Challenge-4

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Questions

Load the "CommQuest2023.csv" dataset using the `read_csv()` command and assign it to a variable named "comm_data."

```
# Enter code here
library("tidyverse")
```

```
## Warning: package 'tidyverse' was built under R version 4.2.3
```

```
## Warning: package 'ggplot2' was built under R version 4.2.3
```

```
## Warning: package 'tibble' was built under R version 4.2.3
```

```
## Warning: package 'tidyr' was built under R version 4.2.3
```

```
## Warning: package 'readr' was built under R version 4.2.3
```

```
## Warning: package 'purrr' was built under R version 4.2.3
```

```
## Warning: package 'dplyr' was built under R version 4.2.3
```

```
## Warning: package 'stringr' was built under R version 4.2.2
```

```
## Warning: package 'forcats' was built under R version 4.2.3
```

```
## Warning: package 'lubridate' was built under R version 4.2.3
```

```
## ── Attaching core tidyverse packages ──────────────────── tidyverse 2.0.0 ──
## ✓ dplyr     1.1.2     ✓ readr     2.1.4
## ✓ forcats   1.0.0     ✓ stringr   1.5.0
## ✓ ggplot2   3.4.3     ✓ tibble    3.2.1
## ✓ lubridate 1.9.2     ✓ tidyr     1.3.0
## ✓ purrr     1.0.2
## ── Conflicts ──────────────────────────────────── tidyverse_conflicts() ──
## ✗ dplyr::filter() masks stats::filter()
## ✗ dplyr::lag()    masks stats::lag()
## ℹ Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to be
come errors
```

```
comm_data <- read_csv("CommQuest2023_Larger.csv")
```

```
## Rows: 1000 Columns: 5
## ── Column specification ────────────────────────────────────────────────────
## Delimiter: ","
## chr  (3): channel, sender, message
## dbl  (1): sentiment
## date (1): date
##
## ℹ Use `spec()` to retrieve the full column specification for this data.
## ℹ Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

Question-1: Communication Chronicles Click Me to scroll to top

Using the select command, create a new dataframe containing only the "date," "channel," and "message" columns from the "comm_data" dataset.

Solution:

```
# Enter code here
comm_data %>%
  select(date, channel, message)
```

```
## # A tibble: 1,000 × 3
##    date       channel message
##    <date>     <chr>   <chr>
##  1 2023-08-11 Twitter Fun weekend!
##  2 2023-08-11 Email   Hello everyone!
##  3 2023-08-11 Slack   Hello everyone!
##  4 2023-08-18 Email   Fun weekend!
##  5 2023-08-14 Slack   Need assistance
##  6 2023-08-04 Email   Need assistance
##  7 2023-08-10 Twitter Hello everyone!
##  8 2023-08-04 Slack   Hello everyone!
##  9 2023-08-20 Email   Team meeting
## 10 2023-08-09 Slack   Hello everyone!
## # i 990 more rows
```

Question-2: Channel Selection Click Me to scroll to top

Use the filter command to create a new dataframe that includes messages sent through the "Twitter" channel on August 2nd.

Solution:

```
# Enter code here
comm_data %>%
  filter(channel=="Twitter", date=="2023-08-02")
```

```
## # A tibble: 15 × 5
##    date       channel sender        message         sentiment
##    <date>     <chr>   <chr>         <chr>               <dbl>
##  1 2023-08-02 Twitter alice@example Team meeting        0.210
##  2 2023-08-02 Twitter @erin_tweets  Exciting news!      0.750
##  3 2023-08-02 Twitter dave@example  Exciting news!      0.817
##  4 2023-08-02 Twitter @erin_tweets  Exciting news!      0.582
##  5 2023-08-02 Twitter @erin_tweets  Exciting news!     -0.525
##  6 2023-08-02 Twitter alice@example Team meeting        0.965
##  7 2023-08-02 Twitter dave@example  Great work!         0.516
##  8 2023-08-02 Twitter carol_slack   Hello everyone!     0.451
##  9 2023-08-02 Twitter carol_slack   Hello everyone!     0.174
## 10 2023-08-02 Twitter carol_slack   Need assistance     0.216
## 11 2023-08-02 Twitter @frank_chat   Need assistance    -0.115
## 12 2023-08-02 Twitter alice@example Need assistance     0.158
## 13 2023-08-02 Twitter carol_slack   Exciting news!     -0.693
## 14 2023-08-02 Twitter @bob_tweets   Need assistance    -0.282
## 15 2023-08-02 Twitter @erin_tweets  Need assistance     0.821
```

Question-3: Chronological Order Click Me to scroll to top

Utilizing the arrange command, arrange the "comm_data" dataframe in ascending order based on the "date" column.

Solution:

```
# Enter code here
comm_data %>%
  arrange(date)
```

```
## # A tibble: 1,000 × 5
##    date       channel sender       message         sentiment
##    <date>     <chr>   <chr>        <chr>               <dbl>
##  1 2023-08-01 Twitter alice@example Need assistance     0.677
##  2 2023-08-01 Twitter @bob_tweets  Need assistance     0.148
##  3 2023-08-01 Twitter @frank_chat  Need assistance     0.599
##  4 2023-08-01 Twitter @frank_chat  Exciting news!     -0.823
##  5 2023-08-01 Slack   @frank_chat  Team meeting       -0.202
##  6 2023-08-01 Slack   @bob_tweets  Exciting news!      0.146
##  7 2023-08-01 Slack   @erin_tweets Great work!         0.244
##  8 2023-08-01 Twitter @frank_chat  Team meeting       -0.526
##  9 2023-08-01 Twitter @frank_chat  Exciting news!     -0.399
## 10 2023-08-01 Slack   @frank_chat  Need assistance     0.602
## # i 990 more rows
```

Question-4: Distinct Discovery Click Me to scroll to top

Apply the distinct command to find the unique senders in the "comm_data" dataframe.

Solution:

```
# Enter code here
comm_data %>%
  distinct(sender)
```

```
## # A tibble: 6 × 1
##   sender
##   <chr>
## 1 dave@example
## 2 @bob_tweets
## 3 @frank_chat
## 4 @erin_tweets
## 5 alice@example
## 6 carol_slack
```

Question-5: Sender Stats Click Me to scroll to top

Employ the count and group_by commands to generate a summary table that shows the count of messages sent by each sender in the "comm_data" dataframe.

Solution:

```
# Enter code here
comm_data %>%
  group_by(sender) %>%
  count()
```

```
## # A tibble: 6 × 2
## # Groups:   sender [6]
##   sender           n
##   <chr>        <int>
## 1 @bob_tweets    179
## 2 @erin_tweets   171
## 3 @frank_chat    174
## 4 alice@example  180
## 5 carol_slack    141
## 6 dave@example   155
```

Question-6: Channel Chatter Insights Click Me to scroll to top

Using the group_by and count commands, create a summary table that displays the count of messages sent through each communication channel in the "comm_data" dataframe.

Solution:

```
# Enter code here
comm_data %>%
  group_by(channel) %>%
  count()
```

```
## # A tibble: 3 × 2
## # Groups:   channel [3]
##   channel      n
##   <chr>    <int>
## 1 Email      331
## 2 Slack      320
## 3 Twitter    349
```

Question-7: Positive Pioneers Click Me to scroll to top

Utilize the filter, select, and arrange commands to identify the top three senders with the highest average positive sentiment scores. Display their usernames and corresponding sentiment averages.

Solution:

```
# Enter code here
comm_data %>%
  filter(sentiment>0) %>%
  group_by(sender) %>%
  summarise(average_pos_sentiment=mean(sentiment)) %>%
  arrange(-average_pos_sentiment) %>%
  slice(1:3) %>%
  select(sender,average_pos_sentiment)
```

```
## # A tibble: 3 × 2
##   sender          average_pos_sentiment
##   <chr>                           <dbl>
## 1 dave@example                    0.541
## 2 @frank_chat                     0.528
## 3 alice@example                   0.493
```

Question-8: Message Mood Over Time Click Me to scroll to top

With the group_by, summarise, and arrange commands, calculate the average sentiment score for each day in the "comm_data" dataframe.

Solution:

```
# Enter code here
comm_data %>%
  group_by(date) %>%
  summarise(mean(sentiment)) %>%
  arrange(date)
```

```
## # A tibble: 20 × 2
##    date        `mean(sentiment)`
##    <date>                  <dbl>
##  1 2023-08-01            -0.0616
##  2 2023-08-02             0.136
##  3 2023-08-03             0.107
##  4 2023-08-04            -0.0510
##  5 2023-08-05             0.193
##  6 2023-08-06            -0.0144
##  7 2023-08-07             0.0364
##  8 2023-08-08             0.0666
##  9 2023-08-09             0.0997
## 10 2023-08-10            -0.0254
## 11 2023-08-11            -0.0340
## 12 2023-08-12             0.0668
## 13 2023-08-13            -0.0604
## 14 2023-08-14            -0.0692
## 15 2023-08-15             0.0617
## 16 2023-08-16            -0.0220
## 17 2023-08-17            -0.0191
## 18 2023-08-18            -0.0760
## 19 2023-08-19             0.0551
## 20 2023-08-20             0.0608
```

Question-9: Selective Sentiments Click Me to scroll to top

Use the filter and select commands to extract messages with a negative sentiment score (less than 0) and create a new dataframe.

Solution:

```
# Enter code here
new_comm_data <- data.frame(comm_data %>%
  filter(sentiment<0) %>%
  select(message,sentiment))
new_comm_data
```

```
##                message    sentiment
## 1    Hello everyone! -0.143450806
## 2    Need assistance -0.108376242
## 3    Hello everyone! -0.740855453
## 4    Hello everyone! -0.187917918
## 5    Hello everyone! -0.932525445
## 6    Need assistance -0.879413284
## 7        Great work! -0.751736611
## 8       Team meeting -0.786887704
## 9       Fun weekend! -0.539049788
## 10    Exciting news! -0.141741692
## 11      Team meeting -0.189370414
## 12   Need assistance -0.493062959
## 13       Great work! -0.179680133
## 14      Team meeting -0.092784007
## 15      Team meeting -0.955364774
## 16   Need assistance -0.766245456
## 17   Need assistance -0.547700667
## 18    Exciting news! -0.415566467
## 19       Great work! -0.579760317
## 20    Exciting news! -0.290788232
## 21   Need assistance -0.340010146
## 22       Great work! -0.443448592
## 23      Team meeting -0.774452816
## 24   Hello everyone! -0.882707532
## 25   Hello everyone! -0.689319659
## 26   Hello everyone! -0.219064676
## 27      Team meeting -0.004460444
## 28      Team meeting -0.935610580
## 29   Hello everyone! -0.452905738
## 30   Need assistance -0.834047724
## 31   Need assistance -0.195926677
## 32      Fun weekend! -0.285561244
## 33      Team meeting -0.060755176
## 34      Fun weekend! -0.569811309
## 35    Exciting news! -0.018193701
## 36    Exciting news! -0.301641050
## 37       Great work! -0.244326655
## 38   Hello everyone! -0.761104998
## 39    Exciting news! -0.408464086
## 40      Fun weekend! -0.584208118
## 41      Team meeting -0.178657859
## 42       Great work! -0.329095908
## 43      Fun weekend! -0.707901944
## 44   Hello everyone! -0.166448134
## 45    Exciting news! -0.533024813
## 46   Need assistance -0.356371285
## 47      Team meeting -0.467768930
## 48      Fun weekend! -0.056202481
## 49      Team meeting -0.757670477
## 50    Exciting news! -0.265161676
## 51    Exciting news! -0.822780307
## 52   Need assistance -0.680233249
## 53   Hello everyone! -0.647561021
## 54       Great work! -0.705626460
```

```
## 55  Hello everyone! -0.050532605
## 56      Great work! -0.459148118
## 57     Fun weekend! -0.034278538
## 58      Great work! -0.013945965
## 59    Team meeting -0.934943126
## 60     Fun weekend! -0.474169046
## 61     Team meeting -0.815906889
## 62  Exciting news! -0.200843529
## 63     Fun weekend! -0.958858334
## 64     Fun weekend! -0.558302570
## 65  Need assistance -0.435741366
## 66  Need assistance -0.770186925
## 67   Exciting news! -0.871460078
## 68  Hello everyone! -0.843954970
## 69     Fun weekend! -0.576360519
## 70  Need assistance -0.462980804
## 71   Exciting news! -0.745493084
## 72  Hello everyone! -0.075317414
## 73  Need assistance -0.815106571
## 74      Great work! -0.526421044
## 75     Team meeting -0.202094683
## 76     Fun weekend! -0.390309056
## 77      Great work! -0.733910211
## 78     Fun weekend! -0.496555788
## 79  Hello everyone! -0.892831107
## 80  Hello everyone! -0.108963726
## 81     Fun weekend! -0.799520459
## 82     Fun weekend! -0.558283084
## 83   Exciting news! -0.608554570
## 84     Team meeting -0.526283488
## 85  Need assistance -0.635092593
## 86      Great work! -0.446627778
## 87     Fun weekend! -0.149422837
## 88      Great work! -0.630844017
## 89     Fun weekend! -0.533522750
## 90   Exciting news! -0.398672424
## 91   Exciting news! -0.686074989
## 92  Need assistance -0.514785561
## 93   Exciting news! -0.445320373
## 94   Exciting news! -0.433124611
## 95  Hello everyone! -0.369747002
## 96      Great work! -0.912142744
## 97     Fun weekend! -0.760701751
## 98  Hello everyone! -0.243440011
## 99     Fun weekend! -0.159573650
## 100  Exciting news! -0.260005387
## 101 Need assistance -0.356432681
## 102 Need assistance -0.577738499
## 103    Team meeting -0.767587414
## 104    Team meeting -0.014527882
## 105    Fun weekend! -0.391704335
## 106 Need assistance -0.857863282
## 107    Team meeting -0.024207670
## 108 Need assistance -0.611560303
## 109 Need assistance -0.542398809
## 110 Hello everyone! -0.940684421
```

```
## 111     Great work! -0.404516522
## 112  Exciting news! -0.476039052
## 113     Great work! -0.045373839
## 114 Need assistance -0.042491458
## 115 Hello everyone! -0.024430894
## 116 Need assistance -0.299717092
## 117 Hello everyone! -0.558468956
## 118    Team meeting -0.386754569
## 119 Hello everyone! -0.081353148
## 120 Need assistance -0.194268964
## 121    Fun weekend! -0.927836751
## 122     Great work! -0.518683678
## 123 Need assistance -0.240649289
## 124     Great work! -0.743658878
## 125    Team meeting -0.176315426
## 126    Team meeting -0.320228465
## 127  Exciting news! -0.582243779
## 128 Need assistance -0.384110797
## 129  Exciting news! -0.415822029
## 130     Great work! -0.970631612
## 131    Team meeting -0.823923888
## 132 Need assistance -0.611636332
## 133  Exciting news! -0.388513986
## 134    Fun weekend! -0.049394990
## 135    Team meeting -0.143542713
## 136    Team meeting -0.385177557
## 137 Need assistance -0.438415068
## 138    Team meeting -0.549432104
## 139     Great work! -0.769964864
## 140    Fun weekend! -0.103599444
## 141 Hello everyone! -0.321912185
## 142     Great work! -0.150377708
## 143 Need assistance -0.639425840
## 144    Team meeting -0.801527123
## 145    Team meeting -0.134665603
## 146  Exciting news! -0.525143623
## 147    Fun weekend! -0.417790642
## 148     Great work! -0.410223121
## 149  Exciting news! -0.302134784
## 150    Team meeting -0.249497572
## 151     Great work! -0.488912587
## 152    Team meeting -0.271451744
## 153  Exciting news! -0.007040349
## 154 Hello everyone! -0.893453151
## 155    Team meeting -0.670432338
## 156 Need assistance -0.345415825
## 157    Fun weekend! -0.848228461
## 158    Fun weekend! -0.143456620
## 159  Exciting news! -0.195798854
## 160    Fun weekend! -0.358376735
## 161  Exciting news! -0.930242309
## 162 Hello everyone! -0.598425182
## 163  Exciting news! -0.875286373
## 164     Great work! -0.643276188
## 165  Exciting news! -0.452694423
## 166 Need assistance -0.754348847
```

```
## 167 Need assistance -0.829999507
## 168     Fun weekend! -0.877705400
## 169    Team meeting -0.111247493
## 170      Great work! -0.317266905
## 171     Fun weekend! -0.415885320
## 172  Exciting news! -0.537696546
## 173 Need assistance -0.130674560
## 174 Need assistance -0.375053814
## 175  Exciting news! -0.978982675
## 176 Need assistance -0.220039924
## 177 Need assistance -0.613432584
## 178      Great work! -0.951084716
## 179 Need assistance -0.920249034
## 180  Exciting news! -0.209318373
## 181 Need assistance -0.806338225
## 182  Exciting news! -0.597888714
## 183  Exciting news! -0.122806889
## 184    Team meeting -0.976236885
## 185  Exciting news! -0.858994203
## 186     Fun weekend! -0.926554946
## 187    Team meeting -0.718652172
## 188     Fun weekend! -0.928850479
## 189  Exciting news! -0.298691060
## 190      Great work! -0.900102365
## 191     Fun weekend! -0.371842024
## 192    Team meeting -0.012694929
## 193     Fun weekend! -0.357268680
## 194     Fun weekend! -0.566594298
## 195    Team meeting -0.284638313
## 196    Team meeting -0.150205611
## 197 Need assistance -0.904224418
## 198  Exciting news! -0.901918261
## 199     Fun weekend! -0.259928443
## 200      Great work! -0.545365768
## 201 Need assistance -0.104900640
## 202     Fun weekend! -0.818538250
## 203      Great work! -0.349391197
## 204  Exciting news! -0.212464974
## 205 Need assistance -0.543064435
## 206     Fun weekend! -0.286604216
## 207 Hello everyone! -0.038818533
## 208      Great work! -0.574539005
## 209  Exciting news! -0.762122771
## 210    Team meeting -0.956999032
## 211  Exciting news! -0.050068120
## 212 Hello everyone! -0.355751095
## 213 Need assistance -0.998774239
## 214    Team meeting -0.970338997
## 215  Exciting news! -0.033773244
## 216    Team meeting -0.476500273
## 217  Exciting news! -0.719712700
## 218 Need assistance -0.064178423
## 219 Hello everyone! -0.567197050
## 220 Hello everyone! -0.510870771
## 221 Hello everyone! -0.939573104
## 222 Need assistance -0.014521594
```

```
## 223    Team meeting -0.287118956
## 224 Need assistance -0.883181106
## 225 Hello everyone! -0.863882122
## 226    Great work! -0.641657173
## 227  Exciting news! -0.847681918
## 228    Team meeting -0.094959955
## 229    Team meeting -0.024243061
## 230 Need assistance -0.750471560
## 231 Hello everyone! -0.526591262
## 232    Fun weekend! -0.345988781
## 233    Great work! -0.784876938
## 234    Great work! -0.947211589
## 235    Team meeting -0.235653992
## 236 Hello everyone! -0.426096413
## 237 Hello everyone! -0.774547359
## 238    Team meeting -0.674190784
## 239    Team meeting -0.993759494
## 240    Team meeting -0.536957865
## 241 Need assistance -0.718395420
## 242    Great work! -0.400677142
## 243    Team meeting -0.232014328
## 244 Hello everyone! -0.918783627
## 245    Fun weekend! -0.375794835
## 246    Fun weekend! -0.021554315
## 247    Team meeting -0.423585835
## 248  Exciting news! -0.184577833
## 249    Fun weekend! -0.624432764
## 250    Fun weekend! -0.173903828
## 251 Hello everyone! -0.029610693
## 252  Exciting news! -0.616928389
## 253    Great work! -0.359934055
## 254  Exciting news! -0.615862965
## 255    Great work! -0.049498704
## 256    Fun weekend! -0.111042333
## 257    Team meeting -0.943049938
## 258    Great work! -0.336303487
## 259    Team meeting -0.642315470
## 260 Need assistance -0.236316590
## 261 Need assistance -0.249764988
## 262 Hello everyone! -0.161284721
## 263    Great work! -0.956337988
## 264    Fun weekend! -0.673607849
## 265 Need assistance -0.775436828
## 266    Team meeting -0.134102609
## 267    Fun weekend! -0.436848105
## 268  Exciting news! -0.823877914
## 269    Team meeting -0.299451457
## 270  Exciting news! -0.542942689
## 271    Team meeting -0.118006961
## 272 Need assistance -0.070094255
## 273 Need assistance -0.919222645
## 274  Exciting news! -0.768564025
## 275    Great work! -0.595158034
## 276    Fun weekend! -0.064443091
## 277 Hello everyone! -0.605858998
## 278    Great work! -0.823533585
```

```
## 279    Fun weekend! -0.485003887
## 280 Need assistance -0.438784983
## 281    Fun weekend! -0.495438306
## 282 Hello everyone! -0.143556185
## 283    Fun weekend! -0.735883705
## 284  Exciting news! -0.024743940
## 285    Fun weekend! -0.797102704
## 286    Team meeting -0.365139902
## 287 Need assistance -0.264464825
## 288 Need assistance -0.461871512
## 289 Need assistance -0.107154121
## 290    Team meeting -0.229243480
## 291 Need assistance -0.035525655
## 292     Great work! -0.405934577
## 293 Hello everyone! -0.606922586
## 294 Hello everyone! -0.172054263
## 295 Hello everyone! -0.987261285
## 296    Fun weekend! -0.672147054
## 297  Exciting news! -0.792284821
## 298     Great work! -0.026141260
## 299    Fun weekend! -0.141636565
## 300    Fun weekend! -0.693275109
## 301 Need assistance -0.115035673
## 302     Great work! -0.068923920
## 303    Team meeting -0.289186294
## 304  Exciting news! -0.633368273
## 305     Great work! -0.725357866
## 306    Team meeting -0.812502595
## 307    Fun weekend! -0.042934414
## 308    Fun weekend! -0.895003283
## 309 Need assistance -0.992002849
## 310    Fun weekend! -0.552409418
## 311    Team meeting -0.780283807
## 312    Fun weekend! -0.835450725
## 313     Great work! -0.236779108
## 314     Great work! -0.495721815
## 315 Hello everyone! -0.446434771
## 316    Team meeting -0.144443278
## 317    Team meeting -0.877922161
## 318 Hello everyone! -0.725457437
## 319    Team meeting -0.232356975
## 320 Need assistance -0.115179492
## 321 Hello everyone! -0.812013249
## 322    Team meeting -0.320194449
## 323  Exciting news! -0.546088908
## 324     Great work! -0.018533767
## 325     Great work! -0.777630202
## 326    Team meeting -0.351081788
## 327 Hello everyone! -0.217646003
## 328    Team meeting -0.203160496
## 329 Need assistance -0.100954488
## 330    Team meeting -0.493501368
## 331  Exciting news! -0.487793705
## 332    Fun weekend! -0.329790550
## 333  Exciting news! -0.149807401
## 334     Great work! -0.022698464
```

```
## 335  Exciting news! -0.283369262
## 336    Team meeting -0.933677876
## 337 Hello everyone! -0.878399170
## 338     Great work! -0.311243319
## 339 Hello everyone! -0.572465386
## 340    Fun weekend! -0.372473280
## 341 Need assistance -0.713639749
## 342     Great work! -0.700269639
## 343  Exciting news! -0.539138246
## 344  Exciting news! -0.054910814
## 345  Exciting news! -0.693217811
## 346 Hello everyone! -0.164491392
## 347 Hello everyone! -0.694118693
## 348     Great work! -0.222633559
## 349     Great work! -0.111933967
## 350     Great work! -0.417041691
## 351     Great work! -0.841218561
## 352 Need assistance -0.173975688
## 353    Fun weekend! -0.102208237
## 354     Great work! -0.505026447
## 355 Need assistance -0.544543609
## 356 Hello everyone! -0.289897254
## 357    Team meeting -0.801572199
## 358  Exciting news! -0.736287751
## 359    Team meeting -0.303564250
## 360 Need assistance -0.281915764
## 361 Need assistance -0.273263505
## 362     Great work! -0.693289580
## 363 Hello everyone! -0.395961934
## 364 Need assistance -0.970480603
## 365    Team meeting -0.113114946
## 366 Hello everyone! -0.666331347
## 367  Exciting news! -0.995861550
## 368     Great work! -0.549234209
## 369 Hello everyone! -0.325806037
## 370  Exciting news! -0.873230109
## 371 Hello everyone! -0.851052538
## 372 Hello everyone! -0.633588556
## 373     Great work! -0.481857921
## 374 Hello everyone! -0.378329881
## 375     Great work! -0.674055766
## 376 Hello everyone! -0.508614742
## 377 Need assistance -0.917325706
## 378 Need assistance -0.600080754
## 379     Great work! -0.539260621
## 380    Team meeting -0.074092148
## 381 Need assistance -0.846264025
## 382 Hello everyone! -0.562214842
## 383 Hello everyone! -0.945477226
## 384 Need assistance -0.329706852
## 385    Team meeting -0.927027794
## 386    Team meeting -0.996662613
## 387     Great work! -0.853163924
## 388    Team meeting -0.887928675
## 389    Team meeting -0.608078998
## 390     Great work! -0.114574431
```

```
## 391 Need assistance -0.065970336
## 392  Exciting news! -0.616592484
## 393     Fun weekend! -0.953222217
## 394 Hello everyone! -0.120084892
## 395 Hello everyone! -0.568787924
## 396    Team meeting -0.641849058
## 397    Fun weekend! -0.530567507
## 398    Fun weekend! -0.998980226
## 399    Team meeting -0.492082868
## 400     Great work! -0.160749977
## 401    Team meeting -0.709024122
## 402 Hello everyone! -0.440484574
## 403    Fun weekend! -0.898072343
## 404 Need assistance -0.161143415
## 405 Hello everyone! -0.040838550
## 406  Exciting news! -0.798021044
## 407     Great work! -0.652119522
## 408  Exciting news! -0.286527871
## 409     Great work! -0.597466531
## 410  Exciting news! -0.113282133
## 411    Fun weekend! -0.520876877
## 412    Team meeting -0.528815492
## 413 Hello everyone! -0.279889458
## 414    Fun weekend! -0.455487390
## 415 Hello everyone! -0.822144668
## 416 Hello everyone! -0.160779689
## 417 Need assistance -0.102778860
## 418    Fun weekend! -0.511013610
## 419    Team meeting -0.879799920
## 420     Great work! -0.387922954
## 421  Exciting news! -0.750027833
## 422 Need assistance -0.614020258
## 423  Exciting news! -0.770805090
## 424 Hello everyone! -0.638266036
## 425 Hello everyone! -0.416070993
## 426     Great work! -0.232635738
## 427 Hello everyone! -0.798660460
## 428     Great work! -0.389785778
## 429 Hello everyone! -0.691606675
## 430 Hello everyone! -0.359136123
## 431     Great work! -0.351176404
## 432     Great work! -0.311684015
## 433    Fun weekend! -0.789119672
## 434    Team meeting -0.472906698
## 435    Team meeting -0.789976987
## 436    Team meeting -0.307752223
## 437     Great work! -0.948017055
## 438 Hello everyone! -0.318016798
## 439    Team meeting -0.893834382
## 440 Need assistance -0.600851388
## 441     Great work! -0.548428072
## 442 Need assistance -0.003094339
## 443    Fun weekend! -0.528116655
## 444     Great work! -0.124954135
## 445 Need assistance -0.198273231
## 446    Fun weekend! -0.240693055
```

```
## 447     Team meeting -0.075425136
## 448     Fun weekend! -0.088887415
## 449     Team meeting -0.939407335
## 450       Great work! -0.666475324
## 451 Hello everyone! -0.936083395
## 452       Great work! -0.389590032
## 453 Hello everyone! -0.555095884
## 454     Team meeting -0.047711935
## 455  Exciting news! -0.618614707
## 456     Fun weekend! -0.412842807
## 457       Great work! -0.251496902
## 458 Need assistance -0.459899545
## 459 Need assistance -0.101536875
## 460  Exciting news! -0.329569053
## 461       Great work! -0.806566573
## 462  Exciting news! -0.249575844
## 463 Hello everyone! -0.064463819
## 464 Hello everyone! -0.357717138
## 465 Need assistance -0.696885624
## 466  Exciting news! -0.662697271
## 467       Great work! -0.704862314
## 468 Need assistance -0.129298556
## 469 Need assistance -0.988749139
## 470 Need assistance -0.044029484
## 471  Exciting news! -0.237763272
## 472     Team meeting -0.666378770
## 473  Exciting news! -0.010767524
## 474     Team meeting -0.712716471
## 475       Great work! -0.839583620
## 476       Great work! -0.887057793
## 477 Need assistance -0.837423526
## 478       Great work! -0.462906254
## 479       Great work! -0.129584252
## 480     Team meeting -0.377541550
## 481     Fun weekend! -0.363247766
## 482 Need assistance -0.716619523
## 483       Great work! -0.071027102
## 484 Hello everyone! -0.360894154
## 485 Need assistance -0.316063035
## 486  Exciting news! -0.531753783
## 487     Team meeting -0.785379849
```

Question-10: Enhancing Engagement Click Me to scroll to top

Apply the mutate command to add a new column to the "comm_data" dataframe, representing a sentiment label: "Positive," "Neutral," or "Negative," based on the sentiment score.

Solution:

```
# Enter code here
comm_data %>%
  mutate(sentiment_label = case_when(sentiment>0 ~ 'Positive',sentiment==0 ~ 'Neutral',sentim
ent<0 ~ 'Negative'))
```

```
## # A tibble: 1,000 × 6
##     date       channel sender        message          sentiment sentiment_label
##     <date>     <chr>   <chr>         <chr>                <dbl> <chr>
##  1 2023-08-11 Twitter dave@example  Fun weekend!         0.824 Positive
##  2 2023-08-11 Email   @bob_tweets   Hello everyone!      0.662 Positive
##  3 2023-08-11 Slack   @frank_chat   Hello everyone!     -0.143 Negative
##  4 2023-08-18 Email   @frank_chat   Fun weekend!         0.380 Positive
##  5 2023-08-14 Slack   @frank_chat   Need assistance      0.188 Positive
##  6 2023-08-04 Email   @erin_tweets  Need assistance     -0.108 Negative
##  7 2023-08-10 Twitter @frank_chat   Hello everyone!     -0.741 Negative
##  8 2023-08-04 Slack   alice@example Hello everyone!     -0.188 Negative
##  9 2023-08-20 Email   dave@example  Team meeting         0.618 Positive
## 10 2023-08-09 Slack   @erin_tweets  Hello everyone!     -0.933 Negative
## # i 990 more rows
```

Question-11: Message Impact Click Me to scroll to top

Create a new dataframe using the mutate and arrange commands that calculates the product of the sentiment score and the length of each message. Arrange the results in descending order.

Solution:

```
# Enter code here
new_data <- data.frame(comm_data %>%
  mutate(sentiment_length=sentiment*nchar(message)) %>%
  arrange(desc(sentiment_length)))

new_data
```

```
##            date channel        sender         message   sentiment
## 1   2023-08-16   Email    @frank_chat Hello everyone!  0.997601895
## 2   2023-08-14   Slack   @erin_tweets Hello everyone!  0.987832270
## 3   2023-08-18   Email   dave@example Hello everyone!  0.978220029
## 4   2023-08-17   Email   dave@example Hello everyone!  0.976894801
## 5   2023-08-07   Slack    carol_slack Hello everyone!  0.973429719
## 6   2023-08-06   Slack   dave@example Hello everyone!  0.968081689
## 7   2023-08-08   Slack    @frank_chat Need assistance  0.963640937
## 8   2023-08-09   Email   @erin_tweets Need assistance  0.953375103
## 9   2023-08-17 Twitter    @frank_chat Hello everyone!  0.951721462
## 10  2023-08-12   Email    carol_slack Need assistance  0.937844194
## 11  2023-08-17   Slack   @erin_tweets Hello everyone!  0.937329018
## 12  2023-08-13   Email    @frank_chat Need assistance  0.935812009
## 13  2023-08-04   Slack    @frank_chat Need assistance  0.933738099
## 14  2023-08-11   Slack   dave@example Need assistance  0.930096855
## 15  2023-08-07   Slack    @frank_chat  Exciting news!  0.993148146
## 16  2023-08-13   Email    carol_slack  Exciting news!  0.991050147
## 17  2023-08-07   Email  alice@example Hello everyone!  0.917979236
## 18  2023-08-07   Slack    @frank_chat Need assistance  0.914976185
## 19  2023-08-06 Twitter    @bob_tweets  Exciting news!  0.979591473
## 20  2023-08-08 Twitter   dave@example Need assistance  0.911442756
## 21  2023-08-06   Email   @erin_tweets Hello everyone!  0.905330024
## 22  2023-08-17 Twitter  alice@example  Exciting news!  0.968932204
## 23  2023-08-03 Twitter   dave@example Hello everyone!  0.902683333
## 24  2023-08-01   Email    @bob_tweets Hello everyone!  0.902623749
## 25  2023-08-09   Slack    carol_slack Hello everyone!  0.902016178
## 26  2023-08-15   Slack  alice@example Need assistance  0.899728119
## 27  2023-08-03   Slack   @erin_tweets Need assistance  0.896539724
## 28  2023-08-07 Twitter    carol_slack Need assistance  0.895823483
## 29  2023-08-17 Twitter    @bob_tweets  Exciting news!  0.953910344
## 30  2023-08-13   Slack    carol_slack Need assistance  0.886342321
## 31  2023-08-11   Slack   dave@example Hello everyone!  0.879992486
## 32  2023-08-07   Slack  alice@example Need assistance  0.877496709
## 33  2023-08-20   Email    @bob_tweets  Exciting news!  0.931368547
## 34  2023-08-14   Email   @erin_tweets Need assistance  0.867801995
## 35  2023-08-12   Email   @erin_tweets Need assistance  0.866607873
## 36  2023-08-16 Twitter  alice@example  Exciting news!  0.927110374
## 37  2023-08-19 Twitter  alice@example Hello everyone!  0.857508211
## 38  2023-08-02   Slack   @erin_tweets  Exciting news!  0.900116188
## 39  2023-08-10   Email   dave@example Need assistance  0.834841503
## 40  2023-08-02 Twitter   @erin_tweets Need assistance  0.821079701
## 41  2023-08-12 Twitter  alice@example  Exciting news!  0.874988238
## 42  2023-08-10 Twitter    carol_slack Need assistance  0.809991531
## 43  2023-08-11 Twitter    @frank_chat Hello everyone!  0.807257727
## 44  2023-08-16 Twitter   @erin_tweets Hello everyone!  0.806540163
## 45  2023-08-02   Slack    carol_slack Hello everyone!  0.805289558
## 46  2023-08-01   Slack    carol_slack Hello everyone!  0.802523659
## 47  2023-08-03   Email    @frank_chat    Fun weekend!  0.992682932
## 48  2023-08-12   Slack    @bob_tweets    Fun weekend!  0.990166281
## 49  2023-08-13 Twitter   dave@example    Fun weekend!  0.986894567
## 50  2023-08-20   Email   dave@example    Team meeting  0.985037738
## 51  2023-08-15 Twitter   @erin_tweets Need assistance  0.787741330
## 52  2023-08-18 Twitter  alice@example    Fun weekend!  0.977650215
## 53  2023-08-15   Email   dave@example Need assistance  0.773382573
## 54  2023-08-02 Twitter  alice@example    Team meeting  0.964958043
```

```
## 55   2023-08-15 Twitter   @erin_tweets Hello everyone!  0.768580468
## 56   2023-08-19   Email   dave@example  Exciting news!  0.821827833
## 57   2023-08-10   Slack    @bob_tweets    Fun weekend!  0.957983019
## 58   2023-08-09 Twitter alice@example Hello everyone!  0.762754925
## 59   2023-08-02 Twitter   dave@example  Exciting news!  0.817105632
## 60   2023-08-19 Twitter   @erin_tweets    Team meeting  0.945942261
## 61   2023-08-13 Twitter alice@example Hello everyone!  0.752351641
## 62   2023-08-07   Slack   dave@example Hello everyone!  0.747580624
## 63   2023-08-03 Twitter alice@example Need assistance  0.747163485
## 64   2023-08-06   Slack    @frank_chat Need assistance  0.746888391
## 65   2023-08-17   Email    @frank_chat    Team meeting  0.932789830
## 66   2023-08-06   Slack    @bob_tweets Need assistance  0.743181323
## 67   2023-08-04 Twitter   @frank_chat  Exciting news!  0.795437461
## 68   2023-08-08   Slack    @bob_tweets Hello everyone!  0.740663246
## 69   2023-08-03   Email   @erin_tweets    Fun weekend!  0.924321534
## 70   2023-08-14 Twitter   carol_slack Need assistance  0.739025190
## 71   2023-08-11   Slack    carol_slack    Team meeting  0.921573296
## 72   2023-08-07   Email    carol_slack  Exciting news!  0.785684678
## 73   2023-08-18 Twitter   @frank_chat  Exciting news!  0.784590872
## 74   2023-08-20   Email    carol_slack    Team meeting  0.909817838
## 75   2023-08-12   Email    @frank_chat  Exciting news!  0.777389107
## 76   2023-08-05   Email    @bob_tweets Hello everyone!  0.725036937
## 77   2023-08-07   Email alice@example  Exciting news!  0.773558143
## 78   2023-08-13 Twitter   carol_slack  Exciting news!  0.771407587
## 79   2023-08-10   Slack    @frank_chat  Exciting news!  0.769946682
## 80   2023-08-09   Email alice@example    Fun weekend!  0.893210486
## 81   2023-08-19   Email    carol_slack    Fun weekend!  0.892766985
## 82   2023-08-02   Email   dave@example    Great work!  0.973676749
## 83   2023-08-13 Twitter alice@example    Team meeting  0.892404643
## 84   2023-08-03   Email alice@example Hello everyone!  0.713812393
## 85   2023-08-06   Slack alice@example Hello everyone!  0.710270591
## 86   2023-08-15   Slack    @frank_chat    Great work!  0.960373470
## 87   2023-08-14 Twitter   @bob_tweets  Exciting news!  0.754322437
## 88   2023-08-09   Email    @bob_tweets Hello everyone!  0.703965933
## 89   2023-08-02 Twitter   @erin_tweets  Exciting news!  0.750492542
## 90   2023-08-11   Email    @frank_chat    Fun weekend!  0.874191639
## 91   2023-08-08 Twitter alice@example    Team meeting  0.870818266
## 92   2023-08-05   Email alice@example Need assistance  0.694902051
## 93   2023-08-18 Twitter   @bob_tweets    Fun weekend!  0.866654206
## 94   2023-08-04   Slack    @bob_tweets    Fun weekend!  0.866016825
## 95   2023-08-04   Slack    @frank_chat Need assistance  0.691338675
## 96   2023-08-17   Email   @erin_tweets    Team meeting  0.863822790
## 97   2023-08-10   Slack   @erin_tweets    Team meeting  0.862134462
## 98   2023-08-04   Email   @erin_tweets Need assistance  0.689327837
## 99   2023-08-07   Slack    carol_slack    Great work!  0.937586371
## 100  2023-08-16   Email alice@example    Team meeting  0.858062949
## 101  2023-08-19   Email    @bob_tweets    Team meeting  0.855612874
## 102  2023-08-15 Twitter   @bob_tweets    Team meeting  0.853966497
## 103  2023-08-20   Email alice@example    Fun weekend!  0.851679420
## 104  2023-08-08   Slack   @erin_tweets    Team meeting  0.849549761
## 105  2023-08-19   Slack    @bob_tweets Hello everyone!  0.679174718
## 106  2023-08-10   Email    @bob_tweets    Great work!  0.924440826
## 107  2023-08-01 Twitter alice@example Need assistance  0.676776995
## 108  2023-08-07   Slack alice@example    Fun weekend!  0.844455994
## 109  2023-08-13   Slack    carol_slack Hello everyone!  0.675182751
## 110  2023-08-08   Email alice@example  Exciting news!  0.723251828
```

```
## 111  2023-08-15    Slack   carol_slack Need assistance  0.674294885
## 112  2023-08-05 Twitter alice@example  Exciting news!   0.722319741
## 113  2023-08-10    Slack   @frank_chat Hello everyone!   0.672468295
## 114  2023-08-02    Email dave@example  Exciting news!   0.717076284
## 115  2023-08-16    Slack alice@example Need assistance  0.669039086
## 116  2023-08-11 Twitter   carol_slack     Great work!   0.910158344
## 117  2023-08-09    Slack alice@example Need assistance  0.665302936
## 118  2023-08-06    Email  @erin_tweets Need assistance  0.664381829
## 119  2023-08-11    Email   @bob_tweets Hello everyone!   0.662486946
## 120  2023-08-09    Slack  dave@example Need assistance  0.662048494
## 121  2023-08-17    Email   @bob_tweets    Fun weekend!   0.825692308
## 122  2023-08-05 Twitter alice@example    Team meeting   0.824948560
## 123  2023-08-11 Twitter  dave@example    Fun weekend!   0.824099663
## 124  2023-08-02    Slack alice@example    Fun weekend!   0.823352248
## 125  2023-08-06    Email   @frank_chat    Team meeting   0.819675826
## 126  2023-08-18 Twitter   @frank_chat    Team meeting   0.818109252
## 127  2023-08-14    Email  @erin_tweets     Great work!   0.891589128
## 128  2023-08-15    Slack   @frank_chat    Fun weekend!   0.816346027
## 129  2023-08-16 Twitter alice@example  Exciting news!   0.696509592
## 130  2023-08-06    Email   @frank_chat  Exciting news!   0.696377364
## 131  2023-08-09 Twitter   @frank_chat Hello everyone!   0.649366590
## 132  2023-08-03    Slack   @bob_tweets     Great work!   0.884830707
## 133  2023-08-12    Slack   carol_slack     Great work!   0.874556832
## 134  2023-08-20 Twitter   carol_slack Hello everyone!   0.640248996
## 135  2023-08-07    Slack   @bob_tweets     Great work!   0.872962321
## 136  2023-08-20    Slack alice@example  Exciting news!   0.685212519
## 137  2023-08-16 Twitter  dave@example    Team meeting   0.796688539
## 138  2023-08-04    Slack  dave@example    Fun weekend!   0.796501584
## 139  2023-08-14 Twitter  dave@example     Great work!   0.866824818
## 140  2023-08-10    Email  @erin_tweets  Exciting news!   0.679597112
## 141  2023-08-06    Email   @frank_chat    Fun weekend!   0.791513952
## 142  2023-08-14 Twitter   @bob_tweets  Exciting news!   0.671785708
## 143  2023-08-01    Email   @bob_tweets    Team meeting   0.783531986
## 144  2023-08-10    Slack   @frank_chat Need assistance  0.626154714
## 145  2023-08-05 Twitter  dave@example    Team meeting   0.779166287
## 146  2023-08-08    Email   @frank_chat    Team meeting   0.778342899
## 147  2023-08-10    Email   @bob_tweets  Exciting news!   0.664575256
## 148  2023-08-17 Twitter  dave@example    Fun weekend!   0.775130778
## 149  2023-08-12    Email alice@example    Team meeting   0.774573303
## 150  2023-08-05    Email   @bob_tweets Hello everyone!   0.616259416
## 151  2023-08-05    Email  @erin_tweets     Great work!   0.830162693
## 152  2023-08-16 Twitter  dave@example     Great work!   0.827052074
## 153  2023-08-01    Email   carol_slack    Fun weekend!   0.757286296
## 154  2023-08-14    Slack  @erin_tweets Hello everyone!   0.605556316
## 155  2023-08-01    Slack   @frank_chat Need assistance  0.601800072
## 156  2023-08-05 Twitter   @frank_chat Hello everyone!   0.599585856
## 157  2023-08-15 Twitter  @erin_tweets Need assistance  0.599532404
## 158  2023-08-01 Twitter   @frank_chat Need assistance  0.599045397
## 159  2023-08-20    Slack  dave@example     Great work!   0.814900840
## 160  2023-08-09    Email dave@example    Team meeting   0.746085706
## 161  2023-08-13    Email alice@example Need assistance  0.596431601
## 162  2023-08-19 Twitter  @erin_tweets  Exciting news!   0.638825124
## 163  2023-08-07    Slack  dave@example Hello everyone!   0.593321668
## 164  2023-08-08    Slack  @erin_tweets Need assistance  0.593302410
## 165  2023-08-07 Twitter   carol_slack     Great work!   0.805481421
## 166  2023-08-10    Slack alice@example     Great work!   0.804542714
```

```
## 167  2023-08-08   Email   @erin_tweets    Fun weekend!  0.734125260
## 168  2023-08-15  Twitter  alice@example     Great work!  0.798867194
## 169  2023-08-03   Email    @frank_chat Hello everyone!  0.583445542
## 170  2023-08-17  Twitter  alice@example Hello everyone!  0.582868762
## 171  2023-08-20   Slack   dave@example   Exciting news!  0.617734990
## 172  2023-08-11   Email    @bob_tweets Hello everyone!  0.576369455
## 173  2023-08-03   Email   dave@example Hello everyone!  0.575844854
## 174  2023-08-08  Twitter    carol_slack  Exciting news!  0.614791796
## 175  2023-08-11  Twitter    carol_slack     Great work!  0.782265475
## 176  2023-08-06   Slack     carol_slack Need assistance  0.572155187
## 177  2023-08-05  Twitter    carol_slack    Fun weekend!  0.706561523
## 178  2023-08-09  Twitter    @bob_tweets  Exciting news!  0.605349668
## 179  2023-08-12  Twitter    carol_slack    Team meeting  0.704733795
## 180  2023-08-06   Email    carol_slack     Great work!  0.766328182
## 181  2023-08-05   Email    carol_slack Need assistance  0.558824511
## 182  2023-08-09   Email   dave@example    Fun weekend!  0.698494015
## 183  2023-08-14   Email    carol_slack  Exciting news!  0.596924395
## 184  2023-08-09   Slack  alice@example    Fun weekend!  0.690391378
## 185  2023-08-03   Slack    @frank_chat  Exciting news!  0.591279314
## 186  2023-08-10   Slack   dave@example     Great work!  0.746216161
## 187  2023-08-12   Email    @frank_chat Need assistance  0.544408341
## 188  2023-08-02  Twitter   @erin_tweets  Exciting news!  0.581556937
## 189  2023-08-08   Email    carol_slack    Fun weekend!  0.670605208
## 190  2023-08-10   Email    @frank_chat Hello everyone!  0.535708998
## 191  2023-08-04   Slack  alice@example Need assistance  0.534302738
## 192  2023-08-12  Twitter  alice@example Hello everyone!  0.532433989
## 193  2023-08-01  Twitter  dave@example Hello everyone!  0.530999278
## 194  2023-08-03  Twitter  alice@example Hello everyone!  0.530733542
## 195  2023-08-05   Email    @frank_chat  Exciting news!  0.567230823
## 196  2023-08-16   Slack    carol_slack Hello everyone!  0.529127310
## 197  2023-08-20  Twitter    @frank_chat    Team meeting  0.659773430
## 198  2023-08-12   Slack   dave@example  Exciting news!  0.563268560
## 199  2023-08-01  Twitter   @erin_tweets Hello everyone!  0.524320859
## 200  2023-08-08   Email    carol_slack     Great work!  0.710615378
## 201  2023-08-20   Slack    @bob_tweets Hello everyone!  0.520647362
## 202  2023-08-12   Email   dave@example    Fun weekend!  0.650773503
## 203  2023-08-17   Email   @erin_tweets     Great work!  0.709753431
## 204  2023-08-12  Twitter   @erin_tweets    Team meeting  0.650313874
## 205  2023-08-05   Slack   @erin_tweets Need assistance  0.519475343
## 206  2023-08-13   Email    @bob_tweets  Exciting news!  0.553149406
## 207  2023-08-05   Email   @erin_tweets  Exciting news!  0.549038415
## 208  2023-08-10   Email  alice@example     Great work!  0.693037350
## 209  2023-08-11  Twitter    @frank_chat    Team meeting  0.629940747
## 210  2023-08-20   Email    carol_slack     Great work!  0.680826971
## 211  2023-08-14   Email    @bob_tweets Hello everyone!  0.498191035
## 212  2023-08-10   Slack   dave@example  Exciting news!  0.532747218
## 213  2023-08-03   Slack    @bob_tweets Need assistance  0.496275815
## 214  2023-08-03   Slack   dave@example     Great work!  0.675534202
## 215  2023-08-05  Twitter   @erin_tweets    Fun weekend!  0.619198539
## 216  2023-08-20   Email   dave@example    Team meeting  0.617879979
## 217  2023-08-08   Email  alice@example  Exciting news!  0.529548995
## 218  2023-08-06   Email   dave@example Need assistance  0.492307736
## 219  2023-08-14   Slack   dave@example Hello everyone!  0.491653796
## 220  2023-08-05   Email    @frank_chat    Team meeting  0.611721705
## 221  2023-08-03   Email    @frank_chat Hello everyone!  0.488557915
## 222  2023-08-19   Slack    @bob_tweets Hello everyone!  0.487545231
```

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## 223  2023-08-12   Slack   carol_slack     Fun weekend!  0.608656868
## 224  2023-08-16   Slack   dave@example  Need assistance  0.484403751
## 225  2023-08-20   Slack   @erin_tweets    Fun weekend!  0.604609676
## 226  2023-08-20 Twitter  alice@example Hello everyone!  0.482187657
## 227  2023-08-19 Twitter   @frank_chat  Need assistance  0.481529109
## 228  2023-08-17   Slack  alice@example     Great work!  0.652192219
## 229  2023-08-03 Twitter   carol_slack     Great work!  0.646422371
## 230  2023-08-18 Twitter   @bob_tweets     Fun weekend!  0.590919483
## 231  2023-08-07   Email   @bob_tweets     Great work!  0.642848774
## 232  2023-08-19   Slack  alice@example  Exciting news!  0.502961815
## 233  2023-08-12 Twitter  alice@example   Team meeting  0.582250814
## 234  2023-08-18   Email   @bob_tweets  Exciting news!  0.497974098
## 235  2023-08-19 Twitter   carol_slack    Team meeting  0.578111817
## 236  2023-08-07   Slack  alice@example    Team meeting  0.569526526
## 237  2023-08-12   Slack  alice@example Need assistance  0.454688824
## 238  2023-08-14 Twitter   @bob_tweets     Fun weekend!  0.567614020
## 239  2023-08-18   Slack   @bob_tweets     Fun weekend!  0.567603516
## 240  2023-08-18   Email   @bob_tweets  Need assistance  0.453627230
## 241  2023-08-02 Twitter   carol_slack Hello everyone!  0.450987421
## 242  2023-08-14   Slack   @bob_tweets Hello everyone!  0.450289166
## 243  2023-08-20   Email   @frank_chat    Team meeting  0.560076173
## 244  2023-08-16   Slack  alice@example Need assistance  0.445466304
## 245  2023-08-20   Slack   @frank_chat     Great work!  0.606102686
## 246  2023-08-01   Email   carol_slack     Great work!  0.605523043
## 247  2023-08-13   Slack   carol_slack  Exciting news!  0.474910577
## 248  2023-08-05   Email   carol_slack  Exciting news!  0.468174768
## 249  2023-08-07 Twitter  dave@example  Exciting news!  0.466239469
## 250  2023-08-09   Slack   @erin_tweets    Fun weekend!  0.542777083
## 251  2023-08-13   Email  alice@example Hello everyone!  0.433930994
## 252  2023-08-03   Slack  alice@example    Fun weekend!  0.542070733
## 253  2023-08-16   Slack  dave@example  Exciting news!  0.461496073
## 254  2023-08-15   Email   @frank_chat     Fun weekend!  0.535877908
## 255  2023-08-07   Slack  alice@example     Great work!  0.580541194
## 256  2023-08-09 Twitter   @bob_tweets    Team meeting  0.526457346
## 257  2023-08-19 Twitter   @bob_tweets Hello everyone!  0.420571170
## 258  2023-08-09   Slack   @erin_tweets    Fun weekend!  0.525517232
## 259  2023-08-19   Email   @erin_tweets     Great work!  0.570171806
## 260  2023-08-12   Slack   @frank_chat     Fun weekend!  0.519153008
## 261  2023-08-15   Email   carol_slack Need assistance  0.414960733
## 262  2023-08-13   Slack   @frank_chat  Exciting news!  0.443950114
## 263  2023-08-08 Twitter   @bob_tweets     Great work!  0.564973874
## 264  2023-08-09   Email   @erin_tweets    Fun weekend!  0.513564137
## 265  2023-08-13 Twitter   @bob_tweets  Need assistance  0.408644735
## 266  2023-08-08 Twitter  alice@example     Great work!  0.552484959
## 267  2023-08-13   Email  dave@example     Great work!  0.550955762
## 268  2023-08-12   Slack   carol_slack    Team meeting  0.504667453
## 269  2023-08-03 Twitter   @bob_tweets Hello everyone!  0.401231622
## 270  2023-08-09   Slack   @bob_tweets    Team meeting  0.500293179
## 271  2023-08-14 Twitter   @frank_chat    Team meeting  0.499737595
## 272  2023-08-05 Twitter  dave@example     Great work!  0.544805384
## 273  2023-08-20 Twitter   carol_slack     Great work!  0.544291852
## 274  2023-08-15 Twitter   carol_slack    Team meeting  0.498292263
## 275  2023-08-13   Email   @erin_tweets    Fun weekend!  0.496487776
## 276  2023-08-01 Twitter   @erin_tweets  Exciting news!  0.423581860
## 277  2023-08-15   Slack   @bob_tweets  Exciting news!  0.423514269
## 278  2023-08-14   Slack  dave@example     Great work!  0.538406652
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## 279   2023-08-18    Email alice@example   Exciting news!  0.422912350
## 280   2023-08-10    Email    @frank_chat      Great work!  0.533465849
## 281   2023-08-08 Twitter    @frank_chat      Fun weekend!  0.484796492
## 282   2023-08-14 Twitter alice@example   Exciting news!  0.415267176
## 283   2023-08-15    Email    @frank_chat Need assistance  0.385732211
## 284   2023-08-15 Twitter    @frank_chat Hello everyone!  0.384222084
## 285   2023-08-19 Twitter    @bob_tweets      Great work!  0.521462946
## 286   2023-08-14 Twitter dave@example      Fun weekend!  0.474564350
## 287   2023-08-02 Twitter dave@example      Great work!  0.516138048
## 288   2023-08-13 Twitter   @erin_tweets      Great work!  0.515643027
## 289   2023-08-15 Twitter dave@example      Fun weekend!  0.469535301
## 290   2023-08-19    Email alice@example   Exciting news!  0.401543677
## 291   2023-08-11    Email dave@example      Great work!  0.509797142
## 292   2023-08-15 Twitter    @bob_tweets Need assistance  0.373691486
## 293   2023-08-04 Twitter dave@example      Fun weekend!  0.463157478
## 294   2023-08-03    Slack    @frank_chat Hello everyone!  0.368215033
## 295   2023-08-15    Slack   @erin_tweets     Team meeting  0.457860831
## 296   2023-08-19 Twitter    @frank_chat   Exciting news!  0.388266448
## 297   2023-08-05    Email    carol_slack      Fun weekend!  0.451752027
## 298   2023-08-14    Email    carol_slack      Fun weekend!  0.446355308
## 299   2023-08-13    Slack alice@example      Great work!  0.480868685
## 300   2023-08-12    Email dave@example      Great work!  0.480317921
## 301   2023-08-16    Slack dave@example      Fun weekend!  0.438361928
## 302   2023-08-01 Twitter    @frank_chat      Great work!  0.473425272
## 303   2023-08-07    Slack    @bob_tweets   Exciting news!  0.370947586
## 304   2023-08-09    Slack    carol_slack Hello everyone!  0.346090994
## 305   2023-08-05    Slack    carol_slack      Great work!  0.470731148
## 306   2023-08-15 Twitter    @frank_chat Need assistance  0.344264537
## 307   2023-08-16    Email    @frank_chat Need assistance  0.343977793
## 308   2023-08-14 Twitter   @erin_tweets      Great work!  0.468599080
## 309   2023-08-13 Twitter    @frank_chat   Exciting news!  0.368110256
## 310   2023-08-15    Email    @bob_tweets      Great work!  0.468266435
## 311   2023-08-02    Slack    @bob_tweets   Exciting news!  0.365244868
## 312   2023-08-10    Slack alice@example     Team meeting  0.425960287
## 313   2023-08-19    Email    @frank_chat      Great work!  0.463513046
## 314   2023-08-13    Slack    carol_slack      Great work!  0.460303653
## 315   2023-08-17    Email dave@example      Fun weekend!  0.420022254
## 316   2023-08-04    Email    @bob_tweets      Fun weekend!  0.419715998
## 317   2023-08-13    Email   @erin_tweets      Fun weekend!  0.418006041
## 318   2023-08-14    Email    @bob_tweets Need assistance  0.330107941
## 319   2023-08-01    Slack alice@example   Exciting news!  0.350437745
## 320   2023-08-18    Slack    @bob_tweets     Team meeting  0.403409261
## 321   2023-08-16    Email    @frank_chat      Fun weekend!  0.402509230
## 322   2023-08-15 Twitter dave@example      Great work!  0.435108419
## 323   2023-08-07    Slack alice@example      Fun weekend!  0.397376804
## 324   2023-08-09 Twitter alice@example      Great work!  0.432502551
## 325   2023-08-11    Slack    @frank_chat      Great work!  0.431652104
## 326   2023-08-06 Twitter    carol_slack      Fun weekend!  0.394200163
## 327   2023-08-14    Slack   @erin_tweets   Exciting news!  0.336964048
## 328   2023-08-07    Email    @frank_chat      Fun weekend!  0.387379609
## 329   2023-08-10 Twitter   @erin_tweets     Team meeting  0.384202328
## 330   2023-08-18    Email    @frank_chat      Fun weekend!  0.380196611
## 331   2023-08-08    Email   @erin_tweets      Fun weekend!  0.378708432
## 332   2023-08-19    Email dave@example   Exciting news!  0.324592507
## 333   2023-08-05    Email    carol_slack Need assistance  0.300882405
## 334   2023-08-17 Twitter   @erin_tweets Hello everyone!  0.299843722
```

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## 335  2023-08-16   Slack alice@example  Exciting news! 0.320830711
## 336  2023-08-12 Twitter  @erin_tweets Need assistance 0.298994374
## 337  2023-08-12 Twitter   carol_slack     Great work! 0.407506729
## 338  2023-08-01 Twitter   carol_slack     Great work! 0.406890230
## 339  2023-08-17 Twitter   @bob_tweets     Great work! 0.401612313
## 340  2023-08-05 Twitter   carol_slack    Team meeting 0.364639959
## 341  2023-08-05   Slack   @bob_tweets Need assistance 0.291605130
## 342  2023-08-20 Twitter alice@example  Exciting news! 0.310656996
## 343  2023-08-04   Email alice@example  Exciting news! 0.308247630
## 344  2023-08-20 Twitter   @frank_chat  Exciting news! 0.307898677
## 345  2023-08-16   Email   @frank_chat  Exciting news! 0.305391626
## 346  2023-08-11   Email   carol_slack    Fun weekend! 0.355941510
## 347  2023-08-18   Slack  @erin_tweets    Team meeting 0.353438236
## 348  2023-08-15   Email   dave@example Hello everyone! 0.282330315
## 349  2023-08-12   Email alice@example     Great work! 0.383860287
## 350  2023-08-10   Slack   @bob_tweets Need assistance 0.279333149
## 351  2023-08-12 Twitter   dave@example Hello everyone! 0.278570379
## 352  2023-08-05   Email alice@example    Fun weekend! 0.347548683
## 353  2023-08-10 Twitter   @bob_tweets    Fun weekend! 0.346377916
## 354  2023-08-15 Twitter   dave@example    Fun weekend! 0.345517721
## 355  2023-08-18   Email alice@example Need assistance 0.275121063
## 356  2023-08-18   Email   carol_slack    Team meeting 0.343653605
## 357  2023-08-20 Twitter  @erin_tweets    Team meeting 0.341763970
## 358  2023-08-18 Twitter   @bob_tweets  Exciting news! 0.290797958
## 359  2023-08-08   Email   @frank_chat     Great work! 0.362224979
## 360  2023-08-16   Email alice@example     Great work! 0.360768258
## 361  2023-08-13   Email   @bob_tweets Hello everyone! 0.264306294
## 362  2023-08-07   Email   dave@example    Team meeting 0.327507946
## 363  2023-08-10 Twitter  @erin_tweets  Exciting news! 0.275836162
## 364  2023-08-14 Twitter alice@example     Great work! 0.346799491
## 365  2023-08-19 Twitter   carol_slack    Team meeting 0.317846402
## 366  2023-08-07   Slack   @bob_tweets Need assistance 0.251102221
## 367  2023-08-14 Twitter   @bob_tweets Hello everyone! 0.250149151
## 368  2023-08-03   Email alice@example    Fun weekend! 0.312383833
## 369  2023-08-11   Slack   @frank_chat    Fun weekend! 0.312006338
## 370  2023-08-03   Email   carol_slack Need assistance 0.247236022
## 371  2023-08-14   Email   dave@example    Fun weekend! 0.304697359
## 372  2023-08-11 Twitter   @bob_tweets  Exciting news! 0.260118117
## 373  2023-08-11   Slack   @frank_chat Need assistance 0.235724795
## 374  2023-08-07   Email   @bob_tweets  Exciting news! 0.244900235
## 375  2023-08-16   Email   carol_slack     Great work! 0.306993762
## 376  2023-08-20 Twitter alice@example    Fun weekend! 0.280627117
## 377  2023-08-08 Twitter alice@example Hello everyone! 0.223401716
## 378  2023-08-19   Email alice@example     Great work! 0.301563812
## 379  2023-08-15   Slack alice@example    Fun weekend! 0.271711212
## 380  2023-08-02 Twitter   carol_slack Need assistance 0.215954025
## 381  2023-08-16   Slack   @frank_chat    Fun weekend! 0.269629325
## 382  2023-08-09   Slack  @erin_tweets    Team meeting 0.268132484
## 383  2023-08-12 Twitter   @bob_tweets    Team meeting 0.265132846
## 384  2023-08-18 Twitter   carol_slack  Exciting news! 0.222249684
## 385  2023-08-10 Twitter  @erin_tweets     Great work! 0.282790715
## 386  2023-08-19 Twitter   @frank_chat  Exciting news! 0.221380584
## 387  2023-08-20   Slack   carol_slack  Exciting news! 0.221250645
## 388  2023-08-12   Email alice@example    Team meeting 0.255163795
## 389  2023-08-10   Email   @bob_tweets    Team meeting 0.253805156
## 390  2023-08-10 Twitter   carol_slack     Great work! 0.268422757
```

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## 391  2023-08-10 Twitter alice@example    Great work! 0.266619468
## 392  2023-08-05    Email   @bob_tweets   Team meeting 0.243233590
## 393  2023-08-04    Email   @frank_chat    Great work! 0.263225980
## 394  2023-08-09    Email  @erin_tweets   Fun weekend! 0.237909144
## 395  2023-08-20 Twitter   @bob_tweets   Fun weekend! 0.236553716
## 396  2023-08-04    Email   carol_slack Need assistance 0.188933107
## 397  2023-08-14    Slack   @frank_chat Need assistance 0.187954018
## 398  2023-08-18    Email alice@example   Fun weekend! 0.233402089
## 399  2023-08-08 Twitter   carol_slack   Fun weekend! 0.232626481
## 400  2023-08-20    Slack   carol_slack   Fun weekend! 0.231915887
## 401  2023-08-09 Twitter alice@example Hello everyone! 0.184942272
## 402  2023-08-09    Slack  dave@example   Fun weekend! 0.229193896
## 403  2023-08-12 Twitter   @bob_tweets   Fun weekend! 0.226440192
## 404  2023-08-12    Slack alice@example   Fun weekend! 0.226010282
## 405  2023-08-05 Twitter  dave@example    Great work! 0.245927144
## 406  2023-08-19    Email   @frank_chat Hello everyone! 0.179850068
## 407  2023-08-01    Slack  @erin_tweets    Great work! 0.244422906
## 408  2023-08-07    Slack   carol_slack Exciting news! 0.186763622
## 409  2023-08-02 Twitter   carol_slack Hello everyone! 0.173851238
## 410  2023-08-18    Email  @erin_tweets Need assistance 0.171319252
## 411  2023-08-08    Email   carol_slack   Team meeting 0.213498762
## 412  2023-08-02 Twitter alice@example    Team meeting 0.210089974
## 413  2023-08-04    Slack   @frank_chat Need assistance 0.165087673
## 414  2023-08-08    Email alice@example    Great work! 0.222402995
## 415  2023-08-01    Email  @erin_tweets   Fun weekend! 0.203746784
## 416  2023-08-04    Email alice@example Hello everyone! 0.161035733
## 417  2023-08-06    Email   @bob_tweets   Fun weekend! 0.201027735
## 418  2023-08-02 Twitter alice@example Need assistance 0.157653404
## 419  2023-08-10 Twitter   @frank_chat    Great work! 0.214199054
## 420  2023-08-18    Slack   @bob_tweets   Team meeting 0.192284770
## 421  2023-08-07    Email   @frank_chat   Team meeting 0.192018484
## 422  2023-08-08 Twitter  @erin_tweets   Fun weekend! 0.191519982
## 423  2023-08-07    Slack   carol_slack   Team meeting 0.190247875
## 424  2023-08-20    Slack   @bob_tweets    Great work! 0.203791809
## 425  2023-08-01 Twitter   @bob_tweets Need assistance 0.148395223
## 426  2023-08-04 Twitter   @bob_tweets   Fun weekend! 0.185009266
## 427  2023-08-14 Twitter alice@example  Exciting news! 0.157755047
## 428  2023-08-10 Twitter  @erin_tweets    Great work! 0.199771451
## 429  2023-08-19 Twitter alice@example Need assistance 0.143810244
## 430  2023-08-12 Twitter  dave@example    Great work! 0.195303030
## 431  2023-08-15 Twitter alice@example  Exciting news! 0.153143482
## 432  2023-08-10    Slack   @frank_chat Hello everyone! 0.142070077
## 433  2023-08-15    Email alice@example    Team meeting 0.176413531
## 434  2023-08-14    Slack  @erin_tweets Need assistance 0.141076977
## 435  2023-08-08    Slack  @erin_tweets   Fun weekend! 0.172925062
## 436  2023-08-17 Twitter   carol_slack   Fun weekend! 0.172285239
## 437  2023-08-01    Slack   @bob_tweets Exciting news! 0.146396939
## 438  2023-08-03    Slack alice@example Need assistance 0.135939530
## 439  2023-08-17    Slack   carol_slack   Fun weekend! 0.169502832
## 440  2023-08-10 Twitter  @erin_tweets    Great work! 0.181200765
## 441  2023-08-06 Twitter  dave@example    Team meeting 0.165403601
## 442  2023-08-04 Twitter   @bob_tweets   Fun weekend! 0.163814227
## 443  2023-08-05 Twitter   carol_slack Hello everyone! 0.130742100
## 444  2023-08-07    Slack   @bob_tweets    Great work! 0.170066014
## 445  2023-08-20 Twitter  @erin_tweets  Exciting news! 0.131818828
## 446  2023-08-18    Email   carol_slack Need assistance 0.121493359
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## 447  2023-08-12    Email  alice@example Need assistance  0.120129855
## 448  2023-08-13  Twitter  alice@example Need assistance  0.119616441
## 449  2023-08-19    Email   @erin_tweets    Fun weekend!  0.149510738
## 450  2023-08-11    Email   dave@example    Team meeting  0.146319367
## 451  2023-08-18  Twitter   @erin_tweets Need assistance  0.116931847
## 452  2023-08-01  Twitter    @frank_chat      Great work!  0.159243134
## 453  2023-08-06  Twitter    @bob_tweets Hello everyone!  0.116596443
## 454  2023-08-03  Twitter    @bob_tweets Need assistance  0.115823371
## 455  2023-08-08    Email    @bob_tweets Need assistance  0.115187556
## 456  2023-08-16  Twitter   @erin_tweets      Great work!  0.150156671
## 457  2023-08-02    Email    @frank_chat    Fun weekend!  0.129630754
## 458  2023-08-11  Twitter   dave@example    Fun weekend!  0.124404418
## 459  2023-08-16    Slack    @bob_tweets    Team meeting  0.120248223
## 460  2023-08-12    Email   dave@example Need assistance  0.091942075
## 461  2023-08-05  Twitter    @bob_tweets Need assistance  0.089429019
## 462  2023-08-04    Slack    carol_slack Need assistance  0.088740259
## 463  2023-08-15    Email    @frank_chat      Great work!  0.120376800
## 464  2023-08-10    Slack   @erin_tweets Need assistance  0.086844633
## 465  2023-08-08    Email   dave@example Need assistance  0.084778340
## 466  2023-08-18  Twitter    @bob_tweets Need assistance  0.083397951
## 467  2023-08-09  Twitter  alice@example Need assistance  0.083300223
## 468  2023-08-03    Email   @erin_tweets    Team meeting  0.100578078
## 469  2023-08-08    Slack   @erin_tweets  Exciting news!  0.085280708
## 470  2023-08-07    Slack   @erin_tweets Hello everyone!  0.079340591
## 471  2023-08-06    Email    carol_slack Hello everyone!  0.076276061
## 472  2023-08-01    Slack   dave@example    Team meeting  0.093826082
## 473  2023-08-19    Email   dave@example    Team meeting  0.087382621
## 474  2023-08-20    Email    carol_slack    Team meeting  0.082343857
## 475  2023-08-05  Twitter  alice@example    Team meeting  0.082249742
## 476  2023-08-10    Email   @erin_tweets Hello everyone!  0.063933458
## 477  2023-08-07    Email    @bob_tweets    Fun weekend!  0.079245736
## 478  2023-08-04    Email    @frank_chat Need assistance  0.063336529
## 479  2023-08-20    Email    carol_slack    Team meeting  0.078007510
## 480  2023-08-11    Email   dave@example Need assistance  0.060486035
## 481  2023-08-12    Email  alice@example  Exciting news!  0.063475272
## 482  2023-08-06    Slack   @erin_tweets  Exciting news!  0.063273371
## 483  2023-08-11    Slack    carol_slack  Exciting news!  0.062969209
## 484  2023-08-15    Slack    @frank_chat Hello everyone!  0.058449768
## 485  2023-08-08    Slack   @erin_tweets    Team meeting  0.068864945
## 486  2023-08-10    Email    @frank_chat Hello everyone!  0.051583528
## 487  2023-08-08    Slack    carol_slack  Exciting news!  0.055117640
## 488  2023-08-04  Twitter    @bob_tweets  Exciting news!  0.053784013
## 489  2023-08-18    Email    @frank_chat    Fun weekend!  0.061621126
## 490  2023-08-02    Slack    carol_slack      Great work!  0.066785066
## 491  2023-08-20    Email  alice@example      Great work!  0.062977130
## 492  2023-08-14    Email  alice@example Need assistance  0.043240849
## 493  2023-08-13    Email  alice@example Hello everyone!  0.042741961
## 494  2023-08-03  Twitter    carol_slack  Exciting news!  0.044649603
## 495  2023-08-14    Email  alice@example Need assistance  0.041204039
## 496  2023-08-10    Slack   @erin_tweets Need assistance  0.037588875
## 497  2023-08-06    Slack  alice@example Need assistance  0.037042340
## 498  2023-08-02    Slack    carol_slack    Fun weekend!  0.045978463
## 499  2023-08-03  Twitter    carol_slack      Great work!  0.049291416
## 500  2023-08-12    Email   dave@example    Fun weekend!  0.043927317
## 501  2023-08-11    Slack    @bob_tweets      Great work!  0.041871845
## 502  2023-08-12  Twitter   @erin_tweets    Fun weekend!  0.038330505
```

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## 503  2023-08-10 Twitter   carol_slack   Exciting news!  0.030849482
## 504  2023-08-14    Email  @erin_tweets     Fun weekend!  0.035476264
## 505  2023-08-19    Slack  @erin_tweets      Great work!  0.037533612
## 506  2023-08-10    Slack   @bob_tweets   Exciting news!  0.027252671
## 507  2023-08-01    Slack  @erin_tweets     Team meeting  0.031597136
## 508  2023-08-14 Twitter alice@example     Team meeting  0.024089097
## 509  2023-08-09    Email  @erin_tweets   Exciting news!  0.020394353
## 510  2023-08-04    Email   @bob_tweets  Need assistance  0.017915569
## 511  2023-08-11 Twitter  dave@example   Exciting news!  0.018387399
## 512  2023-08-05    Slack  dave@example      Great work!  0.018169560
## 513  2023-08-06 Twitter  dave@example     Fun weekend!  0.005671109
## 514  2023-08-01 Twitter   @frank_chat  Need assistance -0.003094339
## 515  2023-08-18 Twitter   @frank_chat     Team meeting -0.004460444
## 516  2023-08-08    Email alice@example   Exciting news! -0.007040349
## 517  2023-08-10    Email   @frank_chat   Exciting news! -0.010767524
## 518  2023-08-18 Twitter  dave@example     Team meeting -0.012694929
## 519  2023-08-09 Twitter alice@example      Great work! -0.013945965
## 520  2023-08-07 Twitter  dave@example     Team meeting -0.014527882
## 521  2023-08-14 Twitter   @bob_tweets      Great work! -0.018533767
## 522  2023-08-16    Email  dave@example  Need assistance -0.014521594
## 523  2023-08-03    Email   @frank_chat      Great work! -0.022698464
## 524  2023-08-09    Email  @erin_tweets   Exciting news! -0.018193701
## 525  2023-08-05 Twitter  dave@example     Fun weekend! -0.021554315
## 526  2023-08-13 Twitter alice@example      Great work! -0.026141260
## 527  2023-08-03 Twitter  dave@example     Team meeting -0.024207670
## 528  2023-08-08 Twitter   @bob_tweets     Team meeting -0.024243061
## 529  2023-08-01    Slack   @bob_tweets   Exciting news! -0.024743940
## 530  2023-08-18    Email alice@example  Hello everyone! -0.024430894
## 531  2023-08-11    Email alice@example     Fun weekend! -0.034278538
## 532  2023-08-16    Email   carol_slack  Hello everyone! -0.029610693
## 533  2023-08-11    Slack   @bob_tweets   Exciting news! -0.033773244
## 534  2023-08-16    Email   carol_slack      Great work! -0.045373839
## 535  2023-08-13 Twitter  dave@example     Fun weekend! -0.042934414
## 536  2023-08-17 Twitter  dave@example  Need assistance -0.035525655
## 537  2023-08-11    Email  @erin_tweets      Great work! -0.049498704
## 538  2023-08-17    Email  dave@example     Team meeting -0.047711935
## 539  2023-08-05 Twitter   @bob_tweets  Hello everyone! -0.038818533
## 540  2023-08-04    Slack   carol_slack     Fun weekend! -0.049394990
## 541  2023-08-19    Email alice@example  Hello everyone! -0.040838550
## 542  2023-08-12    Email   @bob_tweets  Need assistance -0.042491458
## 543  2023-08-12    Slack   carol_slack  Need assistance -0.044029484
## 544  2023-08-09 Twitter   carol_slack     Fun weekend! -0.056202481
## 545  2023-08-08    Email   @frank_chat   Exciting news! -0.050068120
## 546  2023-08-10    Email   @bob_tweets     Team meeting -0.060755176
## 547  2023-08-06    Slack   @frank_chat  Hello everyone! -0.050532605
## 548  2023-08-08    Email alice@example      Great work! -0.068923920
## 549  2023-08-14    Slack   @frank_chat   Exciting news! -0.054910814
## 550  2023-08-14 Twitter  dave@example     Fun weekend! -0.064443091
## 551  2023-08-18    Slack   @frank_chat      Great work! -0.071027102
## 552  2023-08-15 Twitter   carol_slack     Team meeting -0.074092148
## 553  2023-08-20    Email  dave@example     Team meeting -0.075425136
## 554  2023-08-06 Twitter  dave@example  Need assistance -0.064178423
## 555  2023-08-08    Email  @erin_tweets  Hello everyone! -0.064463819
## 556  2023-08-17 Twitter   carol_slack  Need assistance -0.065970336
## 557  2023-08-04    Email  @erin_tweets  Need assistance -0.070094255
## 558  2023-08-18    Slack alice@example     Fun weekend! -0.088887415
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## 559  2023-08-13    Email    @bob_tweets    Team meeting -0.092784007
## 560  2023-08-10    Slack    @bob_tweets Hello everyone! -0.075317414
## 561  2023-08-05    Email    @frank_chat    Team meeting -0.094959955
## 562  2023-08-08 Twitter    @frank_chat Hello everyone! -0.081353148
## 563  2023-08-12    Email    @frank_chat    Fun weekend! -0.102208237
## 564  2023-08-14    Email alice@example    Great work! -0.111933967
## 565  2023-08-06    Slack alice@example    Fun weekend! -0.103599444
## 566  2023-08-18    Slack alice@example    Great work! -0.114574431
## 567  2023-08-19 Twitter alice@example    Fun weekend! -0.111042333
## 568  2023-08-04    Slack alice@example    Team meeting -0.111247493
## 569  2023-08-01    Slack    @frank_chat    Team meeting -0.113114946
## 570  2023-08-20 Twitter  dave@example    Great work! -0.124954135
## 571  2023-08-20    Slack    @bob_tweets    Team meeting -0.118006961
## 572  2023-08-14    Email   @erin_tweets    Great work! -0.129584252
## 573  2023-08-13    Slack alice@example Need assistance -0.100954488
## 574  2023-08-17 Twitter    carol_slack Need assistance -0.101536875
## 575  2023-08-11 Twitter   @erin_tweets Need assistance -0.102778860
## 576  2023-08-12    Email    @frank_chat Need assistance -0.104900640
## 577  2023-08-16    Slack   @erin_tweets  Exciting news! -0.113282133
## 578  2023-08-18 Twitter    carol_slack Need assistance -0.107154121
## 579  2023-08-18    Slack    @frank_chat    Team meeting -0.134102609
## 580  2023-08-20    Slack   @erin_tweets    Team meeting -0.134665603
## 581  2023-08-04    Email   @erin_tweets Need assistance -0.108376242
## 582  2023-08-11    Slack    @frank_chat Hello everyone! -0.108963726
## 583  2023-08-03    Slack alice@example    Great work! -0.150377708
## 584  2023-08-15    Email    carol_slack    Fun weekend! -0.141636565
## 585  2023-08-04 Twitter    @bob_tweets  Exciting news! -0.122806889
## 586  2023-08-06    Slack alice@example    Fun weekend! -0.143456620
## 587  2023-08-16    Slack    @frank_chat    Team meeting -0.143542713
## 588  2023-08-19 Twitter  dave@example Need assistance -0.115035673
## 589  2023-08-02 Twitter    @frank_chat Need assistance -0.115179492
## 590  2023-08-15 Twitter    @bob_tweets    Team meeting -0.144443278
## 591  2023-08-18 Twitter  dave@example    Great work! -0.160749977
## 592  2023-08-06 Twitter    @bob_tweets    Fun weekend! -0.149422837
## 593  2023-08-11 Twitter alice@example Hello everyone! -0.120084892
## 594  2023-08-07    Email    @bob_tweets    Team meeting -0.150205611
## 595  2023-08-06    Email    @bob_tweets    Fun weekend! -0.159573650
## 596  2023-08-05    Slack    @frank_chat Need assistance -0.129298556
## 597  2023-08-01    Email    carol_slack Need assistance -0.130674560
## 598  2023-08-16 Twitter alice@example    Great work! -0.179680133
## 599  2023-08-16 Twitter    @bob_tweets  Exciting news! -0.141741692
## 600  2023-08-17    Email dave@example    Fun weekend! -0.173903828
## 601  2023-08-10 Twitter    @frank_chat  Exciting news! -0.149807401
## 602  2023-08-01    Slack dave@example    Team meeting -0.176315426
## 603  2023-08-15 Twitter alice@example    Team meeting -0.178657859
## 604  2023-08-11    Slack    @frank_chat Hello everyone! -0.143450806
## 605  2023-08-07    Email    @frank_chat Hello everyone! -0.143556185
## 606  2023-08-17 Twitter alice@example    Team meeting -0.189370414
## 607  2023-08-07    Slack    @bob_tweets Hello everyone! -0.160779689
## 608  2023-08-03    Email    carol_slack Need assistance -0.161143415
## 609  2023-08-04    Slack    @bob_tweets Hello everyone! -0.161284721
## 610  2023-08-01    Slack    @frank_chat    Team meeting -0.202094683
## 611  2023-08-11    Slack    @frank_chat    Team meeting -0.203160496
## 612  2023-08-03    Email    @frank_chat    Great work! -0.222633559
## 613  2023-08-18    Slack    @bob_tweets Hello everyone! -0.164491392
## 614  2023-08-20    Email alice@example Hello everyone! -0.166448134
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## 615  2023-08-14 Twitter alice@example     Great work! -0.232635738
## 616  2023-08-06    Email  @erin_tweets Hello everyone! -0.172054263
## 617  2023-08-07    Email  dave@example   Exciting news! -0.184577833
## 618  2023-08-08 Twitter alice@example     Great work! -0.236779108
## 619  2023-08-03    Slack  @erin_tweets Need assistance -0.173975688
## 620  2023-08-15 Twitter  @erin_tweets     Great work! -0.244326655
## 621  2023-08-20    Email  @erin_tweets  Exciting news! -0.195798854
## 622  2023-08-17    Email   @frank_chat    Team meeting -0.229243480
## 623  2023-08-04    Email   @bob_tweets     Great work! -0.251496902
## 624  2023-08-17 Twitter   @frank_chat    Team meeting -0.232014328
## 625  2023-08-07    Email   @bob_tweets    Team meeting -0.232356975
## 626  2023-08-04    Email alice@example  Exciting news! -0.200843529
## 627  2023-08-04    Slack alice@example Hello everyone! -0.187917918
## 628  2023-08-04    Email   @bob_tweets    Team meeting -0.235653992
## 629  2023-08-05    Slack  @erin_tweets    Fun weekend! -0.240693055
## 630  2023-08-16 Twitter  dave@example Need assistance -0.194268964
## 631  2023-08-18 Twitter  dave@example  Exciting news! -0.209318373
## 632  2023-08-05    Slack  @erin_tweets Need assistance -0.195926677
## 633  2023-08-10    Slack   @frank_chat Need assistance -0.198273231
## 634  2023-08-02    Email  dave@example  Exciting news! -0.212464974
## 635  2023-08-19    Slack alice@example    Team meeting -0.249497572
## 636  2023-08-14    Slack  @erin_tweets    Fun weekend! -0.259928443
## 637  2023-08-15    Slack   @bob_tweets    Team meeting -0.271451744
## 638  2023-08-04 Twitter  @erin_tweets Hello everyone! -0.217646003
## 639  2023-08-12    Slack   @frank_chat Hello everyone! -0.219064676
## 640  2023-08-14    Email  @erin_tweets Need assistance -0.220039924
## 641  2023-08-17 Twitter   carol_slack  Exciting news! -0.237763272
## 642  2023-08-19 Twitter  dave@example    Team meeting -0.284638313
## 643  2023-08-07    Slack   @bob_tweets     Great work! -0.311243319
## 644  2023-08-12    Slack  dave@example    Fun weekend! -0.285561244
## 645  2023-08-01 Twitter   carol_slack     Great work! -0.311684015
## 646  2023-08-16 Twitter  dave@example    Fun weekend! -0.286604216
## 647  2023-08-16    Email   @frank_chat    Team meeting -0.287118956
## 648  2023-08-10 Twitter   @frank_chat    Team meeting -0.289186294
## 649  2023-08-04    Email   @frank_chat     Great work! -0.317266905
## 650  2023-08-06    Slack   carol_slack  Exciting news! -0.249575844
## 651  2023-08-10    Slack alice@example Need assistance -0.236316590
## 652  2023-08-19 Twitter alice@example    Team meeting -0.299451457
## 653  2023-08-18    Email  @erin_tweets Need assistance -0.240649289
## 654  2023-08-07    Email alice@example     Great work! -0.329095908
## 655  2023-08-12    Email  @erin_tweets  Exciting news! -0.260005387
## 656  2023-08-11 Twitter   @frank_chat    Team meeting -0.303564250
## 657  2023-08-03 Twitter   @bob_tweets Hello everyone! -0.243440011
## 658  2023-08-01    Email   @frank_chat    Team meeting -0.307752223
## 659  2023-08-19    Email  dave@example     Great work! -0.336303487
## 660  2023-08-16 Twitter  @erin_tweets  Exciting news! -0.265161676
## 661  2023-08-08    Email   @bob_tweets Need assistance -0.249764988
## 662  2023-08-10    Email   @frank_chat    Team meeting -0.320194449
## 663  2023-08-05    Slack   carol_slack    Team meeting -0.320228465
## 664  2023-08-20 Twitter  @erin_tweets     Great work! -0.349391197
## 665  2023-08-16    Email   @bob_tweets     Great work! -0.351176404
## 666  2023-08-08 Twitter alice@example    Fun weekend! -0.329790550
## 667  2023-08-07    Email  dave@example     Great work! -0.359934055
## 668  2023-08-15    Email alice@example Need assistance -0.264464825
## 669  2023-08-05    Email  @erin_tweets  Exciting news! -0.283369262
## 670  2023-08-10    Email   @bob_tweets  Exciting news! -0.286527871
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## 671  2023-08-16    Slack  @erin_tweets  Exciting news! -0.290788232
## 672  2023-08-14 Twitter   dave@example Need assistance -0.273263505
## 673  2023-08-03 Twitter   @erin_tweets    Fun weekend! -0.345988781
## 674  2023-08-14    Slack  dave@example  Exciting news! -0.298691060
## 675  2023-08-05 Twitter    carol_slack Hello everyone! -0.279889458
## 676  2023-08-11 Twitter   @erin_tweets    Team meeting -0.351081788
## 677  2023-08-17    Slack alice@example  Exciting news! -0.301641050
## 678  2023-08-02 Twitter    @bob_tweets Need assistance -0.281915764
## 679  2023-08-05    Slack  @erin_tweets  Exciting news! -0.302134784
## 680  2023-08-06    Slack  @erin_tweets     Great work! -0.387922954
## 681  2023-08-01    Email   carol_slack     Great work! -0.389590032
## 682  2023-08-02    Email  dave@example    Fun weekend! -0.357268680
## 683  2023-08-07 Twitter    @bob_tweets     Great work! -0.389785778
## 684  2023-08-09    Slack  dave@example    Fun weekend! -0.358376735
## 685  2023-08-09    Slack   carol_slack Hello everyone! -0.289897254
## 686  2023-08-10 Twitter   dave@example    Fun weekend! -0.363247766
## 687  2023-08-07 Twitter alice@example    Team meeting -0.365139902
## 688  2023-08-06    Email   @bob_tweets     Great work! -0.400677142
## 689  2023-08-20 Twitter   @erin_tweets     Great work! -0.404516522
## 690  2023-08-19 Twitter    @frank_chat    Fun weekend! -0.371842024
## 691  2023-08-12 Twitter    @bob_tweets     Great work! -0.405934577
## 692  2023-08-09    Email    @frank_chat    Fun weekend! -0.372473280
## 693  2023-08-20    Email    @bob_tweets Need assistance -0.299717092
## 694  2023-08-09    Email    @bob_tweets    Fun weekend! -0.375794835
## 695  2023-08-08    Slack  @erin_tweets     Great work! -0.410223121
## 696  2023-08-18    Email alice@example    Team meeting -0.377541550
## 697  2023-08-06    Email   @bob_tweets     Great work! -0.417041691
## 698  2023-08-06 Twitter    carol_slack  Exciting news! -0.329569053
## 699  2023-08-06 Twitter    carol_slack    Team meeting -0.385177557
## 700  2023-08-05    Slack   @bob_tweets    Team meeting -0.386754569
## 701  2023-08-07 Twitter    @bob_tweets    Fun weekend! -0.390309056
## 702  2023-08-09 Twitter alice@example    Fun weekend! -0.391704335
## 703  2023-08-10    Email   @bob_tweets Need assistance -0.316063035
## 704  2023-08-06    Email  @erin_tweets Hello everyone! -0.318016798
## 705  2023-08-16    Slack   carol_slack Hello everyone! -0.321912185
## 706  2023-08-13    Slack   @bob_tweets     Great work! -0.443448592
## 707  2023-08-01 Twitter   @erin_tweets Hello everyone! -0.325806037
## 708  2023-08-07    Email  @erin_tweets     Great work! -0.446627778
## 709  2023-08-12 Twitter   @erin_tweets Need assistance -0.329706852
## 710  2023-08-13 Twitter    carol_slack    Fun weekend! -0.412842807
## 711  2023-08-04    Email  @erin_tweets    Fun weekend! -0.415885320
## 712  2023-08-17 Twitter   @erin_tweets    Fun weekend! -0.417790642
## 713  2023-08-20    Slack alice@example     Great work! -0.459148118
## 714  2023-08-07    Email   @bob_tweets    Team meeting -0.423585835
## 715  2023-08-12 Twitter   dave@example     Great work! -0.462906254
## 716  2023-08-10 Twitter   @erin_tweets Need assistance -0.340010146
## 717  2023-08-03    Email    @frank_chat Need assistance -0.345415825
## 718  2023-08-20 Twitter alice@example    Fun weekend! -0.436848105
## 719  2023-08-15    Slack  dave@example     Great work! -0.481857921
## 720  2023-08-07 Twitter    carol_slack Hello everyone! -0.355751095
## 721  2023-08-07    Slack   @bob_tweets Need assistance -0.356371285
## 722  2023-08-10    Slack alice@example Need assistance -0.356432681
## 723  2023-08-20    Slack  @erin_tweets Hello everyone! -0.357717138
## 724  2023-08-03    Slack  dave@example     Great work! -0.488912587
## 725  2023-08-14    Email  dave@example Hello everyone! -0.359136123
## 726  2023-08-12    Slack  @erin_tweets Hello everyone! -0.360894154
```

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## 727  2023-08-08   Slack    carol_slack  Exciting news! -0.388513986
## 728  2023-08-09 Twitter   dave@example      Great work! -0.495721815
## 729  2023-08-12 Twitter    carol_slack     Fun weekend! -0.455487390
## 730  2023-08-13 Twitter    @frank_chat Hello everyone! -0.369747002
## 731  2023-08-10 Twitter   dave@example      Great work! -0.505026447
## 732  2023-08-01 Twitter    @frank_chat  Exciting news! -0.398672424
## 733  2023-08-17   Email    @bob_tweets    Team meeting -0.467768930
## 734  2023-08-16 Twitter    carol_slack Need assistance -0.375053814
## 735  2023-08-19   Slack    @frank_chat     Team meeting -0.472906698
## 736  2023-08-19 Twitter alice@example Hello everyone! -0.378329881
## 737  2023-08-02   Slack   @erin_tweets     Fun weekend! -0.474169046
## 738  2023-08-14   Slack   @erin_tweets      Great work! -0.518683678
## 739  2023-08-20 Twitter    @frank_chat     Team meeting -0.476500273
## 740  2023-08-03 Twitter    @bob_tweets  Exciting news! -0.408464086
## 741  2023-08-14   Slack    @frank_chat Need assistance -0.384110797
## 742  2023-08-19   Slack   dave@example      Great work! -0.526421044
## 743  2023-08-06 Twitter   @erin_tweets  Exciting news! -0.415566467
## 744  2023-08-02   Slack  alice@example     Fun weekend! -0.485003887
## 745  2023-08-20   Slack  alice@example  Exciting news! -0.415822029
## 746  2023-08-12   Email    carol_slack     Team meeting -0.492082868
## 747  2023-08-13   Slack  alice@example     Team meeting -0.493501368
## 748  2023-08-11   Email    @bob_tweets      Great work! -0.539260621
## 749  2023-08-18   Slack   @erin_tweets Hello everyone! -0.395961934
## 750  2023-08-04 Twitter   dave@example     Fun weekend! -0.495438306
## 751  2023-08-10 Twitter   @erin_tweets     Fun weekend! -0.496555788
## 752  2023-08-06   Slack  alice@example      Great work! -0.545365768
## 753  2023-08-07 Twitter    @bob_tweets      Great work! -0.548428072
## 754  2023-08-11   Slack    @bob_tweets      Great work! -0.549234209
## 755  2023-08-06 Twitter   dave@example  Exciting news! -0.433124611
## 756  2023-08-07   Slack    @bob_tweets     Fun weekend! -0.511013610
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## 758  2023-08-13   Slack    carol_slack Hello everyone! -0.416070993
## 759  2023-08-10   Email    @frank_chat     Fun weekend! -0.520876877
## 760  2023-08-01 Twitter    @frank_chat     Team meeting -0.526283488
## 761  2023-08-20   Slack    carol_slack      Great work! -0.574539005
## 762  2023-08-10 Twitter    @frank_chat     Fun weekend! -0.528116655
## 763  2023-08-01 Twitter    @bob_tweets  Exciting news! -0.452694423
## 764  2023-08-19   Email   dave@example     Team meeting -0.528815492
## 765  2023-08-04   Slack    @frank_chat     Fun weekend! -0.530567507
## 766  2023-08-06   Email    carol_slack      Great work! -0.579760317
## 767  2023-08-13 Twitter    @frank_chat Hello everyone! -0.426096413
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## 769  2023-08-06   Slack   dave@example     Team meeting -0.536957865
## 770  2023-08-04   Email    @bob_tweets     Fun weekend! -0.539049788
## 771  2023-08-12 Twitter    carol_slack Need assistance -0.435741366
## 772  2023-08-20   Slack    carol_slack      Great work! -0.595158034
## 773  2023-08-07 Twitter   @erin_tweets      Great work! -0.597466531
## 774  2023-08-06   Email   dave@example Need assistance -0.438415068
## 775  2023-08-15   Email    @frank_chat Need assistance -0.438784983
## 776  2023-08-06 Twitter    @bob_tweets     Team meeting -0.549432104
## 777  2023-08-03   Email  alice@example Hello everyone! -0.440484574
## 778  2023-08-16   Email    @frank_chat     Fun weekend! -0.552409418
## 779  2023-08-20   Slack   dave@example  Exciting news! -0.476039052
## 780  2023-08-14   Email   @erin_tweets Hello everyone! -0.446434771
## 781  2023-08-18   Email    @bob_tweets     Fun weekend! -0.558283084
## 782  2023-08-18   Slack    @bob_tweets     Fun weekend! -0.558302570
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## 784  2023-08-18   Slack   dave@example    Fun weekend! -0.566594298
## 785  2023-08-12 Twitter alice@example   Exciting news! -0.487793705
## 786  2023-08-18   Email   @frank_chat     Fun weekend! -0.569811309
## 787  2023-08-16   Email   @bob_tweets Need assistance -0.459899545
## 788  2023-08-15   Email   @erin_tweets    Fun weekend! -0.576360519
## 789  2023-08-08   Slack   @erin_tweets Need assistance -0.461871512
## 790  2023-08-05 Twitter alice@example     Great work! -0.630844017
## 791  2023-08-11 Twitter  @erin_tweets Need assistance -0.462980804
## 792  2023-08-16   Email   @frank_chat     Fun weekend! -0.584208118
## 793  2023-08-17 Twitter alice@example     Great work! -0.641657173
## 794  2023-08-07   Slack   @erin_tweets     Great work! -0.643276188
## 795  2023-08-14 Twitter alice@example     Great work! -0.652119522
## 796  2023-08-17 Twitter  @frank_chat    Team meeting -0.608078998
## 797  2023-08-02   Slack   @bob_tweets     Great work! -0.666475324
## 798  2023-08-02 Twitter  @erin_tweets  Exciting news! -0.525143623
## 799  2023-08-17 Twitter  @bob_tweets Need assistance -0.493062959
## 800  2023-08-16 Twitter  @bob_tweets     Great work! -0.674055766
## 801  2023-08-14   Slack   dave@example  Exciting news! -0.531753783
## 802  2023-08-19   Email   dave@example  Exciting news! -0.533024813
## 803  2023-08-17 Twitter  @frank_chat     Fun weekend! -0.624432764
## 804  2023-08-18   Slack   @erin_tweets  Exciting news! -0.537696546
## 805  2023-08-09   Slack   alice@example Exciting news! -0.539138246
## 806  2023-08-20 Twitter  dave@example  Exciting news! -0.542942689
## 807  2023-08-13   Email   @frank_chat     Great work! -0.693289580
## 808  2023-08-15   Slack   @frank_chat Hello everyone! -0.508614742
## 809  2023-08-18   Email   carol_slack  Exciting news! -0.546088908
## 810  2023-08-15   Slack   dave@example Hello everyone! -0.510870771
## 811  2023-08-11   Email   alice@example   Team meeting -0.641849058
## 812  2023-08-17   Slack   @frank_chat     Great work! -0.700269639
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## 816  2023-08-13 Twitter  @bob_tweets     Great work! -0.705626460
## 817  2023-08-07   Email   dave@example Hello everyone! -0.526591262
## 818  2023-08-19   Slack   @erin_tweets     Great work! -0.725357866
## 819  2023-08-17 Twitter  @erin_tweets    Team meeting -0.666378770
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## 821  2023-08-14 Twitter  @frank_chat     Fun weekend! -0.672147054
## 822  2023-08-12   Slack   carol_slack     Great work! -0.733910211
## 823  2023-08-08 Twitter  @frank_chat     Fun weekend! -0.673607849
## 824  2023-08-16 Twitter  @erin_tweets    Team meeting -0.674190784
## 825  2023-08-11   Slack   @bob_tweets Need assistance -0.542398809
## 826  2023-08-14 Twitter  @erin_tweets Need assistance -0.543064435
## 827  2023-08-15   Slack   @frank_chat  Exciting news! -0.582243779
## 828  2023-08-13   Slack   @erin_tweets Need assistance -0.544543609
## 829  2023-08-20 Twitter  @erin_tweets     Great work! -0.743658878
## 830  2023-08-11   Email   carol_slack Need assistance -0.547700667
## 831  2023-08-11 Twitter  @bob_tweets     Great work! -0.751736611
## 832  2023-08-04 Twitter alice@example     Fun weekend! -0.693275109
## 833  2023-08-20   Email   alice@example Hello everyone! -0.555095884
## 834  2023-08-12   Email   @bob_tweets  Exciting news! -0.597888714
## 835  2023-08-19   Slack   @bob_tweets Hello everyone! -0.558468956
## 836  2023-08-15   Slack   @erin_tweets Hello everyone! -0.562214842
## 837  2023-08-04   Email   alice@example    Great work! -0.769964864
## 838  2023-08-15 Twitter alice@example    Fun weekend! -0.707901944
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## 839  2023-08-03 Twitter alice@example Hello everyone! -0.567197050
## 840  2023-08-14   Slack    @bob_tweets     Team meeting -0.709024122
## 841  2023-08-12 Twitter   @bob_tweets     Exciting news! -0.608554570
## 842  2023-08-08   Slack   @erin_tweets Hello everyone! -0.568787924
## 843  2023-08-09   Email    @frank_chat     Team meeting -0.712716471
## 844  2023-08-03   Slack    carol_slack      Great work! -0.777630202
## 845  2023-08-01   Slack    @frank_chat Hello everyone! -0.572465386
## 846  2023-08-04 Twitter    carol_slack   Exciting news! -0.615862965
## 847  2023-08-18   Slack   dave@example     Team meeting -0.718652172
## 848  2023-08-12   Email alice@example   Exciting news! -0.616592484
## 849  2023-08-02   Email alice@example      Great work! -0.784876938
## 850  2023-08-07   Email    @bob_tweets   Exciting news! -0.616928389
## 851  2023-08-13 Twitter  dave@example   Exciting news! -0.618614707
## 852  2023-08-18 Twitter   dave@example Need assistance -0.577738499
## 853  2023-08-07   Email   dave@example     Fun weekend! -0.735883705
## 854  2023-08-06   Slack    carol_slack   Exciting news! -0.633368273
## 855  2023-08-13 Twitter alice@example      Great work! -0.806566573
## 856  2023-08-15   Email   @erin_tweets Hello everyone! -0.598425182
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## 859  2023-08-07 Twitter    @frank_chat      Great work! -0.823533585
## 860  2023-08-17 Twitter alice@example Hello everyone! -0.605858998
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## 863  2023-08-15   Slack    carol_slack     Fun weekend! -0.760701751
## 864  2023-08-07   Slack    @bob_tweets Need assistance -0.611560303
## 865  2023-08-12   Slack    @frank_chat Need assistance -0.611636332
## 866  2023-08-18 Twitter   dave@example Need assistance -0.613432584
## 867  2023-08-01   Slack    @bob_tweets Need assistance -0.614020258
## 868  2023-08-07   Email    @bob_tweets     Team meeting -0.767587414
## 869  2023-08-18 Twitter   @bob_tweets      Great work! -0.839583620
## 870  2023-08-12   Email   dave@example      Great work! -0.841218561
## 871  2023-08-02   Slack   dave@example   Exciting news! -0.662697271
## 872  2023-08-16   Slack    @bob_tweets     Team meeting -0.774452816
## 873  2023-08-07   Slack   @erin_tweets     Team meeting -0.780283807
## 874  2023-08-17   Slack alice@example      Great work! -0.853163924
## 875  2023-08-04 Twitter   dave@example     Team meeting -0.785379849
## 876  2023-08-12 Twitter   dave@example     Team meeting -0.786887704
## 877  2023-08-09   Email    @frank_chat     Fun weekend! -0.789119672
## 878  2023-08-19   Slack   dave@example     Team meeting -0.789976987
## 879  2023-08-09   Email    @frank_chat Hello everyone! -0.633588556
## 880  2023-08-04 Twitter   dave@example Need assistance -0.635092593
## 881  2023-08-01   Email    @frank_chat     Fun weekend! -0.797102704
## 882  2023-08-15 Twitter    carol_slack Hello everyone! -0.638266036
## 883  2023-08-15 Twitter    @frank_chat Need assistance -0.639425840
## 884  2023-08-11   Slack alice@example     Fun weekend! -0.799520459
## 885  2023-08-07   Slack alice@example   Exciting news! -0.686074989
## 886  2023-08-20   Email    @bob_tweets     Team meeting -0.801527123
## 887  2023-08-15   Email    @bob_tweets     Team meeting -0.801572199
## 888  2023-08-02 Twitter    carol_slack   Exciting news! -0.693217811
## 889  2023-08-14 Twitter  @erin_tweets Hello everyone! -0.647561021
## 890  2023-08-03   Slack   @erin_tweets     Team meeting -0.812502595
## 891  2023-08-02   Slack   @erin_tweets      Great work! -0.887057793
## 892  2023-08-14   Email    @bob_tweets     Team meeting -0.815906889
## 893  2023-08-20 Twitter   dave@example     Fun weekend! -0.818538250
## 894  2023-08-19   Email   @erin_tweets     Team meeting -0.823923888
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## 895  2023-08-03    Email   @erin_tweets      Great work! -0.900102365
## 896  2023-08-08    Email alice@example Hello everyone! -0.666331347
## 897  2023-08-14    Email   @erin_tweets      Fun weekend! -0.835450725
## 898  2023-08-14 Twitter    @frank_chat      Great work! -0.912142744
## 899  2023-08-18    Slack   @erin_tweets  Exciting news! -0.719712700
## 900  2023-08-04    Slack   dave@example      Fun weekend! -0.848228461
## 901  2023-08-03 Twitter    @erin_tweets Need assistance -0.680233249
## 902  2023-08-14    Slack   @erin_tweets  Exciting news! -0.736287751
## 903  2023-08-15    Slack   @erin_tweets Hello everyone! -0.689319659
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## 905  2023-08-13 Twitter    @frank_chat Hello everyone! -0.694118693
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## 907  2023-08-01    Email   dave@example      Great work! -0.948017055
## 908  2023-08-15    Email    carol_slack  Exciting news! -0.745493084
## 909  2023-08-01 Twitter    @frank_chat Need assistance -0.696885624
## 910  2023-08-17    Email   @frank_chat      Great work! -0.951084716
## 911  2023-08-10    Slack   dave@example  Exciting news! -0.750027833
## 912  2023-08-13 Twitter    @erin_tweets      Great work! -0.956337988
## 913  2023-08-01    Slack   carol_slack      Fun weekend! -0.877705400
## 914  2023-08-13 Twitter    @frank_chat    Team meeting -0.877922161
## 915  2023-08-10 Twitter    dave@example    Team meeting -0.879799920
## 916  2023-08-19    Slack   @frank_chat    Team meeting -0.887928675
## 917  2023-08-10    Slack   dave@example  Exciting news! -0.762122771
## 918  2023-08-14 Twitter    @bob_tweets      Great work! -0.970631612
## 919  2023-08-12 Twitter    dave@example Need assistance -0.713639749
## 920  2023-08-11    Slack   @erin_tweets    Team meeting -0.893834382
## 921  2023-08-06    Slack   @bob_tweets      Fun weekend! -0.895003283
## 922  2023-08-08 Twitter    @bob_tweets Need assistance -0.716619523
## 923  2023-08-18    Email   dave@example  Exciting news! -0.768564025
## 924  2023-08-07    Slack   dave@example Need assistance -0.718395420
## 925  2023-08-18    Slack   @bob_tweets      Fun weekend! -0.898072343
## 926  2023-08-17    Email   @frank_chat  Exciting news! -0.770805090
## 927  2023-08-09    Email   @bob_tweets Hello everyone! -0.725457437
## 928  2023-08-09 Twitter alice@example  Exciting news! -0.792284821
## 929  2023-08-10 Twitter    @frank_chat Hello everyone! -0.740855453
## 930  2023-08-11 Twitter    @frank_chat      Fun weekend! -0.926554946
## 931  2023-08-13    Slack alice@example    Team meeting -0.927027794
## 932  2023-08-06    Slack   @bob_tweets      Fun weekend! -0.927836751
## 933  2023-08-16    Email   @erin_tweets      Fun weekend! -0.928850479
## 934  2023-08-05 Twitter    @bob_tweets  Exciting news! -0.798021044
## 935  2023-08-16    Slack   @frank_chat    Team meeting -0.933677876
## 936  2023-08-10    Slack   dave@example    Team meeting -0.934943126
## 937  2023-08-14 Twitter    @frank_chat    Team meeting -0.935610580
## 938  2023-08-17    Slack   carol_slack Need assistance -0.750471560
## 939  2023-08-10    Slack alice@example    Team meeting -0.939407335
## 940  2023-08-18    Slack   @bob_tweets Need assistance -0.754348847
## 941  2023-08-19    Email   @frank_chat    Team meeting -0.943049938
## 942  2023-08-15 Twitter    carol_slack Hello everyone! -0.761104998
## 943  2023-08-04    Email   @bob_tweets      Fun weekend! -0.953222217
## 944  2023-08-11    Slack   @bob_tweets    Team meeting -0.955364774
## 945  2023-08-09    Email   @erin_tweets    Team meeting -0.956999032
## 946  2023-08-10    Slack   @erin_tweets Need assistance -0.766245456
## 947  2023-08-13 Twitter alice@example      Fun weekend! -0.958858334
## 948  2023-08-01 Twitter    @frank_chat  Exciting news! -0.822780307
## 949  2023-08-07    Slack   dave@example  Exciting news! -0.823877914
## 950  2023-08-18    Email   dave@example Need assistance -0.770186925
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## 951  2023-08-04 Twitter    @bob_tweets Hello everyone! -0.774547359
## 952  2023-08-08    Email  @erin_tweets Need assistance -0.775436828
## 953  2023-08-10    Email   carol_slack    Team meeting -0.970338997
## 954  2023-08-10 Twitter    @frank_chat    Team meeting -0.976236885
## 955  2023-08-08    Email  @erin_tweets  Exciting news! -0.847681918
## 956  2023-08-20    Email   @frank_chat    Team meeting -0.993759494
## 957  2023-08-14    Email   @bob_tweets    Team meeting -0.996662613
## 958  2023-08-14    Slack alice@example Hello everyone! -0.798660460
## 959  2023-08-14 Twitter  dave@example    Fun weekend! -0.998980226
## 960  2023-08-16    Email alice@example  Exciting news! -0.858994203
## 961  2023-08-17 Twitter    carol_slack Need assistance -0.806338225
## 962  2023-08-08    Slack alice@example Hello everyone! -0.812013249
## 963  2023-08-11    Slack   @frank_chat  Exciting news! -0.871460078
## 964  2023-08-10    Slack   @bob_tweets  Exciting news! -0.873230109
## 965  2023-08-10    Email alice@example Need assistance -0.815106571
## 966  2023-08-16 Twitter    carol_slack  Exciting news! -0.875286373
## 967  2023-08-05    Email alice@example Hello everyone! -0.822144668
## 968  2023-08-14    Email  dave@example Need assistance -0.829999507
## 969  2023-08-13    Email  dave@example Need assistance -0.834047724
## 970  2023-08-17    Email   @frank_chat Need assistance -0.837423526
## 971  2023-08-11    Email alice@example  Exciting news! -0.901918261
## 972  2023-08-11    Slack  dave@example Hello everyone! -0.843954970
## 973  2023-08-07    Slack   @bob_tweets Need assistance -0.846264025
## 974  2023-08-16    Email   carol_slack Hello everyone! -0.851052538
## 975  2023-08-10    Email   @frank_chat Need assistance -0.857863282
## 976  2023-08-20    Slack alice@example Hello everyone! -0.863882122
## 977  2023-08-13    Email   carol_slack  Exciting news! -0.930242309
## 978  2023-08-16    Slack   @frank_chat Hello everyone! -0.878399170
## 979  2023-08-08    Slack  @erin_tweets Need assistance -0.879413284
## 980  2023-08-06 Twitter alice@example Hello everyone! -0.882707532
## 981  2023-08-13 Twitter    @bob_tweets Need assistance -0.883181106
## 982  2023-08-14 Twitter alice@example Hello everyone! -0.892831107
## 983  2023-08-03 Twitter alice@example Hello everyone! -0.893453151
## 984  2023-08-10    Slack  @erin_tweets Need assistance -0.904224418
## 985  2023-08-18    Email   carol_slack  Exciting news! -0.978982675
## 986  2023-08-10    Slack alice@example Need assistance -0.917325706
## 987  2023-08-01 Twitter    @bob_tweets Hello everyone! -0.918783627
## 988  2023-08-12    Slack   carol_slack Need assistance -0.919222645
## 989  2023-08-14    Slack   @frank_chat Need assistance -0.920249034
## 990  2023-08-12    Email alice@example  Exciting news! -0.995861550
## 991  2023-08-09    Slack  @erin_tweets Hello everyone! -0.932525445
## 992  2023-08-18 Twitter alice@example Hello everyone! -0.936083395
## 993  2023-08-13    Email  @erin_tweets Hello everyone! -0.939573104
## 994  2023-08-05    Slack   @bob_tweets Hello everyone! -0.940684421
## 995  2023-08-13    Slack  dave@example Hello everyone! -0.945477226
## 996  2023-08-01 Twitter   @frank_chat Need assistance -0.970480603
## 997  2023-08-06    Email  dave@example Hello everyone! -0.987261285
## 998  2023-08-01    Slack  dave@example Need assistance -0.988749139
## 999  2023-08-08    Email   @frank_chat Need assistance -0.992002849
## 1000 2023-08-08    Email  dave@example Need assistance -0.998774239
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## 747       -5.92201642
## 748       -5.93186683
## 749       -5.93942901
## 750       -5.94525967
## 751       -5.95866945
## 752       -5.99902345
## 753       -6.03270879
## 754       -6.04157630
## 755       -6.06374456
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## 757       -6.23448522
## 758       -6.24106490
## 759       -6.25052253
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## 761       -6.31992906
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## 766       -6.37736349
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## 769       -6.44349438
## 770       -6.46859746
## 771       -6.53612049
## 772       -6.54673837
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## 774       -6.57622602
## 775       -6.58177475
## 776       -6.59318525
## 777       -6.60726860
## 778       -6.62891302
## 779       -6.66454673
## 780       -6.69652157
## 781       -6.69939701
## 782       -6.69963084
## 783       -6.79358607
## 784       -6.79913158
## 785       -6.82911187
## 786       -6.83773571
## 787       -6.89849318
## 788       -6.91632623
## 789       -6.92807268
```

```
## 790          -6.93928418
## 791          -6.94471205
## 792          -7.01049741
## 793          -7.05822890
## 794          -7.07603807
## 795          -7.17331475
## 796          -7.29694798
## 797          -7.33122857
## 798          -7.35201072
## 799          -7.39594438
## 800          -7.41461343
## 801          -7.44455296
## 802          -7.46234738
## 803          -7.49319317
## 804          -7.52775165
## 805          -7.54793544
## 806          -7.60119764
## 807          -7.62618538
## 808          -7.62922113
## 809          -7.64524471
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## 826          -8.14596653
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## 828          -8.16815414
## 829          -8.18024766
## 830          -8.21551000
## 831          -8.26910272
## 832          -8.31930131
## 833          -8.32643827
## 834          -8.37044200
## 835          -8.37703433
## 836          -8.43322262
## 837          -8.46961350
## 838          -8.49482333
## 839          -8.50795575
## 840          -8.50828946
## 841          -8.51976397
## 842          -8.53181886
## 843          -8.55259765
## 844          -8.55393222
## 845          -8.58698079
```

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## 885       -9.60504984
## 886       -9.61832548
## 887       -9.61886638
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## 891       -9.75763572
## 892       -9.79088267
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## 894       -9.88708666
## 895       -9.90112602
## 896       -9.99497020
## 897      -10.02540870
## 898      -10.03357018
## 899      -10.07597780
## 900      -10.17874153
## 901      -10.20349873
```

```
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## 904        -10.37410012
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## 923        -10.75989636
## 924        -10.77593130
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## 927        -10.88186155
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## 943        -11.43866660
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## 946        -11.49368184
## 947        -11.50630001
## 948        -11.51892430
## 949        -11.53429080
## 950        -11.55280388
## 951        -11.61821038
## 952        -11.63155242
## 953        -11.64406797
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## 956        -11.92511393
## 957        -11.95995136
```

```
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## 961      -12.09507338
## 962      -12.18019874
## 963      -12.20044109
## 964      -12.22522152
## 965      -12.22659857
## 966      -12.25400923
## 967      -12.33217002
## 968      -12.44999260
## 969      -12.51071587
## 970      -12.56135289
## 971      -12.62685565
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## 974      -12.76578807
## 975      -12.86794923
## 976      -12.95823183
## 977      -13.02339232
## 978      -13.17598754
## 979      -13.19119926
## 980      -13.24061299
## 981      -13.24771659
## 982      -13.39246661
## 983      -13.40179727
## 984      -13.56336626
## 985      -13.70575745
## 986      -13.75988559
## 987      -13.78175441
## 988      -13.78833968
## 989      -13.80373551
## 990      -13.94206170
## 991      -13.98788168
## 992      -14.04125092
## 993      -14.09359656
## 994      -14.11026632
## 995      -14.18215839
## 996      -14.55720904
## 997      -14.80891927
## 998      -14.83123708
## 999      -14.88004273
## 1000     -14.98161358
```

Question-12: Daily Message Challenge Click Me to scroll to top

Use the group_by, summarise, and arrange commands to find the day with the highest total number of characters sent across all messages in the "comm_data" dataframe.

Solution:

```
# Enter code here
comm_data %>%
  group_by(date) %>%
  summarise(total_characters = sum(nchar(message))) %>%
  arrange(desc(total_characters))
```

```
## # A tibble: 20 × 2
##    date       total_characters
##    <date>               <int>
##  1 2023-08-10            875
##  2 2023-08-14            850
##  3 2023-08-07            790
##  4 2023-08-12            764
##  5 2023-08-18            743
##  6 2023-08-15            694
##  7 2023-08-13            680
##  8 2023-08-08            679
##  9 2023-08-20            669
## 10 2023-08-16            659
## 11 2023-08-06            643
## 12 2023-08-11            635
## 13 2023-08-01            597
## 14 2023-08-03            593
## 15 2023-08-19            593
## 16 2023-08-04            587
## 17 2023-08-05            584
## 18 2023-08-09            568
## 19 2023-08-17            561
## 20 2023-08-02            422
```

Question-13: Untidy data Click Me to scroll to top

Can you list at least two reasons why the dataset illustrated in slide 10 is non-tidy? How can it be made Tidy?

Solution: *Firstly, there are multiple variables under the Subject column, including different age groups, genders, and employment statuses. Secondly, there are multiple variables under the Percent column, including the population and the percentage values. To address theese two issues, additional columns need to be added. For instance, we can create columns for age group column, employment status, country, and gender. This transformation will make the dataset tidy.*