Analyzing twitter data

ANALYZING SOCIAL MEDIA DATA IN R

Sowmya Vivek
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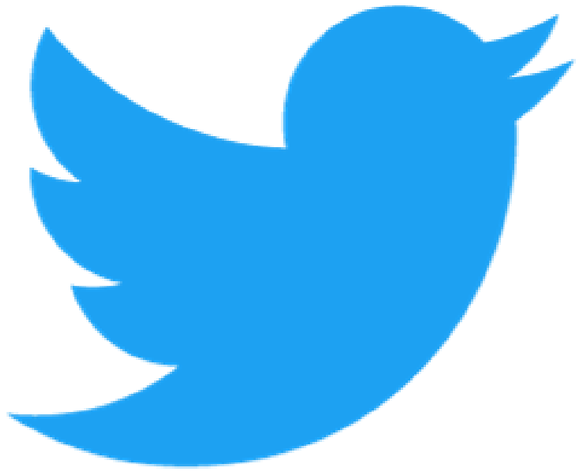
Course Overview

- Extract and visualize twitter data
- Analyze tweet text
- Perform network analysis
- View tweets on the map
- Explore tweets on celebrities, brands, hot topics, and sports

Introduction to social media analysis

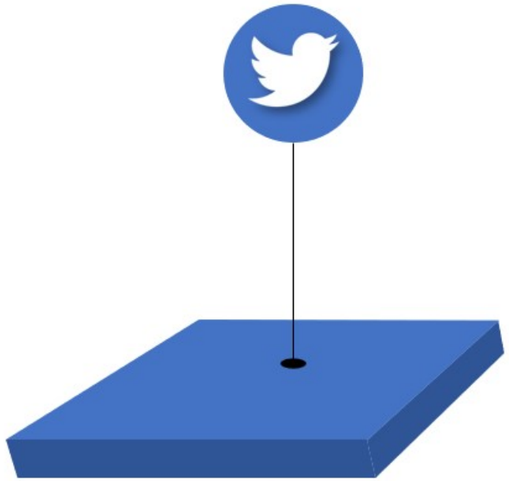
- Collect data from social media websites
- Analyze data to derive insights
- Make improved business decisions

About Twitter



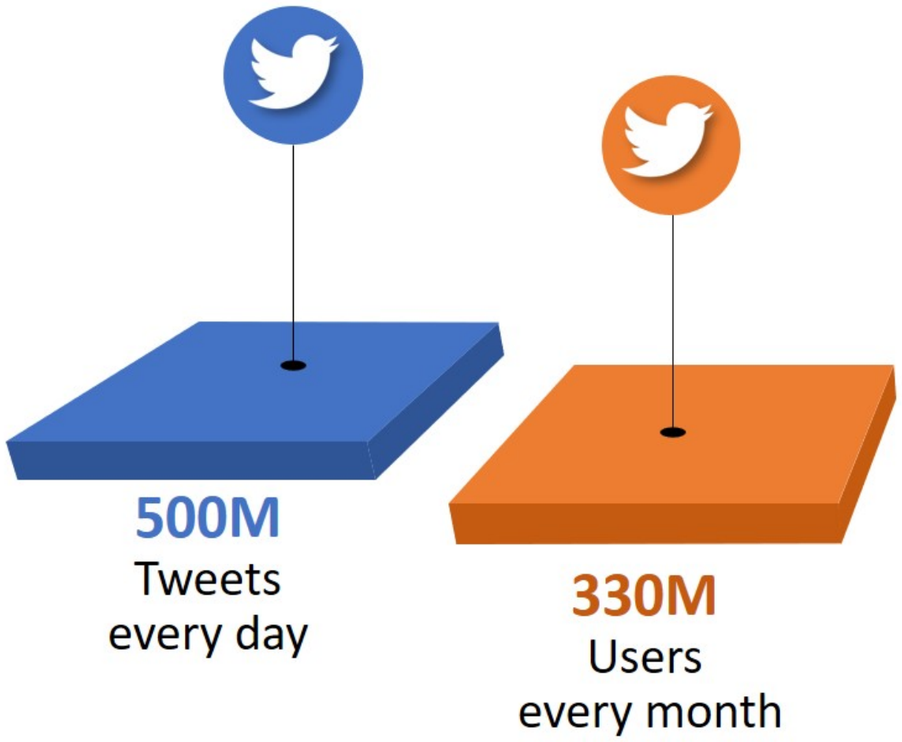
- Social media platform
- Short messages called tweets
- Micro-blogging site
- Information from tweets & tweet metadata

Power of twitter data

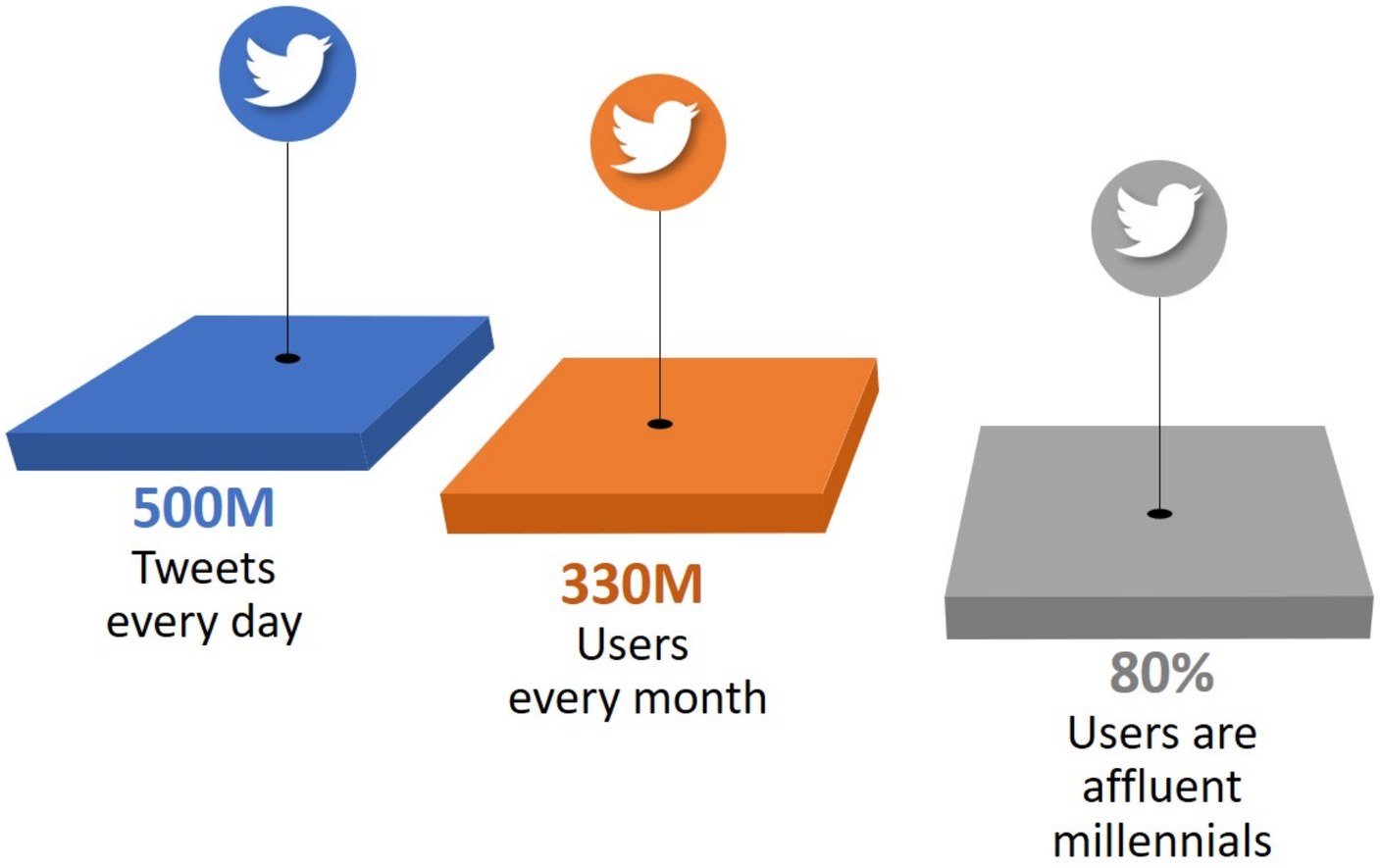


500M
Tweets
every day

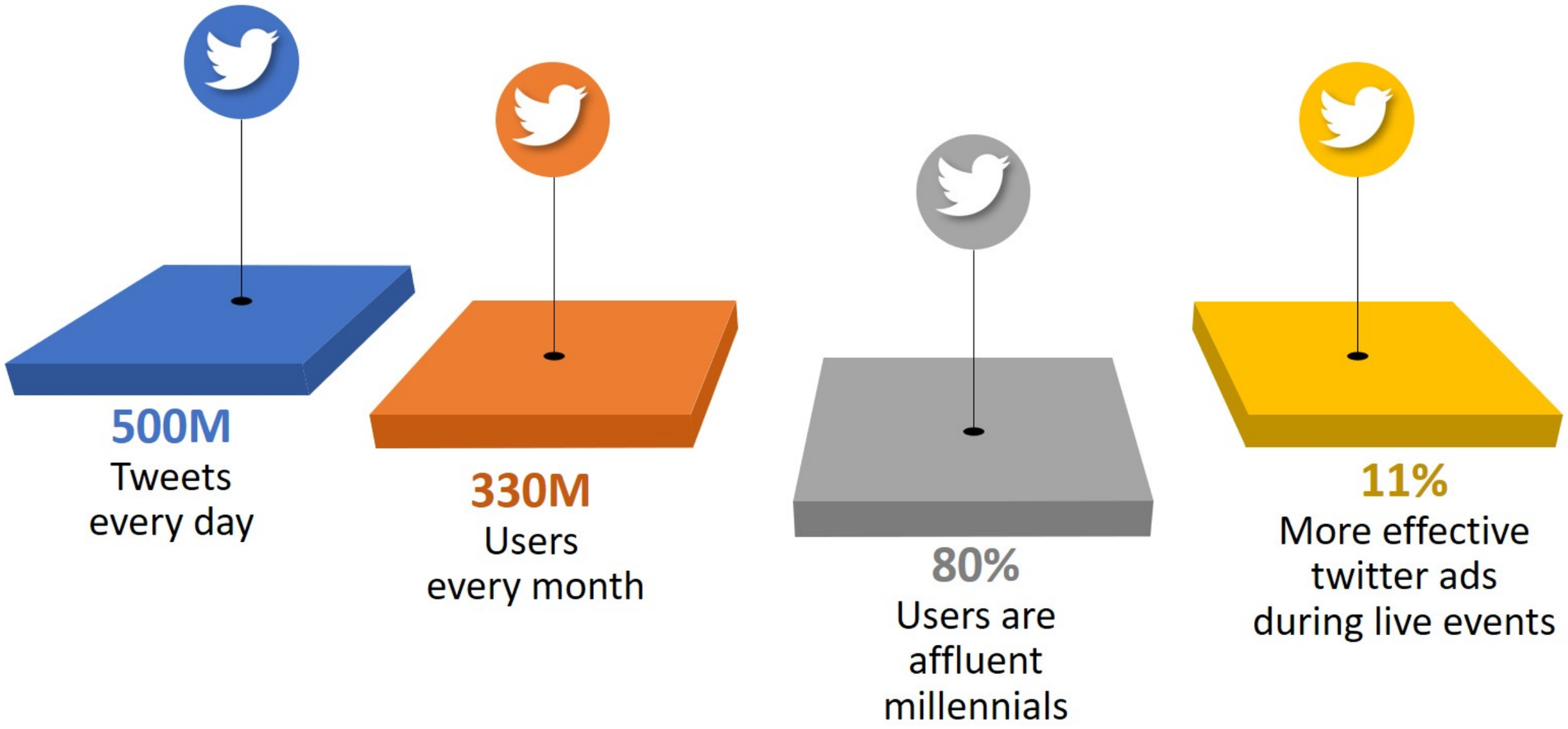
Power of twitter data



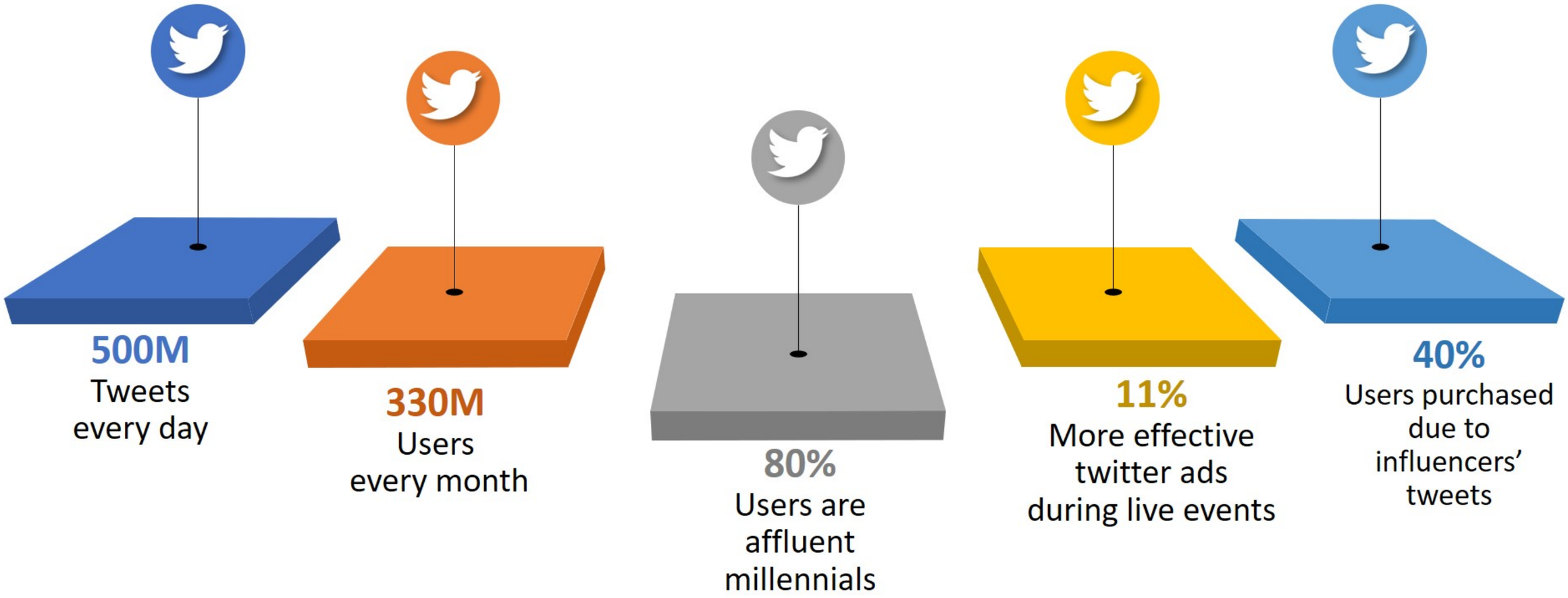
Power of twitter data



Power of twitter data



Power of twitter data



Volume of tweets

- Many functions available in R to extract tweets for analysis
- `stream_tweets()` samples 1% of all publicly available tweets
- Tweets extracted for a 30 second time interval by default

Volume of tweets

```
live_tweets <- stream_tweets("")
dim(live_tweets)
```

```
[1] 1047   90
```

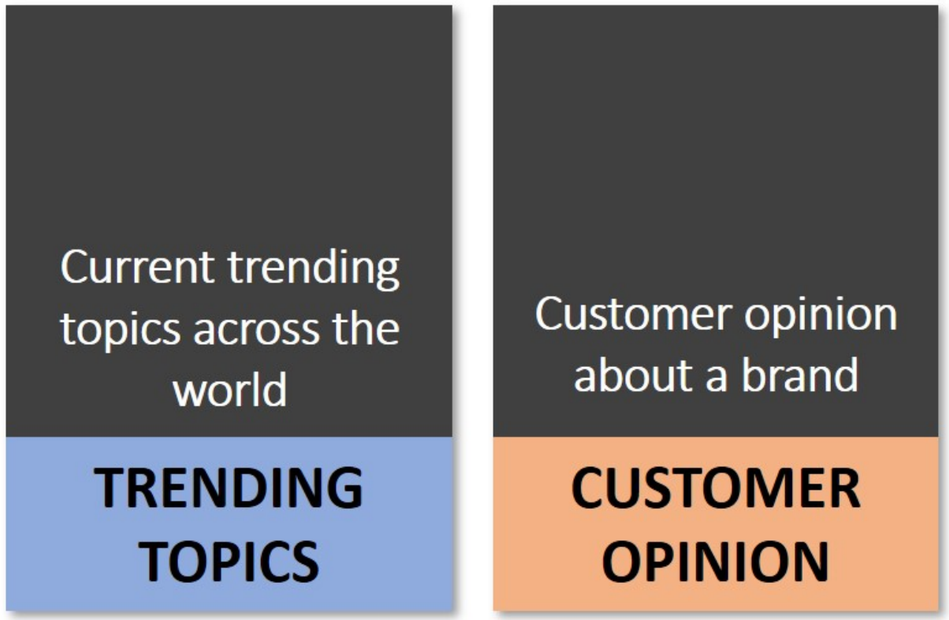
Volume of tweets

```
live_tweets60 <- stream_tweets("", timeout = 60)
dim(live_tweets60)
```

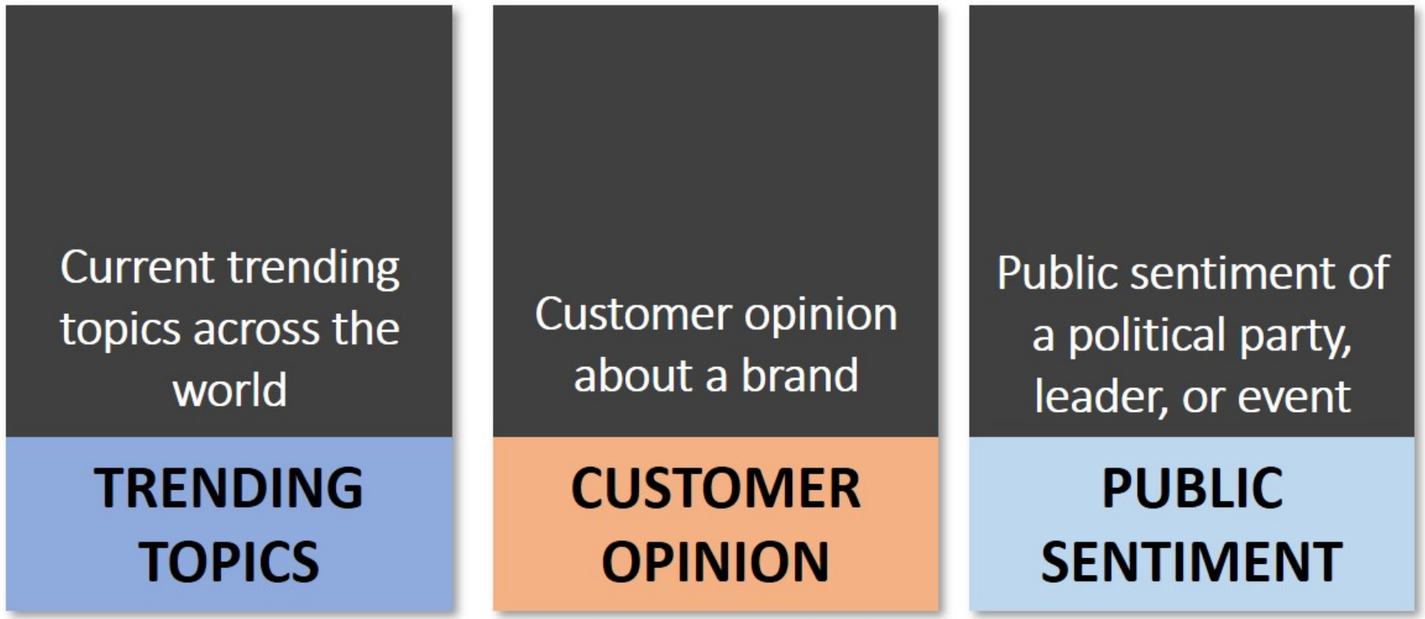
```
[1] 3464   90
```

Applications of twitter data

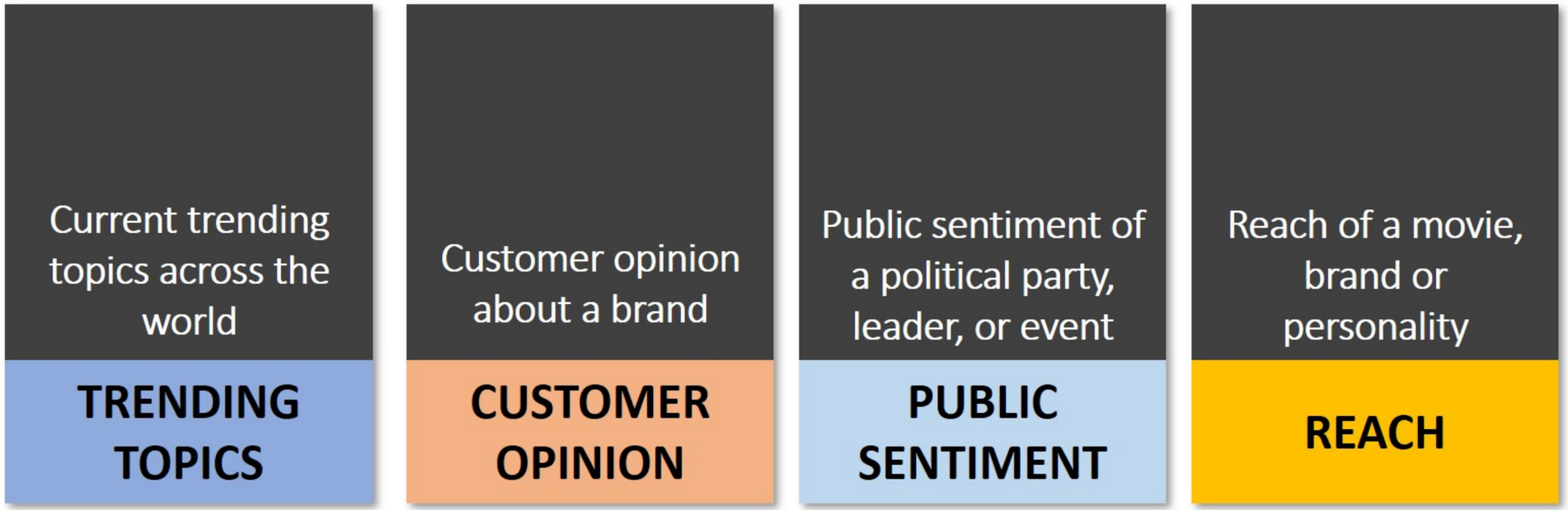
Applications of twitter data



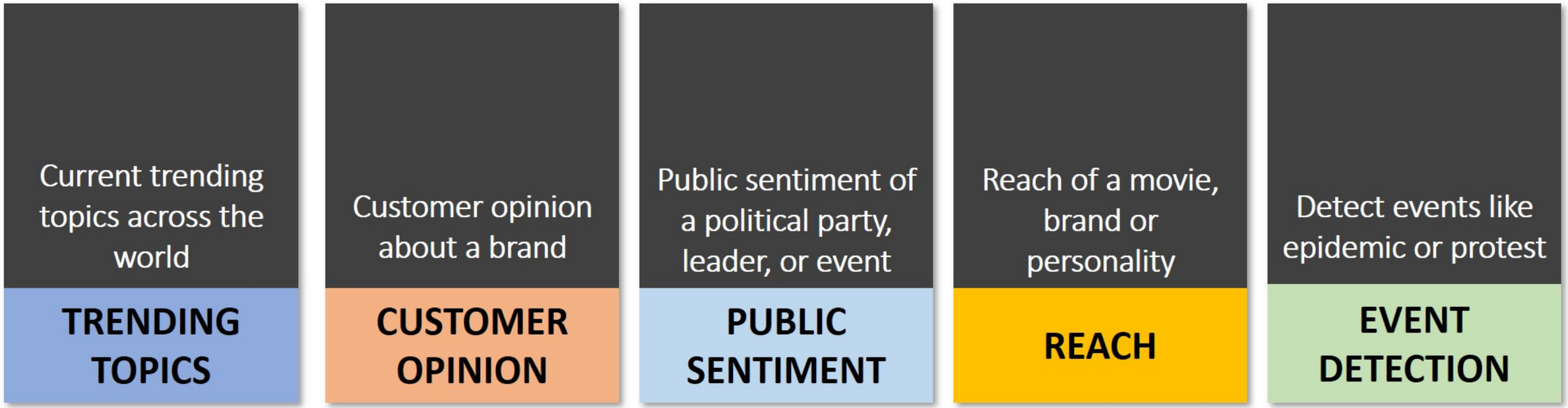
Applications of twitter data



Applications of twitter data



Applications of twitter data



Advantages of twitter data

- Twitter API is open and accessible
- Easier to find conversations because of the hashtag norms
- Since the length of tweets is limited, running algorithms is easy and controlled

Limitations of twitter data

- Historical search is limited for a free account
- A limited number of tweets extracted for a free account
- 1% sample tweets extracted may not be accurate
- Very small % of tweets have geographic tagging

Let's practice!

ANALYZING SOCIAL MEDIA DATA IN R

Extracting twitter data

ANALYZING SOCIAL MEDIA DATA IN R

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Lesson Overview

- API fundamentals
- Twitter API types
- Setup the R environment
- Extract data from twitter

API explained

- Application Programming Interface
- Software intermediary that allows two applications to talk to each other
- Twitter APIs interact with twitter and help access tweets

API-based subscriptions

Standard APIs

- Free account
- Basic queries for searching and streaming tweets
- Access to last 7 days tweet data

API-based subscriptions

Standard APIs

- Free account
- Basic queries for searching and streaming tweets
- Access to last 7 days tweet data

Premium and Enterprise APIs

- Paid subscription models
- Access to last 30 days or full archive of tweets

Prerequisites to set up R

- Prerequisites to set up R in your computer
  - A twitter account
  - Pop-up blocker disabled in the browser
  - Interactive R session
  - `rtweet` and `httpuv` packages installed in R
- All prerequisites have been setup within the DataCamp interface

The rtweet and httpuv packages

`rtweet`

- R package used for extracting data from Twitter API
- Converts twitter data to user friendly data structures

`httpuv`

- Helps authenticate twitter API access via web browser
- Building block for other R packages

Setting up the R environment

- Steps to set up the R environment in your computer
  - `rtweet` and `httpuv` libraries activated
  - `search_tweets()` function with a search query to connect with twitter
  - Authorize access via browser pop-up
  - "Authentication complete" confirms authorization of twitter access
- R environment has already been setup within the DataCamp interface

Extract twitter data: search_tweets()

- `search_tweets()` returns twitter data matching a search query
- Tweets from the past 7 days only
- Maximum of 18,000 tweets returned per request

```
# Load the rtweet library
library(rtweet)
```

```
# Extract tweets on "#gameofthrones" using search_tweets()
tweets_got <- search_tweets("#gameofthrones", n = 1000, include_rts = TRUE, lang = "en")
```

Extract twitter data: search_tweets()

```
head(tweets_got, 4)
```

```
  user_id              status_id             created_at          screen_name          text
    <chr>                <chr>              <S3: POSIXct>           <chr>              <chr>
727816588171350017   1176103860554915841   2019-09-23 11:59:45   LeonardoUzcat1   Today.\n\n#GameofThrones has wo
363838927            1176103859464396806   2019-09-23 11:59:45   mariaaa_carmen   We break the wheel together.\n\
881880538461618176   1176103856163434497   2019-09-23 11:59:44   _valkyriez       The #Emmys had their chance wit
521127287            1176103856075431936   2019-09-23 11:59:44   Nudeus           Congrats to #GameofThrones (60%
```

Extract twitter data: get_timeline()

- `get_timeline()` extracts tweets posted by a specific twitter user
- Returns upto 3200 tweets

```
# Extract tweets of Katy Perry using get_timeline()
gt_katy <- get_timeline("@katyperry", n = 3200)
```

Extract twitter data: get_timeline()

```
# View the output
head(gt_katy)
```

```
user_id          status_id                created_at          screen_name                    text
<chr>              <chr>                  <S3: POSIXct>          <chr>                       <chr>
21447363    1175132444103565312    2019-09-20 19:39:42     katyperry    My baby angel @cynthialovely
21447363    1175033932355649536    2019-09-20 13:08:15     katyperry    CHICAGO! I’m going to make i
21447363    1174461907656273920    2019-09-18 23:15:13     katyperry    I still dress like a child t
21447363    1174428616735756288    2019-09-18 21:02:56     katyperry    watch me perform ????Small T
21447363    1174381476227338240    2019-09-18 17:55:37     katyperry    ???? #SmallTalk ???? with my
21447363    1174061536580497409    2019-09-17 20:44:17     katyperry    Make a ???? connection with
```

Let's practice!

ANALYZING SOCIAL MEDIA DATA IN R

Components of twitter data

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Lesson Overview

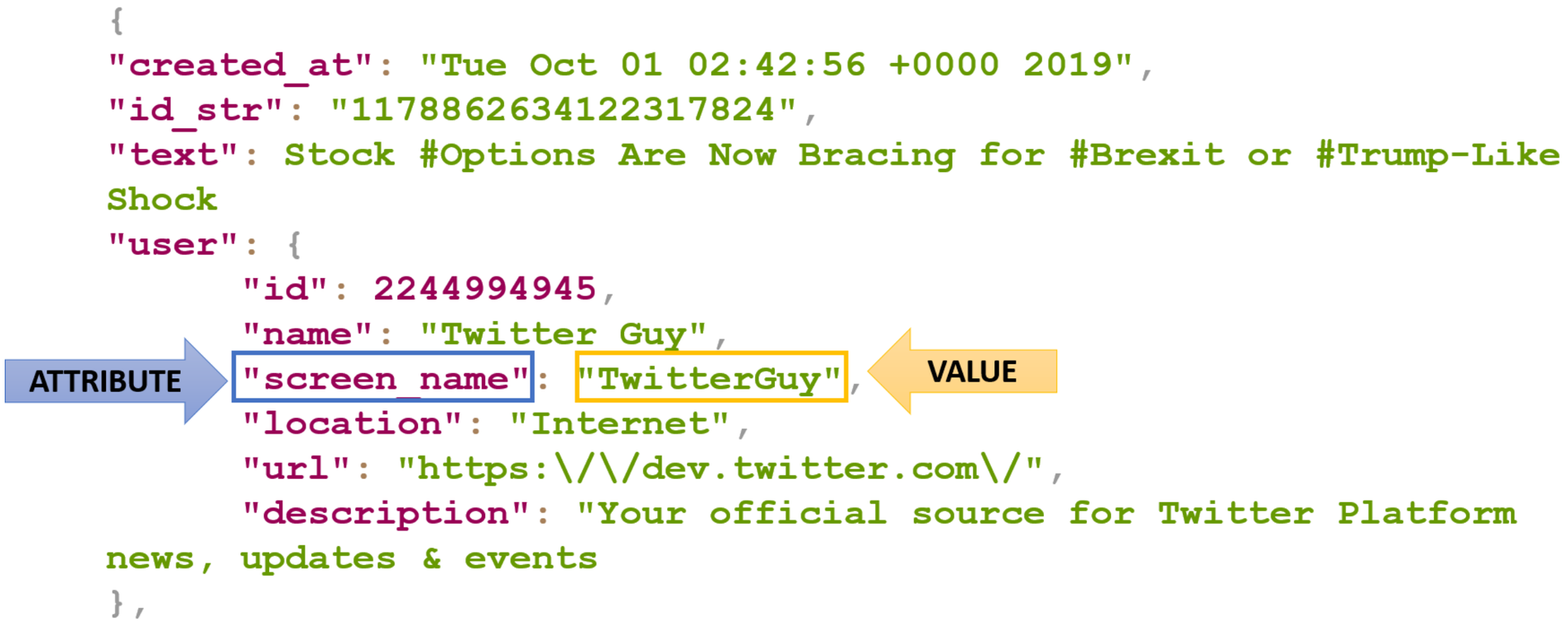
- Introduction to twitter JSON
- Extract components of metadata from the JSON
- Use components to derive insights

Twitter JSON

- A tweet can have over 150 metadata components
- Tweets and their components returned as JavaScript Object Notation

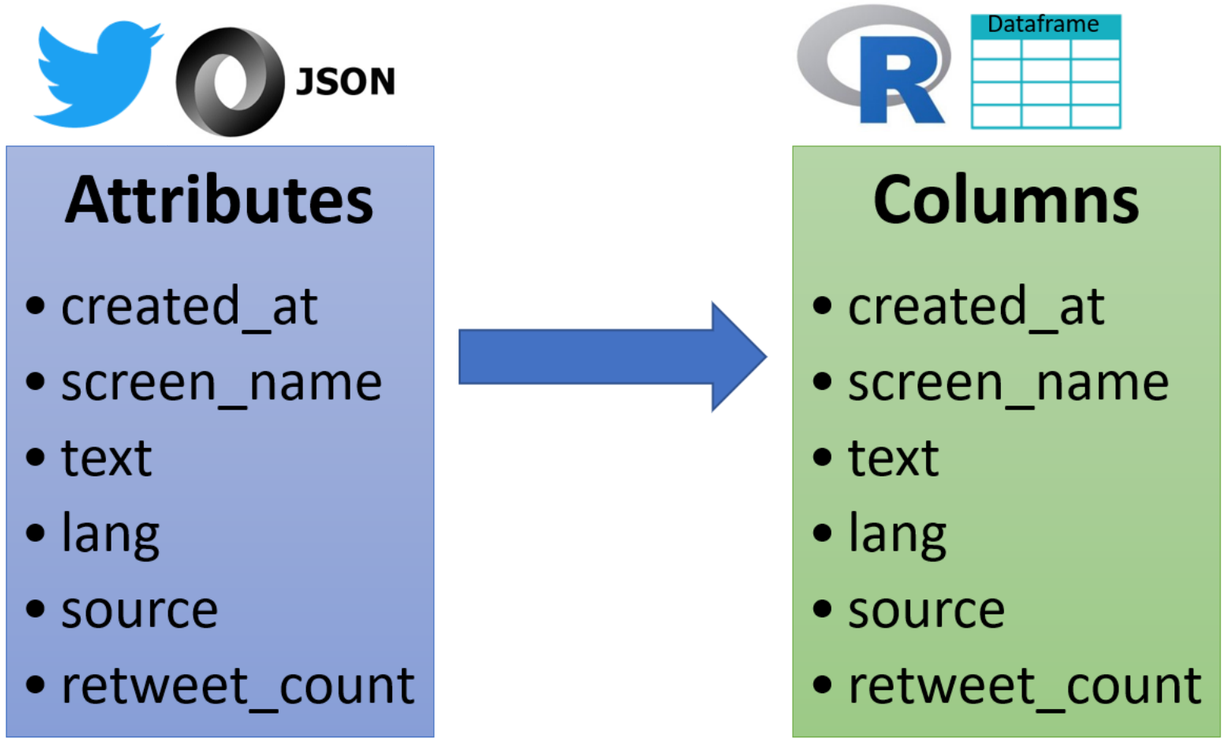
JSON attributes and values

- Attributes and values to describe tweets and components
- Example: `screen_name` stores the twitter handle of a user



Converting JSON to a dataframe

- Twitter JSON converted to dataframe by `rtweet` library
- Attributes and values converted to column names and values



Viewing components of tweets

```
# Extract tweets on "#brexit" using search_tweets()
tweets_df <- search_tweets("#brexit")
```

```
# View the column names
names(tweets_df)
```

Viewing components of tweets

```
 [1] "user_id"                 "status_id"               "created_at"
 [4] "screen_name"             "text"                    "source"
 [7] "display_text_width"      "reply_to_status_id"      "reply_to_user_id"
[10] "reply_to_screen_name"    "is_quote"                "is_retweet"
[13] "favorite_count"          "retweet_count"           "quote_count"
[16] "reply_count"             "hashtags"                "symbols"
[19] "urls_url"                "urls_t.co"               "urls_expanded_url"
[22] "media_url"               "media_t.co"              "media_expanded_url"
[25] "media_type"              "ext_media_url"           "ext_media_t.co"
[28] "ext_media_expanded_url"  "ext_media_type"          "mentions_user_id"
[31] "mentions_screen_name"    "lang"                    "quoted_status_id"
[34] "quoted_text"             "quoted_created_at"       "quoted_source"
[37] "quoted_favorite_count"   "quoted_retweet_count"   "quoted_user_id"
[40] "quoted_screen_name"      "quoted_name"             "quoted_followers_count"
[43] "quoted_friends_count"    "quoted_statuses_count"   "quoted_location"
[46] "quoted_description"      "quoted_verified"         "retweet_status_id"
[49] "retweet_text"            "retweet_created_at"      "retweet_source"
[52] "retweet_favorite_count"  "retweet_retweet_count"   "retweet_user_id"
[55] "retweet_screen_name"     "retweet_name"            "retweet_followers_count"
[58] "retweet_friends_count"   "retweet_statuses_count" "retweet_location"
[61] "retweet_description"     "retweet_verified"        "place_url"
[64] "place_name"              "place_full_name"         "place_type"
[67] "country"                 "country_code"            "geo_coords"
[70] "coords_coords"           "bbox_coords"             "status_url"
[73] "name"                    "location"                "description"
[76] "url"                     "protected"               "followers_count"
[79] "friends_count"           "listed_count"            "statuses_count"
[82] "favourites_count"        "account_created_at"      "verified"
[85] "profile_url"             "profile_expanded_url"    "account_lang"
[88] "profile_banner_url"      "profile_background_url"  "profile_image_url"
```

Exploring components

- `screen_name` to understand user interest
- `followers_count` to compare social media influence
- `retweet_count` and `text` to identify popular tweets

User interest and tweet counts

- `screen_name` refers to the twitter handle
- Number of tweets posted indicate interest in a topic
- Promote products to interested users

User interest and tweet counts

```
# Extract tweets on "#Arsenal" using search_tweets()
twts_arsnl <- search_tweets("#Arsenal", n = 18000)
```

```
# Create a table of users and tweet counts for the topic
sc_name <- table(twts_arsnl$screen_name)
head(sc_name)
```

```
_____today_____    ___JJ23    ___SAbI__    __ambell    __Amzo__    __bobbysingh
              1           2            3           1           1               1
```

User interest and tweet counts

```
# Sort the table in descending order of tweet counts
sc_name_sort <- sort(sc_name, decreasing = TRUE)
```

```
# View top 6 users and tweet frequencies
head(sc_name_sort)
```

```
 _whatthesport  footy90com  Official_ATG1  TheShortFuse  RubellM  ArsenalZone_Ind
           176          90             88            53       48               43
```

Follower count

- Count of followers subscribed to a twitter account
- Indicates popularity of the account
- A measure of influence in social media
- Position ads on popular accounts for increased visibility

Compare follower count

```
# Extract user data using lookup_users()
tvseries <- lookup_users(c("GameOfThrones", "fleabag", "BreakingBad"))
```

```
# Create a dataframe with the columns screen_name and followers_count
user_df <- tvseries[,c("screen_name","followers_count")]
```

Compare follower count

```
# View the followers count for comparison
user_df
```

```
screen_name         followers_count
<chr>                        <int>
GameOfThrones               8597188
fleabag                       58727
BreakingBad                 1240349
```

Retweet counts and popular tweets

- A retweet is a tweet re-shared by another user
- `retweet_count` stores number of retweets
- Number of retweets helps identify trends
- Popular retweets can be used to promote a brand

Retweet counts and popular tweets

```
# Create a data frame of tweet text and retweet counts
rtwt <- tweets_arsenal[,c("retweet_count", "text")]
```

```
# Sort data frame based on descending order of retweet counts
rtwt_sort <- arrange(rtwt, desc(retweet_count))
```

Retweet counts and popular tweets

```
# Exclude rows with duplicate tweet text
library(data.table)
rtwt_unique <- unique(rtwt_sort, by = "text")
```

Retweet counts and popular tweets

```
# Print top 6 unique posts retweeted most number of times
head(rtwt_unique)
```

```
retweet_count                  text
<int>                          <chr>
5606             Once a Gunner, Always a Gunner. We are proud of you @alexanderiwob
3764             Emirates on Fire ???????????????? Never give up Gunners????????????????
2798             That mood tonight ?????? 3?? POINTS ?????? #Arsenal #Gunners #COYG h
2741             #Arsenal fan: "I reckon we'll win the League this season." @Robbie
1687             Auba ???????????????? This is what I call happiness #aubameyang #arsenal
1166             When sky sports introduced the new Monday night football! The Sha
```

Let's practice!

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