How many times have users turned off the notifications?

05/06/2019

```
# Options about chunks
knitr::opts_chunk$set(echo = TRUE, warning = FALSE, message = FALSE, tidy = TRUE)

# Reading final scores
library(xlsx)

# Loading Todyverse to work with tables
library(tidyverse)
```

```
## Registered S3 methods overwritten by 'ggplot2':
##   method         from
##   [.quosures     rlang
##   c.quosures     rlang
##   print.quosures rlang

## Registered S3 method overwritten by 'rvest':
##   method            from
##   read_xml.response xml2

## -- Attaching packages ---------------------------------------------------------------------------

## v ggplot2 3.1.1       v purrr   0.3.2
## v tibble  2.1.1       v dplyr   0.8.0.1
## v tidyr   0.8.3       v stringr 1.4.0
## v readr   1.3.1       v forcats 0.4.0

## -- Conflicts ------------------------------------------------------------------------------------
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
# Printing table in a nice format
#library(kableExtra) #(This doesn't allow PDF creation)
```

Step 1: Data selection

```
# Collecting the ID of users
Uid_raw <- read.xlsx("data/UID.xlsx", header = TRUE, sheetIndex = 1)

# Collecting the list of UID
Uid_list <- read.xlsx("data/UID.xlsx", header = TRUE, sheetIndex = 2)

r1<- nrow(Uid_raw)
r2<- nrow(Uid_list)
```

The selected file analyzes 243 users for 329 days, from the beginning of the experimental phase (06.09.2017) until the end (11.01.2018).

Step 2: Pre-processing

```
### Already done
```

Data has already been pre-processed and only data in the selected period and only notifications stating "The following UIDs have been unregistered" are shown.

Step 3: Transformation

```
UID <- Uid_raw[,-2]%>%
  gather('UID01', 'UID02', 'UID03', 'UID04', 'UID05', 'UID06', 'UID07', 'UID08', 'UID09', 'UID10', 'UID
         key="Column", value="UID")%>%
  filter(UID!="NA")%>%
  arrange(Day)
```

For each day, the list of users is extracted.

```
head(UID)
```

```
##   Day Column UID
## 1  31  UID01  64
## 2  31  UID02  76
## 3  31  UID03  79
## 4  31  UID04 108
## 5  31  UID05 143
## 6  31  UID06 162
```

Some user in the list appear to be not active (UID= 64, 79, 108, 143, 162, 222, 237), and they shall be removed from the next table.

```
Performance <- UID[,-2] %>%
  left_join(Uid_list,by="UID")%>%
  filter(Type!="NA")

head(Performance)
```

```
##   Day UID Type
## 1  31  76  CON
## 2  32   2  FIX
## 3  32  76  CON
## 4  36  76  CON
## 5  40  76  CON
## 6  44  99  CON
```

The resulting table allows obtaining the study conditions of each participant.

Step 4: Data mining

The resulting table presents the sum of how many times participants have turned the system off, divided by type of intervention.

```
result <- Performance%>%
  group_by(Type)%>%
  count(Type)

result
```

```
## # A tibble: 4 x 2
## # Groups:   Type [4]
##   Type      n
##   <fct> <int>
## 1 CON     228
## 2 FIX      96
## 3 LOT      94
## 4 POW     506
```

An in-depth analysis allows observing some interesting trends concerning how many times each user has turned the system off.

```
# Listing the UID per type
result_details <- Performance%>%
  group_by(Type)%>%
  count(UID)

# Counting how many UID per type
UID_details <- result_details%>%
  group_by(Type)%>%
  count(Type)

# Assessing the average of events per Type
result_avg <- result
result_avg$n <- as.numeric(format(round(result$n/UID_details$n,2), nsmall = 2))
```

The amount of times each participant has turned the system off varies greatly among particiapants.

```
head(result_details,10)
```

```
## # A tibble: 10 x 3
## # Groups:   Type [2]
##    Type    UID     n
##    <fct> <dbl> <int>
##  1 CON       8     1
##  2 CON      56    17
##  3 CON      57    24
##  4 CON      76    10
##  5 CON      87    46
##  6 CON      99     2
##  7 CON     109    64
```

```
##  8 CON     112    24
##  9 CON     415    40
## 10 FIX       2     1
```

By gathering the information about the participant, it is possible to count how many participants are listed in each type.

```
UID_details
```

```
## # A tibble: 4 x 2
## # Groups:   Type [4]
##   Type      n
##   <fct> <int>
## 1 CON       9
## 2 FIX       7
## 3 LOT       3
## 4 POW       5
```

Consequently, it is possible to obtain the average of how many times each user has turned the system off.

```
result_avg
```

```
## # A tibble: 4 x 2
## # Groups:   Type [4]
##   Type      n
##   <fct> <dbl>
## 1 CON    25.3
## 2 FIX    13.7
## 3 LOT    31.3
## 4 POW   101.
```

In the end, it apperars that the average of CON (25.33) is smaller than the average of LOT (31.33).

Step 5: Evaluation

```
# NO additional test
```

As requested, the current analysis allows stating that:

- In CON condition users turned off the notifications 228 amount of times.
- In FIX condition users turned off the notifications 96 amount of times.
- In LOT condition users turned off the notifications 94 amount of times.
- In POW condition users turned off the notifications 506 amount of times.