

COVID-19 Sentiment Analysis

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5/13/2020

Reading in Cleaned Data and Basic Reformatting

```
headlines <- read.csv("data/news_clean.csv")

# Names of variables
names(headlines)

## [1] "id"          "timestamp"   "source"      "title"       "description"
## [6] "date"

# Load all of the data into the working environment
attach(headlines)
# We ignore the id, timestamp and source, and focus on the title, description and date
headlines <- data.frame(title, description, date)
# Reformat and separate year month and day
headlines$month = substr(date, 6, 7)
headlines$day <- substr(date, 9, 10)
attach(headlines)

## The following objects are masked from headlines (pos = 3):
##
##   date, description, title

We want to check how many days there are in the dataset:

begin <- headlines$date[1]
end <- headlines$date[length(headlines$date)]
as.Date(end) - as.Date(begin)

## Time difference of 52 days

cat(begin, end)

## 1 53
```

Frequency of Strings

```
library("ggplot2") #beautiful plots
library("reshape2") #melt-function

plot_word_in_day <- function(phrase){
  freq <- NULL
  days <- unique(headlines$date)
```

```

    for(day in days)
    {
      matching_day <- headlines[headlines$date == day,]
      freq[length(freq)+1] <- length(grepl(phrase, matching_day$title, fixed = TRUE))
    }
    return(freq)
  }

list <- c("stay", "recession", "pandemic")
time <- data.frame(seq(as.Date("2020-03-21"),by="week",length.out=53))

for(i in list)
{
  out <- plot_word_in_day(i)
  time <- cbind(time, out)
}

```

```

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 139 is
## invalid in this locale

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## invalid in this locale

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## invalid in this locale
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## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 115 is
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## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 436 is
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## invalid in this locale

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## invalid in this locale

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## invalid in this locale

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## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 689 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 694 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 73 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 81 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 180 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 301 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 322 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 330 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 453 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 471 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 541 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 621 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 145 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 238 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 263 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 107 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 215 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 432 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 439 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 481 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 150 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 204 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 412 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 537 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 554 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 275 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 366 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 386 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 661 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 679 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 700 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 755 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 7 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 359 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 474 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 551 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 751 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 349 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 431 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 448 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 637 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 672 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 93 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 391 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 604 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 670 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 376 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 462 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 541 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 574 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 605 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 157 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 172 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 176 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 173 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 196 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 201 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 164 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 214 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 70 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 267 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 334 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 85 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 292 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 492 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 529 is
## invalid in this locale
```



```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 580 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 100 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 299 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 384 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 396 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 491 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 101 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 212 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 333 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 378 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 444 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 647 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 655 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 162 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 281 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 372 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 531 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 342 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 376 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 678 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 118 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 150 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 115 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 436 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 492 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 589 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 622 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 195 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 254 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 399 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 404 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 464 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 166 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 167 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 176 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 208 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 645 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 754 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 859 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 891 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 144 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 232 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 14 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 95 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 166 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 340 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 386 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 173 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 424 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 679 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 801 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 188 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 658 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 785 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 946 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 10 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 160 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 189 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 346 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 368 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 43 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 130 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 131 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 135 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 253 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 370 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 417 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 465 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 199 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 208 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 132 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 417 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 139 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 483 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 620 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 706 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 735 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 949 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 99 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 144 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 327 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 416 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 557 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 308 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 427 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 835 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 988 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 92 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 140 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 159 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 437 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 489 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 13 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 303 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 729 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 924 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 251 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 467 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 487 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 490 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 527 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 159 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 314 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 459 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 532 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 569 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 104 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 330 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 360 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 385 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 533 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 644 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 115 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 215 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 262 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 280 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 341 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 312 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 442 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 661 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 917 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 32 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 100 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 160 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 689 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 694 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 73 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 81 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 180 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 301 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 322 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 330 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 453 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 471 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 541 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 621 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 145 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 238 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 263 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 107 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 215 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 432 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 439 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 481 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 150 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 204 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 412 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 537 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 554 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 275 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 366 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 386 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 661 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 679 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 700 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 755 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 7 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 359 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 474 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 551 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 751 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 349 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 431 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 448 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 637 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 672 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 93 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 391 is
## invalid in this locale
```



```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 604 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 670 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 376 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 462 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 541 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 574 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 605 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 157 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 172 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 176 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 173 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 196 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 201 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 164 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 214 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 70 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 267 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 334 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 85 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 292 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 492 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 529 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 580 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 100 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 299 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 384 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 396 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 491 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 101 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 212 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 333 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 378 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 444 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 647 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 655 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 162 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 281 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 372 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 531 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 342 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 376 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 678 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 118 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 150 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 115 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 436 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 492 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 589 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 622 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 195 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 254 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 399 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 404 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 464 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 166 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 167 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 176 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 208 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 645 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 754 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 859 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 891 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 144 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 232 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 14 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 95 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 166 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 340 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 386 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 173 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 424 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 679 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 801 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 188 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 658 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 785 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 946 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 10 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 160 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 189 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 346 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 368 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 43 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 130 is
## invalid in this locale
```

```
## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 131 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 135 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 253 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 370 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 417 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 465 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 199 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 208 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 132 is
## invalid in this locale

## Warning in grepl(phrase, matching_day$title, fixed = TRUE): input string 417 is
## invalid in this locale
```

```
colnames(time) <- c("date", list)
charts <- melt(time, id="date")
names(charts) <- c('x', 'func', 'value')

g=ggplot() +
  geom_line(data = charts, aes(x = x, y = value, color = func),size=1)+
  xlab("year") +
  ylab("frequency")
g+scale_color_manual(values=c("#999999", "#FF0000", "#FF00D0", "#0007FF", "#09FF00"))
```

