

Twitter Sentiment Analysis

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OVERVIEW



Why Sentiment Analysis?

Motivation and approach behind our project.



Pre-processing Steps

Steps taken to prepare the data for Machine Learning Model.



Workflow of Project

Workflow along with demo of our Model



Epoch Progression

Detailed of Epoch progress



Machine Learning Curves

Dive into the progress of our model



Lessons Learned

Road blocks and challenges faced, and how we overcame them.

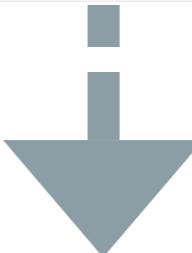
Why Twitter Sentiment Analysis?

- Social media has become a daily part of life, allowing everyone around the world to express their feelings, emotions, and opinions openly. Because of this, companies and other entities can gauge (basically in real time) how the public feels about them or their products.
- **Motivation:** Get an idea of wider public opinion regarding specific, user-defined topics.
- **Approach:** Train a machine learning model on a set of pre-defined tweets and apply the model to tweets pulled from the API based on particular hashtags.



BEFORE

#	id	date	flag	user	text
1467810369	1.47b	Mon Apr 06 22:19:45 PDT 2009	NO_QUERY	_TheSpecialOne_	@switchfoot http://twitpic.com/2y1zl - Awww, t...
	2.33b	774362 unique values	1 unique value	659775 unique values	1581465 unique values
1467810672		Mon Apr 06 22:19:49 PDT 2009	NO_QUERY	scotthamilton	is upset that he can't update his Facebook by texting it... and might cry as a result School today ...
1467810917		Mon Apr 06 22:19:53 PDT 2009	NO_QUERY	mattycus	@Kenichan I dived many times for the ball. Managed to save 50% The rest go out of bounds
1467811184		Mon Apr 06 22:19:57 PDT 2009	NO_QUERY	ElleCTF	my whole body feels itchy and like its on fire



AFTER

	date	user	tweet	tidy_tweet	stemmed_tweet
Mon Apr 06 22:19:45 PDT 2009	_TheSpecialOne_	@switchfoot	Awww that bummer shoulda David Carr Third	awww that bummer shoulda david carr third	
Mon Apr 06 22:19:49 PDT 2009	scotthamilton	is upset that he can't update his Facebook by ...	upset that update Facebook texting might resul...	upset that updat facebook text might result sc...	
Mon Apr 06 22:19:53 PDT 2009	mattycus	@Kenichan I dived many times for the ball. Man...	dived many times ball Managed save rest bounds	dive mani time ball manag save rest bound	
Mon Apr 06 22:19:57 PDT 2009	ElleCTF	my whole body feels itchy and like its on fire	whole body feels itchy like fire	whole bodi feel itchi like fire	
Mon Apr 06 22:19:57 PDT 2009	Karoli	@nationwideclass no, it's not behaving at all....	behaving here because over there	behav here becaus over there	

Preprocessing Data

Preparing the data for the Machine Learning Model



Remove unneeded column

- Flag, was a unnecessary column



Remove items from the tweet text

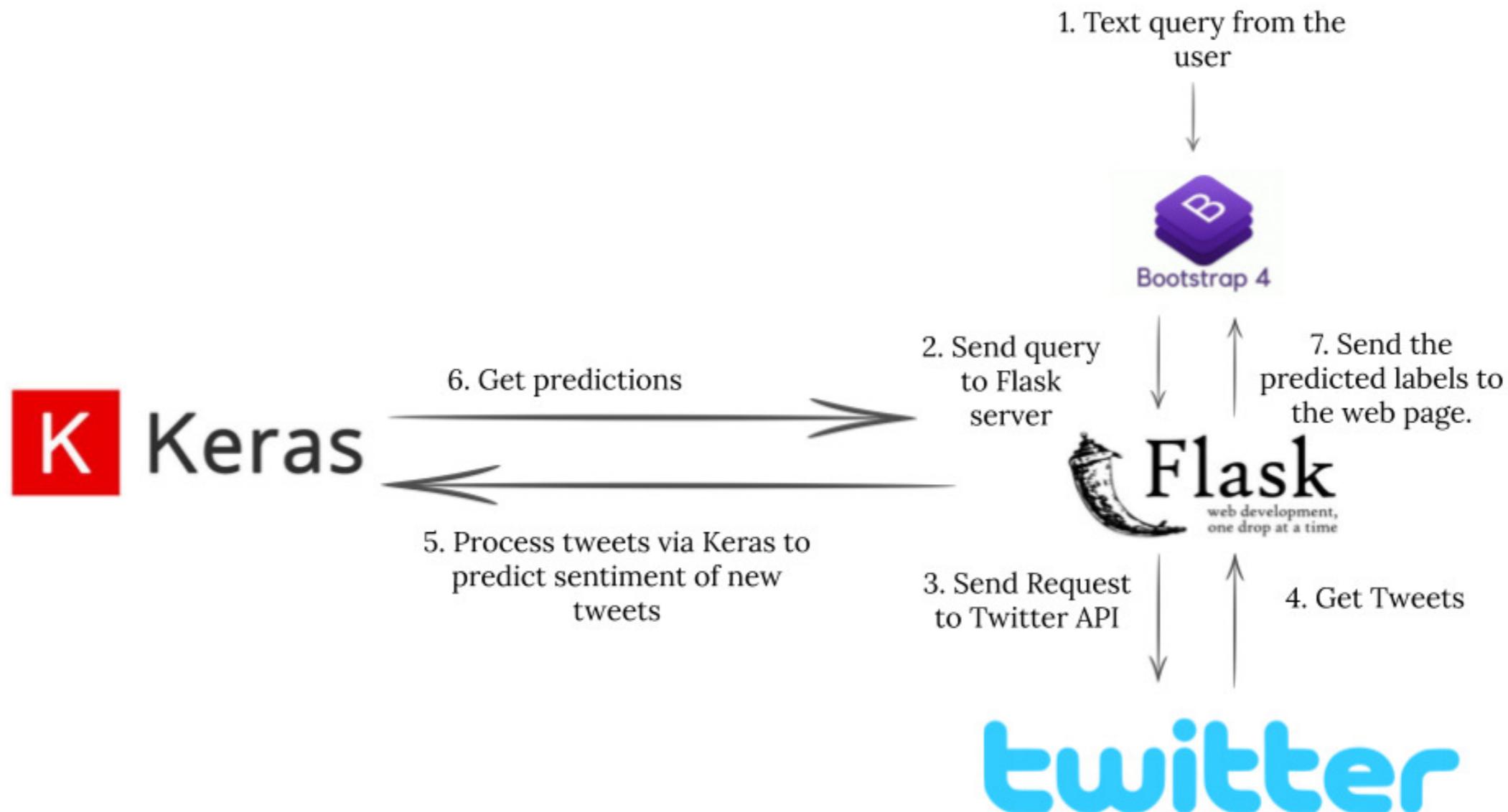
- Links
- Handles
- Special Characters
- Numbers
- Punctuation
- Short words (<3 chars)



Stemming the tweet text

Returning each word in the tweets to its stem form.

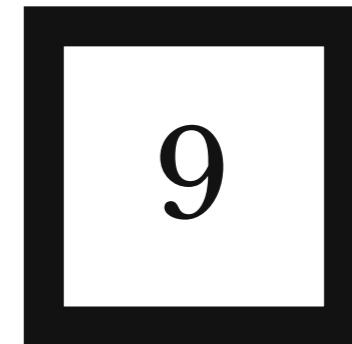
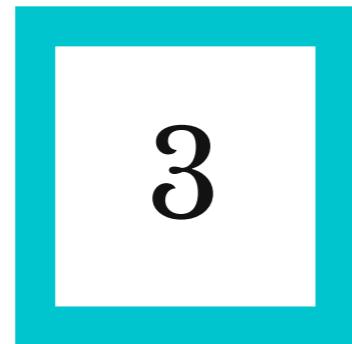
Project Workflow



Epoch Progression

Accuracy: 0.8912

val_loss: 0.2625



Accuracy: 0.7669

val_loss: 0.4121

Accuracy: 0.9563

val_loss: 0.1483

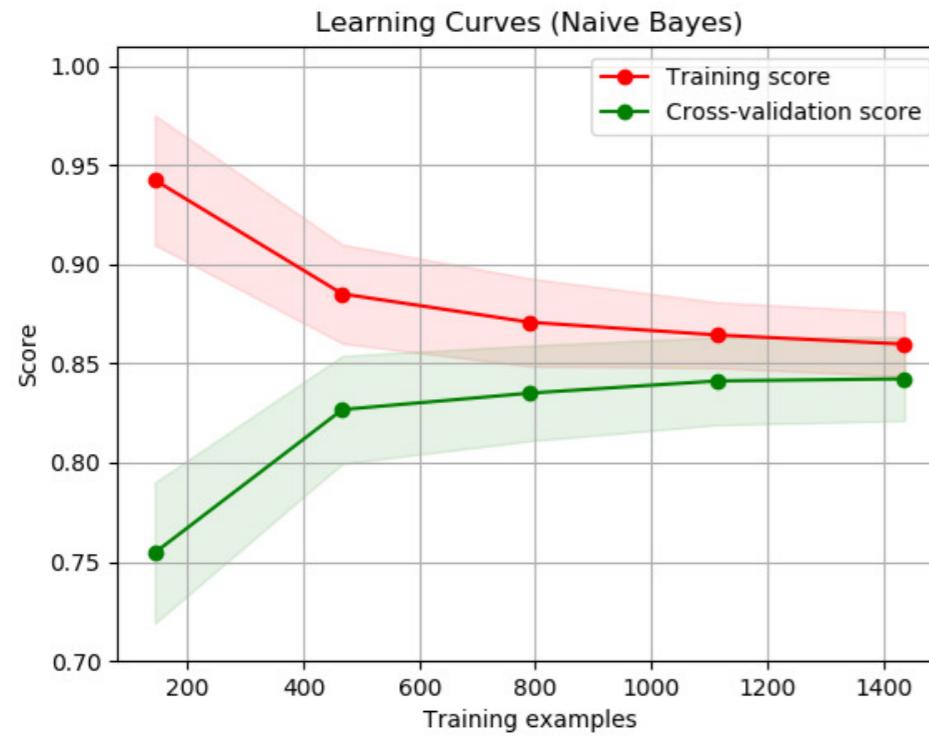
Accuracy: 0.9874

val_loss: 0.0485

Machine Learning Curves

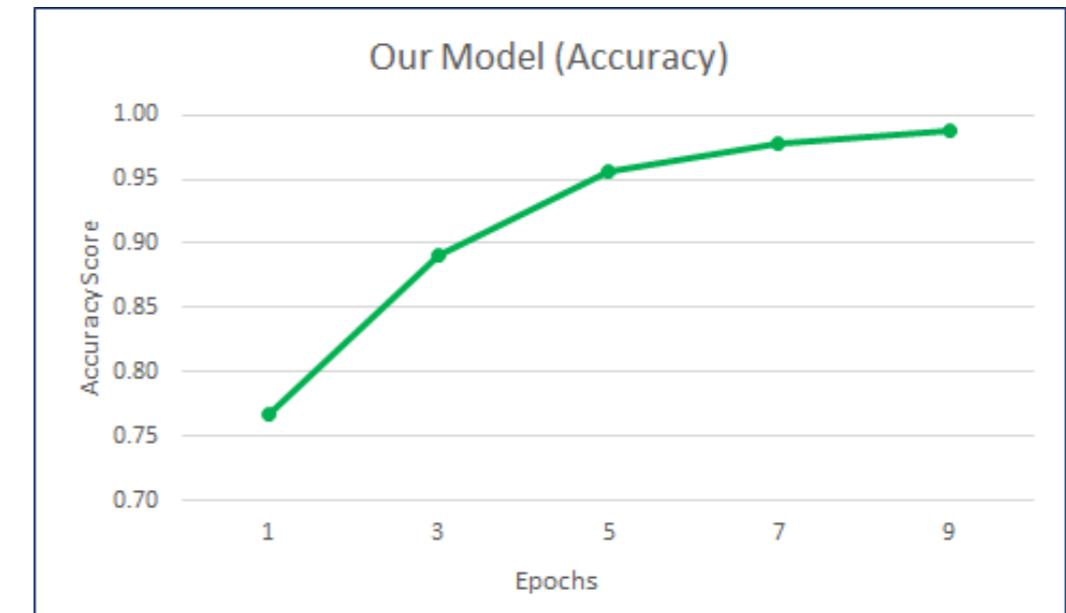
Learning Curves

Exemplar learning curves for model machine learning.



Our Model

Accuracy scores showed a similar regression curve as the exemplar, beginning.



Website Demo



LESSONS LEARNED

on the sentiment analysis

Plotly for Dynamic Visuals

allowed for dynamic changes
based on the user's input

API Call to Twitter

documentation made it easy to
pull the specific tweets and
languages we needed

Learned Vader Analysis

fast and accurate sentiment
processing

Using Multiple ML Libs

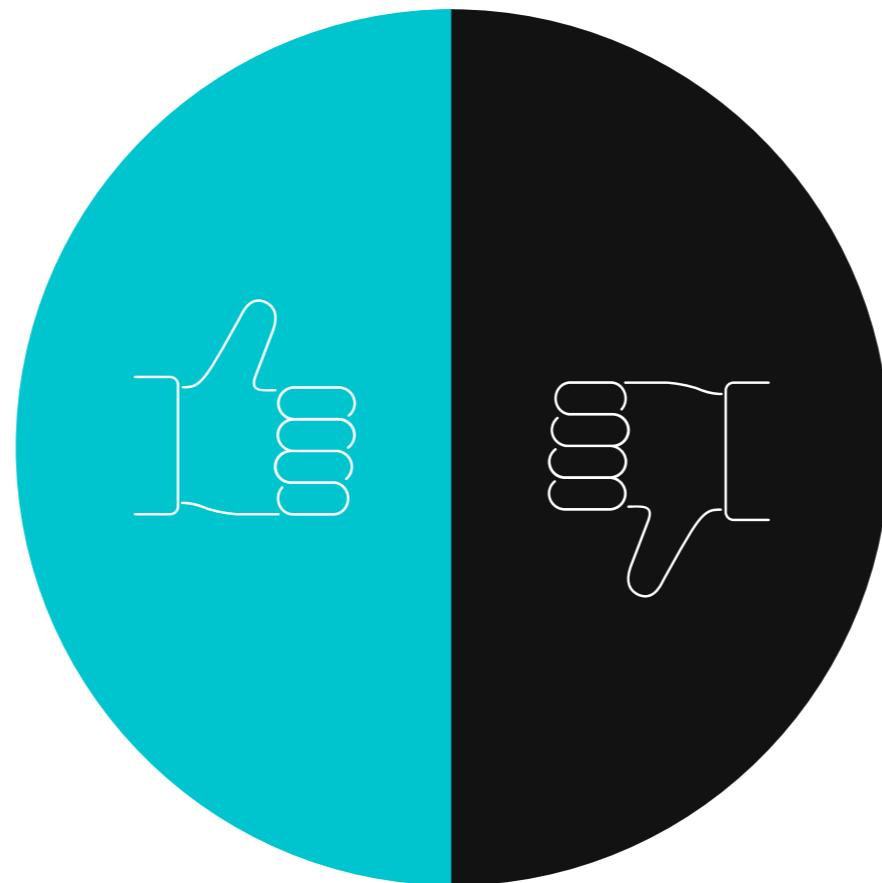
integrating multiple machine
learning libraries that all have
intricacies and dependencies

Docker Image Building

actually building a Docker image
after serialization

Managing Complexity

the tradeoff between a complex
model and our processing power



Conclusion

While this assignment was challenging, it really allowed us to utilize all the skills that we have acquired in this class in a meaningful way. Although we did not achieve our initial desired result, we gained a lot of insights about how all of these systems can work together.

THANK YOU

