



TDS3751 – Social Media Computing

(Session 2 2022/2023)

Assignment 2: Chocolate Brand Analysis

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by Group Number: 13

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Part 1: Method research

Table 1: Method research comparison

Methods / Metrics	Manual Method: Copy and Paste	Access API: Tweepy	Website Scraper: Apify	Web Scraping Software: Octoparse
Ease of use	Medium	Easy	Easy	Hard
Price	Free	Free	Provide a free tier with limited resources. Paid plans are offered to accommodate larger workloads	Partially free with basic functionality
Accuracy	Medium accuracy	High accuracy	High accuracy when scraping an account's tweets.	Low accuracy with many missing data
Speed	Very Slow	Very fast	Fast	Fast
Problems meet	Need to copy and paste the data one by one.	The search results are only able to return tweets that have been published in the past 7 days. Tweets that are beyond 7 days will not be returned	Search is no longer supported as Twitter put it behind a login	Only able to extract data from the owner account or users whose tweets you want to extract and also do not include reply tweets
Advantage	Able to extract the information that we are focused on directly from the tweets.	Able to provide rich content of tweets.	Able to customise the data that we required.	Supports various types of data extraction, including text, images, tables, and more
Disadvantage	Time consumes	Imposes rate limits on the number of requests we can make within a given time frame	May not provide complete information about a user	Inconsistent data scraping with search inconsistencies

Data Collection

After doing some research on multiple different approaches to scraping data from Twitter, we decided to choose the API method and the website scraper.

① Tweepy:

Tweepy is used in this assignment to collect Cadbury's hashtag within 7 days and also to collect text to perform sentiment analysis.

② Apify:

Apify is a one-stop shop for web scraping and data extraction. Apify provides multiple social media scrapers that are free to use. Examples of scrapers provided are Twitter Scraper, TikTok Scraper, Instagram Profile Scraper, and Facebook Groups Scraper. In this assignment, we have applied Twitter Scraper and Twitter Flash - Twitter Scraper for data extraction. Twitter Scraper is used to scrape the brand home timelines and the replies from the brand, while Twitter Flash - Twitter Scraper is used to extract the tweets that used a certain hashtag.

a) Tweet Flash - Twitter Scraper:

The screenshot displays the 'Tweet Flash - Twitter Scraper' interface. At the top, it shows the scraper's name, a 'Pay per result' dropdown, and buttons for 'Create new task', 'Actions', and 'API'. Below this is a description: 'Search, Filter, URL, User: This All-In-One Twitter Scraper delivers ~75 Tweets Per Second with Historical Search and Other Unique Features.' A navigation bar includes 'Input', 'Information', 'Runs' (50), 'Builds' (14), 'Integrations' (0), 'Monitoring', 'Issues' (1), and 'Saved tasks' (1). The 'Input' tab is active, showing a 'Search Terms (optional)' section with a list containing '@CadburyUK'. Below this are controls for 'Max Tweets Per Query/Profile/URL' (500), 'Overall Maximum Tweets' (100), and 'Tweet Language' (Any). There are also checkboxes for 'Language Detection' and 'Collect Detailed User Information (3x slower)'. A list of expandable sections includes 'Scrape by Profile', 'Scrape by URL', 'Filter Content', 'Custom Time Frame', 'Customize Run', and 'Options'. The 'Options' section shows a table with columns 'BUILD', 'TIMEOUT', and 'MEMORY', with values '0.0.49', '3,600s', and '1 GB' respectively. At the bottom, there are 'Save' and 'Cancel changes' buttons, and a 'Start' button. A status bar at the very bottom indicates 'Last run' as 'Succeeded' with '34 results' and a 'View run' link.

Figure 1: Example of Twitter Scraper

1. To get replies and tweets from the brand home timeline

Step 1: Enter the **brand Twitter name** that you wished to get the replies in the Search Terms box.

This is a close-up of the 'Search Terms (optional)' input field. It shows a list with one item, '1 @CadburyUK'. Below the list are two buttons: '+ Add' and 'Bulk edit'.

Figure 2: Search Terms

Step 2: Set the Overall Maximum number of Tweets that you want to set. In this example, we set it to **100**.

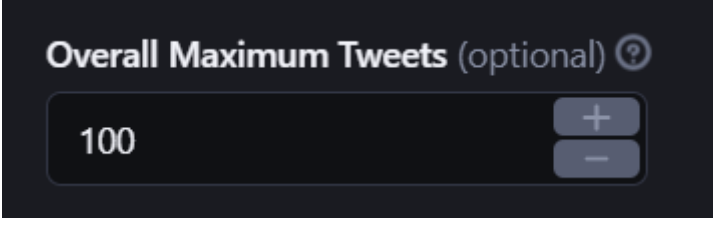
A dark-themed UI element titled "Overall Maximum Tweets (optional) ?". Below the title is a text input field containing the number "100". To the right of the input field are two small, rounded buttons: a plus sign (+) and a minus sign (-).

Figure 3: Overall Maximum Tweets

Step 3: In order to take replies from the brand, we need to scrape the tweets from the **profile**.

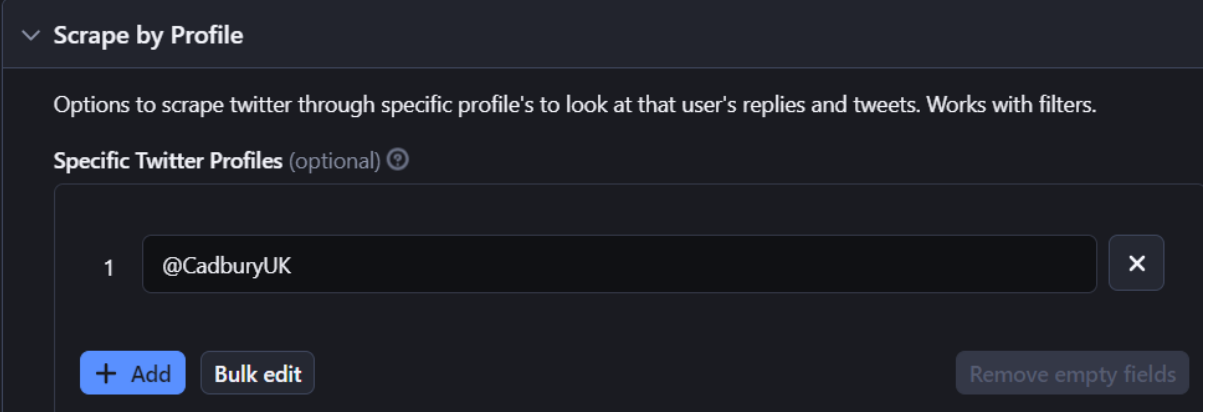
A dark-themed UI section titled "Scrape by Profile" with a dropdown arrow. Below the title is a descriptive text: "Options to scrape twitter through specific profile's to look at that user's replies and tweets. Works with filters." Below this is a sub-header "Specific Twitter Profiles (optional) ?". Underneath is a list of profiles, with the first one labeled "1" and containing "@CadburyUK". To the right of the profile name is a small "x" button. At the bottom of the list are three buttons: a blue "+ Add" button, a "Bulk edit" button, and a "Remove empty fields" button.

Figure 4: Scrape by Profile

Step 4: To make sure that the replies are collected, we could **add the URL** of the brand replies Twitter page.

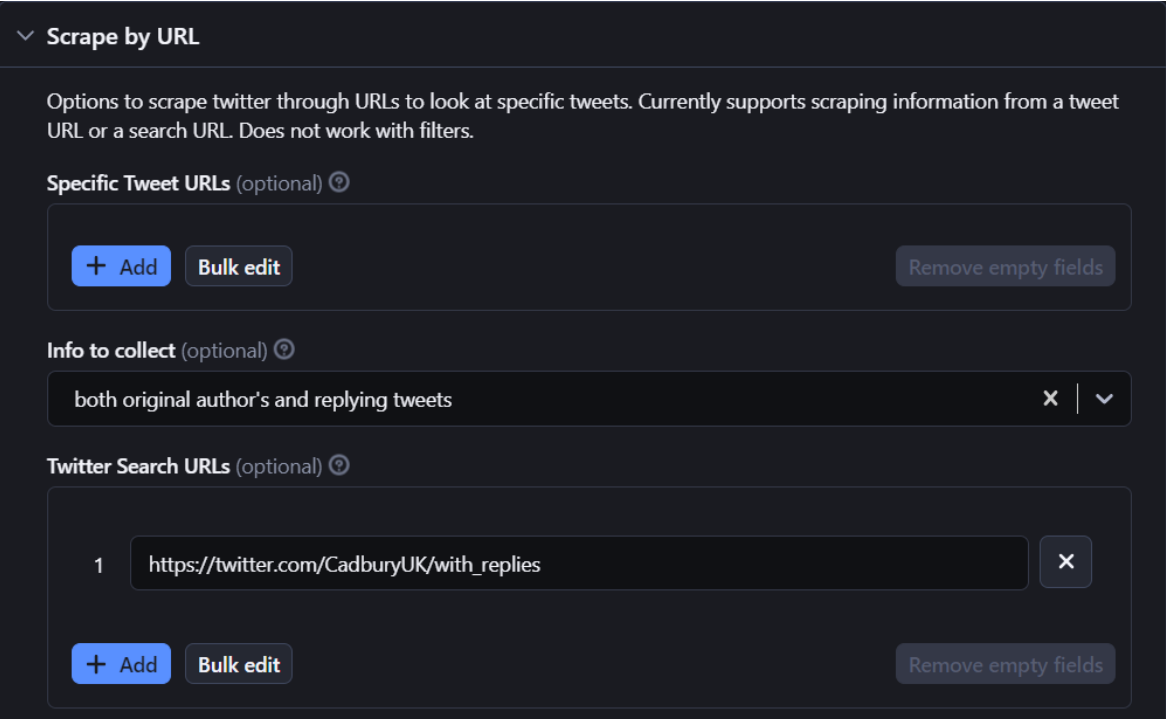
A dark-themed UI section titled "Scrape by URL" with a dropdown arrow. Below the title is a descriptive text: "Options to scrape twitter through URLs to look at specific tweets. Currently supports scraping information from a tweet URL or a search URL. Does not work with filters." Below this is a sub-header "Specific Tweet URLs (optional) ?". Underneath is a list of URLs, with the first one labeled "1" and containing "https://twitter.com/CadburyUK/with_replies". To the right of the URL is a small "x" button. At the bottom of the list are three buttons: a blue "+ Add" button, a "Bulk edit" button, and a "Remove empty fields" button. Above the URL list is another sub-header "Info to collect (optional) ?" with a dropdown menu currently showing "both original author's and replying tweets".

Figure 5: Twitter Search URLs

Step 5: We could also set the **time frame** that we want to collect the tweets. In this example, we will collect the tweets between June 17 to June 25.

▼ Custom Time Frame

To set a custom time frame for tweets published between start inclusive and end exclusive, (from start up to be not including end).

Start (optional) ⓘ

2023-06-17

×

End (optional) ⓘ

2023-06-25

×

Figure 6: Custom Time Frame

Step 6: After all the settings are set, we could click “**Save & Start**” to start extracting the tweets. The collected data will then be displayed in the dashboard.







#	Avatar tweet_avatar	image images[0]	Username	Tweet Text text	In Reply To in_reply_to	Replies	Retweets	Quotes	Likes	URL	Timestamp
1			@CadburyUK	Here's our Festival Survival Pack with plenty of snacks for all your hungry mates 🍫 👉 Anything you think we've missed? Let us know down below 🙌 Top Tip: Don't forget...	0 items	11	2	0	13	https://twitter.com/CadburyU...	2023-06-22 23:08:00
2			@CadburyUK	Super tasty, let us know if you try to make these! We hope you love them as much as we do 💜	1 item	2	1	0	1	https://twitter.com/CadburyU...	2023-06-21 18:43:00
3			@CadburyUK	Sorry to hear that! Please contact the customer care team here: bit.ly/YCpDCW & they'll look into this for you.	1 item	0	0	0	0	https://twitter.com/CadburyU...	2023-06-20 16:45:00
4			@CadburyUK	Hi there, If you head to contactus.mdlzapps.com/form?... our customer care team will be able to help you 😊	1 item	0	0	0	0	https://twitter.com/CadburyU...	2023-06-19 21:54:00
5			@CadburyUK	💜	1 item	0	0	0	1	https://twitter.com/CadburyU...	2023-06-21 18:44:00
6			@CadburyUK	The best way to spend it 🍫💜	1 item	0	0	0	1	https://twitter.com/CadburyU...	2023-06-22 19:11:00

Figure 7: Extracted Tweets

Step 7: Export the data based on your favourable format.

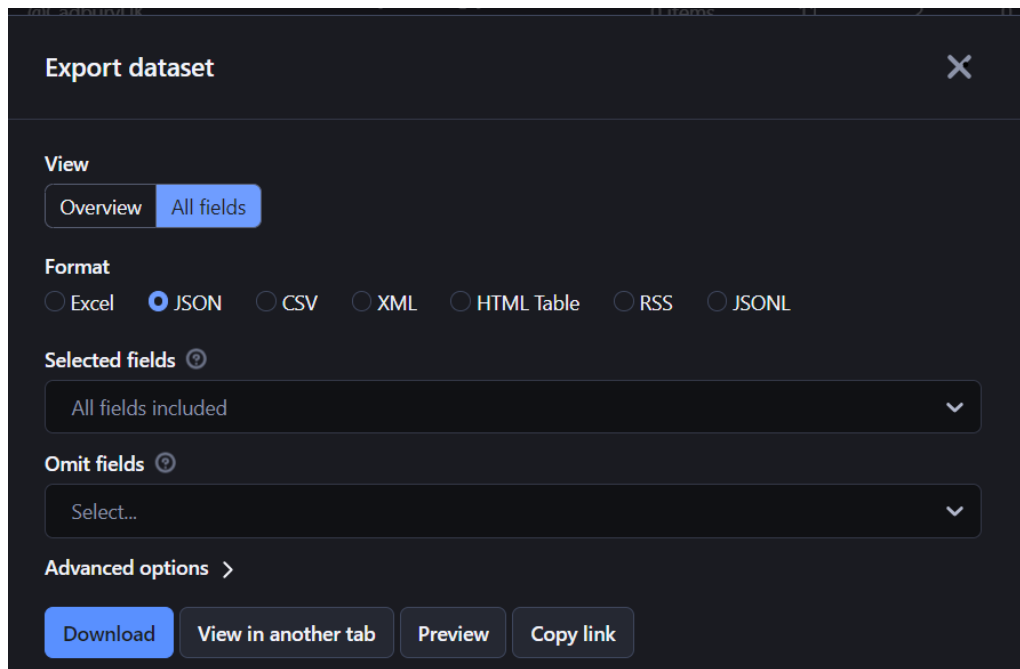
The screenshot shows a dark-themed 'Export dataset' dialog box. At the top, there's a title bar with a close button (X). Below the title, there are two tabs: 'Overview' and 'All fields', with 'All fields' being the active tab. Under the 'Format' section, there are radio buttons for 'Excel', 'JSON' (which is selected), 'CSV', 'XML', 'HTML Table', 'RSS', and 'JSONL'. Below this, there are two dropdown menus: 'Selected fields' (currently showing 'All fields included') and 'Omit fields' (currently showing 'Select...'). At the bottom, there's an 'Advanced options' link with a right-pointing arrow. Below that are four buttons: 'Download' (highlighted in blue), 'View in another tab', 'Preview', and 'Copy link'.

Figure 8: Export dataset

Hashtag Usage

Step 1: Type the **hashtag name**.

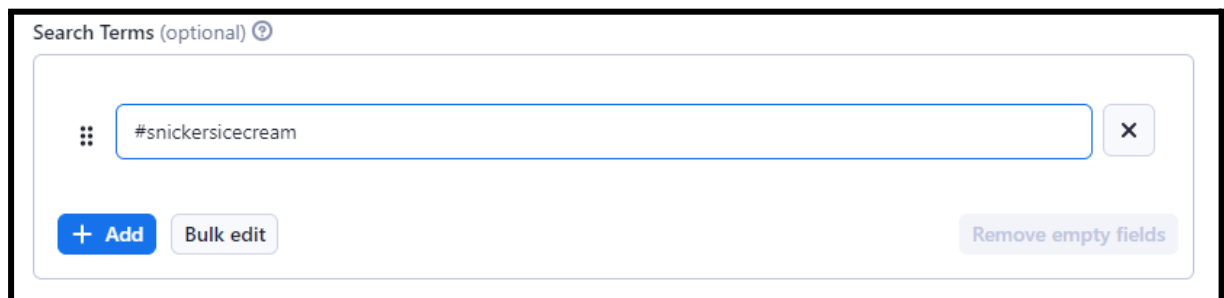
The screenshot shows a light-themed 'Search Terms' input field. At the top, there's a label 'Search Terms (optional)' with a help icon. Below it is a large text input area. Inside this area, there's a small icon of three vertical bars to the left of a text box containing '#snickersicecream'. To the right of the text box is a close button (X). Below the input area, there are two buttons: '+ Add' (highlighted in blue) and 'Bulk edit'. To the right of these buttons is a button labeled 'Remove empty fields'.

Figure 9: Search Terms

Step 2: Enter the **time range** that you want to collect the data.

The screenshot shows a light-themed 'Custom Time Frame' section. At the top, there's a dropdown arrow and the text 'Custom Time Frame'. Below this is a paragraph of text: 'To set a custom time frame for tweets published between start inclusive and end exclusive, (from start up to be not including end)'. Below the text are two input fields. The first is labeled 'Start (optional)' with a help icon, and it contains the date '2012-01-01'. The second is labeled 'End (optional)' with a help icon, and it contains the date '2023-06-28'. Both input fields have a close button (X) to their right.

Figure 10: Custom Time Frame

Step 3: Switch on “Collect Detailed User Information”.

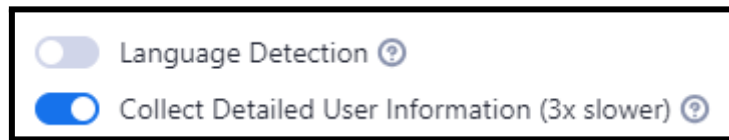


Figure 11: Option to select

Part 2

The following chocolate manufacturers were employed in this analysis: Cadbury, Snickers, KitKat, M&M, and Smarties. In this assignment, each team member is responsible for each chocolate brand.

Table 2: Work Distribution

Brand	Student
Cadbury	Adeline Low Hui Min
Snickers	Chee Wan Ying
KitKat	Chee Wei Jae
M&M	Jenniffer Teh Sue Ling
Smarties	Ng Yoong Kee

1. Domain Analysis

Since 1824, there has been a well-known chocolate manufacturer by the name of **Cadbury**. The company was started in the UK and has now become a household name. Milk chocolate, dark chocolate, and white chocolate are just a few of the many chocolate items that Cadbury offers. Cadbury Dairy Milk, Cadbury Flake, and Cadbury Creme Egg are a few of their best-selling goods. Additionally, Cadbury has received praise for its dedication to ethical and sustainable procurement of cocoa beans for its chocolate goods. In general, Cadbury chocolate is a cherished pleasure that people all over the world adore. Cadbury interacts with their fans and advertises their products on a variety of social media platforms. Cadbury has three social media platforms in addition to Twitter. Nearly 4000000 people follow Cadbury on Google+, however, they don't frequently update their content. There is no contact with the page's supporters and they just post every few weeks. Then there is Cadbury's Instagram account, but it has not been active since September 2014. They used to routinely post pictures

of baked goods produced at home with Cadbury's ingredients. In addition to the main Cadbury UK page, Cadbury also maintains individual Facebook pages for Cadbury World and other of their most well-known brand products. To promote the recipe ideas and actively engage with customers, all pages are regularly updated with brand-related content. Additionally, Cadbury has been operating a Pinterest board for over a year, but the dedication is weak. The account is relatively inactive and only has 622 followers.

Snickers is another well-known chocolate brand that has gained high popularity worldwide. The Snickers brand has a long history, it was introduced in 1930. It is produced by Mars, Incorporated, a global confectionery company in the United States. Over the years, Snickers has become one of the best-selling chocolate bars globally, loved for its distinctive flavor and texture. It has gained a reputation for providing a substantial and energy-boosting snack due to its combination of peanuts and caramel. Snickers bars are known for their combination of caramel, nougat, roasted peanuts, and milk chocolate, creating a satisfying and indulgent treat. Snickers is similar to Cadbury, it maintains a strong presence on various social media platforms such as Twitter, Facebook, Weibo, TikTok, Pinterest, Youtube, and Instagram to engage with its fans and promote its products. On Twitter, Snickers has a large following and frequently shares humorous tweets, boasting approximately 515k followers. Facebook is another platform Snickers effectively utilises to showcase its products, share captivating visuals, and run creative advertising campaigns. With an impressive 9 million likes on its Facebook page, Snickers actively interacts with its vast audience. Moreover, Snickers frequently collaborates with popular influencers and celebrities to reach a wider audience and generate buzz around their brand. The official Snickers account in China has amassed 415k followers on Weibo, a significant social media platform in the country. In addition, Snickers maintains a presence on TikTok, where it has garnered 158k followers. Furthermore, Snickers has an account on Pinterest, a platform known for sharing visual content, where it currently has 763 followers. On YouTube, Snickers operates a channel releasing entertaining and comedic videos, amassing 34k subscribers. Lastly, Snickers boasts a substantial following on Instagram, with approximately 687k devoted followers.

Besides, **KITKAT** is a well-known chocolate brand that has been enjoyed by people since its inception in 1935. Produced by Nestlé, KITKAT has gained popularity globally for its unique wafer and chocolate combination. Besides Twitter, KITKAT maintains a presence on various social media platforms to engage with its audience and promote its products. Let's

delve into KITKAT's social media channels. On Facebook, KITKAT has a dedicated page with a substantial following of over 3.5 million likes. The page is regularly updated with content related to KITKAT, including product updates, recipes, and promotional campaigns. KITKAT actively interacts with its Facebook community through comments, likes, and shares, creating a sense of connection with its fans. Instagram is another platform where KITKAT has a strong presence. With over 1 million followers, KITKAT utilises visually appealing posts to showcase its chocolate bars, create brand awareness, and engage with its audience. The Instagram account features mouth-watering images of KITKAT varieties, creative snack ideas, and collaborations with influencers and content creators. YouTube serves as a video-sharing platform for KITKAT, which has its own branded channel. The channel boasts a subscriber base of approximately 25k. KITKAT utilises YouTube to share entertaining and engaging video content, such as commercials, behind-the-scenes footage, and fun challenges related to their brand. In addition to Facebook, Instagram, and YouTube, KITKAT also maintains a presence on Pinterest. While the follower counts on Pinterest are relatively modest, with around 1.5k followers, KITKAT leverages the platform to curate boards showcasing recipe ideas, DIY crafts using KITKAT and chocolate-inspired creations. Overall, KITKAT utilises its social media channels effectively to connect with its audience, share appealing content, and promote its chocolate bars. The brand's engagement on Facebook, visually appealing posts on Instagram, entertaining videos on YouTube, and curated boards on Pinterest contribute to its social media presence and customer engagement.

Moreover, mmschocolate is the official Twitter account representing the iconic brand of **M&M's** chocolates. With its vibrant red and yellow colour scheme, the account exudes the playful and delightful nature of M&M's candies. From mouth-watering photos to engaging content, M&M's is a must-follow for chocolate lovers, fans of the brand, and anyone looking for a sweet treat in their feed. M&M's emerged on Twitter as a result of the overwhelming popularity and success of M&M's, one of the world's most beloved chocolate brands. The account was created to provide a digital platform for M&M's enthusiasts to connect, share experiences, and celebrate the brand's colourful and delicious candies. The story of M&M's dates back to the 1940s when Forrest Mars Sr., the son of the founder of the Mars company, collaborated with Bruce Murrie, the son of the president of Hershey's chocolate company. Together, they developed a revolutionary concept—a chocolate candy coated in a coloured shell that wouldn't melt in your hands. The iconic M&M's candies were born, and they quickly became a hit among consumers. Over the years, M&M's expanded its product line to

include various flavours, sizes, and limited-edition releases. From classic milk chocolate to peanut, peanut butter, crispy, and pretzel-filled M&M's, the brand has continually delighted taste buds and captivated imaginations. With their vibrant colours, playful personalities, and witty slogans like "Melts in your mouth, not in your hands," M&M's became more than just a chocolate candy—they became a pop culture phenomenon. As social media platforms gained prominence, M&M's recognized the need to establish an online presence to engage with their fans. In 2010, @mmschocolate was born, becoming the official Twitter account for M&M's. The account quickly gained a significant following, captivating audiences with its delightful content, interactive campaigns, and witty responses. Today, @mmschocolate continues to be a source of joy, sweetness, and entertainment for chocolate enthusiasts worldwide. The account shares captivating photos of M&M's in various colourful scenarios, showcases new product launches, runs exciting contests and giveaways, and interacts with its followers in a lively and engaging manner. It has become a virtual community where M&M's fans can connect, share their love for the brand, and experience the playful and delicious world of M&M's chocolates.

Last but not least, **Smarties** is a beloved chocolate brand that has captured the hearts and taste buds of chocolate lovers for decades. Smarties have a rich history that dates back to 1937 when they were first introduced in the United Kingdom. Produced by Nestlé, Smarties are small, colourful chocolate candies coated in a crunchy sugar shell. These iconic treats have become a staple in the confectionery world and are enjoyed by people of all ages. Over the years, the brand has expanded globally, gaining popularity in various countries around the world. Smarties are known not only for their delicious taste but also for their vibrant and cheerful appearance, with each candy boasting a different colour. In the era of social media, Smarties has embraced digital platforms to engage with its audience and promote its brand. On Twitter, Smarties maintains an active presence through its official account, @SmartiesUKI. Smarties uses Twitter to share updates, interact with followers, and run engaging campaigns. Facebook is another social media channel where Smarties engages with its audience. The official Smarties Facebook page features a vibrant display of colourful content, including photos, videos, and creative ideas. The page serves as a hub for Smarties enthusiasts to discover new recipes, participate in contests, and share their love for the brand. Instagram is an ideal platform for visually captivating brands like Smarties. The official Smarties Instagram account, @smartiesuki, curates a delightful feed filled with eye-catching photos and videos. Smarties has successfully utilised social media platforms to connect with

its audience and celebrate the joy of these colourful chocolate candies. With its vibrant personality and commitment to delighting fans, Smarties continues to be a beloved brand that brings a touch of sweetness to people's lives.

2. Metrics used in this assignment

In this assignment, 5 important metrics are used to understand the brand's Twitter status and to compare which chocolate brand is more successful in using its social media channel.

The **first metric** that we are using is the **average response time** a brand takes to respond to its followers. This could show how well the brand is engaging with its followers and is able to build customer loyalty and satisfaction. We believe that a successful chocolate brand will have a lower average response time and also actively reply to customers' queries and complaints. The response is calculated by subtracting the created date and time of a user tweet that mentioned the brand from the date and time the brand replied to the tweet.

The **second metric** is the **engagement rate**. The engagement rate measures the level of interaction and engagement with the brand's social media content. This metric is calculated by dividing the total number of likes, comments, retweets, and quotes by the total number of tweets they have and the total number of followers the brand has. The result is then multiplied by 100. We believe that a successful chocolate brand should have the highest engagement rate and a strong connection between the brand and its followers. The engagement rate formula is shown below:

$$\frac{(total\ likes + total\ comments + total\ retweets + total\ quotes)/no.\ of\ tweet}{No.\ of\ Followers} \times 100$$

The **third metric** is **sentiment analysis**. Sentiment analysis involves analysing the brand mentions and determining the sentiment associated with the brand. Using this metric, we could understand whether the followers are satisfied or dissatisfied with the brand. We will categorise the tweets as positive, negative, or neutral. The brand with the most positive sentiment will have positive impacts on its business and will also be able to identify the areas that require improvement or further promotion.

The **fourth metric** is the **reach metric**. Reach refers to the total number of unique users who see the brand's content. We will be using this metric to evaluate the effectiveness of a hashtag

or campaign used and organised by each chocolate brand. We calculate the reach by totaling the number of users' followers who used a certain hashtag.

The **last metric** is the **impressions metric**. The impressions calculation is almost the same as the reach metric, but impressions represent the total number of times the hashtag is seen by other users. The impressions are calculated based on the number of followers a user who uses the hashtag has and the total number of times a user has used the hashtag.

3. Brand analysis

a. CadburyUK

i) Average response time

Table 3: Response Time in average (Cadbury UK)

Response Time	Description
Average reply in: 1. 56670 seconds 2. 0.66 days	From the result, we can see that Cadbury took an average of 1 day to respond to the tweets that mentioned them using @CadburyUK . We know that Cadbury UK is actively engaging with customers on Twitter. By monitoring and responding to tweets that mention them, Cadbury UK shows a commitment to maintaining a strong online presence and engaging with its customers.

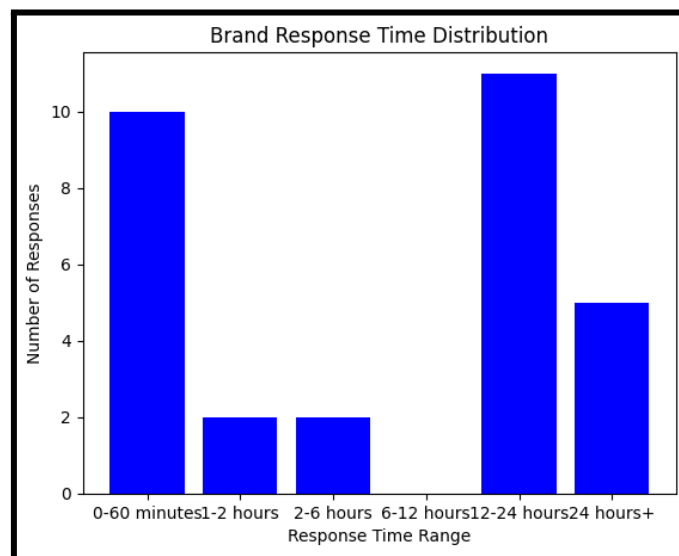


Figure 12: Response Time Distribution (CadburyUK)

The chart reveals that Cadbury UK has a significant portion of their responses falling within two response time categories: less than 1 day and less than 1 hour. This suggests that the majority of their customer interactions receive timely responses. This shows a commitment to addressing customer inquiries, feedback, or concerns within a reasonable period. Customers can expect a response from Cadbury UK within a day, ensuring that their interactions are acknowledged and attended to in a timely manner. The distribution of response times suggests that Cadbury UK prioritises customer satisfaction by maintaining relatively quick response times. Timely responses can contribute to positive customer experiences, demonstrating that the brand values and actively engages with its customers.

ii) Engagement

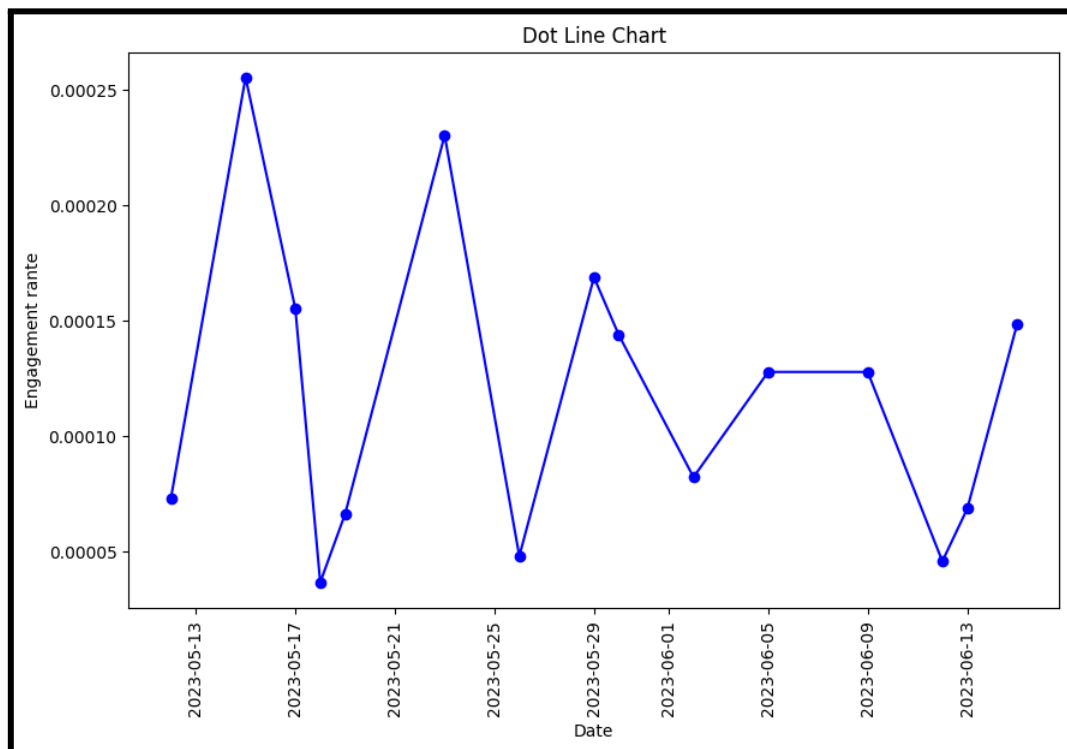


Figure 13: Engagement Chart (CadburyUK)

The data reveals that Cadbury UK's engagement rate is relatively low, with the highest rate recorded at only 0.00025%. This indicates that the overall level of interaction, likes, retweets, and comments on Cadbury UK's tweets is quite limited. A low engagement rate could suggest that their content might not be resonating strongly with their Twitter audience or that they have a smaller and less active follower base. The highest date with the highest engagement rate is May 15, 2023, and the lowest engagement rate is May 18, 2023. The tweet with the highest engagement featured a video review of the Limited Edition Twirl Mint Bar. This tweet introduced the hashtag **#Don'tSearchTwirlMint** to promote their product. The high engagement on this tweet indicates that the combination of visual content (video) and the introduction of a unique hashtag was successful in capturing the attention and interest of their followers.

iii) Sentiment analysis

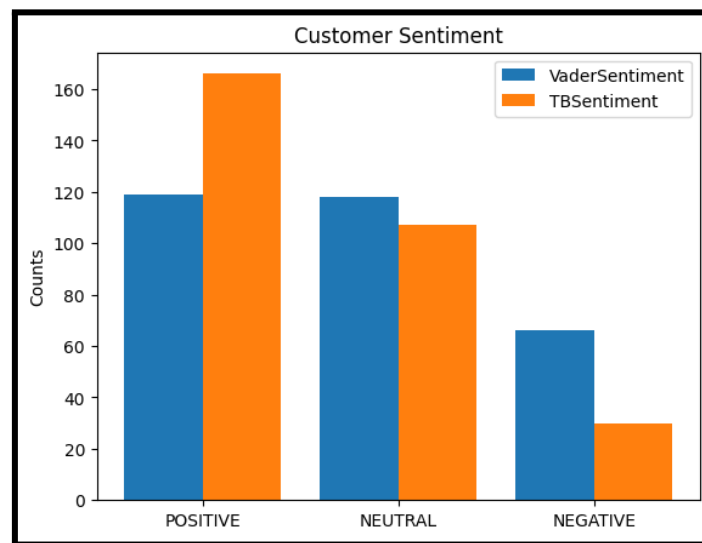


Figure 14: Sentiment Chart (CadburyUK)

Using the text extracted from the Cadbury UK timeline, TextBlob sentiment analysis revealed that the majority of tweets contained favourable comments. In contrast, Vader's sentiment analysis revealed that neutral comments were slightly more tweets than positive comments. Overall, the sentiment analysis indicates that customers' sentiment towards Cadbury UK is predominantly positive, as indicated by the favourable comments detected by TextBlob. The presence of neutral comments, as identified by Vader, suggests that customers might also share neutral or factual information about the brand or its products without explicitly expressing strong positive or negative emotions.

iv) Reach

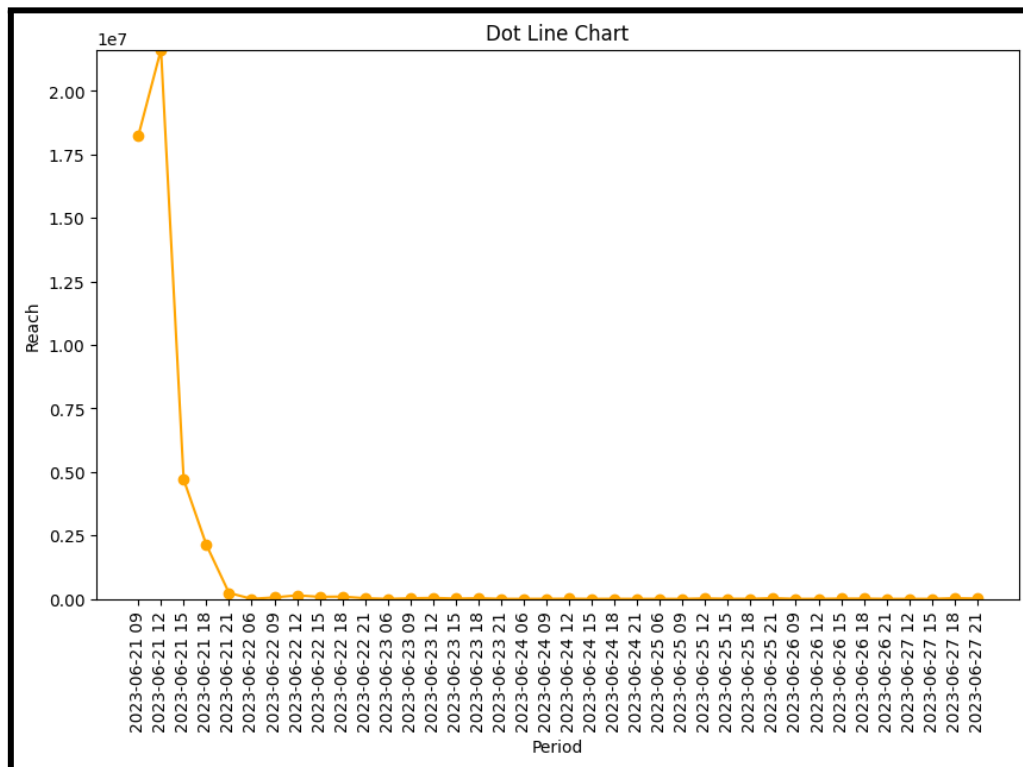


Figure 15: Reach Chart (CadburyUK)

The advertising campaign by Cadbury UK for their Twirl Mint Bar, utilising the hashtag **#DontSearchTwirlMint**, showcased a notable peak in reach during the morning of June 21, 2023. This peak indicates that the campaign successfully captured the attention of a wide audience during that time period. The campaign offered an enticing incentive for followers who used the hashtag, as Cadbury UK planned to give away 100 limited editions of Cadbury Twirl Mint bars to selected participants. This incentive likely contributed to the initial surge in reach and engagement as followers eagerly participated in the campaign. However, it is important to note that the campaign's impact and reach began to decline significantly during the afternoon of June 21, and the reach remained below 25,000 until June 27. This decline suggests that the initial excitement and engagement generated by the campaign diminished over time. It is possible that the limited duration of the campaign, which lasted only for a day, contributed to this decline in reach and engagement.

v) Impression

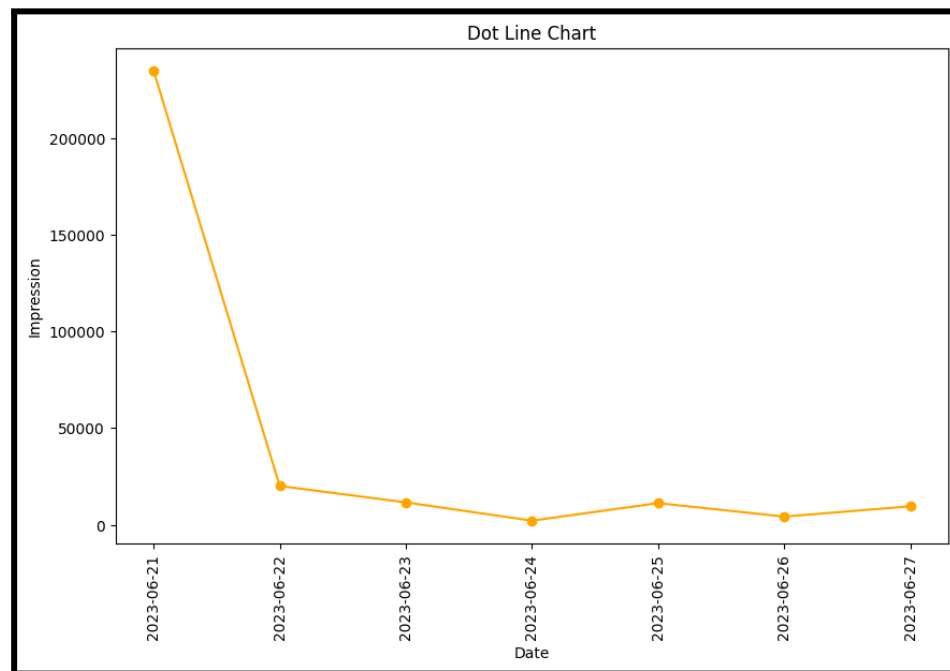


Figure 16: Impression Chart (CadburyUK)

On June 21, the day when the Cadbury UK campaign utilising the hashtag **#DontSearchTwirlMint** was launched, we observed a significant spike in the number of impressions. This indicates that the campaign successfully garnered a high level of visibility and exposure on that particular day. The spike in impressions can be attributed to the excitement and interest generated by the campaign, as followers eagerly posted tweets with the hashtag in hopes of winning the limited edition Twirl Mint Bar. The prospect of winning a coveted product likely motivated many followers to actively participate and engage with the campaign, resulting in a surge in impressions. However, it is noteworthy that the impression rates experienced a substantial decline in the following days, with each date recording less than 50,000 impressions. This decline suggests that the initial burst of interest and engagement surrounding the campaign gradually subsided, leading to a decrease in the overall visibility and exposure of the hashtag.

b. Snickers

i) Average Response Time

Table 4: Response Time in average (Snickers)

Response Time	Description
Average reply in: a) 366750 seconds b) 4.24 days	On average, Snickers takes a few days to respond to tweets that mention them using the handle of their account @SNICKERS on Twitter. This suggests that Snickers' response time may vary and may not be as prompt as some other brands. However, it's important to note that response times can depend on various factors, such as the volume of incoming tweets and the complexity of inquiries. While Snickers' response time may not be immediate, they still actively engage with their audience on Twitter, demonstrating their commitment to addressing customer inquiries and maintaining an online presence.

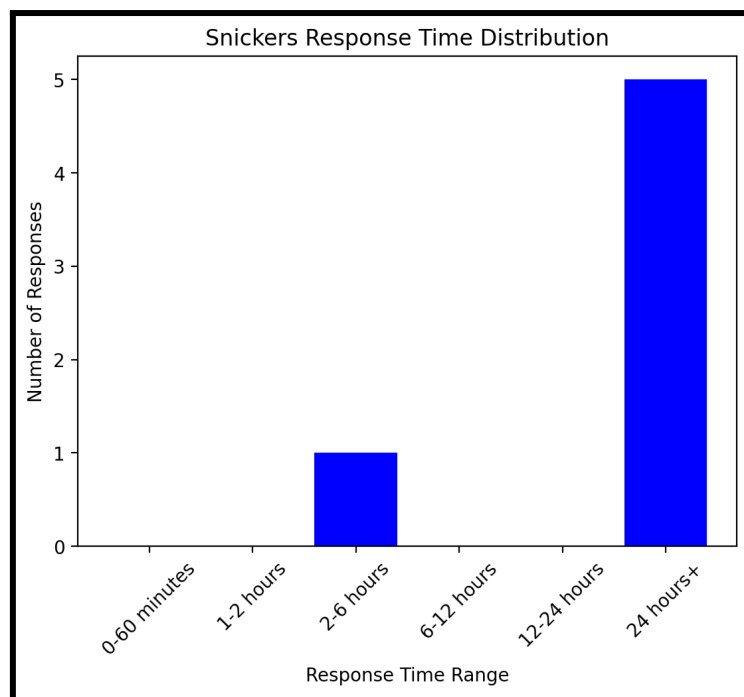


Figure 17: Response Time Distribution (Snickers)

Figure 17 illustrates the distribution of Snickers' response time. From the graph, we can see that Snickers generally takes more than a day to respond to tweets, indicating a relatively long response time compared to other brands. It suggests that Snickers may have room for improvement in terms of responsiveness and engagement with their Twitter audience in a more timely manner. Enhancing their response time can contribute to better customer satisfaction and more effective communication with their followers.

ii) Engagement

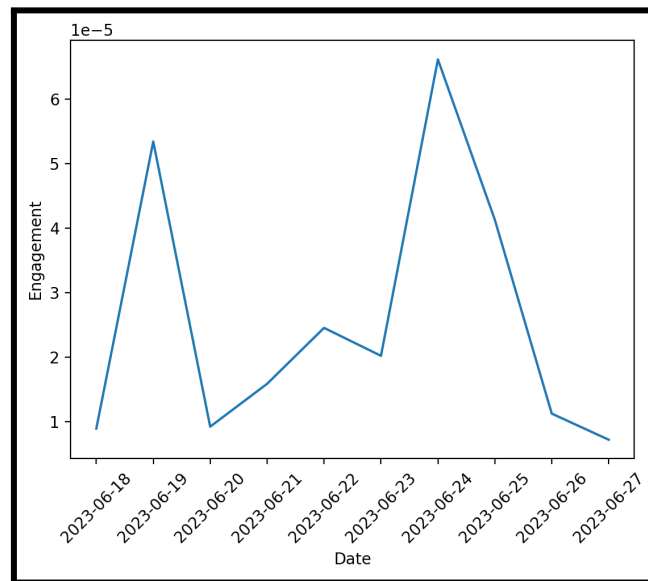


Figure 18: Total Engagement (Snickers)

Based on the data collected from Apify (Tweet Flash - Twitter Scraper), Figure 18 showcases the engagement results for Snickers over the most recent 10-day period. The graph highlights the highest recorded engagement rate for Snickers, which reached 0.000035%. Among the tweets analysed, June 26, 2023, stands out as the date with the highest engagement rate, while June 20, 2023, marks the lowest recorded engagement rate.

iii) Sentiment Analysis

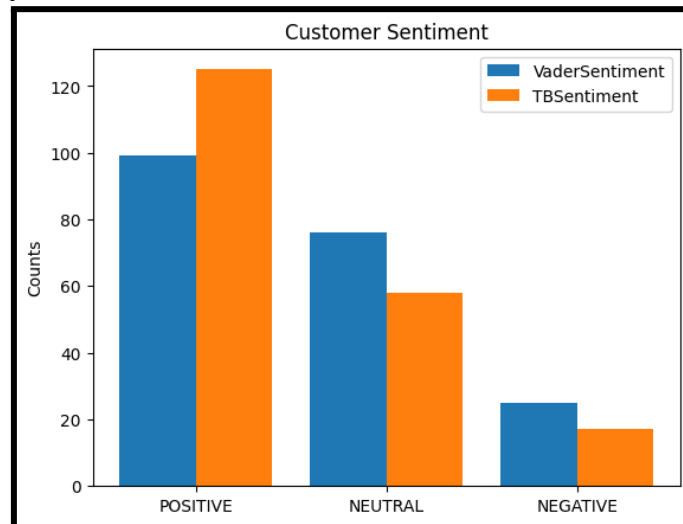


Figure 19: Sentiment Analysis Chart(Snickers)

Figure 19 depicts the sentiment analysis results for the Snickers brand using 2 widely used libraries in natural language processing (NLP) which are Vader Sentiment and TextBlob (TB) Sentiment. The data was collected from the Snickers timeline using Tweepy. After analysing the data, both Vader Sentiment and TextBlob Sentiment consistently indicate a predominantly

positive sentiment in the tweets. Therefore, it can be concluded that most customers are highly satisfied with Snickers products and services.

iv) Reach

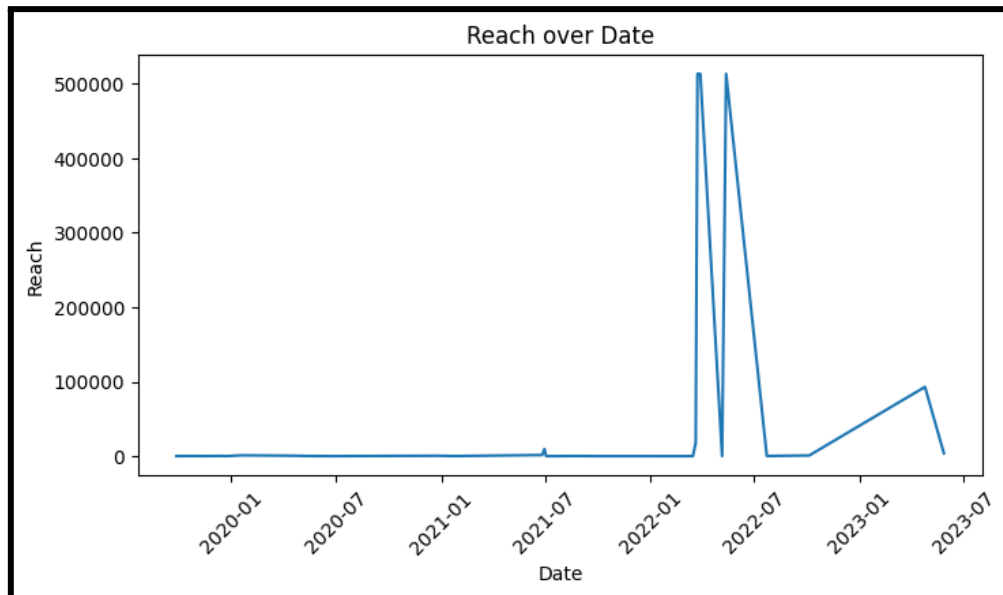


Figure 20: Reach Chart (Snickers)

Figure 20 presents the reached result by using the data collected through Apify (Tweet Flash - Twitter Scraper). Snickers has strategically employed the hashtag "[#SnickersIceCream](#)" to promote its product, Snickers Ice-cream on Twitter. This hashtag serves as a means to increase the visibility and reach of Snickers Ice Cream among Twitter users. By leveraging this promotional strategy, Snickers aims to enhance the awareness and engagement surrounding its ice cream product on the platform.

From the graph, we observe that the reach of the hashtag experienced significant fluctuations over time. Between January 2022 and July 2022, there is a notable peak in reach, where the reach count surpasses 500,000. However, following this peak, the reach gradually declines and eventually drops to zero in the middle of the specified period. The fluctuations in reach indicate variations in the effectiveness of the promotional campaign during different time intervals. It is essential for Snickers to monitor these trends and adjust their marketing strategies accordingly. By identifying the factors that contribute to the peak reach periods, such as specific events or targeted marketing efforts, Snickers can replicate successful approaches to sustain higher reach levels and maximise the impact of their Twitter campaign.

v) Impression

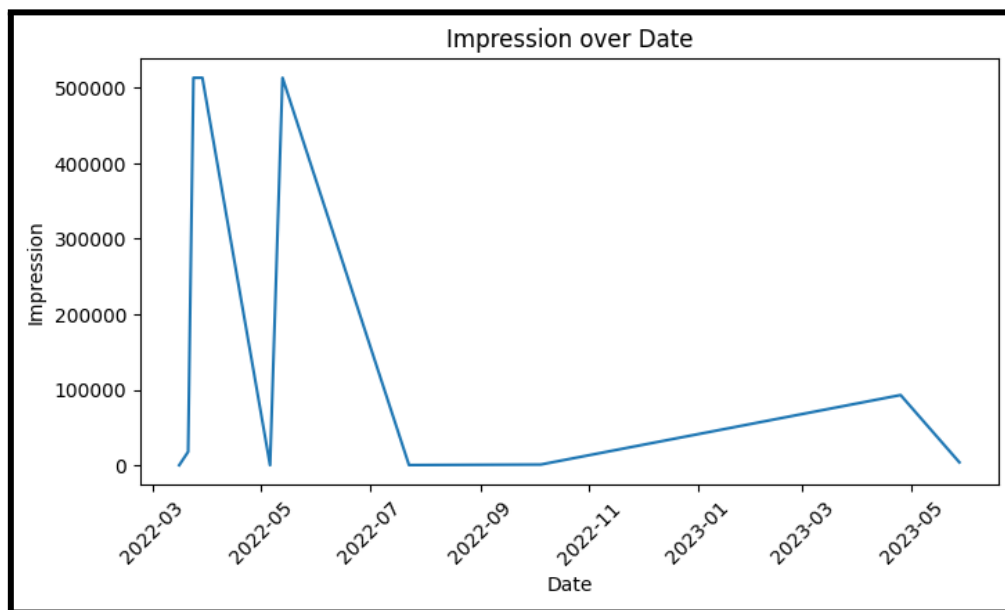


Figure 21: Impression Chart(Snickers)

Using the same data as the previous section **iv) Reach**, Figure 21 displays the impression result of the hashtag "**#SnickersIceCream**". The graph reveals that from March 2022 to July 2022, Snickers experienced a significant peak in impressions, reaching approximately 500000. This suggests a high level of visibility and engagement with the hashtag during that period.

However, following the peak, the impression rates gradually declined, and there was a notable drop to zero in the middle of the specified timeframe. As the days progressed, the impression counts continued to decrease, with subsequent dates recording impressions of less than 100000 each. This decline in impression rates indicates a decrease in overall engagement and reach, indicating that the initial excitement and momentum generated by the campaign diminished over time.

To maintain and sustain user engagement, it is crucial for brands to implement strategies that keep followers interested and motivated throughout the campaign's duration. Continuous promotion, interactive content, and timely incentives can help maintain high impression rates and maximise the campaign's impact.

c. Kitkat

i) Average Response Time

Table 5: Response Time in average (Kitkat)

Response Time	Description
Average reply in: c) 46267.5 seconds d) 0.54 days	Kitkat has an average response time of 46267.5 seconds or approximately 0.54 days. This indicates the average time taken by Kitkat to respond to user queries or interactions. A lower response time suggests that Kitkat is efficient in providing timely responses, which can contribute to a positive user experience. Kitkat's ability to respond quickly demonstrates its responsiveness and dedication to addressing user needs promptly.

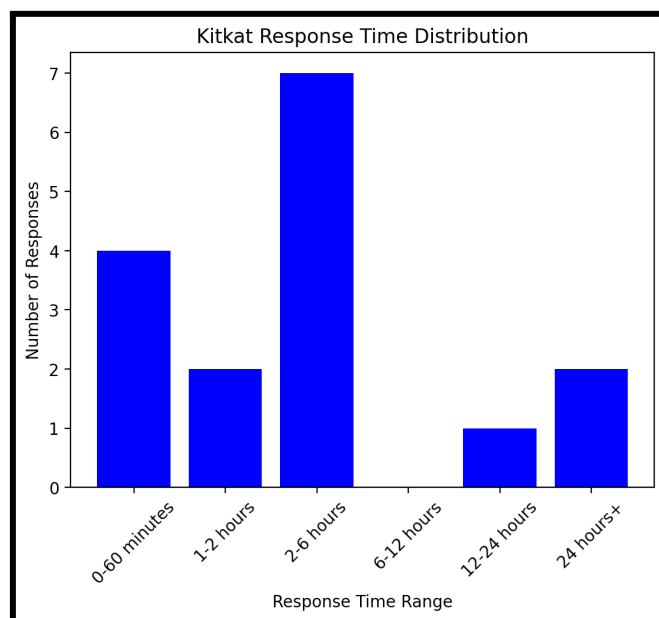


Figure 22: Response Time Distribution (Kitkat)

The bar chart titled "Kitkat Response Time Distribution" provides an overview of the distribution of response times for Kitkat. The x-axis represents the different ranges of response time, while the y-axis represents the number of responses. The graph illustrates that out of the total responses, 4 of them were received within the range of 0 to 60 minutes, indicating a quick and prompt response by Kitkat. Following that, 2 responses were received within the range of 1 to 2 hours, demonstrating a relatively swift response time. The range of 2 to 6 hours exhibits the highest number of responses with a total of 7, suggesting that Kitkat frequently responds within this timeframe. However, there were no responses recorded within the 6 to 12-hour range, indicating a potential area for improvement in terms of response time for Kitkat.

For response times exceeding 12 hours, the graph displays 1 response within the 12 to 24-hour range, indicating a delayed response, and 2 responses for response times exceeding 24 hours. This suggests that while Kitkat generally provides timely responses, there were instances where longer response times were experienced. Overall, the graph provides insights into the distribution of Kitkat's response times, highlighting areas of efficiency as well as potential areas for improvement in ensuring more consistent and prompt responses to user queries or interactions.

ii) Engagement

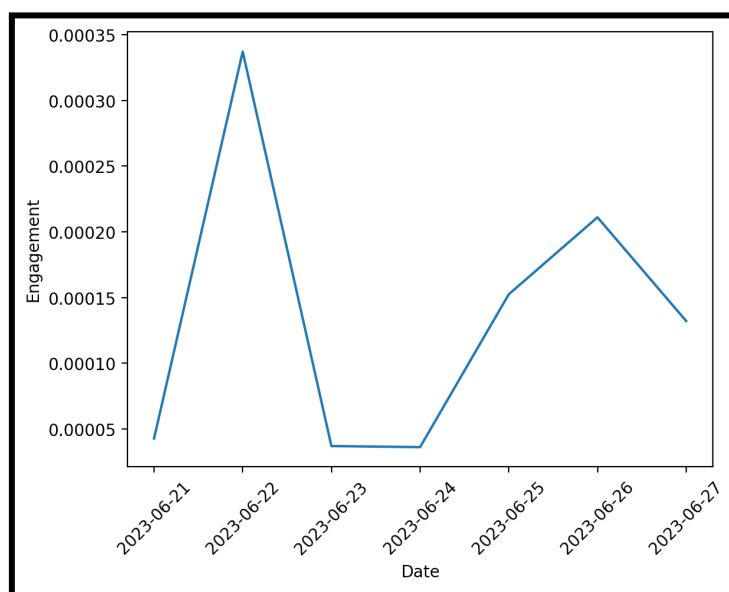


Figure 23: Engagement Chart (Kitkat)

The line graph titled "Engagement (Kitkat)" illustrates the trend of engagement over a period of time. The x-axis represents the dates, while the y-axis represents the level of engagement.

On 2023-06-21, the graph shows the lowest point of engagement, with a value of 0.00005. However, there was a noticeable increase in engagement on 2023-06-22, reaching the highest point at 0.00035. This sudden rise indicates a significant spike in user interaction or interest in Kitkat. Following the peak, the engagement level drops back to the lowest point of 0.00005 on 2023-06-23 and remains consistent on 2023-06-24. On June 25, 2023, there was a slight increase in engagement, reaching 0.00015. This suggests a mild improvement or renewed interest from users. Continuing the trend, the engagement level increased further on 2023-06-26, reaching 0.00020. This indicates a continued positive trend and an enhanced level of user engagement with Kitkat. However, on the final day of observation, 2023-06-27,

the engagement experienced a slight decline, settling at 0.00015.

The line graph provides valuable insights into the fluctuations in engagement over the specified period. It highlights the initial low engagement, followed by a significant spike, subsequent fluctuations, and a final slight decline. These variations may be influenced by various factors, such as marketing campaigns, product updates, or user behaviour. Analysing and understanding these engagement patterns can assist in formulating strategies to maintain or enhance user engagement with Kitkat.

iii) Sentiment Analysis

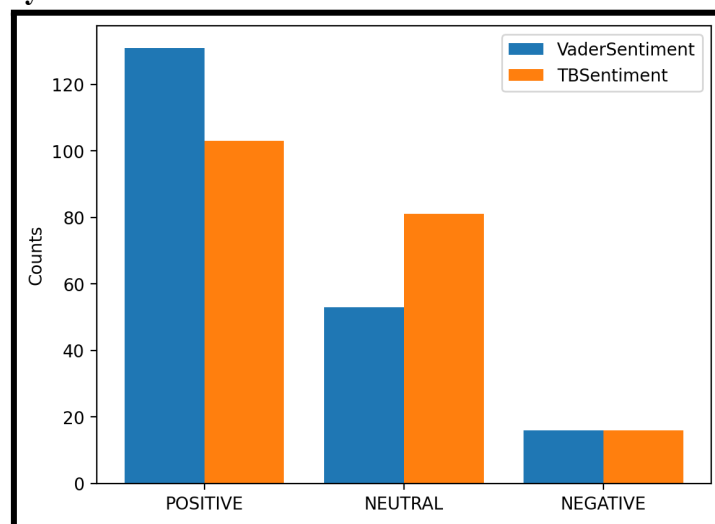


Figure 24: Sentiment Analysis Chart (Kitkat)

The histogram titled "Sentiment (Kitkat)" provides an overview of the sentiment analysis results for Kitkat. The x-axis represents three sentiment categories: "POSITIVE," "NEUTRAL," and "NEGATIVE." The y-axis represents the count of occurrences. In the sentiment analysis, two methods were used: VaderSentiment and TB Sentiment. Each sentiment category on the x-axis is associated with two bars, one representing the count for VaderSentiment and the other representing the count for TB Sentiment.

The sentiment analysis reveals that the majority of sentiments expressed towards Kitkat are classified as "POSITIVE." The "POSITIVE" category has the highest count, with 130 occurrences in VaderSentiment and 100 occurrences in TB Sentiment. This indicates a predominantly positive sentiment among the analysed data. The "NEUTRAL" category represents sentiments that neither strongly lean towards positivity nor negativity. It falls in the middle count range, with 50 occurrences in VaderSentiment and 80 occurrences in TB Sentiment. These responses exhibit a more neutral or ambivalent stance towards Kitkat.

Conversely, the "NEGATIVE" category indicates sentiments characterised by negativity or dissatisfaction. This category has the lowest count, with 10 occurrences in both VaderSentiment and TB Sentiment. Although relatively low in number, these negative sentiments should be considered and addressed to understand the concerns or issues expressed by users.

The histogram effectively visualises the sentiment distribution for Kitkat, highlighting the prevalence of positive sentiments, a moderate presence of neutral sentiments, and a relatively smaller number of negative sentiments. Understanding the sentiment analysis can assist in gauging the overall perception of Kitkat among users and identifying areas for improvement or further engagement.

iv) Reach

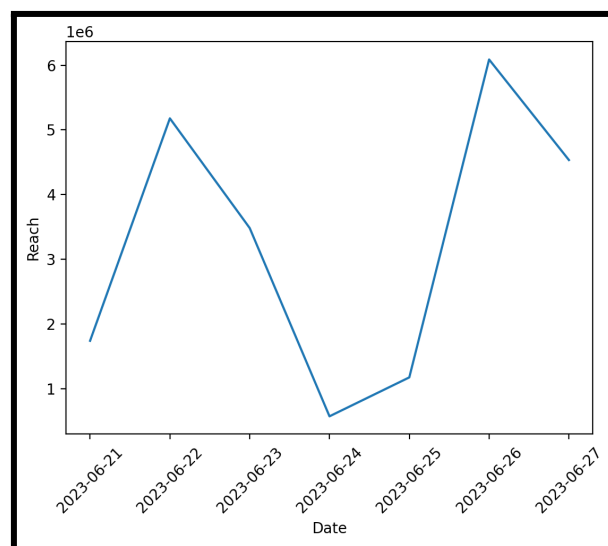


Figure 25: Reach Chart (Kitkat)

The line graph titled "Reach (Kitkat)" depicts the reach rate data collected from the hashtag **#HaveABreak**. The x-axis represents different dates, while the y-axis represents the reach rate. The reach rate, which indicates the number of unique users exposed to the hashtag, is tracked over the course of several days.

On 2023-06-21, the reach rate begins at 1.5, representing a relatively low level of exposure. However, on the following day, 2023-06-22, the reach rate significantly increased, reaching a point of 5.5. This suggests a substantial expansion in the audience reached by the hashtag.

On 2023-06-23, the reach rate experienced a decline, stabilising at 3.5. This indicates a

decrease in the number of unique users exposed to the hashtag compared to the previous day. The trend continues on 2023-06-24, where the reach rate experiences a sharp decrease, reaching its lowest point at 0.5. This significant drop suggests a substantial reduction in the audience reached by the hashtag. However, on 2023-06-25, there is a slight increase in the reach rate, with a value of 1.0. This indicates a modest improvement in the number of unique users exposed to the hashtag compared to the previous day. A notable shift occurs on 2023-06-26, where the reach rate undergoes a substantial and unexpected increase, reaching its highest point at 6.5. This significant surge suggests a remarkable expansion in the audience reached by the hashtag, potentially driven by particular events or factors on that day. On the final day, 2023-06-27, the reach rate experiences a decrease, stabilising at 4.5. Although slightly lower than the peak reached on the previous day, the reach rate remains relatively high compared to the earlier days.

Overall, the line graph provides insights into the fluctuating reach rate of the hashtag **#HaveABreak**. The data shows variations in the number of unique users exposed to the hashtag over time, ranging from lower levels to substantial increases and occasional declines. Understanding the reach dynamics can help evaluate the effectiveness of the hashtag campaign and inform strategies for maximising audience engagement and exposure.

v) Impression

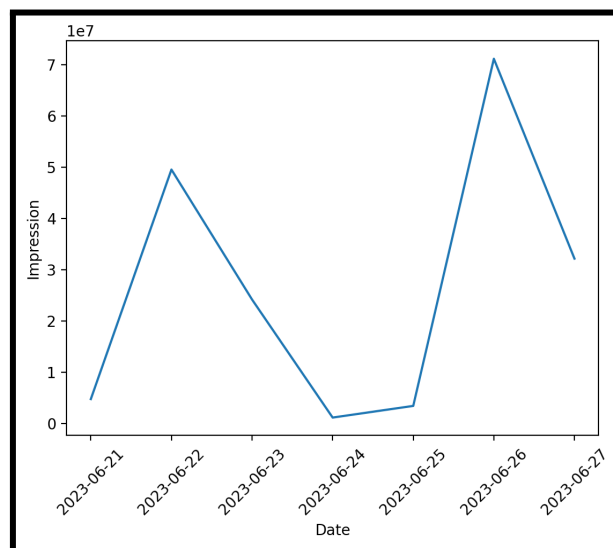


Figure 26: Impression Chart (Kitkat)

The line graph titled "Impression (Kitkat)" presents the impression rate data collected from the hashtag **#HaveABreak**. The x-axis represents different dates, while the y-axis represents

the impression rate. The impression rate reflects the number of times the hashtag was displayed or seen by users. The graph tracks the impression rate over a span of several days.

On 2023-06-21, the impression rate began at 0.5, indicating a relatively low number of times the hashtag was displayed or seen. However, on the following day, 2023-06-22, the impression rate shows a significant increase, reaching a point of 5.0. This suggests a substantial rise in the number of times the hashtag was displayed or viewed by users. On 2023-06-23, the impression rate experienced a decline, reaching a value of 2.5. This indicates a decrease in the number of times the hashtag was displayed or seen compared to the previous day. The trend continues on 2023-06-24, where the impression rate dramatically drops to its lowest point of 0.0. This suggests that the hashtag was not displayed or seen at all on that particular day. However, on 2023-06-25, there is a slight increase in the impression rate, with a value of 0.5. This indicates a modest improvement in the number of times the hashtag was displayed or viewed compared to the previous day. An unexpected turn occurs on 2023-06-26, as the impression rate experiences a significant and sudden increase, reaching its highest point at 7.0. This surge suggests a remarkable rise in the number of times the hashtag was displayed or seen by users, potentially due to specific events or factors on that day. On the final day, 2023-06-27, the impression rate decreased again, stabilising at 3.0. Although slightly lower than the peak reached on the previous day, the impression rate remains relatively high compared to the earlier days.

Overall, the line graph provides insights into the fluctuating impression rate of the hashtag **#HaveABreak**. The data showcases variations in the number of times the hashtag was displayed or seen by users over time, ranging from lower levels to substantial increases and occasional declines. Understanding the impression dynamics can help assess the visibility and reach of the hashtag campaign, aiding in the evaluation of its overall impact and effectiveness.

d. M&M

i) Average Response Time

Table 6: Response Time in average (M&M)

Response Time	Description
Average Reply: a) 383678.66 seconds b) 4.440725 days	The average response time of M&M on Twitter is approximately 383,678.66 seconds, equivalent to around 4.4 days. This means that, on average, it takes M&M approximately 4 days to respond to tweets or direct messages received on Twitter. It's important to note that response times can vary depending on the volume of messages received and the specific circumstances.

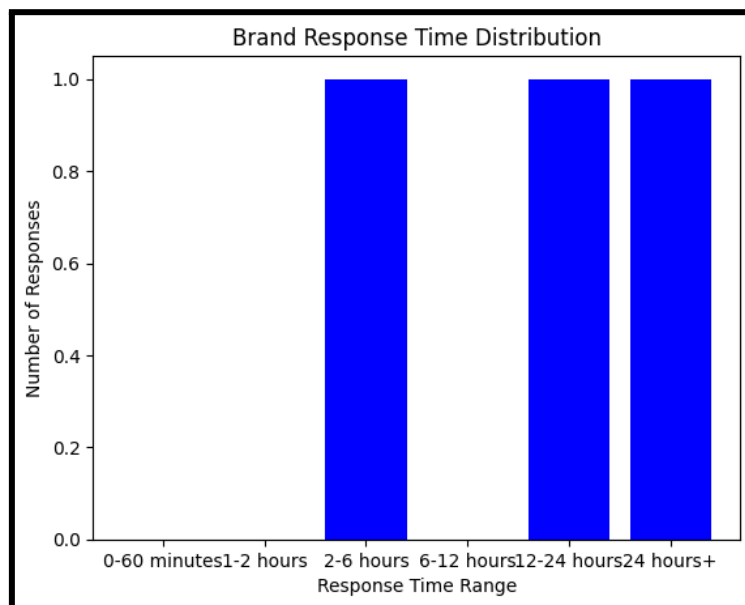


Figure 27: Response Time Distribution (M&M)

Figure 27 represents the distribution of response times for M&M. The bar chart provides an overview of the distribution of response times for M&M. The x-axis represents different ranges of response times, while the y-axis represents the number of responses. The graph shows that the number of responses within the ranges of 2-6 hours, 12-24 hours, and 24+ hours are the same, suggesting that the response time for Kitkat varied more within these ranges. This means that for some inquiries or messages, M&M took between 2 to 6 hours, 12 to 24 hours, or even more than 24 hours to respond, and the number of such responses was equal across these ranges.

ii) Engagement

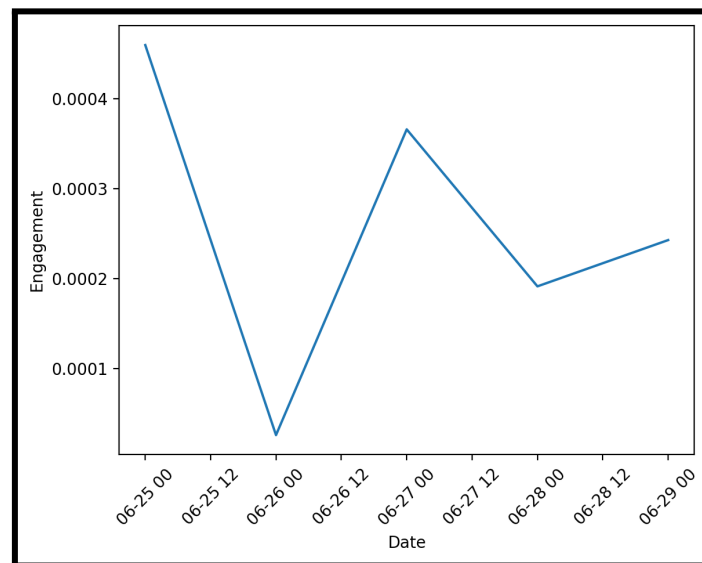


Figure 28: Engagement Chart(M&M)

The graph above displays the engagement rate data for M&M's over a recent 5-day period. During this time, the highest recorded engagement rate was 0.004% between June 25th and June 29th. Conversely, the lowest recorded engagement rate was less than 0.0001% on June 26th. By observing the line graph, we can gain valuable insights into the fluctuations in engagement during this specified period. The graph showcases an initial period of low engagement, followed by a significant spike, subsequent fluctuations, and a slight decline towards the end. These fluctuations could be attributed to various factors such as marketing campaigns, product updates, or changes in user behaviour.

iii) Sentiment Analysis

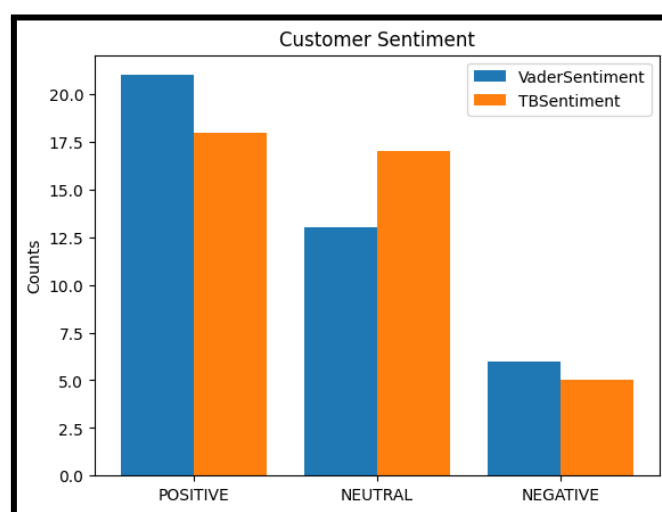


Figure 29: Sentiment Analysis Chart(M&M)

The bar plot provides insights into the sentiment of the customers' tweets related to M&M. Each sentiment category ('POSITIVE', 'NEUTRAL', 'NEGATIVE') is represented on the x-axis, and the corresponding counts are shown on the y-axis. Conversely, the counts for 'NEUTRAL' and 'NEGATIVE' sentiments are relatively low. This implies that a smaller percentage of users have expressed neutral or negative opinions regarding M&M's product. The low count in these categories further supports the idea that the overall sentiment is predominantly positive. Based on the bar plot, we can infer that users are generally satisfied and have a positive sentiment toward the M&M product.

iv) Reach

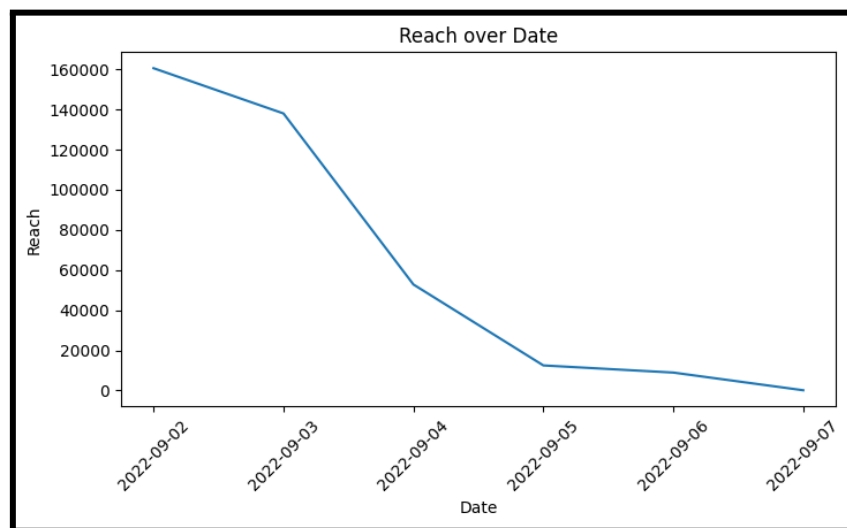


Figure 30: Reach Chart(M&M)

M&M launched a new ice cream chocolate product, specifically cookie sandwiches, and promoted it using the hashtag *#MMSIceCreamSweepstakes*. A key factor contributing to the increased reach and overall success of the campaign was the incentive provided by M&M. They offered a limited edition M&M's ice cream sandwich bag as a reward to users who utilised the hashtag. This incentive system effectively motivated users to actively participate in the campaign, share their excitement and spread the word about the new product. The peak in reach on September 2, 2022, signifies the effectiveness of the promotional campaign and suggests that M&M successfully captured the attention and interest of their target audience. The high level of engagement observed during this period indicates that users were not only aware of the campaign but also actively involved in sharing their experiences and promoting the product through their online presence.

Overall, the launch of M&M's ice cream chocolate cookie sandwiches, combined with the *#MMSIceCreamSweepstakes* campaign, proved to be a successful marketing endeavour, capturing the attention and generating a high level of engagement among consumers.

v) Impression

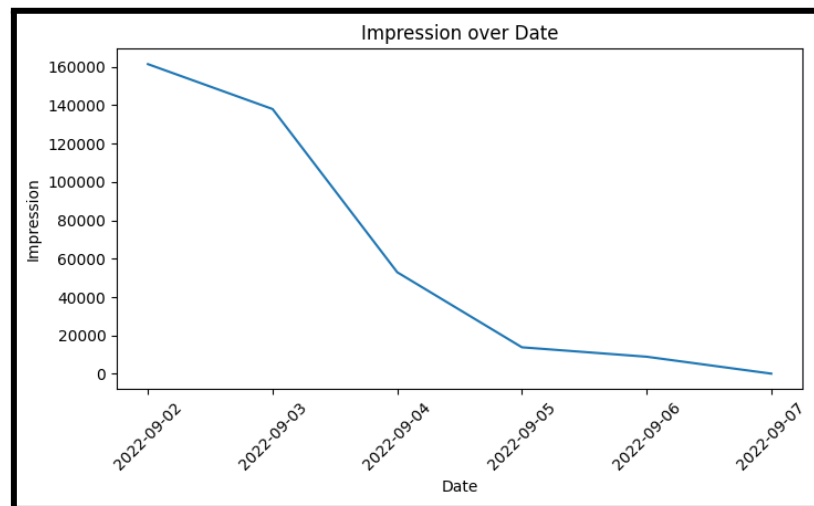


Figure 31: Impression Chart (M&M)

By analysing the data associated with the *#MMSIceCreamSweepstakes* hashtag, it becomes apparent that September 2 experienced the highest number of impressions. This notable surge in user activity can be directly attributed to the fact that the campaign was officially launched on that day. As M&M unveiled their new ice cream chocolate product, followers and enthusiasts eagerly took to social media to participate in the promotional campaign. The allure of winning the limited edition M&M's ice cream sandwich bag by simply including the hashtag in their tweets motivated users to actively engage and share their excitement. This initial launch day generated a significant buzz and heightened user involvement, leading to a substantial increase in impressions and ultimately contributing to the overall success of the *#MMSIceCreamSweepstakes* campaign.

e. Smarties

i) Average Response Time

Table 7: Response Time in average (Smarties)

Response Time	Description
Average Reply: a) 35769 seconds b) 0.4140 days	<p>The calculated average response time for the SmartiesUKI is 35,769 seconds, which is equivalent to approximately 9.94 hours. This means that, on average, it takes the account around 9.94 hours to respond to messages on Twitter.</p> <p>The average response time is 0.4140 days, which is approximately 9 hours and 56 minutes. This implies that, on average, it takes the SmartiesUKI approximately 9 hours and 56 minutes to reply to tweets.</p>

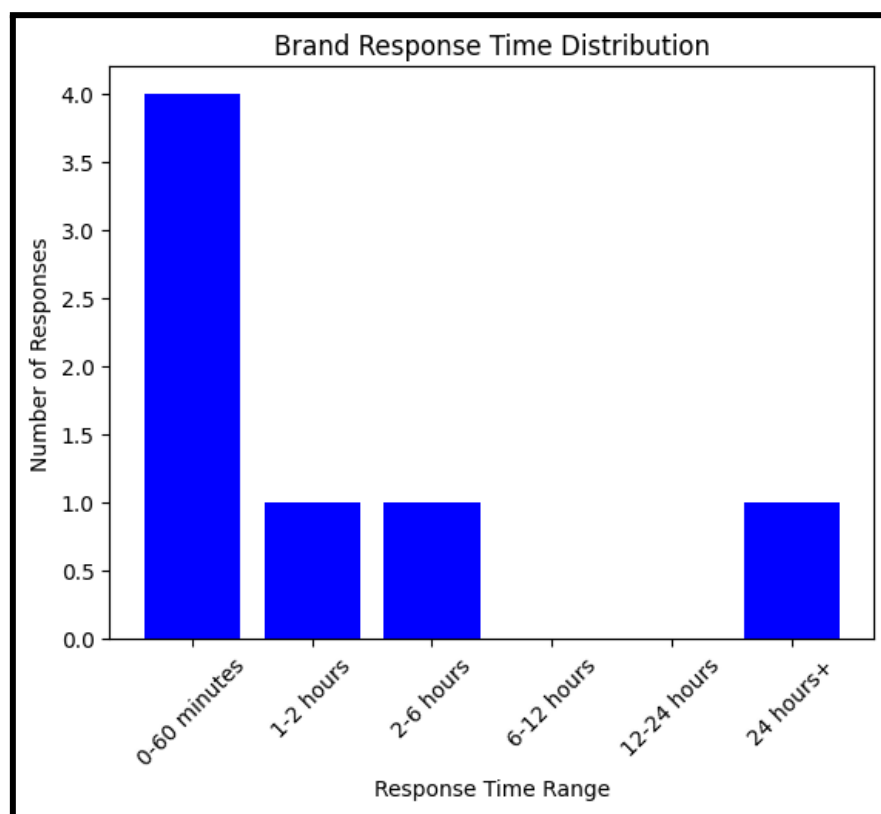


Figure 32: Response Time Distribution (SmartiesUKI)

Figure 32 represents the distribution of response times of SmartiesUKI. The majority of responses fall within the "0-60 minutes" range, suggesting that the brand is generally prompt in addressing user interactions. The second tallest bar corresponds to the "1-2 hours", "2-6 hours" and "24 hours+" range, indicating a moderate number of responses received within

this time frame. There is a noticeable drop in the number of responses for the "6-12 hours" and "12-24 hours" ranges, indicating a less frequent occurrence of responses during this timeframe.

ii) Engagement

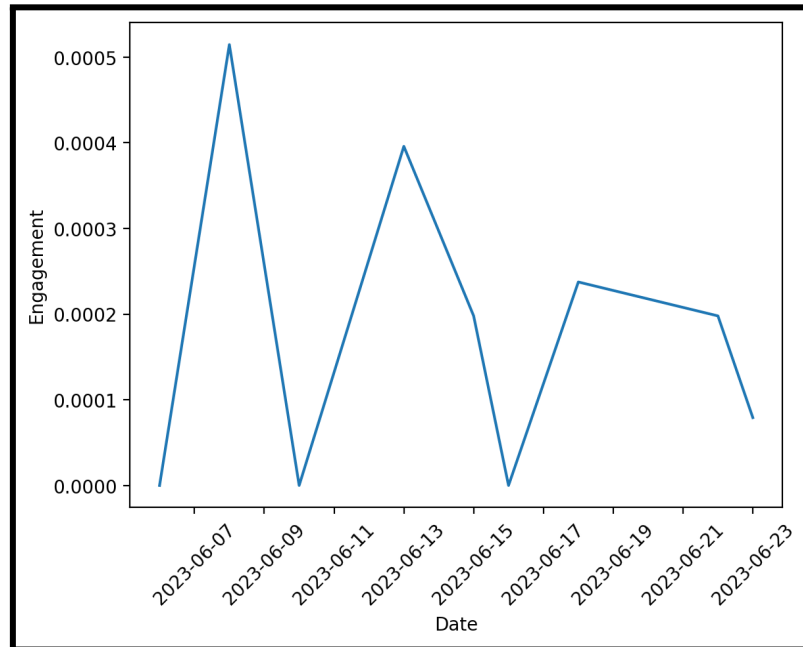


Figure 33: Engagement Chart (SmartiesUKI)

Based on the data collected from Apify (Tweet Flash - Twitter Scraper), Figure 33 illustrates the total engagement of the brand SmartiesUKI. The line exhibits varying peaks and troughs, indicating periods of higher and lower engagement, respectively. These fluctuations suggest that the brand's ability to engage its followers fluctuates over time, with some periods experiencing more active and involved interactions than others. The chart enables viewers to identify specific dates when engagement was particularly high or low. It is worth noting that the chart does not reveal specific reasons behind the observed patterns, but it provides a visual representation of the brand's overall engagement performance. By analysing the line's movement, it becomes apparent that engagement levels tend to vary, indicating that the brand's content, strategies, or external factors influence the audience's response.

iii) Sentiment Analysis



Figure 34: Sentiment AnalysisChart (SmartiesUKI)

Figure 34 represents the sentiment analysis results of customer tweets related to SmartiesUKI. The sentiment analysis was performed using two different methods: VADER and TextBlob.

From the chart, we can observe that the number of tweets classified as "POSITIVE" by both VADER and TextBlob is relatively high, indicating that a significant number of customers expressed positive sentiment in their tweets about SmartiesUKI. The number of tweets classified as "NEUTRAL" by both methods is moderate. These tweets do not exhibit strong positive or negative sentiments and may contain more factual information or general statements about SmartiesUKI. The number of tweets classified as "NEGATIVE" by both VADER and TextBlob is relatively low compared to positive sentiment. This suggests that the majority of customer tweets about SmartiesUKI did not express negative sentiment.

Overall, the sentiment analysis indicates that the majority of customer tweets about Smarties UKI were positive or neutral in nature, with only a small portion expressing negative sentiment.

iv) Reach

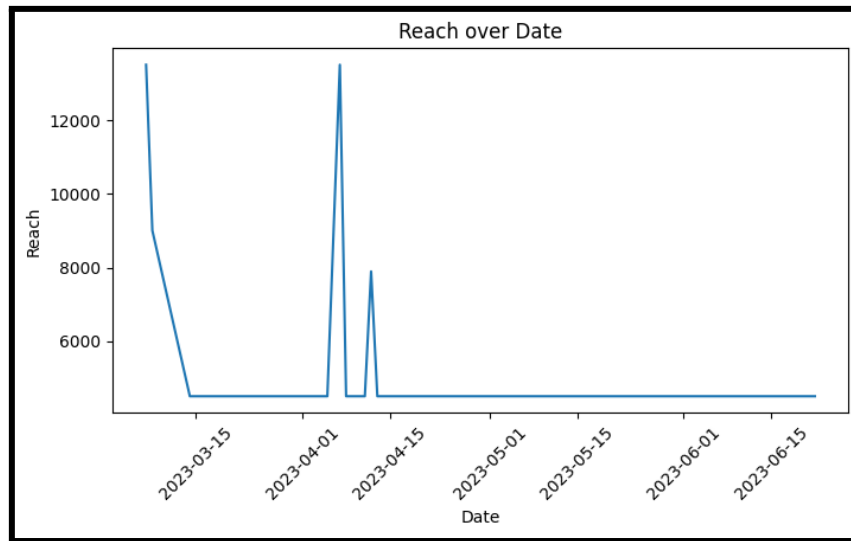


Figure 35: Reach Chart (SmartiesUKI)

Based on the data collected from Apify (Tweet Flash - Twitter Scraper), Figure 35 represents the reach of **#SmartiesButtons** hashtag over a period of time. The reach is measured by the total number of followers of Twitter users who have used the hashtag in their tweets. The line plot shows the trend of the reach over time. Each point on the line represents the cumulative reach on a specific date.

From the chart, we can observe that the line generally shows an upward trend, indicating that the reach of the **#SmartiesButtons** hashtag has been growing since the beginning of April. This suggests that more Twitter users with a significant number of followers have been using the hashtag, leading to increased visibility and potential audience engagement. There are some fluctuations in the reach over time, as indicated by the variations in the slope of the line. These fluctuations may be influenced by various factors such as specific events, promotions, or trending topics related to SmartiesUKI. The chart allows us to identify periods of relatively high and low reach. Higher peaks in the line indicate dates when the hashtag generated a larger cumulative reach, while lower points indicate dates with a lower cumulative reach.

Overall, the chart provides insights into the reach of the **#SmartiesButtons** hashtag over time, highlighting the growth and fluctuations in the cumulative number of followers of users who have used the hashtag.

v) Impression

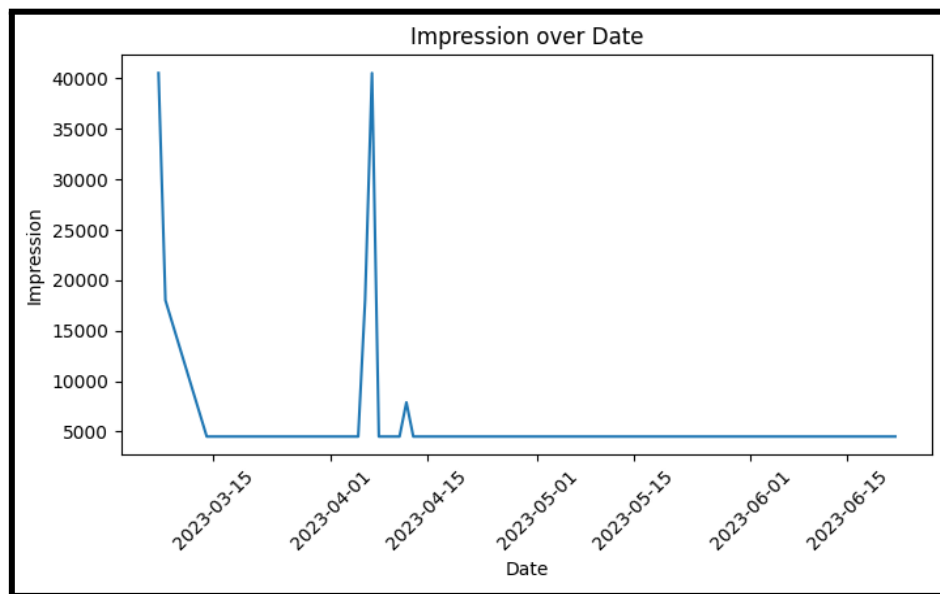


Figure 36: Impression Chart (SmartiesUKI)

Using the same data as the previous section **iv) Reach**, Figure 36 represents the impression count of **#SmartiesButtons** hashtag over a period of time. Impressions refer to the estimated number of times a hashtag has been seen by users on social media platforms. The line plot illustrates how the impressions vary over time.

We can observe the changes in the **#SmartiesButtons** hashtag's visibility on social media. Higher peaks indicate periods when the hashtag gained more visibility and reached a larger audience, resulting in a higher impression count. Conversely, lower points on the chart suggest reduced visibility or engagement with the hashtag during those periods.

It's worth noting that the trends of impression and reach are similar, but impression will achieve a higher frequency than reach. This is because reach is calculating the sum of the followers, while impression is calculating the multiplicity of followers.

f. Comparison

After analysing each brand's metrics output, we need to select the most successful chocolate brand by comparing each brand's metrics.

Response time is crucial for brands to demonstrate their commitment to customer service and responsiveness. A timely response indicates that the brand values its customers and is attentive to their needs. It helps in building trust, resolving customer issues promptly, and fostering positive customer experiences. **Smarties** stand out with the lowest response time among the chocolate brands. They are proactive in addressing their customers' tweets and typically respond within less than 12 hours. Moreover, most of their responses are provided within an impressive timeframe of less than 1 hour. This indicates a high level of attentiveness and dedication to customer satisfaction, as they prioritise timely interactions and support. On the other hand, M&M chocolate has the longest response time among the analysed brands. It takes an average of 4 days for them to reply to customers' tweets, indicating a considerable delay in addressing customer inquiries or concerns. Additionally, the analysis suggests that M&M Chocolate does not actively engage with customers' tweets, which further contributes to the longer response time. This slower response rate may impact customer satisfaction and perception of the brand's responsiveness.

As for **engagement**, we can see that **Smarties** stands out with the highest engagement rate among the chocolate brands. This can be attributed to the relatively low number of followers they have on Twitter. As a result, their engagement rate appears high because their followers actively respond to their tweets. Despite having a smaller follower base, Smarties has successfully cultivated a dedicated and engaged audience that actively interacts with their content. However, it's worth noting that Smarties has a significant number of tweets with zero engagement rate. This indicates that some of their tweets do not receive any responses or interactions from their followers. This could be due to various factors such as the content not resonating with the audience, the timing of the tweets, or other external factors. KitKat demonstrates a relatively high level of engagement in their tweets, with no tweets having zero engagement. This suggests that KitKat has successfully created engaging and appealing content that encourages their followers to interact and respond. Their engagement rate benefits from the consistent participation and response from their audience. Snickers, despite having the highest number of followers among the five chocolate brands, experience a lower

engagement rate. This indicates a lack of active engagement and interaction between Snickers and their followers.

Sentiment analysis enables companies to gauge the sentiment of consumers toward their products and services. By analysing the sentiment of tweets collected over a week, companies can gain valuable insights into customer satisfaction and identify areas for improvement. It helps companies understand the overall sentiment of consumers and evaluate the success of their marketing strategies and brand reputation. The sentiment analysis results indicate that most of the chocolate brands have a higher number of positive tweets compared to negative tweets. This suggests that consumers generally have a positive perception and express satisfaction with the chocolate brand's products and services. Positive tweets reflect consumer appreciation, enjoyment, and favourable experiences associated with the brand. Among the chocolate brands analysed, **Smarties** stands out with the highest number of positive tweets in its timeline over a week. The approximately 150 positive tweets indicate that Smarties has been successful in creating a positive brand image and delivering satisfactory experiences to its consumers. This high number of positive tweets reflects a strong consumer affinity for and satisfaction with Smarties' products and services.

Reach and impression metrics provide insights into the exposure and visibility of a brand's hashtag campaigns. Hashtags such as *#DontSearchMintTwirl*, *#MMSIceCreasmSweeptakes*, *#HaveABreak*, *#SmartiesButtons*, and *#SnickersIceCream* has been used to understand the successfulness of each hashtag for each chocolate brand. From the graphs, it is evident that the reach and impression for each brand's hashtags are highest on a specific day and gradually decrease over time. This pattern suggests that the initial promotion or viral effect of the hashtags generates the most significant reach and impression. Among the chocolate brands analyzed, **KitKat** stands out as the most successful brand in terms of hashtag campaigns. The total impressions and reach of KitKat's hashtag are the highest compared to other brands. This indicates that KitKat has effectively utilized its hashtag campaign to engage and capture the attention of its target audience. The high reach and impression suggest that KitKat's hashtag has gained widespread exposure, reaching a large number of users and generating significant visibility for the brand.

After comparing each chocolate brand with each metric, we can draw some conclusions to verify which chocolate brand is successful. **Smarties** stand out as a successful

brand in terms of customer satisfaction. It has the lowest response time, indicating that they are prompt in addressing customer inquiries or concerns. Additionally, the high engagement rate and positive mentions in tweets suggest that customers are actively engaging with the brand and expressing positive sentiments. Despite having fewer followers compared to other brands, Smarties manages to actively connect with its customers, leading to a positive customer experience. On the other hand, **KitKat** emerges as the most influential chocolate brand in terms of reach and impression. The hashtag campaign used by KitKat has successfully gained significant exposure and recognition among both followers and non-followers. The brand's hashtags have generated the highest reach and impressions, indicating a wider audience reach and increased brand visibility. This suggests that KitKat has effectively utilised its campaign to create brand awareness and capture the attention of a larger audience.

Deployment

Additionally, we deploy our code at <https://streamlit.io/>. Here is the link to view our dashboard: <https://smc-group13.streamlit.app/>.