2021

Graphical user interface, text, application

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Twitter Enalyst

CAB432

Assignment 2

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# Introduction

## Purpose & description

Twitter Enalyst is an amazing application for anyone interested in discovering and analyzing sentiment factor of certain topics. And Twitter Enalyst allows users to search for a keyword and to receive sentiment score of the most recent posts containing that keyword. The app also suggests trending keywords on Google trends at that moment which users can test their sentiment score on our app. On the server side, this app utilizes Sentiment module to perform sentiment analysis on input Twitter posts that are queried from Twitter API.

Chart

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Figure 1 Sample result of the app

## Services used

#### Search Tweets: Standard API v.1.1

Returns a collection of relevant Tweets matching a specified query – can also be filtered based on time, location, language, geography, etc.

Endpoint: <https://api.twitter.com/1.1/search/tweets.json>

Docs: <https://developer.twitter.com/en/docs/twitter-api/v1/tweets/search/api-reference/get-search-tweets>

#### Sentiment

A node.js module that uses the AFINN-165 wordlist and Emoji Sentiment Ranking to perform sentiment analysis on arbitrary blocks of input text.

Endpoint: using from library

Docs: <https://www.npmjs.com/package/sentiment>

#### Google Trend

A node.js module that providing trending keywords from

Endpoint: using from library

Docs: <https://www.npmjs.com/package/google-trends-api>

### Use cases

#### User story 1

|  |  |
| --- | --- |
| As a | User |
| I want | To see what keywords are trending right now in Australia on google search engine |
| So that | I may use them as input for sentiment analysis |

For this user story, we implement the Google Trend library to get trending keywords in Australia. Each time a new user access our app, a request is trigger to route /googleTrend. Then, googleTrend.js will use Google Trend library to get trending keywords and send them to client side.

Text

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Figure 2 getTrends() used for requesting trending keywords in Australia

Text

Description automatically generated with medium confidence

Figure 3 Google trending keywords on client side

#### User story 2

|  |  |
| --- | --- |
| As a | User |
| I want | To search for a keyword |
| So that | The app can return the sentiment score of posts containing that keyword within the last 7 days |

On the client side, users can type in their desired keyword to analyze sentiment score. Once they click ‘Search’, that keyword will be sent to the server via route /twitter and twitter.js will start querying Redis or DynamoDB or sending requests to Twitter API.

Graphical user interface, text, application, website

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Figure 4 Search bar

A screenshot of a computer

Description automatically generated with medium confidence

Figure 5 Code logic to query Tweets: Redis -> DynamoDB -> Twitter API

|  |  |
| --- | --- |
| With the tweets result, the server will analyze responses’ text using get Sentiment from ‘module/sentiment.js’ .  Text  Description automatically generated  Figure 6 Get sentiment score from sentiment.js and send result to client | Text  Description automatically generated  Figure 7 Inside setiment.js |

#### User story 3

|  |  |
| --- | --- |
| As a | User |
| I want | The app to display a chart of sentiment score summary (total positive /negative scores and posts) |
| So that | The result is more intuitive to users |

As said in the previous user story, the analysis results received by client side is handled TotalSearchTweet.js (utilizing react-chartjs-2) to create chart with visualized result summary, namely Total positive/negative score, Number of positive/ negative /neutral posts.

Text, chat or text message

Description automatically generated

Figure 8 Calculating items for chart and then send html components

Chart

Description automatically generated

Figure 9 Sentiment scores and summary

#### User story 4

|  |  |
| --- | --- |
| As a | User |
| I want | The post analyzed to be displayed on the app |
| So that | I can know what those posts says |

|  |  |
| --- | --- |
| Graphical user interface, text, application, chat or text message  Description automatically generated  Figure 10 Tweets found | The app simply uses tweets ID from server response to make <TweetEmbed> components. Client side will use the parameters it got (tweetID) to get full tweets content from Twitter to display.  A screenshot of a computer  Description automatically generated with medium confidence  Figure 11 TweetEmbed component |

# Technical breakdown

## Architecture

Explain how your system operates, making it clear how data flows around the system through requests and responses, and the appearance of scaling and persistence within the architecture. In this report it is not necessary to discuss in detail the effect of these choices. Here we just want you to document the architecture and to tell us how it works.

Your principal helper here will be one or more architecture diagrams – which we will consider in some more detail below. However, you may show us screen grabs of code if that makes your points clearer. Tell us anything you think we need to know about how you have structured the application and made it work, but there also a section below to describe problems. If you have used particular libraries, then you should give us a brief overview of their use in this application.

A number of example architecture diagrams are provided below. Many students use diagram generators such as the tools at <https://cloudcraft.co/>. For assignment 2, this is the most important diagram used to document your approach. The ‘network diagrams’ below show some more complicated alternatives. Only the architecture diagram is compulsory. Please consider the others if they help you, and ignore them if they do not.

Diagram, engineering drawing

Description automatically generated

Figure 12 Architecture diagram

The diagram above describes the high-level overview of architecture and operation of the application.

The whole Twitter Enalyst application is run directly on the EC2 T2 Micro instances. Server is built on Express framework of Nodejs and responsible for handling client request, responding client, interacting with API endpoint as well as DynamoDB and Redis. Each server is run on an EC2 T2 instance of AWS. On the server, Google Trend library is utilized to get trending keywords and Sentiment library is utilized to analyze tweets and give out their sentiment score.

Its client side is built with React to provide users with a modern and interactive interface. Standing between client and server, Elastic load balancer helps to balance load between EC2 T2 instances in the scaling group and deploy new instances to handle an increasing load if it satisfies the scaling policy.

A screenshot of a computer

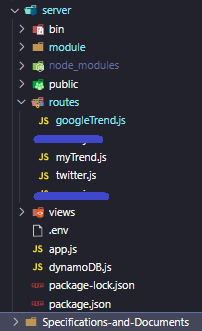
Description automatically generated with medium confidence

Figure 13 App structure

There are 3 main routes in server for client-side to communicate to:

* /**googleTrend**: utilizes google trend library to get trending keywords on Google
* /**myTrend**: queries database and get the trending keywords are being searched on this app
* /**twitter**: queries tweets containing the requested keyword from Twitter API

## Process flow Diagram

For every response, its content is stored in both DynamoDB and Redis for later repeated. Data such as Tweets information, analysis, both Google and on-website trending words will be sent to Client side.

display the tweet sentiment to the user.

*Diagram

Description automatically generated*

Figure 14 The flow of the state in the client-side.

## Response filtering / data object correlation

## Scaling and Performance

# Test plan

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Expected outcome | Result | Screenshot/s |
| Data stored in Redis | New Tweet result is stored in Redis | Pass |  |
| Data stored in DynamoDB | New Tweet result is stored in DynamoDB | Pass |  |
| Retrieve data from DynamoDB | Result of repeated keyword within 24 hours is retrieved from DynamoDB | Pass |  |
| Retrieve data from Redis | Result of repeated keyword within 24 hours is retrieved from Redis | Pass |  |
| Get data from Twitter API | New Tweet result is queried directly from Twitter API | Pass |  |
| Trending keyword is got from Google Trending API | New trending keywords are displayed on client side | Pass |  |
| Check old data from DynamoDB/Redis and get new data from Twitter API | Result in DynamoDB/Redis more than 24 hours old is disqualified and new Tweet post are queried from Twitter API | Pass |  |
| Trending keyword on website is got from DynamoDB | Client receives trending keyword on this website response | Pass |  |
| Background image is loaded | Page displaying background image | Pass |  |
| Search button is functional | Search button directs user to tweets summary chart | Pass |  |
| Notification appears in result page | Notification displays basic result information | Pass |  |
| Client receives the results | Chart display tweet summary with sentiment score and tweet statistic | Pass |  |
| Tweet posts analyzed are displayed at the page bottom | Tweet’s content automatically loads at the page bottom | Pass |  |
| Search for unpopular/invalid keywords | Notification prompts invalid keyword/ no post found | Pass |  |
| Reload button is functional | Reload button brings user back to search page | Pass |  |
| Scale server when load increases | New instance is deployed | Pass |  |
|  |  | Pass |  |
|  |  | Pass |  |
|  |  | Pass |  |
|  |  | Pass |  |

As they are common in industry you could define your Acceptance Criteria as GWT statements. This is not compulsory, but see: <https://www.agilealliance.org/glossary/gwt/>. And here is an example:



# Difficulties / Exclusions / unresolved & persistent errors

Could not scale with using Stream Twitter API and Socket - Minh

Variable declaration type - Rodo

In this section, you should explain anything that caused you problems and how you overcame those problems. Tell us if there was any issue that prevented you completing the assignment to specification. Tell us about any assumptions or compromises that you have made. Those who worked with an API like Spotify, which presented particular concerns, should discuss the compromises here, and this is also where you can tell us about problems with API keys and responses.

More generally, you might consider:

* Your major roadblocks and how you resolved them.
* Any functionality you didn’t or couldn’t finish
* Are there any differences between your brief and what you delivered? If so, explain why.
* Are there any outstanding bugs?

# Extensions

There are some further improvements for this app:

In order to increase the precision of the sentiment scores, we could increase the number of posts and the time range queried from API and. At the moment, due to the limitation of free tier access to the Twitter API, we can only query 100 posts that lies with 7 days period. With a small number of posts in a short time range being analyzed, the sentimental scores do not reflect exactly all the twitter posts in the past 7 days from the moment of query.

Scaling?

Persistence?

# User guide

# References

# Appendices