  11 113032   110    52  121    108    112     74     67
## 1366 4841775  15 138863    48    94   67    103    104     48     56
## 1367 4640976  12 156825   127    47   82     86    115    113     44
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## 1369 3843889  14 163451    65   109   57     94     95     92     60
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## 1372 3955993  13 133914    83   128   44     59     74    105     57
## 1373 4514867  15 225375   122    53   47     49     98    127     41
## 1374 4359332  10 107571   118    80   64     45     92    123     79
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## 1378 3922244  14 183040   109    50   98     74     50     64    122
## 1379 4627740  11 180703    42   124   67     90     56     46    127
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## 1381 4957174  15 202520   122    59   78    106    127     63     44
## 1382 4636951  10 115776   128   102   65     99    108     97     64
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## 5                30   660410  738756 3731527  338946 242861
## 6                29  1157452 1086852       5       5      5
## 7                28   325694 1034008  275095  214566 635157
## 8                39   641129   72050  787295  370605 506296
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## 19               26   506756  359181  743399  405175 162983
## 20               42  1080499   76404  717159  404314 477719
## 21               32   169624  786017  669076  531187 282524
## 22               32  1135200  572747       5       5      5
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## 24               25   993940  992652   96482  334897 762760
## 25               43   243433  981370   12504  360015 753383
## 26               35   955296  540654       5       5      5
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## 28               43   486467   45990   45578  733292  19572
## 29               45   285374  186657       5       5      5
## 30               38   426136  247777  767015  377123 315150
## 31               41  1194301  928679   29778  124250 244049
## 32               26   557708  287714  623587   66891  35044
## 33               24   604063  416313  323352  716655 678548
## 34               34  1159877  318505  463260  381345 282914
## 35               45   272600   91626  404523  674101 242552
## 36               40  1165166   51508  367178  588014 746328
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## 38               43    47190  581000  789780  262941 118971
## 39               31   961292   71146   28241   31034   1417
## 40               39   855099  102520  407306  220006 405497
## 41               33  1047535  320353  349454  546832 643942
## 42               33   271349  206329  151217  307729 174523
## 43               39   272507 1061189  230947  201997 293804
## 44               43   594248 1156859  436512  728279 685286
## 45               26   651671  422729  412086   91529 376394
## 46               35    57911  867787  758773  319688 159764
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## 54              32   253848  257913  382306  672711 385161
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## 56              23   149650  208611  266578   53715 481377
## 57              32   232668  880198  175039  181268 184145
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## 62              29   365429  239426  755513  290266 643822
## 63              26   620102  544738  740639  468459 208323
## 64              38   105958  216076  297086  755656 780066
## 65              27   420923 1109605  655703  753411 554612
## 66              26   175169   68868  632671  207722 258934
## 67              28  1177815  714160   93094  314177 102758
## 68              29   590244  290610  256588   94684 544054
## 69              35   727811  465753  382922  775458  24476
## 70              33   936761  737542  227389  410164 636763
## 71              41   632893  450196  368416  376627 703989
## 72              25   670969 1158751  706532  259979 190526
## 73              36   327706  927906  554740  375087 157528
## 74              30  1041041   99768  787815  413616 317021
## 75              40   265822     813  520004  484017 456419
## 76              32   922015 1146914   21081  136255 172170
## 77              22   168613  137240  550268  301626 234613
## 78              24  1114527  518344  611557  456092 402753
## 79              45   170527 1088486   72854  795019 433726
## 80              40    54743  390760  197060  388410 332045
## 81              39   570662    6556  569496  236595 627163
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## 83              26   422504 1025482  536220  450133 487629
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## 87              25  1168094  695791  409680  633247  96028
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## 89              28   683082  236960  709909  553085 563302
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## 585              32   462689 1120865  793701  731426 301716
## 586              35   819811   71619  504482  293750 259245
## 587              41  1031264  408469  272946  235996 730603
## 588              39   728717  909093       5       5      5
## 589              25   528531  407405  176159  440706  41364
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## 592              34   437454  523111   75918  136680 398180
## 593              34  1053972  283674       5       5      5
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## 595              29    73854   73132   88802  295205 344535
## 596              23    76645  636923   18502  102445 243741
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```

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## 611              43   668540  560691  153110   70765 372759
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## 621              23   836485  338323  368262  256360 179681
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## 665              45   430657 1099190   57946  290652  799098
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## 688              35   296084 1076695  675155  628420   13132
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## 748              35    38898 1104901       5       5      5
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## 754              39   397116  459102   74189   78533   79245
## 755              37   982161 1049576  400177  614535  570169
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## 777              40   520216 1130778       5       5       5
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## 783              31   593103 1134320  626481  662517  534940
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```

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## 944              35   357798 1158165  459605    8165  92591
## 945              35   176923  548229  439001  316184 649875
## 946              35   235213  166819       5       5      5
## 947              38  1135282  381250       5       5      5
## 948              33   179133  883452    5361  294231 566901
```

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```

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```

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```

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## 1311             39   205364  823100   89762  494110  749190
## 1312             42   605166 1136770  505249  198177  390140
## 1313             34   876571  730498  471986  104043  248731
## 1314             39    63467  230185  202205  396004  338688
## 1315             22    53277  409795       5       5       5
## 1316             35    79325 1082472       5       5       5
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## 1348             25   176277  460756       5       5       5
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##      Baseline.histological.Grading Baselinehistological.staging
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## 2                                4                            2
## 3                                4                            4
## 4                               10                            3
## 5                               11                            1
## 6                                4                            4
## 7                               12                            4
## 8                               12                            3
## 9                                5                            2
## 10                               4                            2
## 11                              15                            2
## 12                              16                            1
```

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## 25  6  3
## 26  9  4
## 27  5  1
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## 30  9  1
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## 32  5  2
## 33  8  1
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## 35 11  3
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## 56 11  2
## 57 14  3
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## 59 13  1
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## 110  9  1
## 111  6  1
## 112  6  3
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## 117  5 4
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## 121  7 3
## 122  6 3
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## 126 11 3
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## 144 12 4
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## 151 15 1
## 152 13 1
## 153 11 4
## 154 10 2
## 155 13 2
## 156 15 3
## 157 15 4
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## 159 12 3
## 160 11 4
## 161  5 1
## 162 14 2
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## 212  7  3
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## 229  9 3
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## 232  9 3
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## 256  6 3
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## 258  4 3
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## 260  7 4
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## 340  6 2
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## 342 15 3
## 343 15 3
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## 353  3 2
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## 761  15  2
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## 789   8  3
## 790   4  2
## 791   5  3
## 792  14  2
## 793  11  1
## 794  13  2
## 795   5  3
## 796  11  2
## 797   3  2
## 798  14  2
## 799  13  3
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## 801  12  3
## 802  15  1
## 803   3  3
## 804   6  3
## 805  12  2
## 806   5  2
## 807   9  1
## 808   8  4
## 809  12  3
## 810  10  1
## 811  15  1
## 812  13  3
```

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## 814 15 1
## 815  3 3
## 816 12 2
## 817  8 4
## 818  8 1
## 819  8 4
## 820 12 1
## 821  5 3
## 822  3 2
## 823 10 2
## 824 14 2
## 825  7 4
## 826 14 2
## 827 11 4
## 828 10 1
## 829  9 1
## 830  3 3
## 831 12 1
## 832  4 4
## 833  6 1
## 834 11 3
## 835 12 4
## 836  4 4
## 837 15 4
## 838 14 3
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## 842  4 2
## 843 12 1
## 844  4 4
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## 846 13 1
## 847  7 4
## 848 10 2
## 849  6 2
## 850  8 1
## 851 12 4
## 852 15 2
## 853 13 3
## 854  6 4
## 855 13 4
## 856  9 2
## 857 13 2
## 858 14 1
## 859 13 2
## 860  8 3
## 861 14 1
## 862  8 3
```

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## 865 16  2
## 866 11  4
## 867 11  2
## 868 15  2
## 869 11  1
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## 871  4  1
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## 873  8  4
## 874  9  1
## 875  8  2
## 876  5  1
## 877 15  1
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## 879 13  3
## 880 15  1
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## 882 14  3
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## 884 10  2
## 885  4  4
## 886 15  4
## 887 16  4
## 888  5  4
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## 891  8  2
## 892 15  1
## 893 13  1
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## 896  8  2
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## 904 14  4
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## 907  7  4
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## 909 14  4
## 910  9  3
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## 912 13  3
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## 916 15  3
## 917 15  4
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## 919  6  4
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## 927  4  4
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## 960 10  1
## 961  6  4
## 962 11  3
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## 964  15 4
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## 967  12 1
## 968  16 1
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## 970  15 3
## 971  13 3
## 972  13 2
## 973  10 1
## 974  15 1
## 975  12 1
## 976   3 1
## 977   8 2
## 978  12 1
## 979   9 2
## 980  11 3
## 981  15 2
## 982   4 4
## 983  16 4
## 984  15 3
## 985   5 1
## 986  10 4
## 987   6 1
## 988   9 1
## 989   9 3
## 990  10 3
## 991   7 2
## 992  12 3
## 993   6 4
## 994   5 2
## 995   4 4
## 996   7 4
## 997   3 4
## 998   7 4
## 999  14 3
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## 1003  6 3
## 1004 14 3
## 1005 10 3
## 1006  6 3
## 1007 14 2
## 1008  5 1
## 1009  7 3
## 1010  4 3
## 1011 13 1
## 1012 11 2
```

```
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## 1014  4 1
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## 1016 13 1
## 1017 15 2
## 1018  4 2
## 1019  4 1
## 1020  8 3
## 1021  4 3
## 1022 16 3
## 1023  4 1
## 1024  4 3
## 1025  8 1
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## 1033 14 1
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## 1035 10 2
## 1036 11 1
## 1037  6 1
## 1038  6 4
## 1039 10 2
## 1040 14 1
## 1041 14 1
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## 1043  5 2
## 1044 10 4
## 1045  5 3
## 1046 10 2
## 1047 16 2
## 1048 13 2
## 1049 10 4
## 1050 11 3
## 1051  6 3
## 1052  4 1
## 1053 13 4
## 1054  3 2
## 1055  3 2
## 1056  8 4
## 1057 10 2
## 1058 12 1
## 1059  4 2
## 1060 15 3
## 1061  3 1
## 1062 14 4
```

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## 1063  6  2
## 1064 15  3
## 1065 16  2
## 1066  3  4
## 1067 16  1
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## 1069 13  2
## 1070  3  2
## 1071 11  3
## 1072  6  4
## 1073  9  4
## 1074  8  4
## 1075 13  3
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## 1077  6  3
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## 1079  5  4
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## 1081  9  3
## 1082  4  2
## 1083 11  4
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## 1085 16  3
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## 1087 11  2
## 1088 14  3
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## 1090 16  2
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## 1092  8  1
## 1093  8  4
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## 1096 12  2
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## 1099  5  4
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## 1101  8  2
## 1102 11  4
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## 1104  9  2
## 1105  6  3
## 1106  5  3
## 1107 15  1
## 1108 10  1
## 1109 16  3
## 1110  9  2
## 1111  4  4
## 1112  7  1
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## 1114 11 2
## 1115 14 3
## 1116 15 1
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## 1118 13 2
## 1119 11 4
## 1120 11 1
## 1121  5 1
## 1122  6 4
## 1123 12 4
## 1124 13 1
## 1125 11 3
## 1126  4 2
## 1127  6 4
## 1128 14 4
## 1129 12 3
## 1130  9 4
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## 1132  6 3
## 1133 13 3
## 1134  3 3
## 1135  5 2
## 1136 16 1
## 1137 16 1
## 1138 10 3
## 1139 10 1
## 1140  9 4
## 1141  8 1
## 1142  8 4
## 1143 14 3
## 1144  9 4
## 1145 16 4
## 1146 14 3
## 1147  4 3
## 1148  9 3
## 1149  4 4
## 1150 12 2
## 1151 11 1
## 1152  9 3
## 1153  7 1
## 1154 10 1
## 1155 11 4
## 1156  5 1
## 1157 10 2
## 1158  7 2
## 1159  4 2
## 1160 12 4
## 1161 12 4
## 1162 12 2
```

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## 1169  4  4
## 1170  6  3
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## 1178  4  3
## 1179  8  4
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## 1188 11  2
## 1189  4  2
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## 1204  4  2
## 1205 11  4
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## 1208  3  3
## 1209  8  3
## 1210 14  1
## 1211 14  1
## 1212 14  4
```

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## 1214 14  3
## 1215  7  2
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## 1217 16  2
## 1218 11  4
## 1219 15  3
## 1220 14  2
## 1221 16  1
## 1222 11  4
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## 1225  8  2
## 1226 14  2
## 1227 16  3
## 1228 12  1
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## 1230 12  2
## 1231 10  1
## 1232 14  2
## 1233  9  1
## 1234 16  4
## 1235  9  2
## 1236 14  4
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## 1239  3  3
## 1240  6  3
## 1241  7  3
## 1242 13  1
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## 1244  5  3
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## 1247 10  1
## 1248  6  2
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## 1253  6  1
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## 1256  9  3
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## 1259 15  3
## 1260  3  3
## 1261 14  2
## 1262  4  4
```

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## 1274 14  3
## 1275  9  2
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## 1281  5  3
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## 1284  7  2
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## 1301  4  4
## 1302  5  4
## 1303  5  3
## 1304 13  1
## 1305  9  3
## 1306  5  4
## 1307 11  3
## 1308 15  2
## 1309  3  4
## 1310 15  1
## 1311  9  3
## 1312  4  3
```

```
## 1313 12 3
## 1314 12 4
## 1315  8 4
## 1316  9 2
## 1317 12 3
## 1318 13 4
## 1319  4 4
## 1320 15 2
## 1321  5 4
## 1322  4 4
## 1323 12 3
## 1324 16 3
## 1325  3 3
## 1326 12 3
## 1327  5 4
## 1328  6 3
## 1329  4 4
## 1330 14 4
## 1331  5 3
## 1332 12 4
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## 1337 14 1
## 1338  6 1
## 1339  9 4
## 1340 14 3
## 1341 14 1
## 1342  4 2
## 1343 13 2
## 1344 11 1
## 1345 11 1
## 1346  4 4
## 1347 14 4
## 1348 12 2
## 1349  4 4
## 1350 15 4
## 1351 12 2
## 1352 13 3
## 1353 14 1
## 1354  4 3
## 1355 14 2
## 1356 10 2
## 1357 11 4
## 1358 10 1
## 1359 11 3
## 1360 14 1
## 1361  6 1
## 1362  3 4
```

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## 1363                          11                          3
## 1364                           8                          2
## 1365                           7                          1
## 1366                          15                          1
## 1367                          14                          4
## 1368                          15                          2
## 1369                           8                          3
## 1370                          11                          1
## 1371                          10                          3
## 1372                           6                          2
## 1373                          15                          3
## 1374                           3                          4
## 1375                           9                          1
## 1376                          16                          2
## 1377                          11                          2
## 1378                          16                          2
## 1379                          16                          4
## 1380                          13                          4
## 1381                          15                          4
## 1382                          10                          2
## 1383                           6                          2
## 1384                          15                          3
## 1385                          13                          3
##      Survivorship
## 1               C
## 2               C
## 3              NC
## 4              NC
## 5               C
## 6               C
## 7               C
## 8               C
## 9               C
## 10              C
## 11             NC
## 12              C
## 13              C
## 14              C
## 15             NC
## 16             NC
## 17              C
## 18              C
## 19             NC
## 20             NC
## 21             NC
## 22              C
## 23              C
## 24              C
## 25              C
## 26              C
```

```
## 27             NC
## 28             NC
## 29              C
## 30              C
## 31              C
## 32              C
## 33             NC
## 34              C
## 35             NC
## 36             NC
## 37              C
## 38              C
## 39              C
## 40              C
## 41             NC
## 42              C
## 43              C
## 44             NC
## 45              C
## 46              C
## 47              C
## 48             NC
## 49             NC
## 50             NC
## 51              C
## 52              C
## 53             NC
## 54             NC
## 55              C
## 56              C
## 57              C
## 58              C
## 59              C
## 60             NC
## 61              C
## 62              C
## 63             NC
## 64             NC
## 65             NC
## 66              C
## 67              C
## 68              C
## 69             NC
## 70             NC
## 71              C
## 72              C
## 73              C
## 74             NC
## 75             NC
## 76              C
```

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## 78             NC
## 79             NC
## 80              C
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## 85             NC
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## 93              C
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## 95             NC
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## 98              C
## 99              C
## 100             C
## 101            NC
## 102             C
## 103             C
## 104             C
## 105             C
## 106             C
## 107             C
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## 109            NC
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## 112            NC
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## 120             C
## 121             C
## 122             C
## 123            NC
## 124             C
## 125             C
## 126             C
```

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## 128             C
## 129            NC
## 130             C
## 131            NC
## 132             C
## 133             C
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## 135             C
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## 172            NC
## 173             C
## 174             C
## 175             C
## 176             C
```

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## 225              C
## 226              C
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## 272             NC
## 273             NC
## 274              C
## 275             NC
## 276             NC
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## 326            NC
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## 426              C
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## 524             NC
## 525              C
## 526              C
```

```
## 527              C
## 528              C
## 529              C
## 530              C
## 531              C
## 532              C
## 533              C
## 534             NC
## 535              C
## 536              C
## 537             NC
## 538              C
## 539             NC
## 540             NC
## 541             NC
## 542             NC
## 543              C
## 544             NC
## 545              C
## 546              C
## 547             NC
## 548             NC
## 549              C
## 550              C
## 551              C
## 552              C
## 553              C
## 554             NC
## 555              C
## 556              C
## 557              C
## 558              C
## 559              C
## 560              C
## 561              C
## 562              C
## 563              C
## 564              C
## 565              C
## 566              C
## 567              C
## 568              C
## 569              C
## 570              C
## 571              C
## 572              C
## 573              C
## 574             NC
## 575              C
## 576              C
```

```
## 577              C
## 578              C
## 579              C
## 580             NC
## 581             NC
## 582              C
## 583              C
## 584              C
## 585             NC
## 586              C
## 587              C
## 588              C
## 589             NC
## 590              C
## 591              C
## 592              C
## 593              C
## 594             NC
## 595              C
## 596              C
## 597              C
## 598             NC
## 599              C
## 600              C
## 601              C
## 602             NC
## 603              C
## 604             NC
## 605              C
## 606              C
## 607              C
## 608              C
## 609              C
## 610              C
## 611              C
## 612             NC
## 613              C
## 614              C
## 615             NC
## 616             NC
## 617              C
## 618              C
## 619              C
## 620             NC
## 621              C
## 622             NC
## 623             NC
## 624              C
## 625              C
## 626             NC
```

```
## 627              C
## 628              C
## 629             NC
## 630             NC
## 631              C
## 632              C
## 633              C
## 634             NC
## 635             NC
## 636             NC
## 637              C
## 638              C
## 639              C
## 640              C
## 641              C
## 642              C
## 643              C
## 644              C
## 645              C
## 646              C
## 647             NC
## 648             NC
## 649              C
## 650             NC
## 651             NC
## 652             NC
## 653             NC
## 654              C
## 655              C
## 656              C
## 657              C
## 658              C
## 659              C
## 660             NC
## 661             NC
## 662             NC
## 663             NC
## 664              C
## 665              C
## 666              C
## 667              C
## 668              C
## 669              C
## 670             NC
## 671              C
## 672              C
## 673             NC
## 674              C
## 675              C
## 676              C
```

```
## 677              C
## 678             NC
## 679              C
## 680             NC
## 681             NC
## 682             NC
## 683              C
## 684             NC
## 685              C
## 686             NC
## 687              C
## 688             NC
## 689             NC
## 690             NC
## 691              C
## 692             NC
## 693              C
## 694              C
## 695              C
## 696              C
## 697              C
## 698              C
## 699              C
## 700              C
## 701              C
## 702              C
## 703              C
## 704              C
## 705             NC
## 706             NC
## 707             NC
## 708              C
## 709             NC
## 710              C
## 711              C
## 712             NC
## 713              C
## 714             NC
## 715              C
## 716             NC
## 717              C
## 718              C
## 719              C
## 720              C
## 721              C
## 722              C
## 723             NC
## 724              C
## 725             NC
## 726              C
```

```
## 727              C
## 728              C
## 729              C
## 730             NC
## 731              C
## 732              C
## 733              C
## 734              C
## 735              C
## 736              C
## 737              C
## 738             NC
## 739              C
## 740              C
## 741              C
## 742              C
## 743             NC
## 744              C
## 745             NC
## 746              C
## 747              C
## 748              C
## 749              C
## 750              C
## 751              C
## 752              C
## 753             NC
## 754              C
## 755             NC
## 756             NC
## 757              C
## 758             NC
## 759              C
## 760             NC
## 761             NC
## 762              C
## 763              C
## 764              C
## 765              C
## 766              C
## 767              C
## 768              C
## 769              C
## 770              C
## 771              C
## 772              C
## 773              C
## 774              C
## 775              C
## 776              C
```

```
## 777              C
## 778              C
## 779             NC
## 780              C
## 781              C
## 782             NC
## 783             NC
## 784             NC
## 785             NC
## 786             NC
## 787              C
## 788              C
## 789              C
## 790             NC
## 791             NC
## 792             NC
## 793              C
## 794              C
## 795             NC
## 796              C
## 797             NC
## 798              C
## 799             NC
## 800             NC
## 801             NC
## 802              C
## 803              C
## 804              C
## 805              C
## 806              C
## 807              C
## 808              C
## 809              C
## 810              C
## 811              C
## 812              C
## 813              C
## 814              C
## 815              C
## 816             NC
## 817              C
## 818             NC
## 819              C
## 820              C
## 821             NC
## 822              C
## 823              C
## 824              C
## 825             NC
## 826              C
```

```
## 827              C
## 828             NC
## 829              C
## 830              C
## 831              C
## 832             NC
## 833              C
## 834              C
## 835              C
## 836              C
## 837              C
## 838              C
## 839             NC
## 840              C
## 841              C
## 842              C
## 843             NC
## 844              C
## 845             NC
## 846              C
## 847             NC
## 848              C
## 849             NC
## 850              C
## 851              C
## 852             NC
## 853              C
## 854              C
## 855              C
## 856             NC
## 857              C
## 858              C
## 859              C
## 860              C
## 861              C
## 862              C
## 863             NC
## 864              C
## 865              C
## 866              C
## 867              C
## 868              C
## 869              C
## 870             NC
## 871              C
## 872             NC
## 873             NC
## 874             NC
## 875              C
## 876              C
```

```
## 877              C
## 878              C
## 879              C
## 880              C
## 881              C
## 882              C
## 883             NC
## 884             NC
## 885              C
## 886              C
## 887              C
## 888              C
## 889              C
## 890             NC
## 891              C
## 892              C
## 893              C
## 894             NC
## 895             NC
## 896             NC
## 897              C
## 898             NC
## 899              C
## 900              C
## 901             NC
## 902             NC
## 903              C
## 904              C
## 905             NC
## 906             NC
## 907              C
## 908              C
## 909             NC
## 910              C
## 911              C
## 912              C
## 913              C
## 914              C
## 915              C
## 916              C
## 917              C
## 918              C
## 919              C
## 920              C
## 921             NC
## 922              C
## 923             NC
## 924              C
## 925              C
## 926             NC
```

```
## 927              C
## 928             NC
## 929             NC
## 930             NC
## 931              C
## 932             NC
## 933              C
## 934              C
## 935              C
## 936              C
## 937              C
## 938              C
## 939              C
## 940             NC
## 941             NC
## 942              C
## 943              C
## 944              C
## 945              C
## 946              C
## 947              C
## 948              C
## 949              C
## 950              C
## 951              C
## 952              C
## 953              C
## 954              C
## 955              C
## 956              C
## 957              C
## 958              C
## 959              C
## 960             NC
## 961             NC
## 962             NC
## 963              C
## 964              C
## 965             NC
## 966             NC
## 967              C
## 968             NC
## 969             NC
## 970             NC
## 971              C
## 972              C
## 973              C
## 974              C
## 975             NC
## 976              C
```

```
## 977             C
## 978             C
## 979             C
## 980            NC
## 981             C
## 982            NC
## 983             C
## 984            NC
## 985            NC
## 986            NC
## 987             C
## 988            NC
## 989            NC
## 990             C
## 991             C
## 992             C
## 993             C
## 994            NC
## 995             C
## 996             C
## 997             C
## 998             C
## 999            NC
## 1000           NC
## 1001           NC
## 1002           NC
## 1003            C
## 1004            C
## 1005            C
## 1006            C
## 1007           NC
## 1008            C
## 1009            C
## 1010           NC
## 1011            C
## 1012            C
## 1013           NC
## 1014            C
## 1015           NC
## 1016            C
## 1017            C
## 1018            C
## 1019           NC
## 1020           NC
## 1021           NC
## 1022            C
## 1023           NC
## 1024            C
## 1025            C
## 1026           NC
```

```
## 1027            C
## 1028            C
## 1029            C
## 1030           NC
## 1031            C
## 1032           NC
## 1033            C
## 1034           NC
## 1035            C
## 1036            C
## 1037           NC
## 1038            C
## 1039            C
## 1040            C
## 1041            C
## 1042            C
## 1043            C
## 1044            C
## 1045            C
## 1046            C
## 1047            C
## 1048            C
## 1049            C
## 1050           NC
## 1051           NC
## 1052            C
## 1053           NC
## 1054           NC
## 1055            C
## 1056           NC
## 1057            C
## 1058            C
## 1059            C
## 1060            C
## 1061            C
## 1062           NC
## 1063           NC
## 1064           NC
## 1065            C
## 1066           NC
## 1067            C
## 1068           NC
## 1069            C
## 1070            C
## 1071           NC
## 1072            C
## 1073            C
## 1074            C
## 1075            C
## 1076            C
```

```
## 1077           NC
## 1078            C
## 1079           NC
## 1080           NC
## 1081           NC
## 1082            C
## 1083           NC
## 1084            C
## 1085           NC
## 1086           NC
## 1087            C
## 1088            C
## 1089            C
## 1090            C
## 1091            C
## 1092           NC
## 1093           NC
## 1094           NC
## 1095           NC
## 1096            C
## 1097            C
## 1098           NC
## 1099           NC
## 1100            C
## 1101            C
## 1102           NC
## 1103            C
## 1104           NC
## 1105           NC
## 1106            C
## 1107            C
## 1108            C
## 1109            C
## 1110            C
## 1111           NC
## 1112            C
## 1113            C
## 1114           NC
## 1115            C
## 1116            C
## 1117            C
## 1118            C
## 1119           NC
## 1120            C
## 1121           NC
## 1122           NC
## 1123           NC
## 1124           NC
## 1125           NC
## 1126            C
```

```
## 1127           C
## 1128          NC
## 1129           C
## 1130           C
## 1131           C
## 1132           C
## 1133          NC
## 1134           C
## 1135          NC
## 1136          NC
## 1137          NC
## 1138          NC
## 1139           C
## 1140          NC
## 1141           C
## 1142          NC
## 1143           C
## 1144           C
## 1145           C
## 1146           C
## 1147           C
## 1148          NC
## 1149           C
## 1150          NC
## 1151           C
## 1152          NC
## 1153           C
## 1154           C
## 1155           C
## 1156           C
## 1157           C
## 1158           C
## 1159           C
## 1160          NC
## 1161          NC
## 1162           C
## 1163           C
## 1164          NC
## 1165          NC
## 1166          NC
## 1167          NC
## 1168           C
## 1169          NC
## 1170           C
## 1171           C
## 1172           C
## 1173          NC
## 1174          NC
## 1175           C
## 1176           C
```

```
## 1177           C
## 1178           C
## 1179          NC
## 1180          NC
## 1181           C
## 1182           C
## 1183           C
## 1184          NC
## 1185          NC
## 1186          NC
## 1187          NC
## 1188          NC
## 1189          NC
## 1190          NC
## 1191          NC
## 1192           C
## 1193           C
## 1194           C
## 1195           C
## 1196           C
## 1197          NC
## 1198           C
## 1199           C
## 1200           C
## 1201           C
## 1202          NC
## 1203          NC
## 1204          NC
## 1205          NC
## 1206           C
## 1207          NC
## 1208          NC
## 1209           C
## 1210           C
## 1211           C
## 1212           C
## 1213           C
## 1214           C
## 1215           C
## 1216           C
## 1217           C
## 1218          NC
## 1219          NC
## 1220          NC
## 1221           C
## 1222          NC
## 1223           C
## 1224           C
## 1225           C
## 1226          NC
```

```
## 1227          NC
## 1228          NC
## 1229           C
## 1230           C
## 1231          NC
## 1232          NC
## 1233           C
## 1234           C
## 1235           C
## 1236           C
## 1237           C
## 1238           C
## 1239           C
## 1240          NC
## 1241           C
## 1242          NC
## 1243          NC
## 1244           C
## 1245           C
## 1246           C
## 1247           C
## 1248           C
## 1249           C
## 1250          NC
## 1251           C
## 1252          NC
## 1253           C
## 1254          NC
## 1255           C
## 1256          NC
## 1257          NC
## 1258           C
## 1259           C
## 1260           C
## 1261           C
## 1262          NC
## 1263          NC
## 1264           C
## 1265           C
## 1266           C
## 1267           C
## 1268          NC
## 1269           C
## 1270          NC
## 1271           C
## 1272           C
## 1273          NC
## 1274          NC
## 1275           C
## 1276          NC
```

```
## 1277          NC
## 1278          NC
## 1279           C
## 1280           C
## 1281          NC
## 1282          NC
## 1283          NC
## 1284          NC
## 1285          NC
## 1286           C
## 1287          NC
## 1288           C
## 1289           C
## 1290          NC
## 1291           C
## 1292           C
## 1293           C
## 1294           C
## 1295           C
## 1296           C
## 1297           C
## 1298           C
## 1299           C
## 1300          NC
## 1301          NC
## 1302           C
## 1303           C
## 1304          NC
## 1305           C
## 1306          NC
## 1307           C
## 1308           C
## 1309          NC
## 1310           C
## 1311          NC
## 1312           C
## 1313           C
## 1314           C
## 1315           C
## 1316           C
## 1317           C
## 1318           C
## 1319          NC
## 1320           C
## 1321          NC
## 1322           C
## 1323          NC
## 1324           C
## 1325           C
## 1326          NC
```

```
## 1327            C
## 1328           NC
## 1329           NC
## 1330            C
## 1331            C
## 1332            C
## 1333            C
## 1334            C
## 1335            C
## 1336            C
## 1337            C
## 1338            C
## 1339           NC
## 1340            C
## 1341           NC
## 1342            C
## 1343            C
## 1344           NC
## 1345           NC
## 1346            C
## 1347            C
## 1348            C
## 1349            C
## 1350            C
## 1351            C
## 1352            C
## 1353           NC
## 1354           NC
## 1355            C
## 1356            C
## 1357            C
## 1358            C
## 1359           NC
## 1360            C
## 1361            C
## 1362           NC
## 1363            C
## 1364           NC
## 1365           NC
## 1366            C
## 1367            C
## 1368            C
## 1369            C
## 1370            C
## 1371            C
## 1372            C
## 1373            C
## 1374            C
## 1375            C
## 1376            C
```

```
## 1377            C
## 1378           NC
## 1379           NC
## 1380           NC
## 1381            C
## 1382            C
## 1383            C
## 1384            C
## 1385            C
```

```
data$Survivorship <- as.factor(data$Survivorship)
#####################################
##
## Reformat the data so that it is
## 1) Easy to use (add nice column names)
## 2) Interpreted correctly by glm()..
##
#####################################
head(data) # you see data, but no column names
```

```
##   Age Gender BMI Fever Nausea.Vomting Headache Diarrhea
## 1  56      1  35     2              1        1        1
## 2  46      1  29     1              2        2        1
## 3  57      1  33     2              2        2        2
## 4  49      2  33     1              2        1        2
## 5  59      1  32     1              1        2        1
## 6  58      2  22     2              2        2        1
##   Fatigue...generalized.bone.ache Jaundice Epigastric.pain   WBC     RBC
## 1                               2        2               2  7425 4248807
## 2                               2        2               1 12101 4429425
## 3                               1        1               1  4178 4621191
## 4                               1        2               1  6490 4794631
## 5                               2        2               2  3661 4606375
## 6                               2        2               1 11785 3882456
##   HGB   Plat AST.1 ALT.1 ALT4 ALT.12 ALT.24 ALT.36 ALT.48 ALT.after.24.w
## 1  14 112132    99    84   52    109     81      5      5               5
## 2  10 129367    91   123   95     75    113     57    123              44
## 3  12 151522   113    49   95    107    116      5      5               5
## 4  10 146457    43    64  109     80     88     48     77              33
## 5  11 187684    99   104   67     48    120     94     90              30
## 6  15 131228    66   104  121     96     65     73    114              29
##   RNA.Base   RNA.4  RNA.12 RNA.EOT RNA.EF Baseline.histological.Grading
## 1   655330  634536  288194       5      5                             13
## 2    40620  538635  637056  336804  31085                              4
## 3   571148  661346       5  735945 558829                              4
## 4  1041941  449939  585688  744463 582301                             10
## 5   660410  738756 3731527  338946 242861                             11
## 6  1157452 1086852       5       5      5                              4
##   Baselinehistological.staging Survivorship
## 1                            2            C
```

```
## 2                              2            C
## 3                              4           NC
## 4                              3           NC
## 5                              1            C
## 6                              4            C
```

```
str(data)
```

```
## 'data.frame':    1385 obs. of  30 variables:
##  $ Age                              : int  56 46 57 49 59 58 42 48 44 45 ...
##  $ Gender                           : int  1 1 1 2 1 2 2 2 1 1 ...
##  $ BMI                              : int  35 29 33 33 32 22 26 30 23 30 ...
##  $ Fever                            : int  2 1 2 1 1 2 1 1 1 2 ...
##  $ Nausea.Vomting                   : int  1 2 2 2 1 2 1 1 1 1 ...
##  $ Headache                         : int  1 2 2 1 2 2 2 2 2 2 ...
##  $ Diarrhea                         : int  1 1 2 2 1 1 2 2 2 2 ...
##  $ Fatigue...generalized.bone.ache: int  2 2 1 1 2 2 2 1 2 1 ...
##  $ Jaundice                         : int  2 2 1 2 2 2 2 1 1 1 ...
##  $ Epigastric.pain                  : int  2 1 1 1 2 1 2 2 2 2 ...
##  $ WBC                              : int  7425 12101 4178 6490 3661 11785
11620 7335 10480 6681 ...
##  $ RBC                              : num  4248807 4429425 4621191 4794631
4606375 ...
##  $ HGB                              : int  14 10 12 10 11 15 12 11 12 12 ...
##  $ Plat                             : num  112132 129367 151522 146457
187684 ...
##  $ AST.1                            : int  99 91 113 43 99 66 78 119 93 55
...
##  $ ALT.1                            : int  84 123 49 64 104 104 57 112 83 68
...
##  $ ALT4                             : num  52 95 95 109 67 121 113 80 55 72
...
##  $ ALT.12                           : int  109 75 107 80 48 96 118 127 102
127 ...
##  $ ALT.24                           : int  81 113 116 88 120 65 107 45 97 81
...
##  $ ALT.36                           : int  5 57 5 48 94 73 84 96 122 125 ...
##  $ ALT.48                           : int  5 123 5 77 90 114 80 53 39 43 ...
##  $ ALT.after.24.w                   : int  5 44 5 33 30 29 28 39 45 30 ...
##  $ RNA.Base                         : int  655330 40620 571148 1041941
660410 1157452 325694 641129 591441 1151206 ...
##  $ RNA.4                            : int  634536 538635 661346 449939
738756 1086852 1034008 72050 757361 230488 ...
##  $ RNA.12                           : int  288194 637056 5 585688 3731527 5
275095 787295 5 267320 ...
##  $ RNA.EOT                          : int  5 336804 735945 744463 338946 5
214566 370605 371090 275295 ...
##  $ RNA.EF                           : int  5 31085 558829 582301 242861 5
635157 506296 203042 555516 ...
##  $ Baseline.histological.Grading  : int  13 4 4 10 11 4 12 12 5 4 ...
```

```
##  $ Baselinehistological.staging   : int  2 2 4 3 1 4 4 3 2 2 ...
##  $ Survivorship                   : Factor w/ 2 levels "C","NC": 1 1 2 2 1
1 1 1 1 1 ...

# this shows that we need to tell R which columns contain factors it also
shows us that there are some missing values. There are "?"s
## in the dataset. These are in the "ca" and "thal" columns. First, convert
"?"s to NAs...
data[data == "?"] <- NA
## Now add factors for variables that are factors and clean up the factors
that had missing data...
data[data$Gender == 1,]$Gender <- "M"
data[data$Gender == 2,]$Gender <- "F"
data$Gender <- as.factor(data$Gender)
data[data$Fever == 1,]$Fever <- "No"
data[data$Fever == 2,]$Fever <- "Yes"
data$Fever <- as.factor(data$Fever)
data[data$Nausea.Vomting == 1,]$Nausea.Vomting <- "No"
data[data$Nausea.Vomting == 2,]$Nausea.Vomting <- "Yes"
data$Nausea.Vomting <- as.factor(data$Nausea.Vomting)
data[data$Headache == 1,]$Headache <- "No"
data[data$Headache == 2,]$Headache <- "Yes"
data$Headache <- as.factor(data$Headache)
data[data$Diarrhea == 1,]$Diarrhea <- "No"
data[data$Diarrhea == 2,]$Diarrhea <- "Yes"
data$Diarrhea <- as.factor(data$Diarrhea)
data[data$Fatigue...generalized.bone.ache ==
1,]$Fatigue...generalized.bone.ache <- "No"
data[data$Fatigue...generalized.bone.ache ==
2,]$Fatigue...generalized.bone.ache <- "Yes"
data$Fatigue...generalized.bone.ache <-
as.factor(data$Fatigue...generalized.bone.ache)
data[data$Jaundice == 1,]$Jaundice <- "No"
data[data$Jaundice == 2,]$Jaundice <- "Yes"
data$Jaundice <- as.factor(data$Jaundice)
data[data$Epigastric.pain == 1,]$Epigastric.pain <- "No"
data[data$Epigastric.pain == 2,]$Epigastric.pain <- "Yes"
data$Epigastric.pain <- as.factor(data$Epigastric.pain)
data[data$Baselinehistological.staging == 1,]$Baselinehistological.staging <-
"Portal Fibrosis"
data[data$Baselinehistological.staging == 2,]$Baselinehistological.staging<-
"Few Septa"
data[data$Baselinehistological.staging == 3,]$Baselinehistological.staging <-
"Many Septa "
data[data$Baselinehistological.staging == 4,]$Baselinehistological.staging <-
"Cirrhosis"
data$Baseline.histological.Grading <-
as.factor(data$Baseline.histological.Grading)
data$Baselinehistological.staging <-
```

```r
as.factor(data$Baselinehistological.staging)
str(data)
```

```
## 'data.frame':    1385 obs. of  30 variables:
##  $ Age                             : int  56 46 57 49 59 58 42 48 44 45 ...
##  $ Gender                          : Factor w/ 2 levels "F","M": 2 2 2 1 2
1 1 1 2 2 ...
##  $ BMI                             : int  35 29 33 33 32 22 26 30 23 30 ...
##  $ Fever                           : Factor w/ 2 levels "No","Yes": 2 1 2 1
1 2 1 1 1 2 ...
##  $ Nausea.Vomting                  : Factor w/ 2 levels "No","Yes": 1 2 2 2
1 2 1 1 1 1 ...
##  $ Headache                        : Factor w/ 2 levels "No","Yes": 1 2 2 1
2 2 2 2 2 2 ...
##  $ Diarrhea                        : Factor w/ 2 levels "No","Yes": 1 1 2 2
1 1 2 2 2 2 ...
##  $ Fatigue...generalized.bone.ache: Factor w/ 2 levels "No","Yes": 2 2 1 1
2 2 2 1 2 1 ...
##  $ Jaundice                        : Factor w/ 2 levels "No","Yes": 2 2 1 2
2 2 2 1 1 1 ...
##  $ Epigastric.pain                 : Factor w/ 2 levels "No","Yes": 2 1 1 1
2 1 2 2 2 2 ...
##  $ WBC                             : int  7425 12101 4178 6490 3661 11785
11620 7335 10480 6681 ...
##  $ RBC                             : num  4248807 4429425 4621191 4794631
4606375 ...
##  $ HGB                             : int  14 10 12 10 11 15 12 11 12 12 ...
##  $ Plat                            : num  112132 129367 151522 146457
187684 ...
##  $ AST.1                           : int  99 91 113 43 99 66 78 119 93 55
...
##  $ ALT.1                           : int  84 123 49 64 104 104 57 112 83 68
...
##  $ ALT4                            : num  52 95 95 109 67 121 113 80 55 72
...
##  $ ALT.12                          : int  109 75 107 80 48 96 118 127 102
127 ...
##  $ ALT.24                          : int  81 113 116 88 120 65 107 45 97 81
...
##  $ ALT.36                          : int  5 57 5 48 94 73 84 96 122 125 ...
##  $ ALT.48                          : int  5 123 5 77 90 114 80 53 39 43 ...
##  $ ALT.after.24.w                  : int  5 44 5 33 30 29 28 39 45 30 ...
##  $ RNA.Base                        : int  655330 40620 571148 1041941
660410 1157452 325694 641129 591441 1151206 ...
##  $ RNA.4                           : int  634536 538635 661346 449939
738756 1086852 1034008 72050 757361 230488 ...
##  $ RNA.12                          : int  288194 637056 5 585688 3731527 5
275095 787295 5 267320 ...
##  $ RNA.EOT                         : int  5 336804 735945 744463 338946 5
214566 370605 371090 275295 ...
```

```
##  $ RNA.EF                          : int  5 31085 558829 582301 242861 5
635157 506296 203042 555516 ...
##  $ Baseline.histological.Grading   : Factor w/ 14 levels
"3","4","5","6",..: 11 2 2 8 9 2 10 10 3 2 ...
##  $ Baselinehistological.staging    : Factor w/ 4 levels "Cirrhosis","Few
Septa",..: 2 2 1 3 4 1 1 3 2 2 ...
##  $ Survivorship                    : Factor w/ 2 levels "C","NC": 1 1 2 2 1
1 1 1 1 1 ...

###################################
xtabs(~ Survivorship + Gender, data=data)

##              Gender
## Survivorship   F   M
##            C  425 478
##            NC 253 229

xtabs(~ Survivorship + Fever, data=data)

##              Fever
## Survivorship  No Yes
##            C  440 463
##            NC 231 251

xtabs(~ Survivorship + Nausea.Vomting, data=data)

##              Nausea.Vomting
## Survivorship  No Yes
##            C  451 452
##            NC 238 244

xtabs(~ Survivorship + Headache, data=data)

##              Headache
## Survivorship  No Yes
##            C  450 453
##            NC 248 234

xtabs(~ Survivorship + Diarrhea, data=data)

##              Diarrhea
## Survivorship  No Yes
##            C  452 451
##            NC 237 245

xtabs(~ Survivorship + Fatigue...generalized.bone.ache, data=data)

##              Fatigue...generalized.bone.ache
## Survivorship  No Yes
##            C  463 440
##            NC 231 251

xtabs(~ Survivorship + Jaundice, data=data)
```

```
##             Jaundice
## Survivorship  No Yes
##           C  462 441
##           NC 229 253
```

```
xtabs(~ Survivorship + Epigastric.pain, data=data)
```

```
##             Epigastric.pain
## Survivorship  No Yes
##           C  458 445
##           NC 229 253
```

```
xtabs(~ Survivorship + Baselinehistological.staging, data=data)
```

```
##             Baselinehistological.staging
## Survivorship Cirrhosis Few Septa Many Septa  Portal Fibrosis
##           C        235       221         234             213
##           NC       127       111         121             123
```

```
## Now we are ready for some logistic regression. First we'll create a very
## simple model that uses sex to predict heart disease
##
xtabs(~ Survivorship + Gender, data=data)
```

```
##             Gender
## Survivorship   F   M
##           C  425 478
##           NC 253 229
```

```
## Most of the females are healthy and most of the males are unhealthy.
## Being female is likely to decrease the odds in being unhealthy.
##    In other words, if a sample is female, the odds are against it that it
##    will be unhealthy
## Being male is likely to increase the odds in being unhealthy...
##    In other words, if a sample is male, the odds are for it being
unhealthy
logistic_simple <- glm(Survivorship ~ Gender, data=data, family="binomial")
summary(logistic_simple)
```

```
##
## Call:
## glm(formula = Survivorship ~ Gender, family = "binomial", data = data)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -0.9665  -0.9665  -0.8848   1.4041   1.5015
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) -0.51870    0.07941  -6.532 6.48e-11 ***
## GenderM     -0.21719    0.11298  -1.922   0.0546 .
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1790.0  on 1384  degrees of freedom
## Residual deviance: 1786.3  on 1383  degrees of freedom
## AIC: 1790.3
##
## Number of Fisher Scoring iterations: 4

## The intercept is the log(odds) a female will be unhealthy. This is because
## female is the first factor in "sex" (the factors are ordered,
## alphabetically by default,"female", "male")
## Now let's look at the second coefficient...
##   sexM        1.2737     0.2725   4.674 2.95e-06 ***
##
## sexM is the log(odds ratio) that tells us that if a sample has sex=M, the
## odds of being unhealthy are, on a log scale, 1.27 times greater than if
## a sample has sex=F.
female.log.odds <- log(253 /425)
female.log.odds

## [1] -0.5186997

# Now you know how these are calculated
male.log.odds.ratio <- log((229 / 478) / (253/425))
male.log.odds.ratio

## [1] -0.217189

## Now calculate the overall "Pseudo R-squared" and its p-value
## NOTE: Since we are doing logistic regression...
## Null devaiance = 2*(0 - LogLikelihood(null model))
##                = -2*LogLikihood(null model)
## Residual deviance = 2*(0 - LogLikelihood(proposed model))
##                   = -2*LogLikelihood(proposed model)
ll.null <- logistic_simple$null.deviance/-2
ll.proposed <- logistic_simple$deviance/-2
ll.null

## [1] -894.9992

ll.proposed

## [1] -893.1488

## McFadden's Pseudo R^2 = [ LL(Null) - LL(Proposed) ] / LL(Null)
(ll.null - ll.proposed) / ll.null

## [1] 0.002067477
```

```r
## chi-square value = 2*(LL(Proposed) - LL(Null))
## p-value = 1 - pchisq(chi-square value, df = 2-1)
1 - pchisq(2*(ll.proposed - ll.null), df=1)
```

```
## [1] 0.05438701
```

```r
1 - pchisq((logistic_simple$null.deviance - logistic_simple$deviance), df=1)
```

```
## [1] 0.05438701
```

```r
## Lastly, let's  see what this logistic regression predicts, given
## that a patient is either female or male (and no other data about them).
predicted.data <-
data.frame(probability.of.Survivorship=logistic_simple$fitted.values,Gender=d
ata$Gender)
predicted.data
```

```
##      probability.of.Survivorship Gender
## 1                      0.3239038      M
## 2                      0.3239038      M
## 3                      0.3239038      M
## 4                      0.3731563      F
## 5                      0.3239038      M
## 6                      0.3731563      F
## 7                      0.3731563      F
## 8                      0.3731563      F
## 9                      0.3239038      M
## 10                     0.3239038      M
## 11                     0.3731563      F
## 12                     0.3239038      M
## 13                     0.3731563      F
## 14                     0.3239038      M
## 15                     0.3731563      F
## 16                     0.3239038      M
## 17                     0.3239038      M
## 18                     0.3731563      F
## 19                     0.3239038      M
## 20                     0.3731563      F
## 21                     0.3731563      F
## 22                     0.3239038      M
## 23                     0.3239038      M
## 24                     0.3731563      F
## 25                     0.3731563      F
## 26                     0.3731563      F
## 27                     0.3239038      M
## 28                     0.3731563      F
## 29                     0.3731563      F
## 30                     0.3731563      F
## 31                     0.3731563      F
## 32                     0.3731563      F
## 33                     0.3731563      F
```

```
## 34                    0.3239038      M
## 35                    0.3239038      M
## 36                    0.3239038      M
## 37                    0.3731563      F
## 38                    0.3239038      M
## 39                    0.3731563      F
## 40                    0.3239038      M
## 41                    0.3731563      F
## 42                    0.3731563      F
## 43                    0.3239038      M
## 44                    0.3239038      M
## 45                    0.3731563      F
## 46                    0.3239038      M
## 47                    0.3239038      M
## 48                    0.3239038      M
## 49                    0.3239038      M
## 50                    0.3731563      F
## 51                    0.3731563      F
## 52                    0.3731563      F
## 53                    0.3239038      M
## 54                    0.3239038      M
## 55                    0.3239038      M
## 56                    0.3731563      F
## 57                    0.3731563      F
## 58                    0.3239038      M
## 59                    0.3731563      F
## 60                    0.3731563      F
## 61                    0.3731563      F
## 62                    0.3731563      F
## 63                    0.3731563      F
## 64                    0.3731563      F
## 65                    0.3239038      M
## 66                    0.3239038      M
## 67                    0.3731563      F
## 68                    0.3731563      F
## 69                    0.3731563      F
## 70                    0.3239038      M
## 71                    0.3239038      M
## 72                    0.3731563      F
## 73                    0.3731563      F
## 74                    0.3239038      M
## 75                    0.3731563      F
## 76                    0.3239038      M
## 77                    0.3731563      F
## 78                    0.3239038      M
## 79                    0.3239038      M
## 80                    0.3239038      M
## 81                    0.3239038      M
## 82                    0.3239038      M
## 83                    0.3239038      M
```

```
## 84                      0.3239038      M
## 85                      0.3731563      F
## 86                      0.3239038      M
## 87                      0.3731563      F
## 88                      0.3731563      F
## 89                      0.3239038      M
## 90                      0.3239038      M
## 91                      0.3731563      F
## 92                      0.3731563      F
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## 97                      0.3239038      M
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## 99                      0.3731563      F
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## 118                     0.3239038      M
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## 132                     0.3239038      M
## 133                     0.3731563      F
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## 134                    0.3239038      M
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## 166                    0.3239038      M
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## 171                    0.3239038      M
## 172                    0.3731563      F
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## 183                    0.3731563      F
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## 184                    0.3731563      F
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## 334                    0.3239038      M
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## 384                    0.3731563      F
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## 395                    0.3239038      M
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## 419                    0.3731563      F
## 420                    0.3731563      F
## 421                    0.3239038      M
## 422                    0.3731563      F
## 423                    0.3731563      F
## 424                    0.3731563      F
## 425                    0.3239038      M
## 426                    0.3239038      M
## 427                    0.3239038      M
## 428                    0.3239038      M
## 429                    0.3731563      F
## 430                    0.3731563      F
## 431                    0.3731563      F
## 432                    0.3731563      F
## 433                    0.3239038      M
```

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## 434                    0.3731563      F
## 435                    0.3731563      F
## 436                    0.3731563      F
## 437                    0.3731563      F
## 438                    0.3731563      F
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## 440                    0.3239038      M
## 441                    0.3239038      M
## 442                    0.3731563      F
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## 461                    0.3239038      M
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## 467                    0.3731563      F
## 468                    0.3239038      M
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## 472                    0.3239038      M
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## 474                    0.3239038      M
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## 478                    0.3731563      F
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## 481                    0.3239038      M
## 482                    0.3731563      F
## 483                    0.3731563      F
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## 484                    0.3731563      F
## 485                    0.3731563      F
## 486                    0.3239038      M
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## 491                    0.3239038      M
## 492                    0.3731563      F
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## 495                    0.3239038      M
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## 498                    0.3731563      F
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## 533                    0.3731563      F
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## 534                    0.3239038      M
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## 554                    0.3239038      M
## 555                    0.3239038      M
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## 559                    0.3239038      M
## 560                    0.3731563      F
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## 564                    0.3731563      F
## 565                    0.3239038      M
## 566                    0.3239038      M
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## 573                    0.3731563      F
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## 575                    0.3239038      M
## 576                    0.3239038      M
## 577                    0.3239038      M
## 578                    0.3731563      F
## 579                    0.3731563      F
## 580                    0.3731563      F
## 581                    0.3239038      M
## 582                    0.3239038      M
## 583                    0.3239038      M
```

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## 584                    0.3731563      F
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## 593                    0.3731563      F
## 594                    0.3239038      M
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## 597                    0.3239038      M
## 598                    0.3239038      M
## 599                    0.3731563      F
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## 622                    0.3731563      F
## 623                    0.3731563      F
## 624                    0.3239038      M
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## 632                    0.3239038      M
## 633                    0.3731563      F
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## 640                    0.3239038      M
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## 642                    0.3731563      F
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## 645                    0.3239038      M
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## 672                    0.3239038      M
## 673                    0.3239038      M
## 674                    0.3239038      M
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## 677                    0.3731563      F
## 678                    0.3239038      M
## 679                    0.3731563      F
## 680                    0.3239038      M
## 681                    0.3731563      F
## 682                    0.3239038      M
## 683                    0.3731563      F
```

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## 684                    0.3239038      M
## 685                    0.3239038      M
## 686                    0.3731563      F
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## 688                    0.3239038      M
## 689                    0.3239038      M
## 690                    0.3239038      M
## 691                    0.3239038      M
## 692                    0.3731563      F
## 693                    0.3731563      F
## 694                    0.3239038      M
## 695                    0.3731563      F
## 696                    0.3731563      F
## 697                    0.3239038      M
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## 704                    0.3731563      F
## 705                    0.3731563      F
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## 707                    0.3731563      F
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## 709                    0.3239038      M
## 710                    0.3239038      M
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## 716                    0.3731563      F
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## 727                    0.3239038      M
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## 729                    0.3239038      M
## 730                    0.3239038      M
## 731                    0.3239038      M
## 732                    0.3731563      F
## 733                    0.3731563      F
```

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## 734                    0.3731563      F
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## 739                    0.3731563      F
## 740                    0.3731563      F
## 741                    0.3239038      M
## 742                    0.3239038      M
## 743                    0.3731563      F
## 744                    0.3239038      M
## 745                    0.3731563      F
## 746                    0.3239038      M
## 747                    0.3731563      F
## 748                    0.3239038      M
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## 753                    0.3731563      F
## 754                    0.3731563      F
## 755                    0.3731563      F
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## 758                    0.3239038      M
## 759                    0.3239038      M
## 760                    0.3239038      M
## 761                    0.3239038      M
## 762                    0.3239038      M
## 763                    0.3731563      F
## 764                    0.3239038      M
## 765                    0.3239038      M
## 766                    0.3239038      M
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## 768                    0.3239038      M
## 769                    0.3239038      M
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## 772                    0.3239038      M
## 773                    0.3731563      F
## 774                    0.3239038      M
## 775                    0.3731563      F
## 776                    0.3239038      M
## 777                    0.3239038      M
## 778                    0.3731563      F
## 779                    0.3731563      F
## 780                    0.3731563      F
## 781                    0.3731563      F
## 782                    0.3239038      M
## 783                    0.3239038      M
```

```
## 784                    0.3731563      F
## 785                    0.3731563      F
## 786                    0.3731563      F
## 787                    0.3731563      F
## 788                    0.3239038      M
## 789                    0.3731563      F
## 790                    0.3239038      M
## 791                    0.3239038      M
## 792                    0.3731563      F
## 793                    0.3239038      M
## 794                    0.3731563      F
## 795                    0.3239038      M
## 796                    0.3731563      F
## 797                    0.3239038      M
## 798                    0.3239038      M
## 799                    0.3239038      M
## 800                    0.3239038      M
## 801                    0.3731563      F
## 802                    0.3731563      F
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## 806                    0.3239038      M
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## 808                    0.3731563      F
## 809                    0.3239038      M
## 810                    0.3731563      F
## 811                    0.3239038      M
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## 813                    0.3731563      F
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## 817                    0.3731563      F
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## 819                    0.3731563      F
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## 822                    0.3239038      M
## 823                    0.3731563      F
## 824                    0.3239038      M
## 825                    0.3239038      M
## 826                    0.3731563      F
## 827                    0.3239038      M
## 828                    0.3239038      M
## 829                    0.3731563      F
## 830                    0.3731563      F
## 831                    0.3239038      M
## 832                    0.3731563      F
## 833                    0.3239038      M
```

```
## 834                    0.3731563      F
## 835                    0.3731563      F
## 836                    0.3731563      F
## 837                    0.3731563      F
## 838                    0.3731563      F
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## 840                    0.3731563      F
## 841                    0.3731563      F
## 842                    0.3239038      M
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## 844                    0.3731563      F
## 845                    0.3731563      F
## 846                    0.3731563      F
## 847                    0.3731563      F
## 848                    0.3239038      M
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## 853                    0.3731563      F
## 854                    0.3239038      M
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## 856                    0.3239038      M
## 857                    0.3239038      M
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## 861                    0.3731563      F
## 862                    0.3731563      F
## 863                    0.3239038      M
## 864                    0.3239038      M
## 865                    0.3239038      M
## 866                    0.3731563      F
## 867                    0.3239038      M
## 868                    0.3239038      M
## 869                    0.3239038      M
## 870                    0.3731563      F
## 871                    0.3731563      F
## 872                    0.3731563      F
## 873                    0.3731563      F
## 874                    0.3731563      F
## 875                    0.3239038      M
## 876                    0.3239038      M
## 877                    0.3731563      F
## 878                    0.3731563      F
## 879                    0.3239038      M
## 880                    0.3239038      M
## 881                    0.3239038      M
## 882                    0.3239038      M
## 883                    0.3731563      F
```

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## 884                    0.3239038      M
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## 887                    0.3731563      F
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## 890                    0.3239038      M
## 891                    0.3239038      M
## 892                    0.3731563      F
## 893                    0.3239038      M
## 894                    0.3239038      M
## 895                    0.3731563      F
## 896                    0.3731563      F
## 897                    0.3239038      M
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## 903                    0.3239038      M
## 904                    0.3239038      M
## 905                    0.3239038      M
## 906                    0.3239038      M
## 907                    0.3239038      M
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## 910                    0.3239038      M
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## 915                    0.3239038      M
## 916                    0.3731563      F
## 917                    0.3731563      F
## 918                    0.3731563      F
## 919                    0.3239038      M
## 920                    0.3239038      M
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## 924                    0.3239038      M
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## 927                    0.3239038      M
## 928                    0.3239038      M
## 929                    0.3731563      F
## 930                    0.3239038      M
## 931                    0.3239038      M
## 932                    0.3731563      F
## 933                    0.3239038      M
```

```
## 934                    0.3731563      F
## 935                    0.3239038      M
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## 940                    0.3239038      M
## 941                    0.3731563      F
## 942                    0.3239038      M
## 943                    0.3239038      M
## 944                    0.3731563      F
## 945                    0.3731563      F
## 946                    0.3239038      M
## 947                    0.3239038      M
## 948                    0.3731563      F
## 949                    0.3239038      M
## 950                    0.3239038      M
## 951                    0.3731563      F
## 952                    0.3731563      F
## 953                    0.3731563      F
## 954                    0.3239038      M
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## 956                    0.3731563      F
## 957                    0.3731563      F
## 958                    0.3731563      F
## 959                    0.3239038      M
## 960                    0.3731563      F
## 961                    0.3239038      M
## 962                    0.3239038      M
## 963                    0.3239038      M
## 964                    0.3239038      M
## 965                    0.3731563      F
## 966                    0.3731563      F
## 967                    0.3239038      M
## 968                    0.3239038      M
## 969                    0.3239038      M
## 970                    0.3239038      M
## 971                    0.3731563      F
## 972                    0.3239038      M
## 973                    0.3731563      F
## 974                    0.3731563      F
## 975                    0.3731563      F
## 976                    0.3731563      F
## 977                    0.3239038      M
## 978                    0.3731563      F
## 979                    0.3239038      M
## 980                    0.3731563      F
## 981                    0.3731563      F
## 982                    0.3731563      F
## 983                    0.3731563      F
```

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## 984                    0.3239038      M
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## 989                    0.3239038      M
## 990                    0.3239038      M
## 991                    0.3239038      M
## 992                    0.3239038      M
## 993                    0.3239038      M
## 994                    0.3239038      M
## 995                    0.3239038      M
## 996                    0.3731563      F
## 997                    0.3239038      M
## 998                    0.3731563      F
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## 1000                   0.3239038      M
## 1001                   0.3239038      M
## 1002                   0.3731563      F
## 1003                   0.3239038      M
## 1004                   0.3731563      F
## 1005                   0.3239038      M
## 1006                   0.3731563      F
## 1007                   0.3239038      M
## 1008                   0.3239038      M
## 1009                   0.3731563      F
## 1010                   0.3239038      M
## 1011                   0.3239038      M
## 1012                   0.3239038      M
## 1013                   0.3731563      F
## 1014                   0.3239038      M
## 1015                   0.3731563      F
## 1016                   0.3731563      F
## 1017                   0.3731563      F
## 1018                   0.3731563      F
## 1019                   0.3731563      F
## 1020                   0.3731563      F
## 1021                   0.3239038      M
## 1022                   0.3239038      M
## 1023                   0.3731563      F
## 1024                   0.3239038      M
## 1025                   0.3239038      M
## 1026                   0.3731563      F
## 1027                   0.3239038      M
## 1028                   0.3731563      F
## 1029                   0.3731563      F
## 1030                   0.3731563      F
## 1031                   0.3731563      F
## 1032                   0.3239038      M
## 1033                   0.3731563      F
```

```
## 1034                  0.3731563      F
## 1035                  0.3731563      F
## 1036                  0.3239038      M
## 1037                  0.3239038      M
## 1038                  0.3239038      M
## 1039                  0.3239038      M
## 1040                  0.3239038      M
## 1041                  0.3731563      F
## 1042                  0.3731563      F
## 1043                  0.3239038      M
## 1044                  0.3731563      F
## 1045                  0.3731563      F
## 1046                  0.3239038      M
## 1047                  0.3239038      M
## 1048                  0.3239038      M
## 1049                  0.3731563      F
## 1050                  0.3239038      M
## 1051                  0.3239038      M
## 1052                  0.3239038      M
## 1053                  0.3239038      M
## 1054                  0.3239038      M
## 1055                  0.3731563      F
## 1056                  0.3731563      F
## 1057                  0.3239038      M
## 1058                  0.3239038      M
## 1059                  0.3239038      M
## 1060                  0.3239038      M
## 1061                  0.3239038      M
## 1062                  0.3731563      F
## 1063                  0.3731563      F
## 1064                  0.3239038      M
## 1065                  0.3731563      F
## 1066                  0.3731563      F
## 1067                  0.3239038      M
## 1068                  0.3731563      F
## 1069                  0.3239038      M
## 1070                  0.3239038      M
## 1071                  0.3731563      F
## 1072                  0.3731563      F
## 1073                  0.3731563      F
## 1074                  0.3731563      F
## 1075                  0.3239038      M
## 1076                  0.3239038      M
## 1077                  0.3731563      F
## 1078                  0.3239038      M
## 1079                  0.3239038      M
## 1080                  0.3731563      F
## 1081                  0.3239038      M
## 1082                  0.3239038      M
## 1083                  0.3731563      F
```

```
## 1084                  0.3239038      M
## 1085                  0.3731563      F
## 1086                  0.3731563      F
## 1087                  0.3239038      M
## 1088                  0.3239038      M
## 1089                  0.3731563      F
## 1090                  0.3239038      M
## 1091                  0.3731563      F
## 1092                  0.3239038      M
## 1093                  0.3731563      F
## 1094                  0.3731563      F
## 1095                  0.3731563      F
## 1096                  0.3731563      F
## 1097                  0.3239038      M
## 1098                  0.3731563      F
## 1099                  0.3239038      M
## 1100                  0.3239038      M
## 1101                  0.3239038      M
## 1102                  0.3239038      M
## 1103                  0.3731563      F
## 1104                  0.3731563      F
## 1105                  0.3239038      M
## 1106                  0.3731563      F
## 1107                  0.3239038      M
## 1108                  0.3239038      M
## 1109                  0.3731563      F
## 1110                  0.3239038      M
## 1111                  0.3239038      M
## 1112                  0.3239038      M
## 1113                  0.3239038      M
## 1114                  0.3239038      M
## 1115                  0.3239038      M
## 1116                  0.3239038      M
## 1117                  0.3731563      F
## 1118                  0.3731563      F
## 1119                  0.3731563      F
## 1120                  0.3239038      M
## 1121                  0.3731563      F
## 1122                  0.3239038      M
## 1123                  0.3239038      M
## 1124                  0.3239038      M
## 1125                  0.3239038      M
## 1126                  0.3239038      M
## 1127                  0.3239038      M
## 1128                  0.3731563      F
## 1129                  0.3239038      M
## 1130                  0.3239038      M
## 1131                  0.3731563      F
## 1132                  0.3731563      F
## 1133                  0.3239038      M
```

```
## 1134                  0.3239038      M
## 1135                  0.3731563      F
## 1136                  0.3731563      F
## 1137                  0.3731563      F
## 1138                  0.3731563      F
## 1139                  0.3239038      M
## 1140                  0.3239038      M
## 1141                  0.3239038      M
## 1142                  0.3731563      F
## 1143                  0.3731563      F
## 1144                  0.3731563      F
## 1145                  0.3731563      F
## 1146                  0.3239038      M
## 1147                  0.3731563      F
## 1148                  0.3731563      F
## 1149                  0.3239038      M
## 1150                  0.3731563      F
## 1151                  0.3239038      M
## 1152                  0.3239038      M
## 1153                  0.3239038      M
## 1154                  0.3239038      M
## 1155                  0.3731563      F
## 1156                  0.3731563      F
## 1157                  0.3239038      M
## 1158                  0.3731563      F
## 1159                  0.3239038      M
## 1160                  0.3731563      F
## 1161                  0.3239038      M
## 1162                  0.3731563      F
## 1163                  0.3731563      F
## 1164                  0.3239038      M
## 1165                  0.3239038      M
## 1166                  0.3239038      M
## 1167                  0.3731563      F
## 1168                  0.3731563      F
## 1169                  0.3731563      F
## 1170                  0.3239038      M
## 1171                  0.3731563      F
## 1172                  0.3731563      F
## 1173                  0.3731563      F
## 1174                  0.3731563      F
## 1175                  0.3239038      M
## 1176                  0.3239038      M
## 1177                  0.3731563      F
## 1178                  0.3731563      F
## 1179                  0.3239038      M
## 1180                  0.3731563      F
## 1181                  0.3239038      M
## 1182                  0.3239038      M
## 1183                  0.3731563      F
```

```
## 1184                  0.3731563      F
## 1185                  0.3731563      F
## 1186                  0.3239038      M
## 1187                  0.3239038      M
## 1188                  0.3239038      M
## 1189                  0.3731563      F
## 1190                  0.3239038      M
## 1191                  0.3731563      F
## 1192                  0.3239038      M
## 1193                  0.3239038      M
## 1194                  0.3731563      F
## 1195                  0.3731563      F
## 1196                  0.3731563      F
## 1197                  0.3239038      M
## 1198                  0.3239038      M
## 1199                  0.3731563      F
## 1200                  0.3731563      F
## 1201                  0.3239038      M
## 1202                  0.3239038      M
## 1203                  0.3731563      F
## 1204                  0.3731563      F
## 1205                  0.3239038      M
## 1206                  0.3239038      M
## 1207                  0.3239038      M
## 1208                  0.3731563      F
## 1209                  0.3239038      M
## 1210                  0.3731563      F
## 1211                  0.3731563      F
## 1212                  0.3239038      M
## 1213                  0.3731563      F
## 1214                  0.3731563      F
## 1215                  0.3239038      M
## 1216                  0.3239038      M
## 1217                  0.3731563      F
## 1218                  0.3239038      M
## 1219                  0.3731563      F
## 1220                  0.3239038      M
## 1221                  0.3731563      F
## 1222                  0.3731563      F
## 1223                  0.3731563      F
## 1224                  0.3239038      M
## 1225                  0.3731563      F
## 1226                  0.3239038      M
## 1227                  0.3239038      M
## 1228                  0.3239038      M
## 1229                  0.3731563      F
## 1230                  0.3731563      F
## 1231                  0.3239038      M
## 1232                  0.3731563      F
## 1233                  0.3731563      F
```

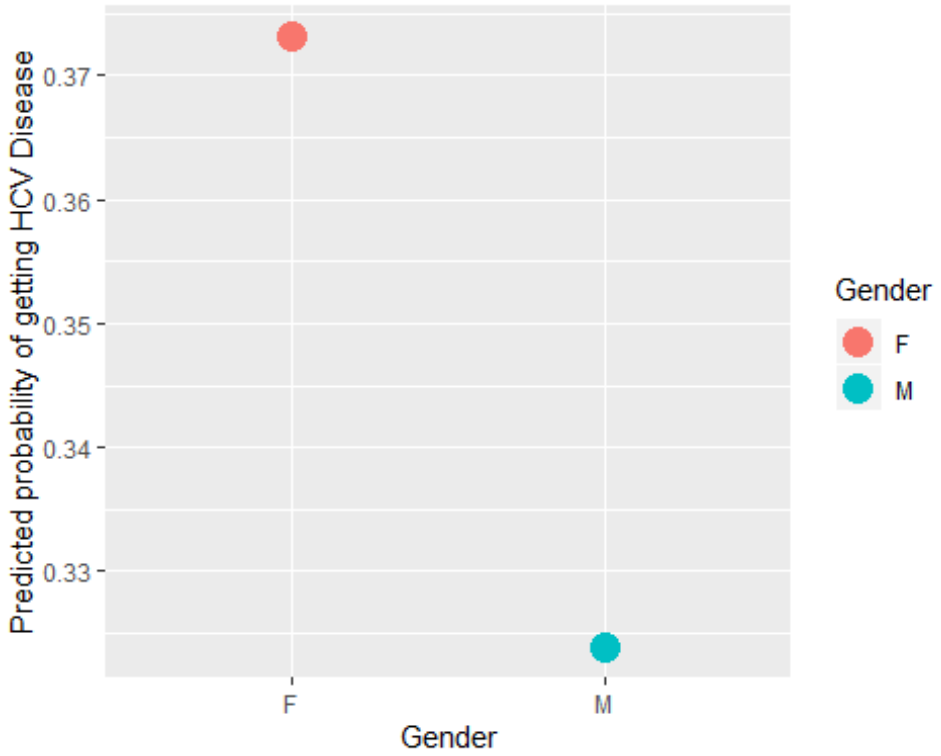
```
## 1234                  0.3239038      M
## 1235                  0.3239038      M
## 1236                  0.3239038      M
## 1237                  0.3239038      M
## 1238                  0.3731563      F
## 1239                  0.3731563      F
## 1240                  0.3239038      M
## 1241                  0.3731563      F
## 1242                  0.3731563      F
## 1243                  0.3731563      F
## 1244                  0.3239038      M
## 1245                  0.3731563      F
## 1246                  0.3731563      F
## 1247                  0.3731563      F
## 1248                  0.3731563      F
## 1249                  0.3731563      F
## 1250                  0.3731563      F
## 1251                  0.3239038      M
## 1252                  0.3239038      M
## 1253                  0.3731563      F
## 1254                  0.3731563      F
## 1255                  0.3731563      F
## 1256                  0.3731563      F
## 1257                  0.3239038      M
## 1258                  0.3731563      F
## 1259                  0.3731563      F
## 1260                  0.3731563      F
## 1261                  0.3731563      F
## 1262                  0.3731563      F
## 1263                  0.3731563      F
## 1264                  0.3239038      M
## 1265                  0.3731563      F
## 1266                  0.3731563      F
## 1267                  0.3731563      F
## 1268                  0.3731563      F
## 1269                  0.3239038      M
## 1270                  0.3239038      M
## 1271                  0.3239038      M
## 1272                  0.3239038      M
## 1273                  0.3239038      M
## 1274                  0.3239038      M
## 1275                  0.3239038      M
## 1276                  0.3239038      M
## 1277                  0.3731563      F
## 1278                  0.3239038      M
## 1279                  0.3731563      F
## 1280                  0.3239038      M
## 1281                  0.3731563      F
## 1282                  0.3731563      F
## 1283                  0.3731563      F
```

```
## 1284                  0.3239038      M
## 1285                  0.3239038      M
## 1286                  0.3239038      M
## 1287                  0.3731563      F
## 1288                  0.3239038      M
## 1289                  0.3239038      M
## 1290                  0.3239038      M
## 1291                  0.3731563      F
## 1292                  0.3239038      M
## 1293                  0.3731563      F
## 1294                  0.3731563      F
## 1295                  0.3239038      M
## 1296                  0.3239038      M
## 1297                  0.3239038      M
## 1298                  0.3239038      M
## 1299                  0.3731563      F
## 1300                  0.3239038      M
## 1301                  0.3731563      F
## 1302                  0.3731563      F
## 1303                  0.3731563      F
## 1304                  0.3239038      M
## 1305                  0.3239038      M
## 1306                  0.3239038      M
## 1307                  0.3239038      M
## 1308                  0.3731563      F
## 1309                  0.3239038      M
## 1310                  0.3239038      M
## 1311                  0.3731563      F
## 1312                  0.3239038      M
## 1313                  0.3731563      F
## 1314                  0.3239038      M
## 1315                  0.3239038      M
## 1316                  0.3239038      M
## 1317                  0.3239038      M
## 1318                  0.3239038      M
## 1319                  0.3239038      M
## 1320                  0.3731563      F
## 1321                  0.3239038      M
## 1322                  0.3239038      M
## 1323                  0.3731563      F
## 1324                  0.3731563      F
## 1325                  0.3239038      M
## 1326                  0.3731563      F
## 1327                  0.3731563      F
## 1328                  0.3731563      F
## 1329                  0.3239038      M
## 1330                  0.3731563      F
## 1331                  0.3239038      M
## 1332                  0.3239038      M
## 1333                  0.3239038      M
```

```
## 1334                  0.3239038      M
## 1335                  0.3239038      M
## 1336                  0.3731563      F
## 1337                  0.3731563      F
## 1338                  0.3239038      M
## 1339                  0.3239038      M
## 1340                  0.3731563      F
## 1341                  0.3731563      F
## 1342                  0.3731563      F
## 1343                  0.3239038      M
## 1344                  0.3731563      F
## 1345                  0.3731563      F
## 1346                  0.3239038      M
## 1347                  0.3731563      F
## 1348                  0.3731563      F
## 1349                  0.3239038      M
## 1350                  0.3239038      M
## 1351                  0.3239038      M
## 1352                  0.3731563      F
## 1353                  0.3239038      M
## 1354                  0.3239038      M
## 1355                  0.3239038      M
## 1356                  0.3239038      M
## 1357                  0.3239038      M
## 1358                  0.3239038      M
## 1359                  0.3239038      M
## 1360                  0.3239038      M
## 1361                  0.3731563      F
## 1362                  0.3239038      M
## 1363                  0.3731563      F
## 1364                  0.3239038      M
## 1365                  0.3731563      F
## 1366                  0.3239038      M
## 1367                  0.3239038      M
## 1368                  0.3239038      M
## 1369                  0.3731563      F
## 1370                  0.3239038      M
## 1371                  0.3731563      F
## 1372                  0.3239038      M
## 1373                  0.3239038      M
## 1374                  0.3239038      M
## 1375                  0.3239038      M
## 1376                  0.3239038      M
## 1377                  0.3239038      M
## 1378                  0.3731563      F
## 1379                  0.3239038      M
## 1380                  0.3239038      M
## 1381                  0.3239038      M
## 1382                  0.3239038      M
## 1383                  0.3239038      M
```

```
## 1384                    0.3239038      M
## 1385                    0.3731563      F

## We can plot the data...
ggplot(data=predicted.data, aes(x=Gender, y=probability.of.Survivorship)) +
  geom_point(aes(color=Gender), size=5) +
  xlab("Gender") +
  ylab("Predicted probability of getting HCV Disease")
```




```
## Since there are only two probabilities (one for females and one for
males),
## we can use a table to summarize the predicted probabilities.
xtabs(~ probability.of.Survivorship + Gender, data=predicted.data)

##                             Gender
## probability.of.Survivorship   F   M
##           0.323903818953405   0 707
##           0.373156342182894 678   0

#######################################
##
## Now we will use all of the data available to predict heart disease. This
is not the best way to do this
##
#######################################
logistic <- glm(Survivorship ~ ., data=data, family="binomial")

## Warning: glm.fit: algorithm did not converge
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
summary(logistic)
```

```
##
## Call:
## glm(formula = Survivorship ~ ., family = "binomial", data = data)
##
## Deviance Residuals:
##        Min          1Q      Median          3Q         Max
## -2.001e-04  -2.100e-08  -2.100e-08   2.100e-08   2.034e-04
##
## Coefficients:
##                                          Estimate Std. Error z value
## (Intercept)                            -6.147e+02  6.931e+04  -0.009
## Age                                    -4.518e-01  4.139e+02  -0.001
## GenderM                                -3.424e+00  1.281e+04   0.000
## BMI                                    -2.747e-01  6.578e+02   0.000
## FeverYes                                8.441e+00  7.660e+03   0.001
## Nausea.VomtingYes                      -1.017e+01  7.678e+03  -0.001
## HeadacheYes                            -2.229e+00  6.399e+03   0.000
## DiarrheaYes                             2.269e+00  6.636e+03   0.000
## Fatigue...generalized.bone.acheYes      4.740e+00  9.352e+03   0.001
## JaundiceYes                             1.829e+01  5.086e+03   0.004
## Epigastric.painYes                     -4.547e+00  1.172e+04   0.000
## WBC                                     7.295e-04  1.239e+00   0.001
## RBC                                     8.384e-06  1.097e-02   0.001
## HGB                                     5.689e+00  1.694e+03   0.003
## Plat                                    3.605e-05  7.103e-02   0.001
## AST.1                                   1.728e-02  9.804e+01   0.000
## ALT.1                                  -1.263e-01  2.944e+02   0.000
## ALT4                                    2.783e-01  1.365e+02   0.002
## ALT.12                                  5.809e-02  9.432e+01   0.001
## ALT.24                                  1.513e-01  1.629e+02   0.001
## ALT.36                                  1.265e-01  1.200e+02   0.001
## ALT.48                                  1.336e-01  1.011e+02   0.001
## ALT.after.24.w                         -1.292e+00  8.390e+02  -0.002
## RNA.Base                                2.232e-05  1.296e-02   0.002
## RNA.4                                  -7.059e-06  6.352e-03  -0.001
## RNA.12                                  1.689e-06  1.613e-02   0.000
## RNA.EOT                                 1.236e-03  7.123e-02   0.017
## RNA.EF                                 -2.340e-05  1.077e-02  -0.002
## Baseline.histological.Grading4          1.320e+01  1.614e+04   0.001
## Baseline.histological.Grading5         -3.246e+00  1.755e+04   0.000
## Baseline.histological.Grading6          3.274e+01  3.118e+04   0.001
## Baseline.histological.Grading7          4.915e+00  1.318e+05   0.000
## Baseline.histological.Grading8         -5.185e-01  1.415e+04   0.000
## Baseline.histological.Grading9          1.295e+01  6.432e+04   0.000
## Baseline.histological.Grading10         1.530e+01  1.485e+04   0.001
## Baseline.histological.Grading11         1.852e+01  2.826e+04   0.001
```

```
## Baseline.histological.Grading12               2.538e+01  1.779e+04   0.001
## Baseline.histological.Grading13              -1.473e+01  2.040e+04  -0.001
## Baseline.histological.Grading14               1.434e+01  1.784e+04   0.001
## Baseline.histological.Grading15               1.279e+01  1.579e+04   0.001
## Baseline.histological.Grading16               4.808e+01  2.328e+04   0.002
## Baselinehistological.stagingFew Septa        -1.186e+01  9.410e+03  -0.001
## Baselinehistological.stagingMany Septa       -5.362e+00  7.264e+03  -0.001
## Baselinehistological.stagingPortal Fibrosis -9.128e+00  1.078e+04  -0.001
##                                                Pr(>|z|)
## (Intercept)                                       0.993
## Age                                               0.999
## GenderM                                           1.000
## BMI                                               1.000
## FeverYes                                          0.999
## Nausea.VomtingYes                                 0.999
## HeadacheYes                                       1.000
## DiarrheaYes                                       1.000
## Fatigue...generalized.bone.acheYes                1.000
## JaundiceYes                                       0.997
## Epigastric.painYes                                1.000
## WBC                                               1.000
## RBC                                               0.999
## HGB                                               0.997
## Plat                                              1.000
## AST.1                                             1.000
## ALT.1                                             1.000
## ALT4                                              0.998
## ALT.12                                            1.000
## ALT.24                                            0.999
## ALT.36                                            0.999
## ALT.48                                            0.999
## ALT.after.24.w                                    0.999
## RNA.Base                                          0.999
## RNA.4                                             0.999
## RNA.12                                            1.000
## RNA.EOT                                           0.986
## RNA.EF                                            0.998
## Baseline.histological.Grading4                    0.999
## Baseline.histological.Grading5                    1.000
## Baseline.histological.Grading6                    0.999
## Baseline.histological.Grading7                    1.000
## Baseline.histological.Grading8                    1.000
## Baseline.histological.Grading9                    1.000
## Baseline.histological.Grading10                   0.999
## Baseline.histological.Grading11                   0.999
## Baseline.histological.Grading12                   0.999
## Baseline.histological.Grading13                   0.999
## Baseline.histological.Grading14                   0.999
## Baseline.histological.Grading15                   0.999
## Baseline.histological.Grading16                   0.998
```

```
## Baselinehistological.stagingFew Septa          0.999
## Baselinehistological.stagingMany Septa         0.999
## Baselinehistological.stagingPortal Fibrosis    0.999
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1.790e+03  on 1384  degrees of freedom
## Residual deviance: 6.632e-07  on 1341  degrees of freedom
## AIC: 88
##
## Number of Fisher Scoring iterations: 25
```

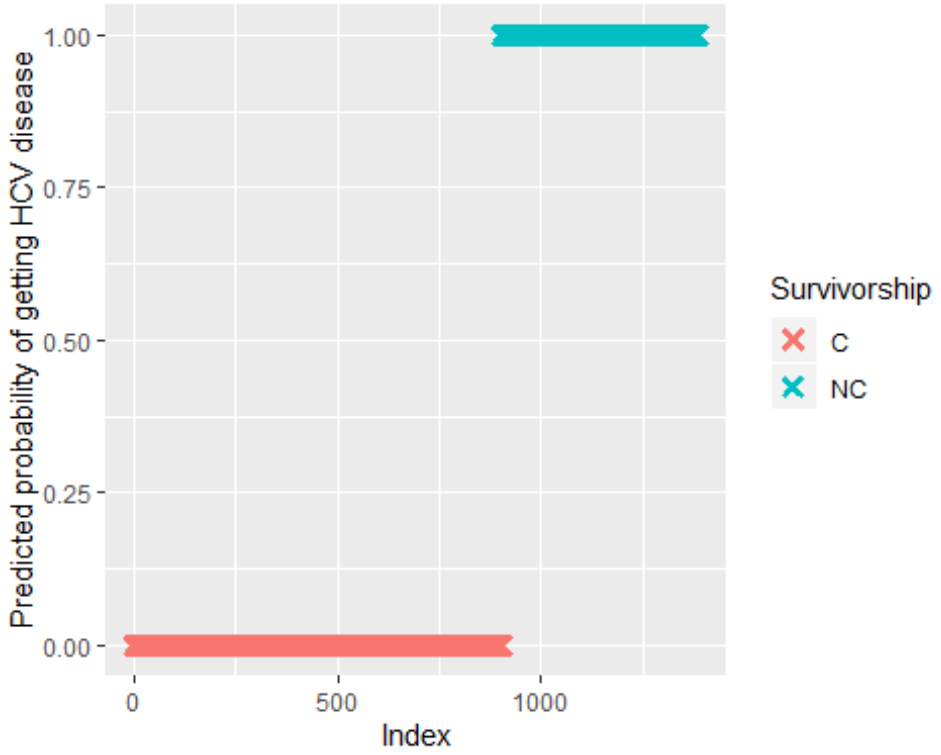
```
## Now calculate the overall "Pseudo R-squared" and its p-value
ll.null <- logistic$null.deviance/-2
ll.proposed <- logistic$deviance/-2
## McFadden's Pseudo R^2 = [ LL(Null) - LL(Proposed) ] / LL(Null)
(ll.null - ll.proposed) / ll.null
```

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

```
## The p-value for the R^2
1 - pchisq(2*(ll.proposed - ll.null), df=(length(logistic$coefficients)-1))
```

```
## [1] 0
```

```
## now we can plot the data
predicted.data <-
data.frame(probability.of.Survivorship=logistic$fitted.values,Survivorship=da
ta$Survivorship)
predicted.data <-
predicted.data[order(predicted.data$probability.of.Survivorship,
decreasing=FALSE),]
predicted.data$rank <- 1:nrow(predicted.data)
## Lastly, we can plot the predicted probabilities for each sample having
## heart disease and color by whether or not they actually had heart disease
ggplot(data=predicted.data, aes(x=rank, y=probability.of.Survivorship)) +
  geom_point(aes(color=Survivorship), alpha=1, shape=4, stroke=2) +
  xlab("Index") +
  ylab("Predicted probability of getting HCV disease")
```




```
# Few packages for confusion matrix. Lets look at them one by one
#install.packages("regclass",
lib="/Library/Frameworks/R.framework/Versions/3.5/Resources/library")
library(regclass)

## Loading required package: bestglm

## Loading required package: leaps

## Loading required package: VGAM

## Loading required package: stats4

## Loading required package: splines

## Loading required package: rpart

## Loading required package: randomForest

## randomForest 4.6-14

## Type rfNews() to see new features/changes/bug fixes.

##
## Attaching package: 'randomForest'

## The following object is masked from 'package:ggplot2':
##
##     margin
```

```
## The following object is masked from 'package:dplyr':
##
##     combine

## Important regclass change from 1.3:
## All functions that had a . in the name now have an _
## all.correlations -> all_correlations, cor.demo -> cor_demo, etc.

confusion_matrix(logistic)

##           Predicted C Predicted NC Total
## Actual C          903            0   903
## Actual NC           0          482   482
## Total             903          482  1385

#install.packages("caret",
lib="/Library/Frameworks/R.framework/Versions/3.5/Resources/library")
library(caret)

## Loading required package: lattice

##
## Attaching package: 'lattice'

## The following object is masked from 'package:regclass':
##
##     qq

##
## Attaching package: 'caret'

## The following object is masked from 'package:VGAM':
##
##     predictors

pdata <- predict(logistic,newdata=data,type="response" )
pdata

##            1            2            3            4            5
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##            6            7            8            9           10
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##           11           12           13           14           15
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##           16           17           18           19           20
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##           21           22           23           24           25
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##           26           27           28           29           30
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##           31           32           33           34           35
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
```

```
##           36           37           38           39           40
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##           41           42           43           44           45
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##           46           47           48           49           50
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##           51           52           53           54           55
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##           56           57           58           59           60
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##           61           62           63           64           65
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##           66           67           68           69           70
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##           71           72           73           74           75
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##           76           77           78           79           80
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##           81           82           83           84           85
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##           86           87           88           89           90
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16
##           91           92           93           94           95
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##           96           97           98           99          100
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          101          102          103          104          105
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          106          107          108          109          110
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          111          112          113          114          115
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
##          116          117          118          119          120
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          121          122          123          124          125
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          126          127          128          129          130
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          131          132          133          134          135
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          136          137          138          139          140
## 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16
##          141          142          143          144          145
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          146          147          148          149          150
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          151          152          153          154          155
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          156          157          158          159          160
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
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##          161          162          163          164          165
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          166          167          168          169          170
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          171          172          173          174          175
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          176          177          178          179          180
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          181          182          183          184          185
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##          186          187          188          189          190
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          191          192          193          194          195
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          196          197          198          199          200
## 1.000000e+00 4.624073e-09 2.220446e-16 2.220446e-16 1.000000e+00
##          201          202          203          204          205
## 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          206          207          208          209          210
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##          211          212          213          214          215
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          216          217          218          219          220
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          221          222          223          224          225
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##          226          227          228          229          230
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          231          232          233          234          235
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          236          237          238          239          240
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          241          242          243          244          245
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          246          247          248          249          250
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          251          252          253          254          255
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          256          257          258          259          260
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          261          262          263          264          265
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          266          267          268          269          270
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          271          272          273          274          275
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##          276          277          278          279          280
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##          281          282          283          284          285
## 1.226682e-12 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
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##          286          287          288          289          290
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##          291          292          293          294          295
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##          296          297          298          299          300
## 1.400537e-08 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##          301          302          303          304          305
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          306          307          308          309          310
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##          311          312          313          314          315
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##          316          317          318          319          320
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##          321          322          323          324          325
## 1.000000e+00 2.220446e-16 2.220446e-16 1.062546e-13 2.220446e-16
##          326          327          328          329          330
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##          331          332          333          334          335
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          336          337          338          339          340
## 1.000000e+00 1.000000e+00 2.144440e-11 1.000000e+00 2.220446e-16
##          341          342          343          344          345
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          346          347          348          349          350
## 1.096984e-10 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          351          352          353          354          355
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          356          357          358          359          360
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          361          362          363          364          365
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##          366          367          368          369          370
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          371          372          373          374          375
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          376          377          378          379          380
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          381          382          383          384          385
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##          386          387          388          389          390
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          391          392          393          394          395
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          396          397          398          399          400
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          401          402          403          404          405
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          406          407          408          409          410
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
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##          411          412          413          414          415
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          416          417          418          419          420
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##          421          422          423          424          425
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##          426          427          428          429          430
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          431          432          433          434          435
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          436          437          438          439          440
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          441          442          443          444          445
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          446          447          448          449          450
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
##          451          452          453          454          455
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          456          457          458          459          460
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          461          462          463          464          465
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##          466          467          468          469          470
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##          471          472          473          474          475
## 2.220446e-16 2.553865e-10 1.000000e+00 1.000000e+00 2.220446e-16
##          476          477          478          479          480
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          481          482          483          484          485
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##          486          487          488          489          490
## 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16
##          491          492          493          494          495
## 2.220446e-16 1.000000e+00 2.220446e-16 6.696274e-09 2.220446e-16
##          496          497          498          499          500
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##          501          502          503          504          505
## 1.000000e+00 1.000000e+00 1.422738e-08 2.220446e-16 1.000000e+00
##          506          507          508          509          510
## 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##          511          512          513          514          515
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          516          517          518          519          520
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          521          522          523          524          525
## 2.858549e-09 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16
##          526          527          528          529          530
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          531          532          533          534          535
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
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##          536          537          538          539          540
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##          541          542          543          544          545
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          546          547          548          549          550
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          551          552          553          554          555
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          556          557          558          559          560
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          561          562          563          564          565
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          566          567          568          569          570
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          571          572          573          574          575
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          576          577          578          579          580
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          581          582          583          584          585
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          586          587          588          589          590
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          591          592          593          594          595
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          596          597          598          599          600
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          601          602          603          604          605
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          606          607          608          609          610
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          611          612          613          614          615
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##          616          617          618          619          620
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          621          622          623          624          625
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 5.933679e-09
##          626          627          628          629          630
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##          631          632          633          634          635
## 3.887578e-09 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##          636          637          638          639          640
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          641          642          643          644          645
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          646          647          648          649          650
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##          651          652          653          654          655
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          656          657          658          659          660
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
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##          661          662          663          664          665
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##          666          667          668          669          670
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          671          672          673          674          675
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          676          677          678          679          680
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##          681          682          683          684          685
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          686          687          688          689          690
## 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##          691          692          693          694          695
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          696          697          698          699          700
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          701          702          703          704          705
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          706          707          708          709          710
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          711          712          713          714          715
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          716          717          718          719          720
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          721          722          723          724          725
## 2.220446e-16 2.220446e-16 1.000000e+00 1.350791e-08 1.000000e+00
##          726          727          728          729          730
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          731          732          733          734          735
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          736          737          738          739          740
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          741          742          743          744          745
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##          746          747          748          749          750
## 2.220446e-16 1.124887e-08 2.220446e-16 2.220446e-16 2.220446e-16
##          751          752          753          754          755
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##          756          757          758          759          760
## 1.000000e+00 3.704052e-09 1.000000e+00 2.220446e-16 1.000000e+00
##          761          762          763          764          765
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          766          767          768          769          770
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          771          772          773          774          775
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          776          777          778          779          780
## 5.595202e-10 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          781          782          783          784          785
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
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##          786          787          788          789          790
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          791          792          793          794          795
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##          796          797          798          799          800
## 2.220446e-16 1.000000e+00 1.034868e-10 1.000000e+00 1.000000e+00
##          801          802          803          804          805
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          806          807          808          809          810
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          811          812          813          814          815
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          816          817          818          819          820
## 1.000000e+00 7.154129e-09 1.000000e+00 2.220446e-16 2.220446e-16
##          821          822          823          824          825
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          826          827          828          829          830
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          831          832          833          834          835
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          836          837          838          839          840
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.001750e-08
##          841          842          843          844          845
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##          846          847          848          849          850
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##          851          852          853          854          855
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          856          857          858          859          860
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          861          862          863          864          865
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          866          867          868          869          870
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          871          872          873          874          875
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16
##          876          877          878          879          880
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          881          882          883          884          885
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##          886          887          888          889          890
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          891          892          893          894          895
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##          896          897          898          899          900
## 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##          901          902          903          904          905
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##          906          907          908          909          910
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
```

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##          911          912          913          914          915
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          916          917          918          919          920
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          921          922          923          924          925
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##          926          927          928          929          930
## 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##          931          932          933          934          935
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##          936          937          938          939          940
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          941          942          943          944          945
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          946          947          948          949          950
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          951          952          953          954          955
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##          956          957          958          959          960
## 2.220446e-16 2.220446e-16 2.220446e-16 8.654866e-09 1.000000e+00
##          961          962          963          964          965
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##          966          967          968          969          970
## 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##          971          972          973          974          975
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          976          977          978          979          980
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##          981          982          983          984          985
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##          986          987          988          989          990
## 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##          991          992          993          994          995
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##          996          997          998          999         1000
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
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## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##         1006         1007         1008         1009         1010
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##         1011         1012         1013         1014         1015
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##         1016         1017         1018         1019         1020
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##         1021         1022         1023         1024         1025
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##         1026         1027         1028         1029         1030
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##         1031         1032         1033         1034         1035
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
```

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##         1036         1037         1038         1039         1040
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## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1046         1047         1048         1049         1050
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##         1051         1052         1053         1054         1055
## 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##         1056         1057         1058         1059         1060
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1061         1062         1063         1064         1065
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16
##         1066         1067         1068         1069         1070
## 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##         1071         1072         1073         1074         1075
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##         1076         1077         1078         1079         1080
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##         1081         1082         1083         1084         1085
## 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##         1086         1087         1088         1089         1090
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1091         1092         1093         1094         1095
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
##         1096         1097         1098         1099         1100
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##         1101         1102         1103         1104         1105
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##         1106         1107         1108         1109         1110
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1111         1112         1113         1114         1115
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##         1116         1117         1118         1119         1120
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##         1121         1122         1123         1124         1125
## 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
##         1126         1127         1128         1129         1130
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##         1131         1132         1133         1134         1135
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##         1136         1137         1138         1139         1140
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00
##         1141         1142         1143         1144         1145
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##         1146         1147         1148         1149         1150
## 2.220446e-16 2.220446e-16 1.000000e+00 1.237843e-08 1.000000e+00
##         1151         1152         1153         1154         1155
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##         1156         1157         1158         1159         1160
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
```

```
##         1161         1162         1163         1164         1165
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##         1166         1167         1168         1169         1170
## 1.000000e+00 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##         1171         1172         1173         1174         1175
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##         1176         1177         1178         1179         1180
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##         1181         1182         1183         1184         1185
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##         1186         1187         1188         1189         1190
## 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
##         1191         1192         1193         1194         1195
## 1.000000e+00 2.220446e-16 2.220446e-16 2.356545e-13 2.220446e-16
##         1196         1197         1198         1199         1200
## 2.220446e-16 1.000000e+00 2.220446e-16 4.090227e-10 2.220446e-16
##         1201         1202         1203         1204         1205
## 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
##         1206         1207         1208         1209         1210
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##         1211         1212         1213         1214         1215
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 3.378042e-13
##         1216         1217         1218         1219         1220
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##         1221         1222         1223         1224         1225
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##         1226         1227         1228         1229         1230
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##         1231         1232         1233         1234         1235
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##         1236         1237         1238         1239         1240
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##         1241         1242         1243         1244         1245
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##         1246         1247         1248         1249         1250
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##         1251         1252         1253         1254         1255
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16
##         1256         1257         1258         1259         1260
## 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16
##         1261         1262         1263         1264         1265
## 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##         1266         1267         1268         1269         1270
## 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00
##         1271         1272         1273         1274         1275
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##         1276         1277         1278         1279         1280
## 1.000000e+00 1.000000e+00 1.000000e+00 2.220446e-16 2.220446e-16
##         1281         1282         1283         1284         1285
## 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00 1.000000e+00
```

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##         1286         1287         1288         1289         1290
## 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00
##         1291         1292         1293         1294         1295
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1296         1297         1298         1299         1300
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00
##         1301         1302         1303         1304         1305
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##         1306         1307         1308         1309         1310
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##         1311         1312         1313         1314         1315
## 1.000000e+00 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1316         1317         1318         1319         1320
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##         1321         1322         1323         1324         1325
## 1.000000e+00 2.220446e-16 1.000000e+00 2.220446e-16 2.220446e-16
##         1326         1327         1328         1329         1330
## 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##         1331         1332         1333         1334         1335
## 2.220446e-16 2.220446e-16 2.220446e-16 5.198558e-12 2.220446e-16
##         1336         1337         1338         1339         1340
## 2.220446e-16 1.135848e-08 2.220446e-16 1.000000e+00 2.220446e-16
##         1341         1342         1343         1344         1345
## 1.000000e+00 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00
##         1346         1347         1348         1349         1350
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1351         1352         1353         1354         1355
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 2.220446e-16
##         1356         1357         1358         1359         1360
## 2.220446e-16 2.220446e-16 2.220446e-16 1.000000e+00 2.220446e-16
##         1361         1362         1363         1364         1365
## 2.220446e-16 1.000000e+00 2.220446e-16 1.000000e+00 1.000000e+00
##         1366         1367         1368         1369         1370
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1371         1372         1373         1374         1375
## 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16 2.220446e-16
##         1376         1377         1378         1379         1380
## 2.220446e-16 2.220446e-16 1.000000e+00 1.000000e+00 1.000000e+00
##         1381         1382         1383         1384         1385
## 2.220446e-16 2.220446e-16 1.932294e-10 2.220446e-16 2.220446e-16
```

```
data$Survivorship
```

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NC
##   [70] NC C  C  C  NC NC C  C  NC NC C  C  C  NC C  NC C  NC NC NC C  C
NC
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```

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NC
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NC
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##  [323] C  C  C  NC NC NC C  NC C  C  C  C  C  NC NC C  NC C  C  C  NC C  C
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NC
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NC
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NC
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##  [898] NC C  C  NC NC C  C  NC NC C  C  NC C  C  C  C  C  C  C  C  C  C  C
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##  [944] C  C  C  C  C  C  C  C  C  C  C  C  C  C  C  C  NC NC NC C  C  NC
```

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NC
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NC
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NC
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NC
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## [1128] NC C  C  C  C  NC C  NC NC NC NC C  NC C  NC C  C  C  C  C  NC C
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## [1220] NC C  NC C  C  C  NC NC NC C  C  NC NC C  C  C  C  C  C  C  NC C
NC
## [1243] NC C  C  C  C  C  C  NC C  NC C  NC C  NC NC C  C  C  C  NC NC C  C
## [1266] C  C  NC C  NC C  C  NC NC C  NC NC NC C  C  NC NC NC NC NC C  NC C
## [1289] C  NC C  C  C  C  C  C  C  C  C  NC NC C  C  NC C  NC C  C  NC C
NC
## [1312] C  C  C  C  C  C  C  NC C  NC C  NC C  C  NC C  NC NC C  C  C  C  C
## [1335] C  C  C  C  NC C  NC C  C  NC NC C  C  C  C  C  C  C  NC NC C  C  C
## [1358] C  NC C  C  NC C  NC NC C  C  C  C  C  C  C  C  C  C  C  C  NC NC
NC
## [1381] C  C  C  C  C
## Levels: C NC
```

```
#pdataF <- as.factor(ifelse(test=as.numeric(pdata>0.5) == 0, yes="Healthy",
no="Unhealthy"))
#install.packages("e1071",
lib="/Library/Frameworks/R.framework/Versions/3.5/Resources/library")
library(e1071)
#confusionMatrix(pdataF, data$Survivorship)
#install.packages("pROC",
lib="/Library/Frameworks/R.framework/Versions/3.5/Resources/library")
library(pROC)
```

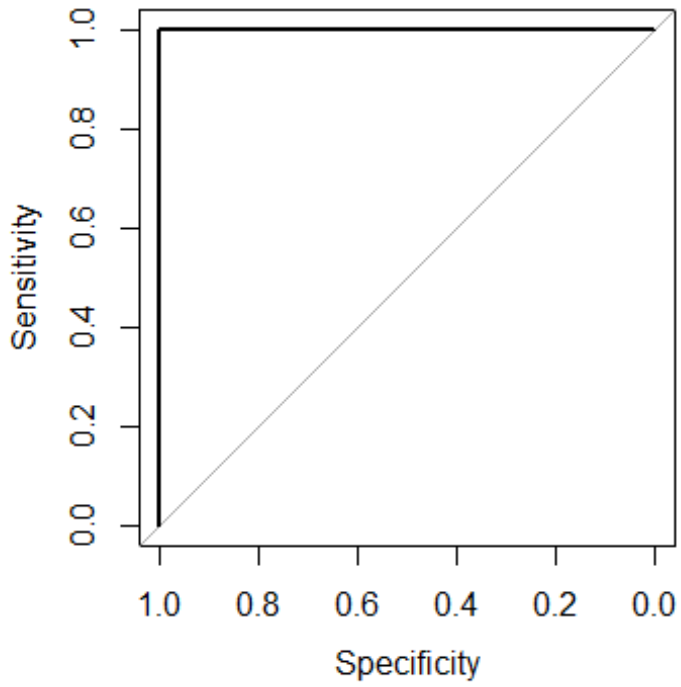
```
## Type 'citation("pROC")' for a citation.

##
## Attaching package: 'pROC'

## The following objects are masked from 'package:stats':
##
##     cov, smooth, var
```

```
roc(data$Survivorship,logistic$fitted.values,plot=TRUE)
```

```
## Setting levels: control = C, case = NC

## Setting direction: controls < cases

##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     plot = TRUE)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Area under the curve: 1
```

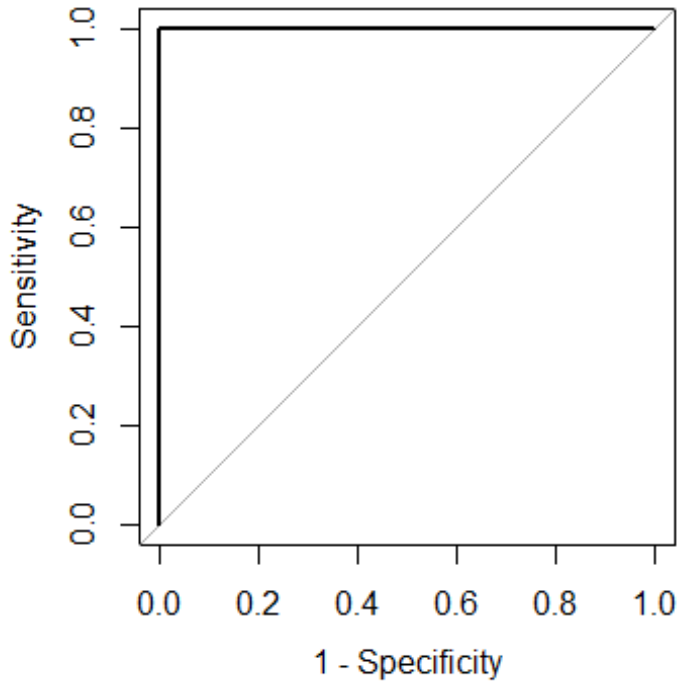
```r
par(pty = "s")
roc(data$Survivorship,logistic$fitted.values,plot=TRUE)
```

```
## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```

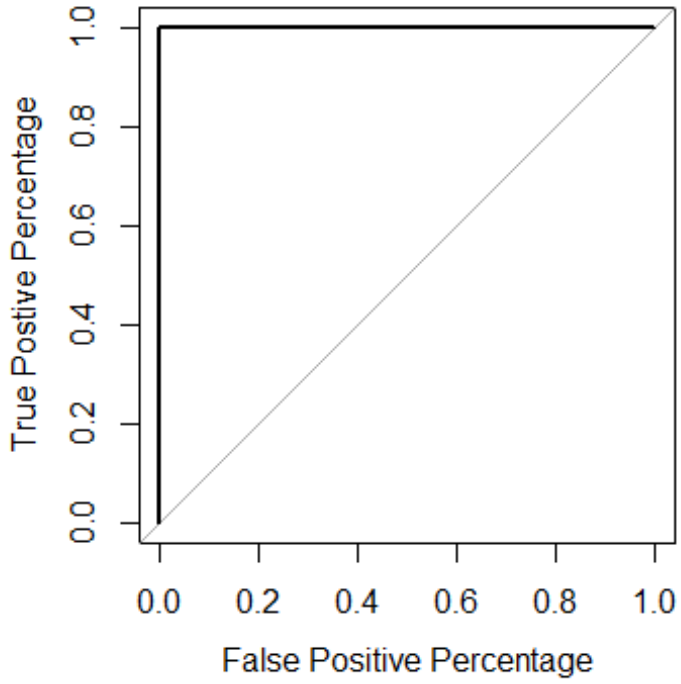



```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     plot = TRUE)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Area under the curve: 1
```

```
## NOTE: By default, roc() uses specificity on the x-axis and the values
range
## from 1 to 0. This makes the graph look like what we would expect, but the
## x-axis itself might induce a headache. To use 1-specificity (i.e. the
## False Positive Rate) on the x-axis, set "legacy.axes" to TRUE.
roc(data$Survivorship,logistic$fitted.values,plot=TRUE, legacy.axes=TRUE)

## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```



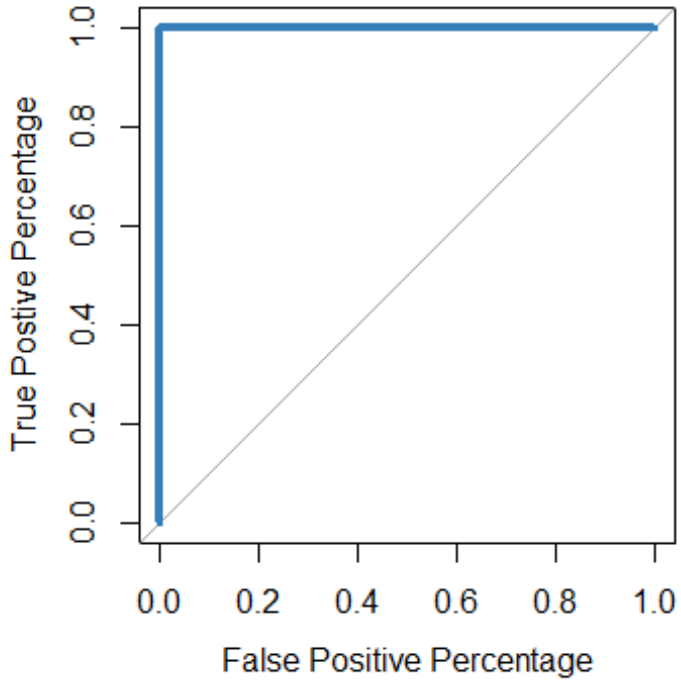

```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     plot = TRUE, legacy.axes = TRUE)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Area under the curve: 1

roc(data$Survivorship,logistic$fitted.values,plot=TRUE, legacy.axes=TRUE,
xlab="False Positive Percentage", ylab="True Postive Percentage")

## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```




```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     plot = TRUE, legacy.axes = TRUE, xlab = "False
Positive Percentage",     ylab = "True Postive Percentage")
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Area under the curve: 1
```

```
roc(data$Survivorship,logistic$fitted.values,plot=TRUE, legacy.axes=TRUE,
xlab="False Positive Percentage", ylab="True Postive Percentage",
col="#377eb8", lwd=4)
```

```
## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```




```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     plot = TRUE, legacy.axes = TRUE, xlab = "False
Positive Percentage",     ylab = "True Postive Percentage", col = "#377eb8",
lwd = 4)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Area under the curve: 1
```

```
roc(data$Survivorship,logistic$fitted.values,plot=TRUE, legacy.axes=TRUE,
xlab="False Positive Percentage", ylab="True Postive Percentage",
col="#377eb8", lwd=4)
```

```
## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```

```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     plot = TRUE, legacy.axes = TRUE, xlab = "False
Positive Percentage",     ylab = "True Postive Percentage", col = "#377eb8",
lwd = 4)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
```

```
cases (data$Survivorship NC).
## Area under the curve: 1

## If we want to find out the optimal threshold we can store the
## data used to make the ROC graph in a variable...
roc.info <- roc(data$Survivorship, logistic$fitted.values, legacy.axes=TRUE)

## Setting levels: control = C, case = NC
## Setting direction: controls < cases

str(roc.info)

## List of 15
##  $ percent           : logi FALSE
##  $ sensitivities     : num [1:71] 1 1 1 1 1 1 1 1 1 1 ...
##  $ specificities     : num [1:71] 0 0.966 0.967 0.968 0.969 ...
##  $ thresholds        : num [1:71] -Inf 5.32e-14 1.71e-13 2.87e-13 7.82e-13
...
##  $ direction         : chr "<"
##  $ cases             : Named num [1:482] 1 1 1 1 1 ...
##   ..- attr(*, "names")= chr [1:482] "3" "4" "11" "15" ...
##  $ controls          : Named num [1:903] 2.22e-16 2.22e-16 2.22e-16 2.22e-
16 2.22e-16 ...
##   ..- attr(*, "names")= chr [1:903] "1" "2" "5" "6" ...
##  $ fun.sesp          :function (thresholds, controls, cases, direction)
##  $ auc               : 'auc' num 1
##   ..- attr(*, "partial.auc")= logi FALSE
##   ..- attr(*, "percent")= logi FALSE
##   ..- attr(*, "roc")=List of 15
##   .. ..$ percent           : logi FALSE
##   .. ..$ sensitivities     : num [1:71] 1 1 1 1 1 1 1 1 1 1 ...
##   .. ..$ specificities     : num [1:71] 0 0.966 0.967 0.968 0.969 ...
##   .. ..$ thresholds        : num [1:71] -Inf 5.32e-14 1.71e-13 2.87e-13
7.82e-13 ...
##   .. ..$ direction         : chr "<"
##   .. ..$ cases             : Named num [1:482] 1 1 1 1 1 ...
##   .. .. ..- attr(*, "names")= chr [1:482] "3" "4" "11" "15" ...
##   .. ..$ controls          : Named num [1:903] 2.22e-16 2.22e-16 2.22e-16
2.22e-16 2.22e-16 ...
##   .. .. ..- attr(*, "names")= chr [1:903] "1" "2" "5" "6" ...
##   .. ..$ fun.sesp          :function (thresholds, controls, cases,
direction)
##   .. ..$ auc               : 'auc' num 1
##   .. .. ..- attr(*, "partial.auc")= logi FALSE
##   .. .. ..- attr(*, "percent")= logi FALSE
##   .. .. ..- attr(*, "roc")=List of 8
##   .. .. .. ..$ percent      : logi FALSE
##   .. .. .. ..$ sensitivities: num [1:71] 1 1 1 1 1 1 1 1 1 1 ...
##   .. .. .. ..$ specificities: num [1:71] 0 0.966 0.967 0.968 0.969 ...
##   .. .. .. ..$ thresholds   : num [1:71] -Inf 5.32e-14 1.71e-13 2.87e-13
7.82e-13 ...
```

```
##   .. .. .. ..$ direction    : chr "<"
##   .. .. .. ..$ cases        : Named num [1:482] 1 1 1 1 1 ...
##   .. .. .. .. ..- attr(*, "names")= chr [1:482] "3" "4" "11" "15" ...
##   .. .. .. ..$ controls     : Named num [1:903] 2.22e-16 2.22e-16 2.22e-16
2.22e-16 2.22e-16 ...
##   .. .. .. .. ..- attr(*, "names")= chr [1:903] "1" "2" "5" "6" ...
##   .. .. .. ..$ fun.sesp     :function (thresholds, controls, cases,
direction)
##   .. .. .. ..- attr(*, "class")= chr "roc"
##   .. ..$ call              : language roc.default(response =
data$Survivorship, predictor = logistic$fitted.values,      legacy.axes =
TRUE)
##   .. ..$ original.predictor: Named num [1:1385] 2.22e-16 2.22e-16 1.00
1.00 2.22e-16 ...
##   .. .. ..- attr(*, "names")= chr [1:1385] "1" "2" "3" "4" ...
##   .. ..$ original.response : Factor w/ 2 levels "C","NC": 1 1 2 2 1 1 1 1
1 1 ...
##   .. ..$ predictor         : Named num [1:1385] 2.22e-16 2.22e-16 1.00
1.00 2.22e-16 ...
##   .. .. ..- attr(*, "names")= chr [1:1385] "1" "2" "3" "4" ...
##   .. ..$ response          : Factor w/ 2 levels "C","NC": 1 1 2 2 1 1 1 1
1 1 ...
##   .. ..$ levels            : chr [1:2] "C" "NC"
##   .. ..- attr(*, "class")= chr "roc"
##  $ call              : language roc.default(response = data$Survivorship,
predictor = logistic$fitted.values,      legacy.axes = TRUE)
##  $ original.predictor: Named num [1:1385] 2.22e-16 2.22e-16 1.00 1.00
2.22e-16 ...
##   ..- attr(*, "names")= chr [1:1385] "1" "2" "3" "4" ...
##  $ original.response : Factor w/ 2 levels "C","NC": 1 1 2 2 1 1 1 1 1 1
...
##  $ predictor         : Named num [1:1385] 2.22e-16 2.22e-16 1.00 1.00
2.22e-16 ...
##   ..- attr(*, "names")= chr [1:1385] "1" "2" "3" "4" ...
##  $ response          : Factor w/ 2 levels "C","NC": 1 1 2 2 1 1 1 1 1 1
...
##  $ levels            : chr [1:2] "C" "NC"
##  - attr(*, "class")= chr "roc"
```

```
roc.df <- data.frame(tpp=roc.info$sensitivities*100, ## tpp = true positive
percentage
                     fpp=(1 - roc.info$specificities)*100, ## fpp = false
positive precentage
                     thresholds=roc.info$thresholds)
roc.df
```

```
##          tpp         fpp   thresholds
## 1  100.00000 100.0000000         -Inf
## 2  100.00000   3.4330011 5.323833e-14
## 3  100.00000   3.3222591 1.709546e-13
```

```
## 4  100.00000   3.2115172 2.867293e-13
## 5  100.00000   3.1007752 7.822429e-13
## 6  100.00000   2.9900332 3.212620e-12
## 7  100.00000   2.8792913 1.332148e-11
## 8  100.00000   2.7685493 6.246558e-11
## 9  100.00000   2.6578073 1.065926e-10
## 10 100.00000   2.5470653 1.514639e-10
## 11 100.00000   2.4363234 2.243080e-10
## 12 100.00000   2.3255814 3.322046e-10
## 13 100.00000   2.2148394 4.842714e-10
## 14 100.00000   2.1040975 1.012910e-09
## 15 100.00000   1.9933555 2.162425e-09
## 16 100.00000   1.8826135 3.249212e-09
## 17 100.00000   1.7718715 3.671963e-09
## 18 100.00000   1.6611296 3.795815e-09
## 19 100.00000   1.5503876 4.255825e-09
## 20 100.00000   1.4396456 5.278876e-09
## 21 100.00000   1.3289037 6.314976e-09
## 22 100.00000   1.2181617 6.925201e-09
## 23 100.00000   1.1074197 7.904498e-09
## 24 100.00000   0.9966777 9.076446e-09
## 25 100.00000   0.8859358 1.037345e-08
## 26 100.00000   0.7751938 1.130368e-08
## 27 100.00000   0.6644518 1.186846e-08
## 28 100.00000   0.5537099 1.238450e-08
## 29 100.00000   0.4429679 1.294924e-08
## 30 100.00000   0.3322259 1.375664e-08
## 31 100.00000   0.2214839 1.411637e-08
## 32 100.00000   0.1107420 1.712244e-08
## 33 100.00000   0.0000000 5.000000e-01
## 34  99.79253   0.0000000 1.000000e+00
## 35  99.58506   0.0000000 1.000000e+00
## 36  99.37759   0.0000000 1.000000e+00
## 37  99.17012   0.0000000 1.000000e+00
## 38  98.96266   0.0000000 1.000000e+00
## 39  98.75519   0.0000000 1.000000e+00
## 40  98.54772   0.0000000 1.000000e+00
## 41  98.34025   0.0000000 1.000000e+00
## 42  98.13278   0.0000000 1.000000e+00
## 43  97.92531   0.0000000 1.000000e+00
## 44  97.71784   0.0000000 1.000000e+00
## 45  97.51037   0.0000000 1.000000e+00
## 46  97.30290   0.0000000 1.000000e+00
## 47  97.09544   0.0000000 1.000000e+00
## 48  96.88797   0.0000000 1.000000e+00
## 49  96.68050   0.0000000 1.000000e+00
## 50  96.47303   0.0000000 1.000000e+00
## 51  96.26556   0.0000000 1.000000e+00
## 52  96.05809   0.0000000 1.000000e+00
## 53  95.85062   0.0000000 1.000000e+00
```

```
## 54  95.64315   0.0000000 1.000000e+00
## 55  95.43568   0.0000000 1.000000e+00
## 56  95.22822   0.0000000 1.000000e+00
## 57  95.02075   0.0000000 1.000000e+00
## 58  94.81328   0.0000000 1.000000e+00
## 59  94.60581   0.0000000 1.000000e+00
## 60  94.39834   0.0000000 1.000000e+00
## 61  94.19087   0.0000000 1.000000e+00
## 62  93.98340   0.0000000 1.000000e+00
## 63  93.77593   0.0000000 1.000000e+00
## 64  93.56846   0.0000000 1.000000e+00
## 65  93.36100   0.0000000 1.000000e+00
## 66  93.15353   0.0000000 1.000000e+00
## 67  92.94606   0.0000000 1.000000e+00
## 68  92.73859   0.0000000 1.000000e+00
## 69  92.53112   0.0000000 1.000000e+00
## 70  92.32365   0.0000000 1.000000e+00
## 71   0.00000   0.0000000          Inf
```

```
head(roc.df) ## head() will show us the values for the upper right-hand
corner of the ROC graph, when the threshold is so low
```

```
##   tpp        fpp   thresholds
## 1 100 100.000000         -Inf
## 2 100   3.433001 5.323833e-14
## 3 100   3.322259 1.709546e-13
## 4 100   3.211517 2.867293e-13
## 5 100   3.100775 7.822429e-13
## 6 100   2.990033 3.212620e-12
```

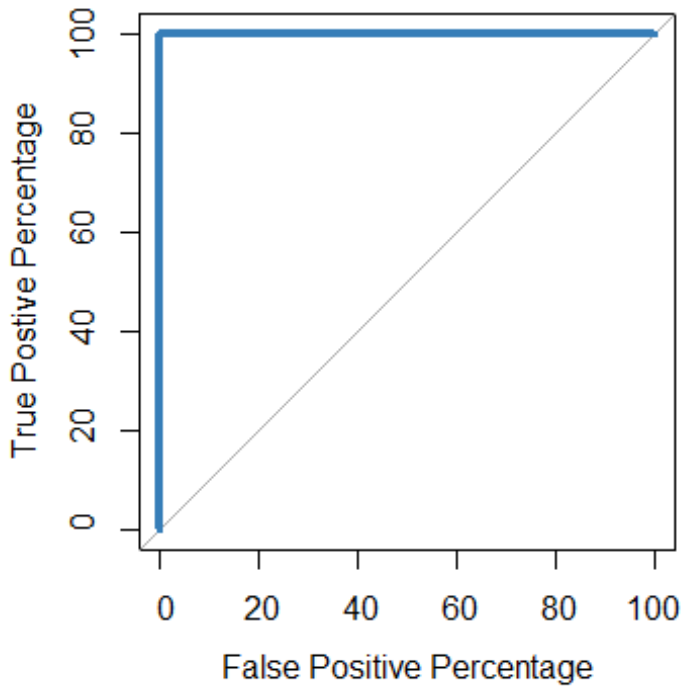
```
## (negative infinity) that every single sample is called "obese".
## Thus TPP = 100% and FPP = 100%
tail(roc.df) ## tail() will show us the values for the lower left-hand corner
```

```
##         tpp fpp thresholds
## 66 93.15353   0          1
## 67 92.94606   0          1
## 68 92.73859   0          1
## 69 92.53112   0          1
## 70 92.32365   0          1
## 71  0.00000   0        Inf
```

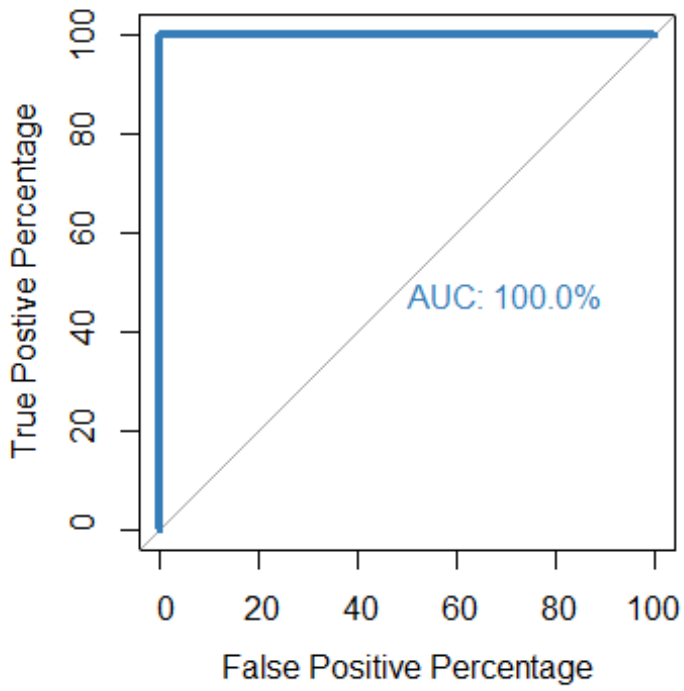
```
## of the ROC graph, when the threshold is so high (infinity)
## that every single sample is called "not obese".
## Thus, TPP = 0% and FPP = 0%
## now let's look at the thresholds between TPP 60% and 80%
roc.df[roc.df$tpp > 60 & roc.df$tpp < 80,]
```

```
## [1] tpp        fpp        thresholds
## <0 rows> (or 0-length row.names)
```

```
roc(data$Survivorship,logistic$fitted.values,plot=TRUE, legacy.axes=TRUE,
xlab="False Positive Percentage", ylab="True Postive Percentage",
col="#377eb8", lwd=4, percent=TRUE)

## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```



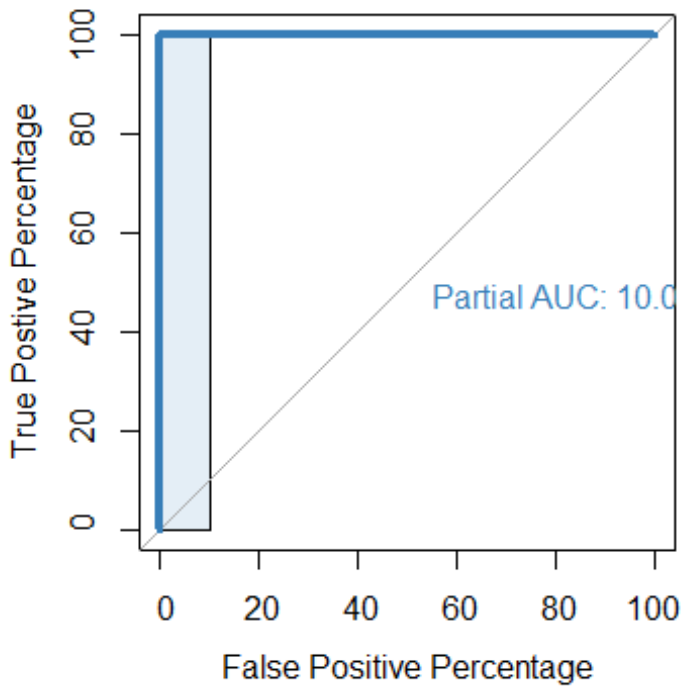

```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     percent = TRUE, plot = TRUE, legacy.axes = TRUE,
xlab = "False Positive Percentage",     ylab = "True Postive Percentage", col
= "#377eb8", lwd = 4)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Area under the curve: 100%

roc(data$Survivorship,logistic$fitted.values,plot=TRUE, legacy.axes=TRUE,
xlab="False Positive Percentage", ylab="True Postive Percentage",
col="#377eb8", lwd=4, percent=TRUE, print.auc=TRUE)

## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```




```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     percent = TRUE, plot = TRUE, legacy.axes = TRUE,
xlab = "False Positive Percentage",     ylab = "True Postive Percentage", col
= "#377eb8", lwd = 4,     print.auc = TRUE)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Area under the curve: 100%
```

```
roc(data$Survivorship,logistic$fitted.values,plot=TRUE, legacy.axes=TRUE,
xlab="False Positive Percentage", ylab="True Postive Percentage",
col="#377eb8", lwd=4, percent=TRUE, print.auc=TRUE, partial.auc=c(100, 90),
auc.polygon = TRUE, auc.polygon.col = "#377eb822", print.auc.x=45)
```

```
## Setting levels: control = C, case = NC
## Setting direction: controls < cases
```




```
##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic$fitted.values,     percent = TRUE, plot = TRUE, legacy.axes = TRUE,
xlab = "False Positive Percentage",     ylab = "True Postive Percentage", col
= "#377eb8", lwd = 4,     print.auc = TRUE, partial.auc = c(100, 90),
auc.polygon = TRUE,     auc.polygon.col = "#377eb822", print.auc.x = 45)
##
## Data: logistic$fitted.values in 903 controls (data$Survivorship C) < 482
cases (data$Survivorship NC).
## Partial area under the curve (specificity 100%-90%): 10%

# Lets do two roc plots to understand which model is better
roc(data$Survivorship, logistic_simple$fitted.values, plot=TRUE,
legacy.axes=TRUE, percent=TRUE, xlab="False Positive Percentage", ylab="True
Postive Percentage", col="#377eb8", lwd=4, print.auc=TRUE)

## Setting levels: control = C, case = NC
## Setting direction: controls < cases

##
## Call:
## roc.default(response = data$Survivorship, predictor =
logistic_simple$fitted.values,     percent = TRUE, plot = TRUE, legacy.axes =
TRUE, xlab = "False Positive Percentage",     ylab = "True Postive
Percentage", col = "#377eb8", lwd = 4,     print.auc = TRUE)
##
```

```
## Data: logistic_simple$fitted.values in 903 controls (data$Survivorship C)
< 482 cases (data$Survivorship NC).
## Area under the curve: 52.71%

# Lets add the other graph
plot.roc(data$Survivorship, logistic$fitted.values, percent=TRUE,
col="#4daf4a", lwd=4, print.auc=TRUE, add=TRUE, print.auc.y=40)

## Setting levels: control = C, case = NC
## Setting direction: controls < cases

legend("bottomright", legend=c("Simple", "Non Simple"), col=c("#377eb8",
"#4daf4a"), lwd=4) # Make it user friendly
```