S23 Data Science and Big Data
Project 1 - Telling Story with Data
Customer Support on Twitter

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Key Findings

- A correlation can be seen between the **customer sentiment** and **average response time** specifically for public transportation companies. Kimpton and Walmart were the companies to observe the most positive customer sentiment on average .

- Most common problems addressed to Apple Support Team were regarding the latest **iPhone** or the latest **iOS update**. Apple Support Team tended to move half of the problems out of Twitter platform.

Key Findings

- Apple's customers tweeted most **after October** when a new product was launched, and mostly between **2PM - 2AM** in a day.

- Responses provided by customer facing, food delivery and transportation companies had the most positive sentiment while the ones by cell providers had the most negative sentiment. The problem will be fixed in the next future update was the most common response provided by the Apple Support team.

Project Overview

Motivation

- Social media platforms have become useful tools for modern businesses to interact with customers.
- Twitter comes into a great place for people to seek out customer support, forming totally different practices and behaviors than before.
- We expect to give insights that companies can work on to enhance customer experience by analyzing the customer support conversation threads on Twitter

Dataset

- Source: Kaggle
- Size: 7 columns / 2,811,774 rows across 108 companies
- Coverage end date: 12/02/2017
- Columns
  - **Tweet_id**: A unique, anonymized ID for the Tweet.
  - **Author_id**: A unique, anonymized user ID.
  - **Inbound**: Whether the tweet is "inbound" to a company doing customer support on Twitter.
  - **Created_at**: Date and time when the tweet was sent.
  - **Text**: Tweet content.
  - **Response_tweet_id**: IDs of tweets that are responses to this tweet, comma-separated.
  - **In_response_to_tweet_id**: ID of the tweet this tweet is in response to, if any.

Objectives

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1. What makes a specific response satisfactory?
2. What are the main reasons customers look for Twitter Support? Are the problems general or specific?
3. When do Support Teams receive more tweets from customers?
4. Company specific response analysis

Q1

What makes a specific response satisfactory?

Response time

Rank: 46/108

	All	Apple
count	790,593.00	63,743.00
mean	238.07	133.25
std	5,046.01	167.08
min	0.00	0.52
25%	5.62	21.70
50%	18.43	61.55
75%	88.87	177.68
max	2,609,747.00	7,173.92

Top 10 Brands with Fastest Response Speed

receiver	response_time_min
Postmates_Help	3.764945
VirginTrains	7.113722
LondonMidland	7.628116
VerizonSupport	7.929221
AlaskaAir	8.961892
nationalrailenq	10.090376
VirginAmerica	11.082554
TMobileHelp	11.206877
PearsonSupport	15.262299
IHGService	15.481625

Customer Sentiment vs Response time
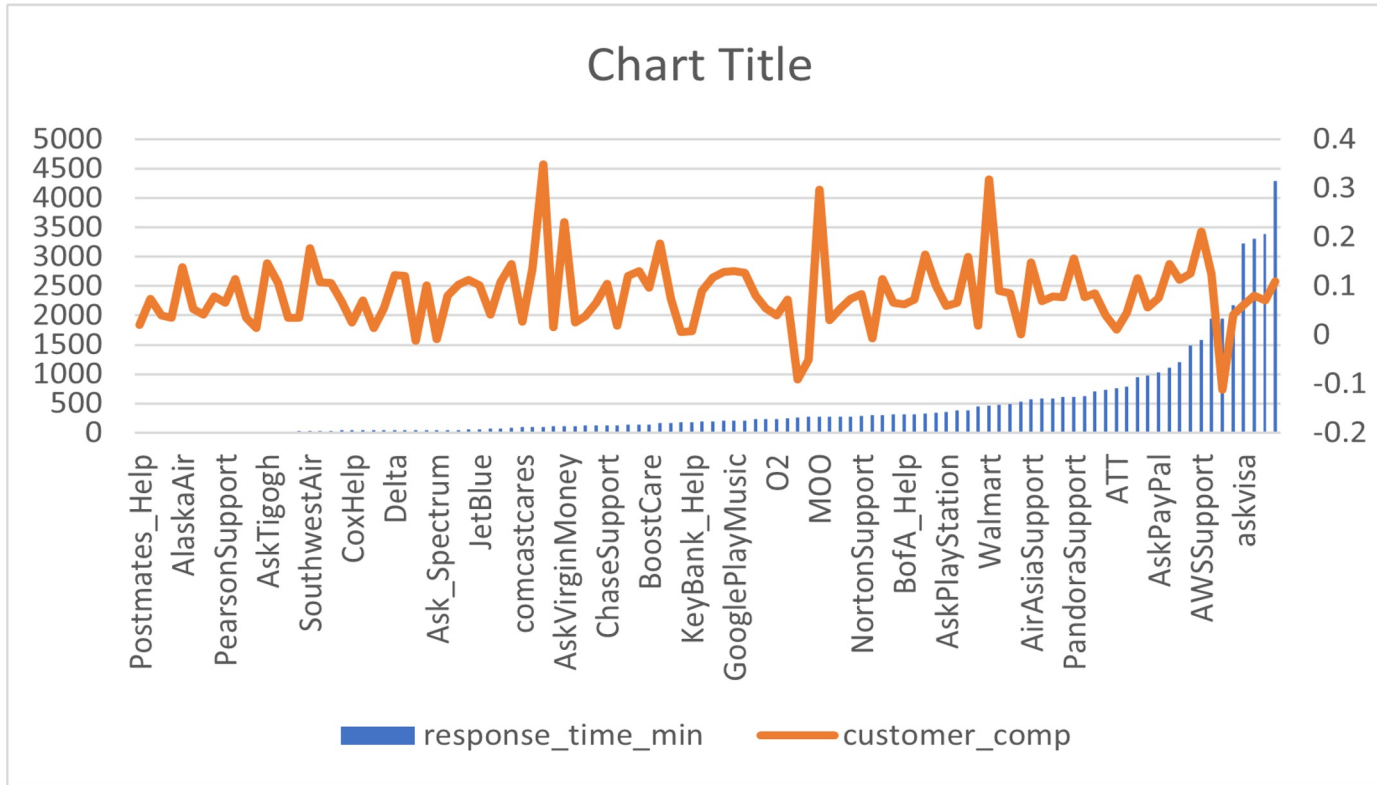
Customer Sentiment
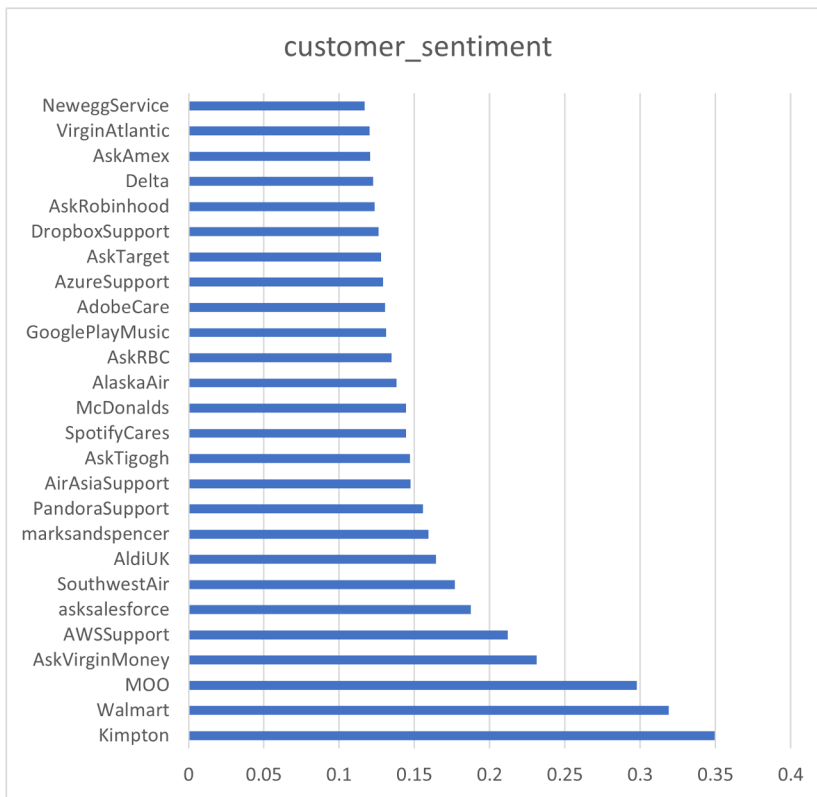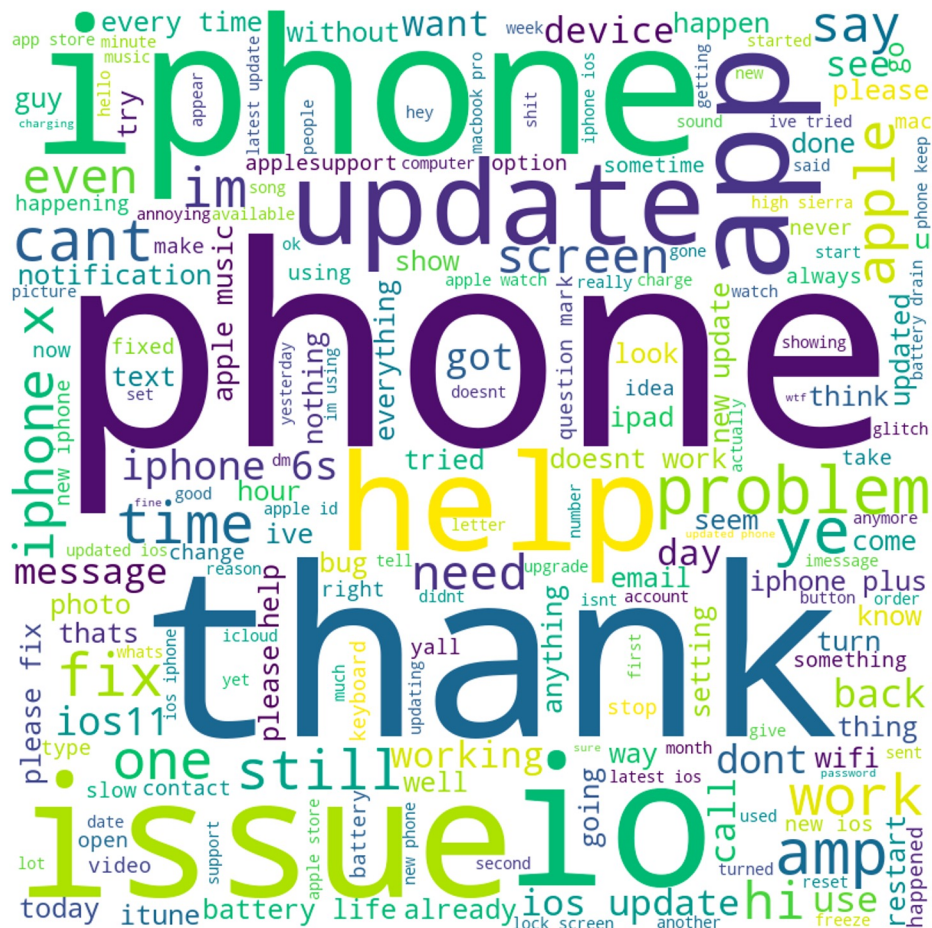
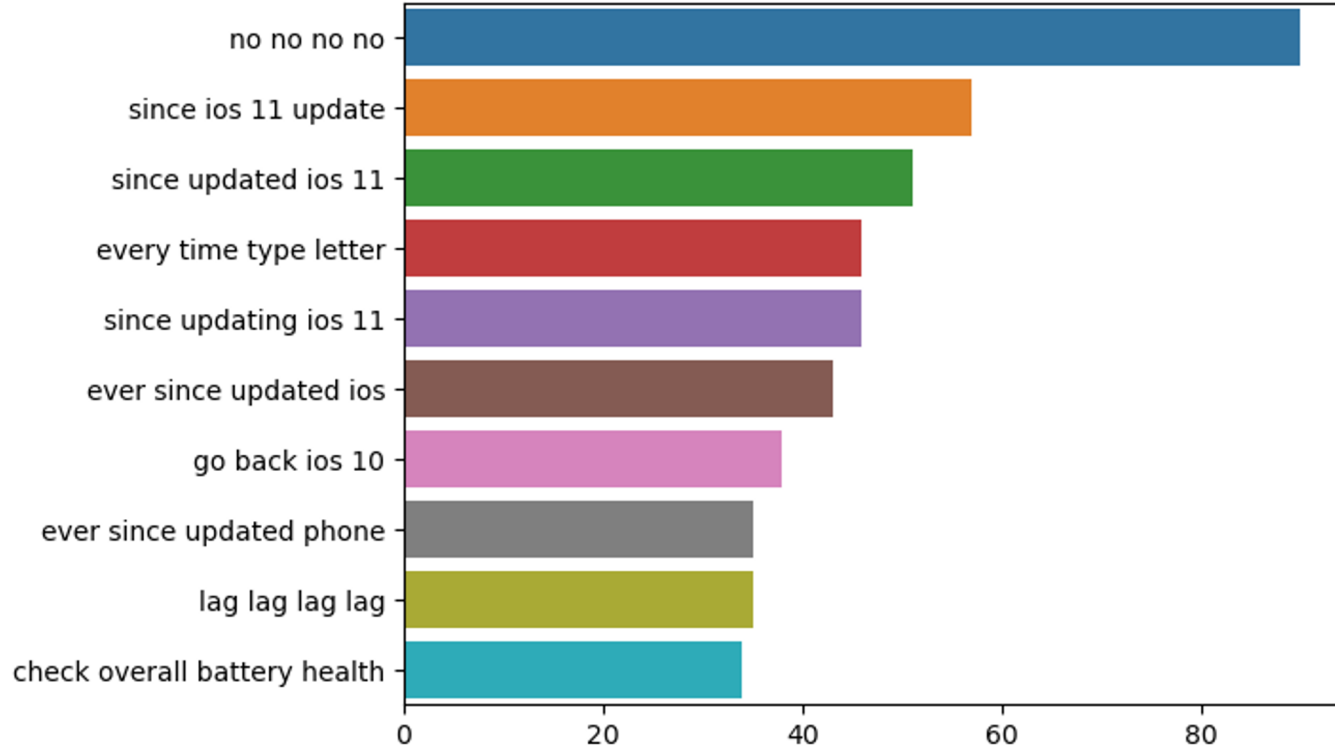# Customer Sentiment for public transportation companies
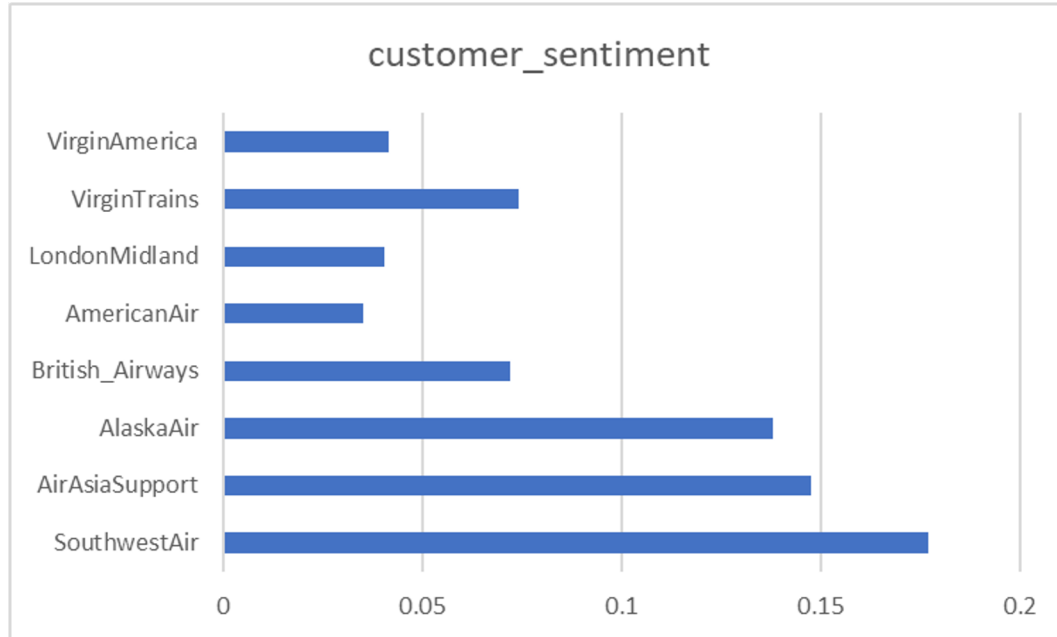
Q2

What are the main reasons customers look for Twitter Support?

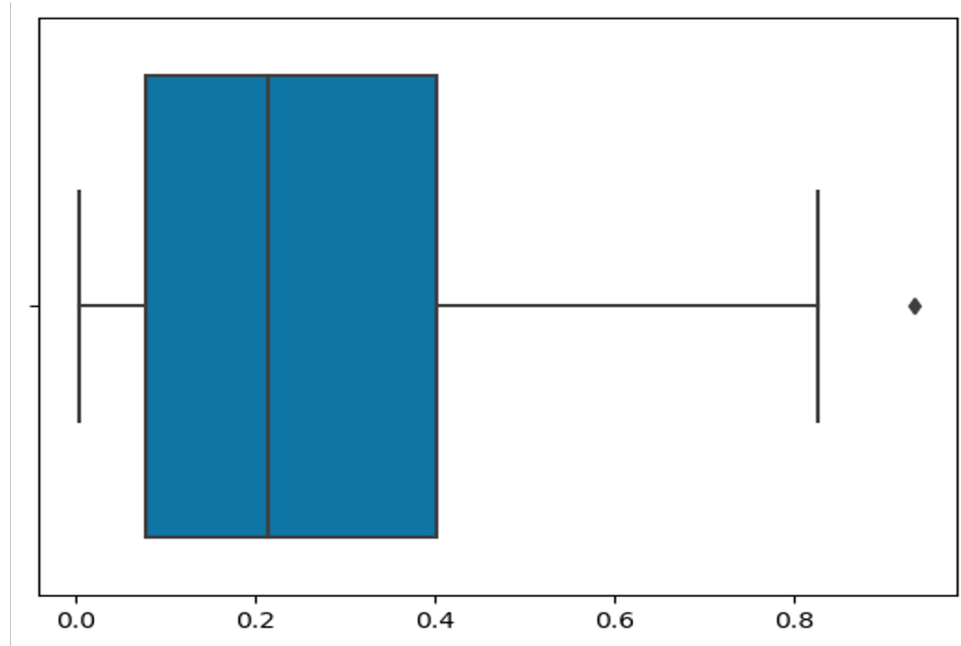Are the problems general or specific?

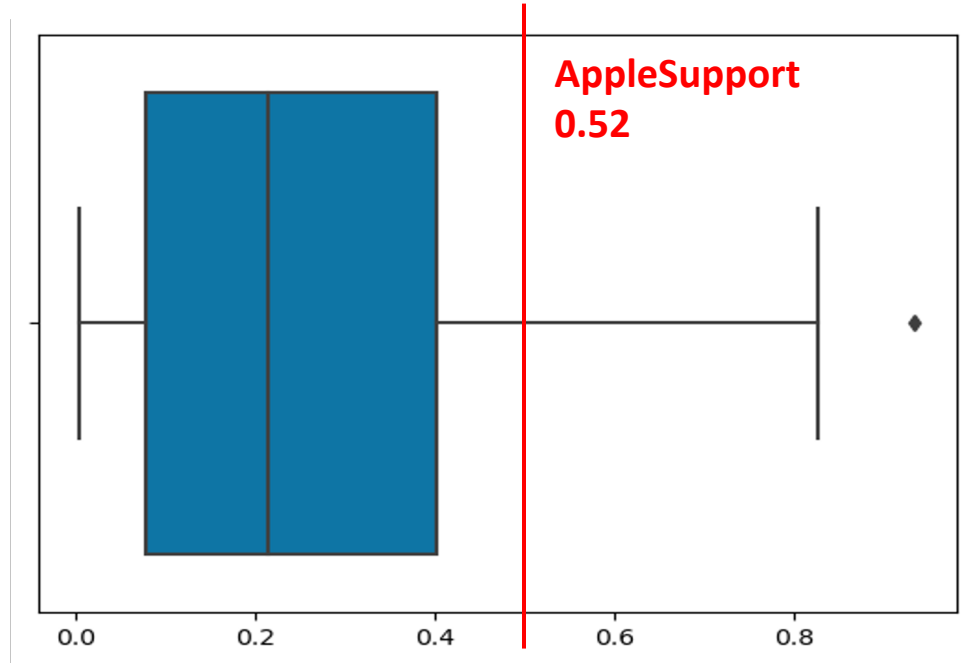Take Apple for example.

Exploratory Data Analysis (EDA)

Most Common Problems - using ngrams

Q2: Tweets % with specific problems
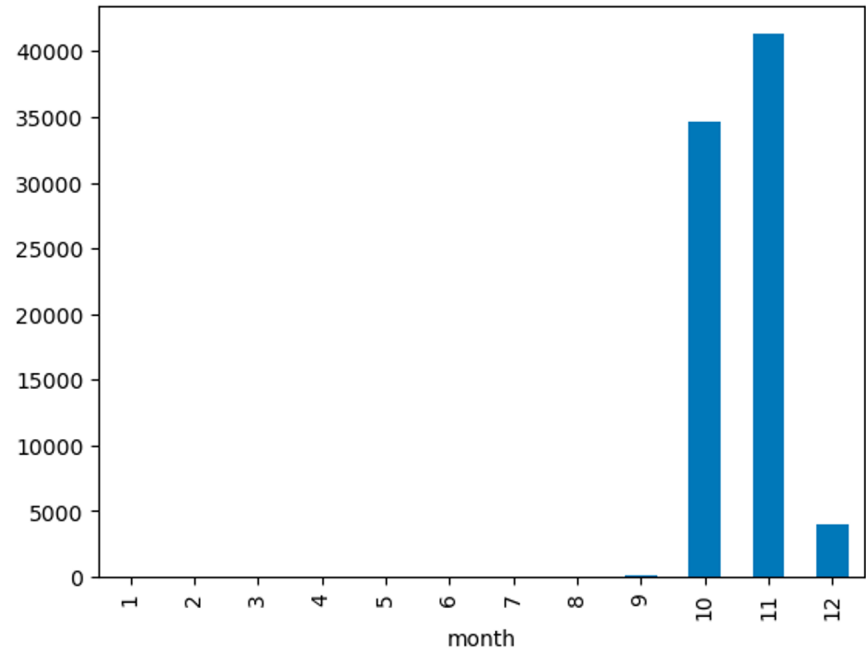
Q2: Tweets % with specific problems

Q3

When do Support Teams receive more tweets from customers?

Take Apple for example.

Q3: # of Tweets to AppleSupport by month

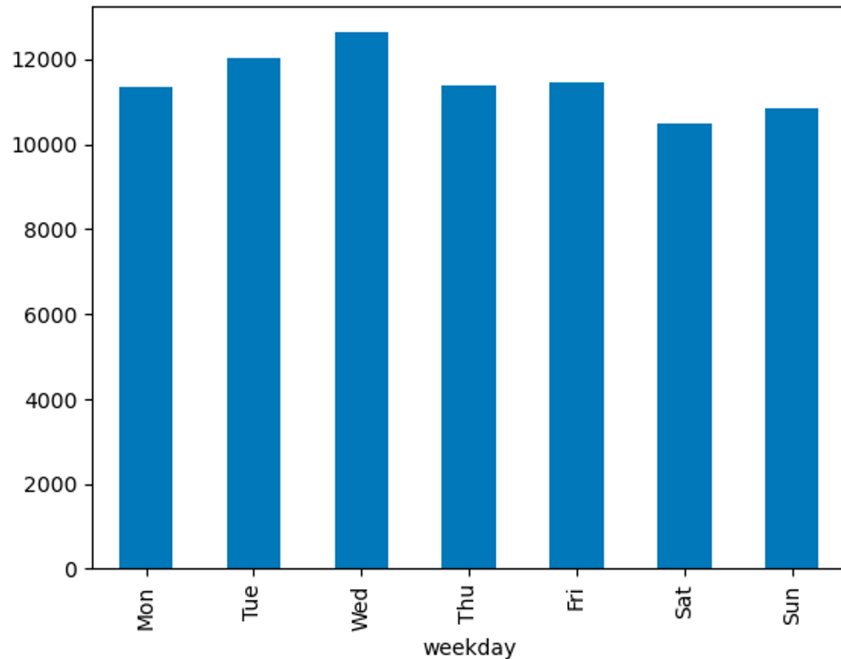Most tweets from customers to AppleSupport are created in October and November.

(*Apple released in 2017:
  Sept. - iPhone 8 / iOS 11
  Nov. - iPhone X)

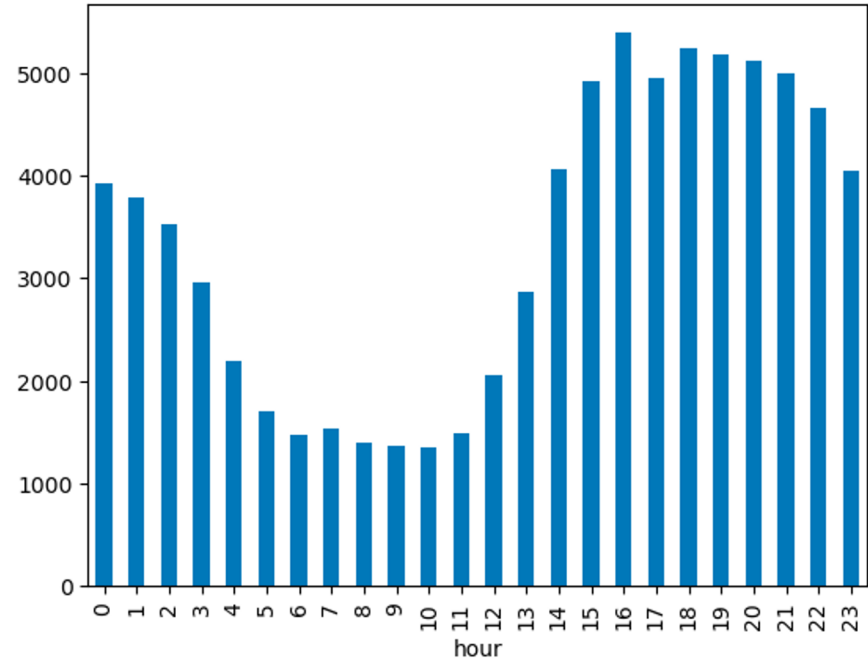# Q3: # of Tweets to AppleSupport by weekday

The number of tweets are almost equally distributed everyday.

Weekends have a bit fewer tweets.
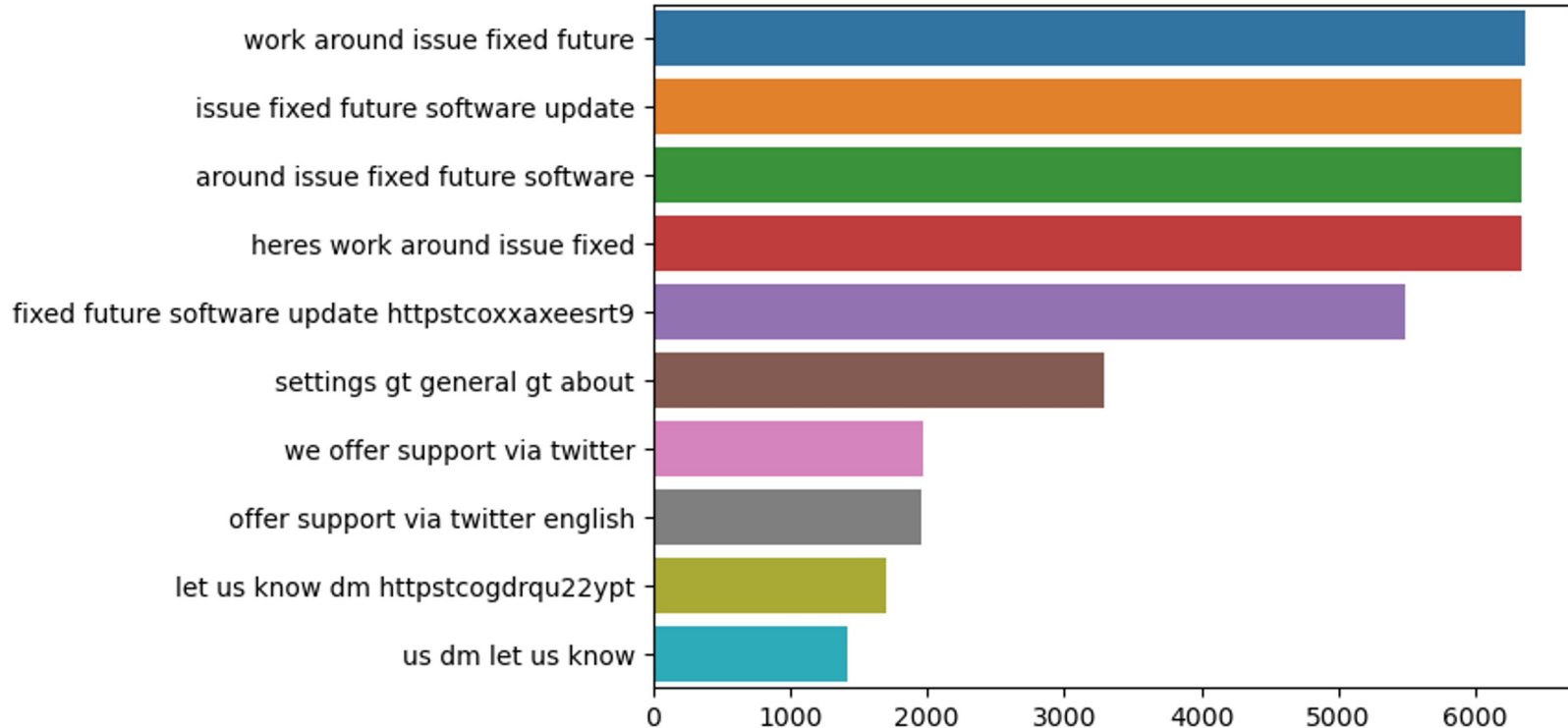
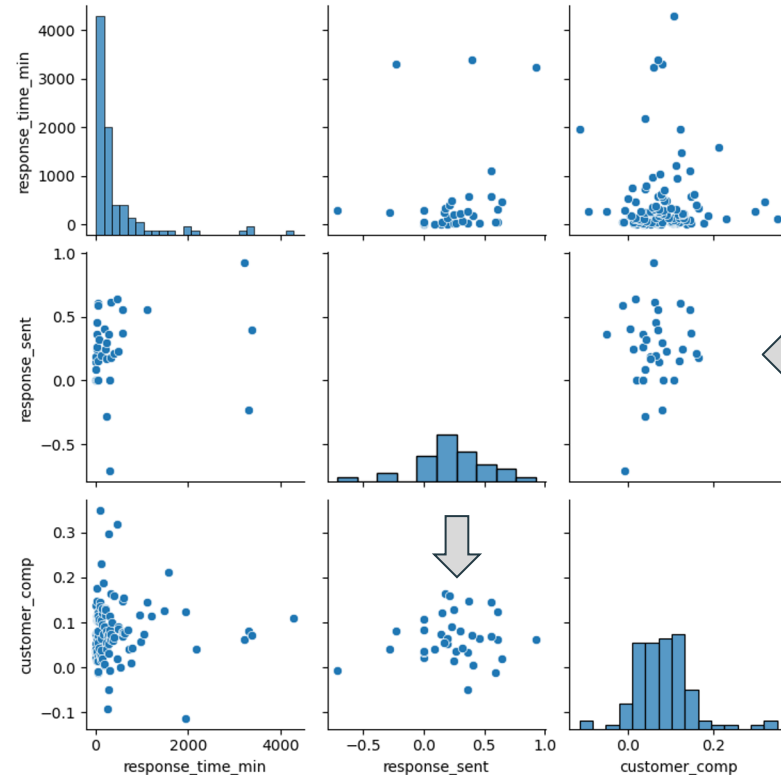# Q3: # of Tweets to AppleSupport by hour

Peak hours: 2PM - 2AM

Q4

Company specific response analysis

Responses by Apple Support Team

Customer Sentiment, Average Response time, Response sentiment

Average Response sentiment and average customer sentiment show the highest correlation

Future Work

1. Topic Modeling can be used to understand the most common topics in the customer tweets for specific companies which can help the companies work on the most common problems.

2. The responses can be automated by creating a knowledge base of the most common occurring problems and their solutions to improve the response speed.

3. Inspecting other factors like language styles and length of response from Support Team may also increase customer sentiment score.

Video Presentation-
https://youtu.be/WvJo4g-W17o