RedditAnalysis

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29 6 2021

Posts

```r
library(pacman)
p_load(RColorBrewer, # color pallets
       ggplot2, # reportable graphs
       cowplot, # arranges ggplot graphs nicely
       stargazer,
       MASS,
       DescTools,
       plyr)
```

Import data set

```r
df_berlin <- read.csv("posts_berlin_2020.csv")
df_germany <- read.csv("posts_de_2020.csv")
df_europe <- read.csv("posts_europe_2020_partial.csv")
df <- rbind(df_berlin, df_germany, df_europe)
```

Inspect

```r
str(df)
```

```
## 'data.frame':    150733 obs. of  23 variables:
##  $ id                  : chr  "eianf4" "eib7eb" "eib7f1" "eibze1" ...
##  $ permalink           : chr  "/r/berlin/comments/eianf4/berlin_changed_my_opinion_on_fireworks/" "/
##  $ author              : chr  "ziozxzioz" "oyeahmann" "" "" ...
##  $ author_fullname     : chr  "t2_6vajm" "t2_hryiqix" "NULL" "NULL" ...
##  $ title               : chr  "Berlin changed my opinion on fireworks" "Alexanderplatz" "We need thi
##  $ url                 : chr  "https://www.reddit.com/r/berlin/comments/eianf4/berlin_changed_my_opi
##  $ subreddit           : chr  "berlin" "berlin" "berlin" "berlin" ...
##  $ stickied            : chr  "False" "False" "False" "False" ...
##  $ created_utc         : num  1.58e+09 1.58e+09 1.58e+09 1.58e+09 1.58e+09 ...
##  $ is_original_content : chr  "False" "False" "False" "False" ...
##  $ author_flair_text   : chr  "Mitte" "" "" "" ...
##  $ is_video            : chr  "False" "False" "False" "False" ...
##  $ locked              : chr  "False" "False" "False" "False" ...
##  $ selftext            : chr  "So, first NYE here since coming from Argentina. In the past few years
##  $ link_flair_richtext : chr  "[]" "[]" "[]" "[]" ...
##  $ domain              : chr  "self.berlin" "i.redd.it" "bbc.com" "i.redd.it" ...
##  $ over_18             : chr  "False" "False" "False" "False" ...
##  $ score               : int  261 121 18 2 1 2 209 15 4 18 ...
##  $ total_awards_received: int  0 0 0 0 0 0 0 0 0 0 ...
##  $ upvote_ratio         : num  0.97 0.92 0.67 0.55 0.56 0.57 0.97 0.94 0.75 0.65 ...
##  $ num_comments         : int  142 3 16 11 0 1 7 6 1 6 ...
##  $ epoch                : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ datetime             : chr  "2020-01-01 00:31:48" "2020-01-01 01:16:07" "2020-01-01 01:16:10" "20
```

```
df$over_18 <- as.logical(df$over_18)
df$locked <- as.logical(df$locked)
df$is_video <- as.logical(df$is_video)
df$is_original_content <- as.logical(df$is_original_content)
df$stickied <- as.logical(df$stickied)
df$subreddit <- as.factor(df$subreddit)

dim(df)
```

```
## [1] 150733     23
```

Preprocess: Treat missing values, if applicable

```
df$author_fullname[df$author_fullname == "NULL"] <- NA
df$author[df$author == ""] <- NA
nrow(df)
```

```
## [1] 150733
```

```
df <-df[!duplicated(df$id), ]
nrow(df)
```

```
## [1] 149097
```

```
# Track down variables with missing values
sum(is.na(df))
```

```
## [1] 95306
```

```
colSums(is.na(df))
```

```
##                    id             permalink                author
##                     0                     0                 47653
##       author_fullname                 title                   url
##                 47653                     0                     0
##             subreddit              stickied           created_utc
##                     0                     0                     0
##   is_original_content     author_flair_text              is_video
##                     0                     0                     0
##                locked              selftext   link_flair_richtext
##                     0                     0                     0
##                domain               over_18                 score
##                     0                     0                     0
## total_awards_received          upvote_ratio          num_comments
##                     0                     0                     0
##                 epoch              datetime
##                     0                     0
```

```
# Check the percentage of missing values in the data set
(nrow(df) - nrow(na.omit(df))) / nrow(df)
```

```
## [1] 0.3196107
```

```r
df$date <- as.Date(df$datetime)



to_interval <- function(anchor.date, future.date, interval.days){
  round(as.integer(future.date - anchor.date) / interval.days, 0)
}

df$week_interval <- to_interval(as.Date('2020-01-01'),
                              df$date, 7 )

df$month <- format(df$date, "%m")
df$month <- factor(df$month)

df <- df[!(df$stickied == TRUE),]

str(df)
```

```
## 'data.frame':    149097 obs. of  26 variables:
##  $ id                    : chr  "eianf4" "eib7eb" "eib7f1" "eibze1" ...
##  $ permalink             : chr  "/r/berlin/comments/eianf4/berlin_changed_my_opinion_on_fireworks/" "/
##  $ author                : chr  "ziozxzioz" "oyeahmann" NA NA ...
##  $ author_fullname       : chr  "t2_6vajm" "t2_hryiqix" NA NA ...
##  $ title                 : chr  "Berlin changed my opinion on fireworks" "Alexanderplatz" "We need thi
##  $ url                   : chr  "https://www.reddit.com/r/berlin/comments/eianf4/berlin_changed_my_opi
##  $ subreddit             : Factor w/ 3 levels "berlin","de",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ stickied              : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
##  $ created_utc           : num  1.58e+09 1.58e+09 1.58e+09 1.58e+09 1.58e+09 ...
##  $ is_original_content   : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
##  $ author_flair_text     : chr  "Mitte" "" "" "" ...
##  $ is_video              : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
##  $ locked                : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
##  $ selftext              : chr  "So, first NYE here since coming from Argentina. In the past few years
##  $ link_flair_richtext   : chr  "[]" "[]" "[]" "[]" ...
##  $ domain                : chr  "self.berlin" "i.redd.it" "bbc.com" "i.redd.it" ...
##  $ over_18               : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
##  $ score                 : int  261 121 18 2 1 2 209 15 4 18 ...
##  $ total_awards_received: int  0 0 0 0 0 0 0 0 0 0 ...
##  $ upvote_ratio          : num  0.97 0.92 0.67 0.55 0.56 0.57 0.97 0.94 0.75 0.65 ...
##  $ num_comments          : int  142 3 16 11 0 1 7 6 1 6 ...
##  $ epoch                 : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ datetime              : chr  "2020-01-01 00:31:48" "2020-01-01 01:16:07" "2020-01-01 01:16:10" "202
##  $ date                  : Date, format: "2020-01-01" "2020-01-01" ...
##  $ week_interval         : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ month                 : Factor w/ 12 levels "01","02","03",..: 1 1 1 1 1 1 1 1 1 1 ...
```

Data Visualisation

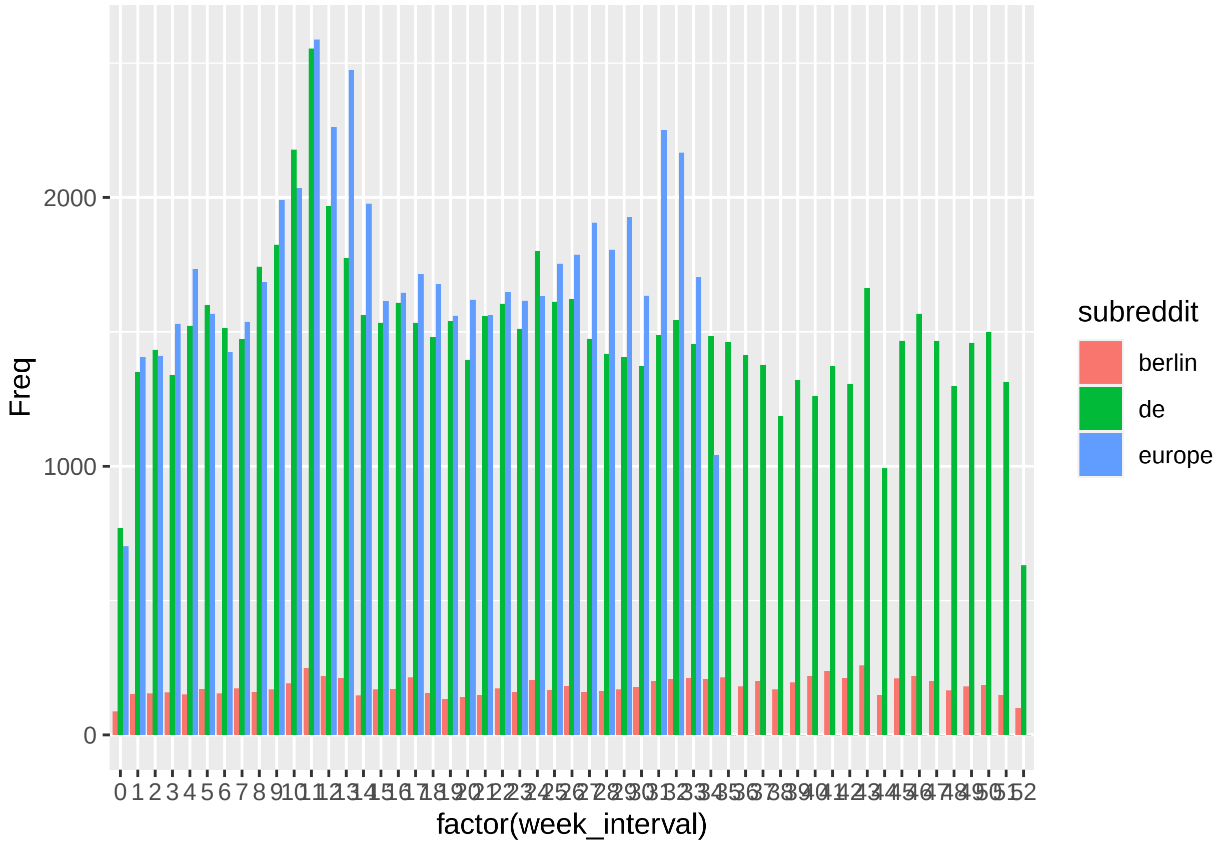
```r
data.frame(table(df$month))
```

```
##    Var1  Freq
## 1    01 13342
## 2    02 13734
## 3    03 20170
## 4    04 15449
## 5    05 14353
## 6    06 14851
## 7    07 15301
## 8    08 14883
## 9    09  6557
## 10   10  7218
## 11   11  6668
## 12   12  6571
```

```
dfwi <- data.frame(table(df$week_interval))
dfwi
```

```
##    Var1 Freq
## 1     0 1557
## 2     1 2904
## 3     2 2996
## 4     3 3025
## 5     4 3405
## 6     5 3336
## 7     6 3089
## 8     7 3180
## 9     8 3584
## 10    9 3982
## 11   10 4403
## 12   11 5389
## 13   12 4446
## 14   13 4459
## 15   14 3685
## 16   15 3316
## 17   16 3421
## 18   17 3460
## 19   18 3312
## 20   19 3232
## 21   20 3154
## 22   21 3266
## 23   22 3423
## 24   23 3285
## 25   24 3635
## 26   25 3531
## 27   26 3588
## 28   27 3539
## 29   28 3384
## 30   29 3498
## 31   30 3183
## 32   31 3936
## 33   32 3917
## 34   33 3367
## 35   34 2731
## 36   35 1673
## 37   36 1593
## 38   37 1577
## 39   38 1356
## 40   39 1514
## 41   40 1481
## 42   41 1609
## 43   42 1518
## 44   43 1919
## 45   44 1140
## 46   45 1676
## 47   46 1785
## 48   47 1666
## 49   48 1461
## 50   49 1637
## 51   50 1684
## 52   51 1460
## 53   52  730
```

```
tbl <- with(df, table(subreddit, week_interval))
ggplot(as.data.frame(tbl), aes(factor(week_interval), Freq, fill = subreddit)) +
  geom_col(position = 'dodge')
```



```
Gini(dfwi$Freq)
```

```
## [1] 0.2115102
```

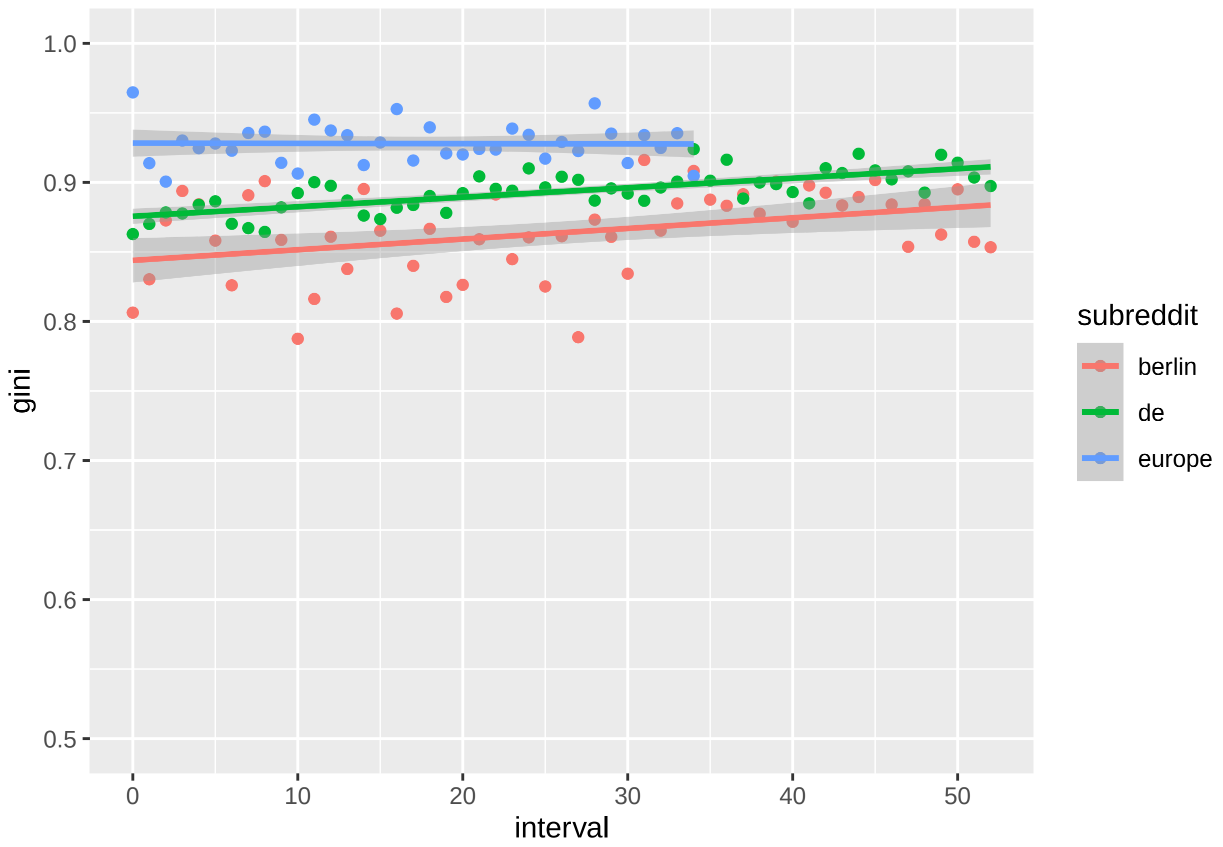
```
nrow(df)
```

```
## [1] 149097
```

```
df_with_acc <- na.omit(df)
nrow(df_with_acc)
```

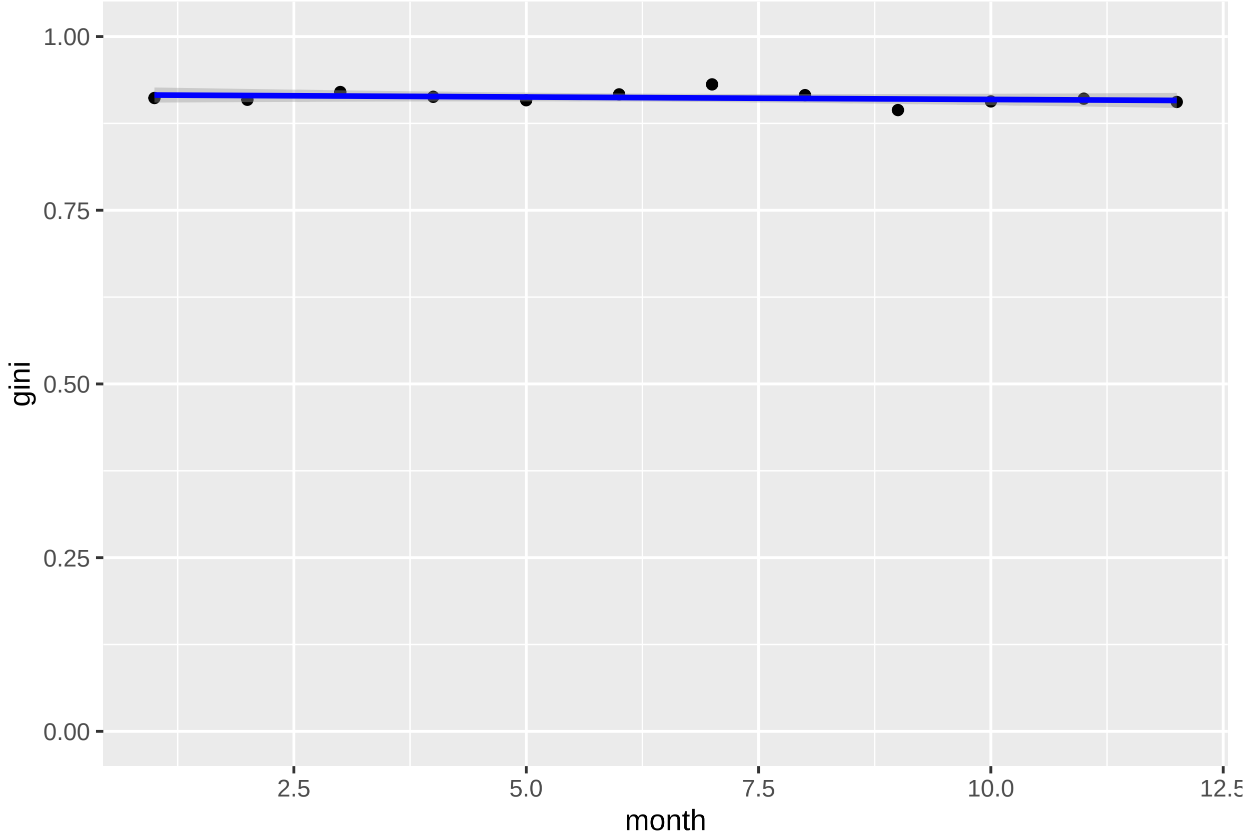
```
## [1] 101444
```

```r
#df_with_acc <- df_with_acc[df_with_acc$score > 10,]



gini_by_7days <- data.frame(
                 interval=character(),
                 gini=double(),
                 subreddit=factor(levels = levels(df_with_acc$subreddit)),
                 stringsAsFactors=TRUE
                 )

for (subreddit in levels(df_with_acc$subreddit)){
  df_subreddit <- df_with_acc[df_with_acc$subreddit == subreddit, ]
  for (interval in unique(df_subreddit$week_interval)){
    df_7day <- df_subreddit[df_subreddit$week_interval == interval, ]

    df_author_posts <- count(df_7day, vars = "author")

    df_author_score <- aggregate(df_7day$score, by=list(author=df_7day$author), FUN=sum)


    df_author <- merge(df_author_posts, df_author_score, by="author")
    df_author$score_per_post <- df_author$x / df_author$freq

    gini <- Gini(df_author$score_per_post)
    gini_by_7day <- data.frame(
                   interval=interval,
                   gini=gini,
                   subreddit=subreddit,
                   stringsAsFactors=TRUE
                   )

    gini_by_7days <- rbind(gini_by_7days, gini_by_7day)
  }
}


gini_by_7days$interval <-as.numeric(as.character(gini_by_7days$interval))

ggplot(gini_by_7days, aes(x=interval, y=gini, group = subreddit, color = subreddit)) +
  geom_point() +
  geom_smooth(method='lm', formula= y~x) +
  ylim(0.5,1)
```



```
gini_by_months <- data.frame(
                 month=character(),
                 gini=double(),
                 stringsAsFactors=TRUE
                 )

for (month in unique(df_with_acc$month)){
  mnth_df <- df_with_acc[df_with_acc$month == month, ]

  df_author_posts <- count(mnth_df, vars = "author")

  df_author_score <- aggregate(mnth_df$score, by=list(author=mnth_df$author), FUN=sum)


  df_author <- merge(df_author_posts, df_author_score, by="author")
  df_author$score_per_post <- df_author$x / df_author$freq

  gini <- Gini(df_author$score_per_post)
  gini_by_month <- data.frame(
                 month=month,
                 gini=gini,
                 stringsAsFactors=TRUE
                 )

  gini_by_months <- rbind(gini_by_months, gini_by_month)
}
```

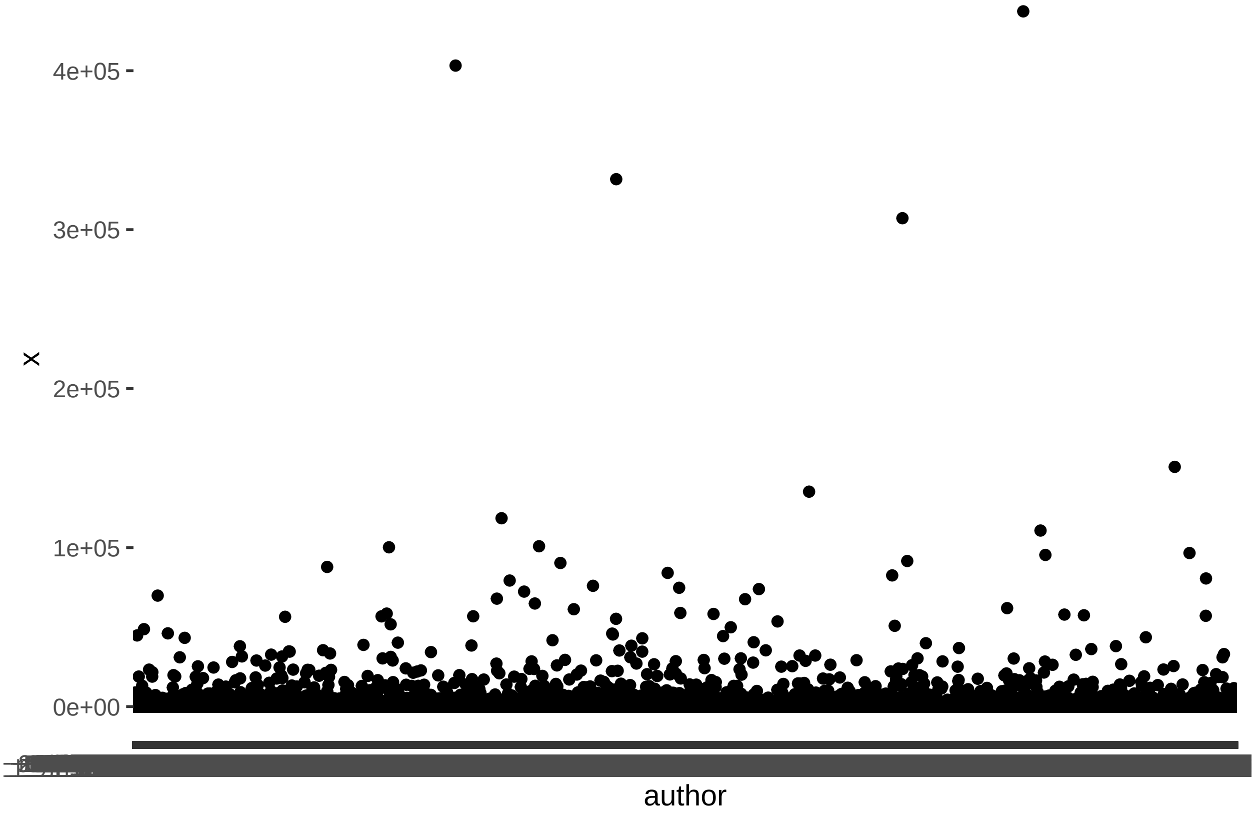
```r
gini_by_months$month <-as.numeric(as.character(gini_by_months$month))

ggplot(gini_by_months, aes(x=month, y=gini)) +
  geom_point() +
  geom_smooth(method='lm', formula= y~x, color = "blue") +
  ylim(0,1)
```



```r
agg <- aggregate(df_with_acc$score, by=list(author=df_with_acc$author), FUN=sum)
#agg
Gini(agg$x)
```

```
## [1] 0.9347126
```

```r
ggplot(agg, aes(x=author, y=x)) + geom_point()
```


4e+05
3e+05
2e+05
1e+05
0e+00
x
author