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US-DSI-10
Capstone
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ShowMeTunes:
A Musical Recommender

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PROBLEM

01

Who’s interested?

Why?

QUESTION

What's your go-to song?

QUESTION

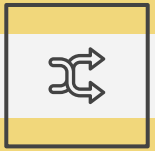
What's your go-to song?

...when you're:
happy?
sad?
frustrated?
stressed?

UNDERSTANDING THE PROBLEM

MOOD

People like to listen to different music depending on their moods.



NEW MUSIC

Some older musicals need some love. Some newer, more popular musicals get old.

CHOICES

People don’t always want endless choices. Sometimes, we just want direction.

SOLUTION

Collect a list of popular musical titles and their synopses

POPULAR MUSICALS

Use NLP to find musicals with similar synopses & sentiments to the user's input

MATCH USER INPUT TO SYNOPSES

Output the names of three new musicals for the user to listen to!

RECOMMEND 3 MUSICALS

PROCESS

02

Collection

Cleaning

Preprocessing

Deployment

DATA COLLECTION

Wikipedia

186

synopses

- Wikipedia API
- BeauitfulSoup

Ranker.com

Musicals to recommend

196 musical names

>100,000 votes

36 Rerankers

- Selenium
- BeauitfulSoup

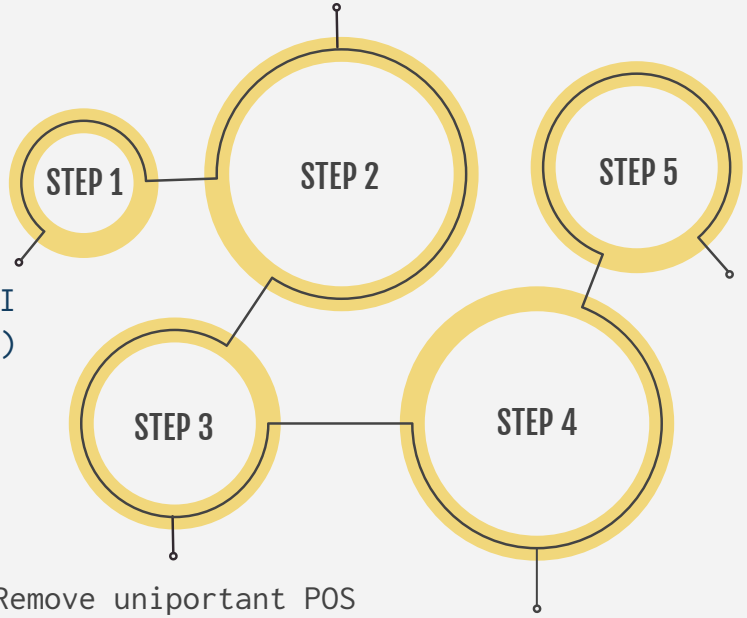
All Musicals

177

synopses

- Requests
- BeauitfulSoup

CLEANING / PREPROCESSING



Replace all non-ASCII characters (Aa-Zz, 0-9)

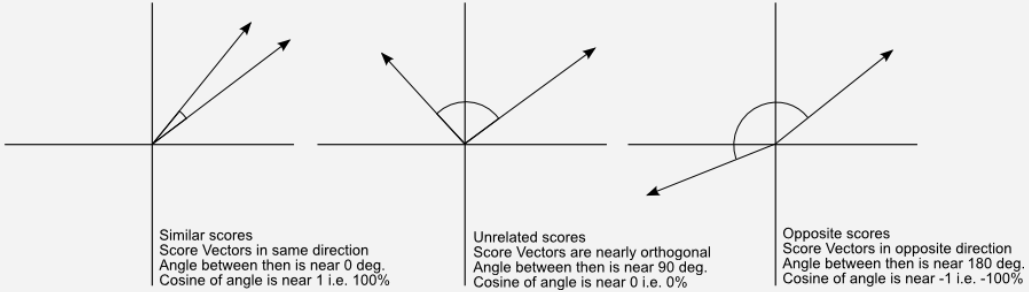
Tokenize text and remove “stopwords”

Remove uniportant POS (parts of speech)

Lemmatize: Find the word’s dictionary entry

Convert to a spaCy “Doc object” to vectorize!

How does a “vector” represent a word?



- **300 dimensions** (list of 300 numbers)
- Each dimension **represents** some aspect of that word
- Communicates its **meaning/relationship** to other words
- Vectors are **unique** to each word, as it’s used in **different contexts**
- Produced using Word2Vec algorithms (shallow, two-layer neural networks)
- AKA **“word embeddings”**

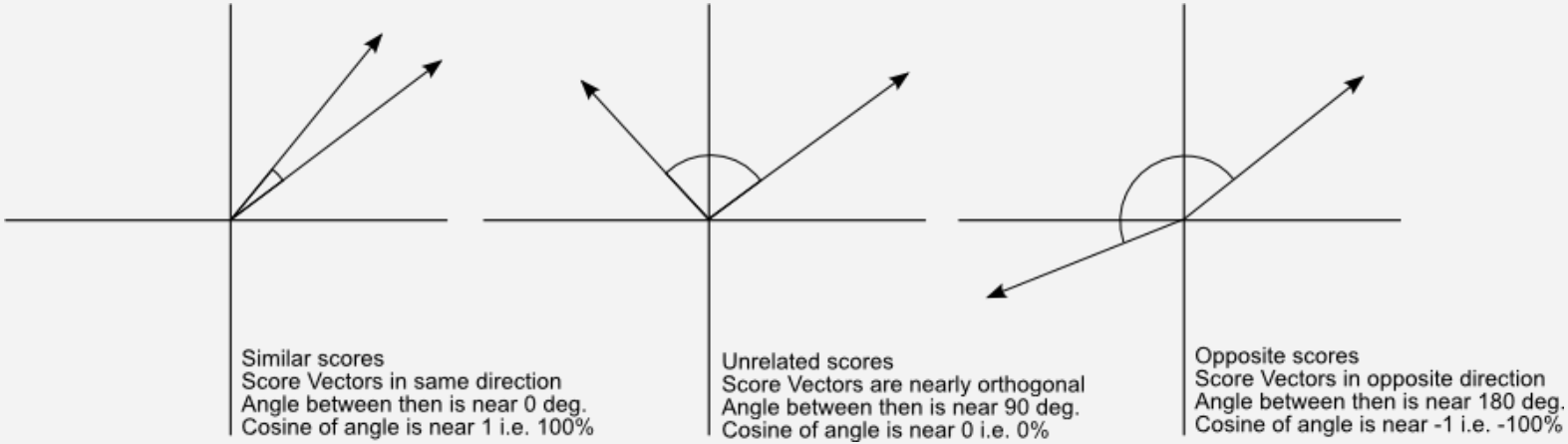
Example:

```
Les Misérables = [-2.55308696e-03  1.25066981e-01
                  -3.78664001e-03 ... 3.62479091e-02
                  1.23177804e-02 -4.90440764e-02]
```

DOCUMENT SIMILARITY

- “cosine similarity” [0,1]
- Doc vector = Average of all Token vectors

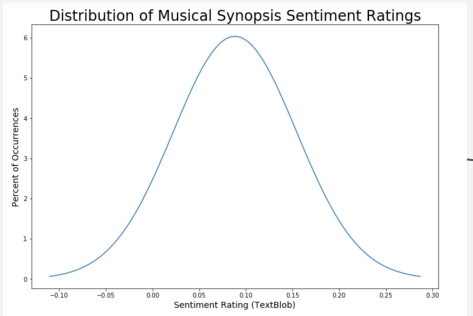
2-D Vectors



SENTIMENT ANALYSIS

- Token sentiment: value representing its sentiment
  - Ex. “awesome”=1, “awful”=-1
- Doc sentiment: Average of all Token sentiments

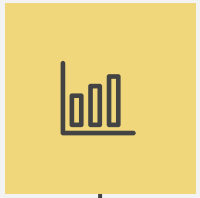
−1	0	+1
negative sentiment	neutral sentiment	positive sentiment



Mean = 0.088

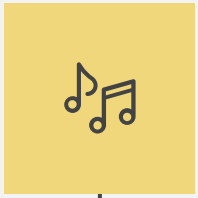
Standard Deviation = 0.066

RECOMMENDER SYSTEM



Rank similarity scores between user input and each musical synopsis

Of the top ten, sort by magnitude of distance from sentiment rating of user input



Reveal the top three musicals!

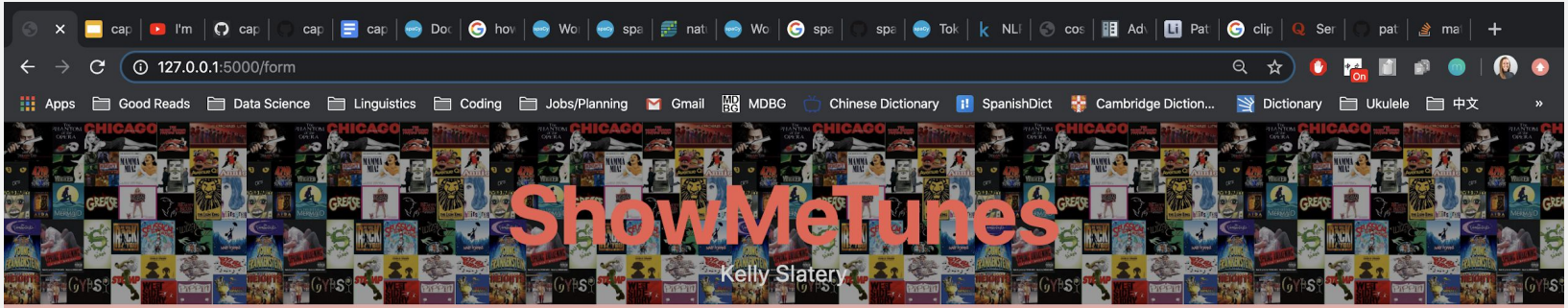
PRODUCT

03

Recommender System

Let’s give it a try!

Switch to terminal /
Local Host



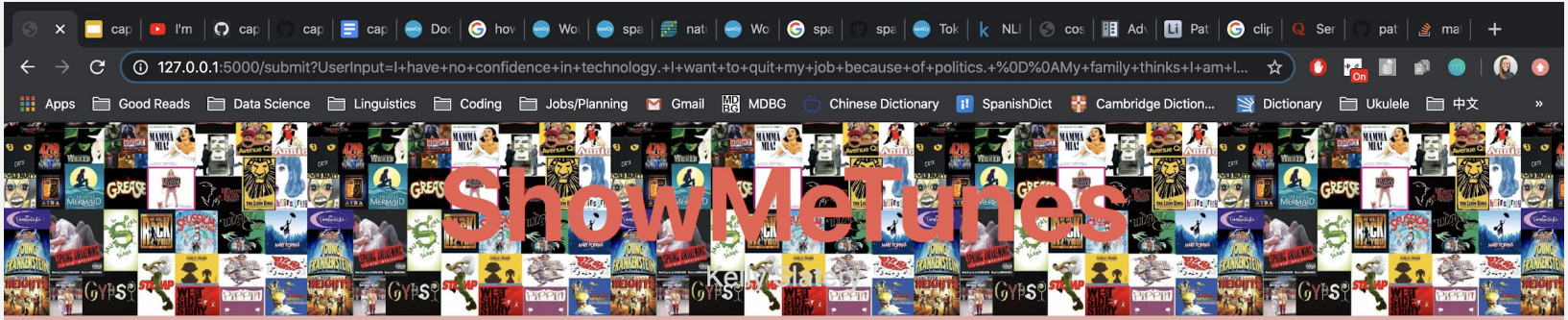
Musical fans come in all shapes and sizes and levels of intensity, but the one thing we all have in common is: we love musicals. But no matter how much of a Broadway buff you are, none of us knows ALL the popular musicals' soundtracks word-for-word. And sometimes you just can't match Rent's "One Song Glory" energy. Sometimes, all we want is for someone (or something) to tell us what musical to listen to in the moment. That's where ShowMeTunes comes in: you input a short description of your current state (mood, what's going on in your head and in your life), and ShowMeTunes will show you the show tunes you should give a listen to right when you need it. Now, you'll never have to go another minute wondering, " What musicals am I missing out on?" or simply, "What should I play next?" So what are you waiting for? Give it a try below!

How are you feeling today?
What's going on with you?

3-5 sentences

I have no confidence in technology. I want to quit my job because of politics. My family thinks I am lazy at computers. I am tired of being disappointed in the country. I have no idea
what I will do in retirement. I am uncertain of the future and it makes me anxious.

Give me my musicals!



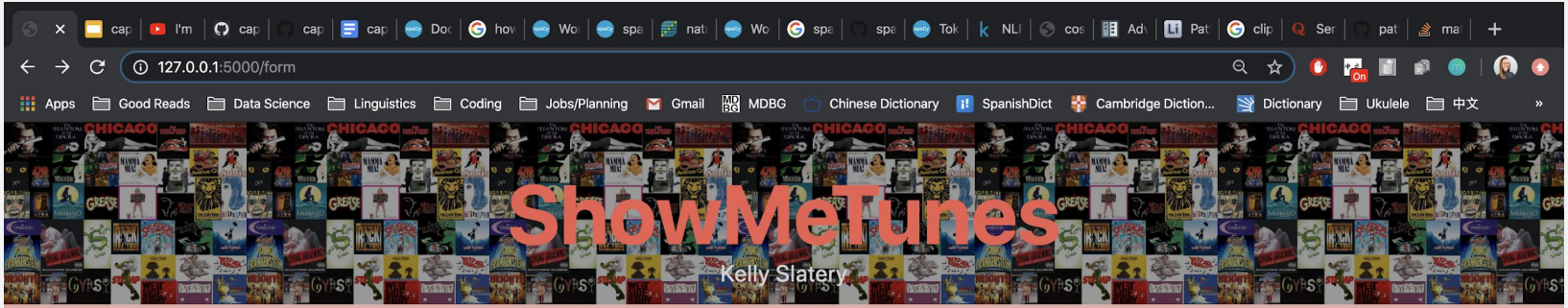
YOU SHOULD LISTEN TO:

1. Urinetown

2. Next to Normal

3. The 25th Annual Putnam County Spelling Bee

Happy listening! :-)



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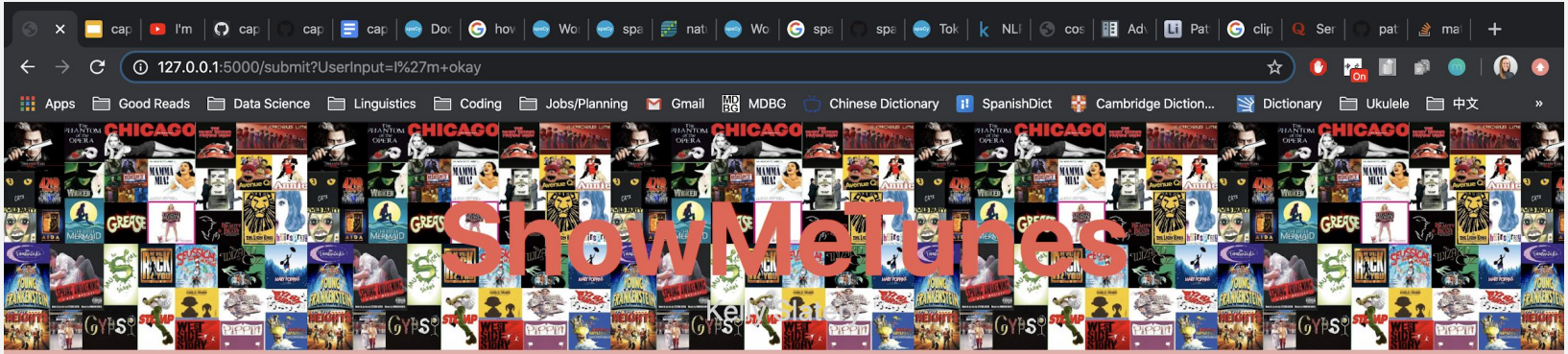
How are you feeling today?
What's going on with you?

3-5 sentences

I'm okay

Give me my musicals!

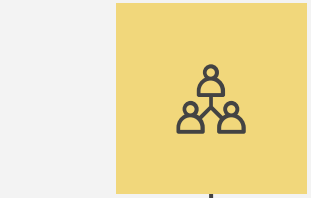


YOU SHOULD LISTEN TO:

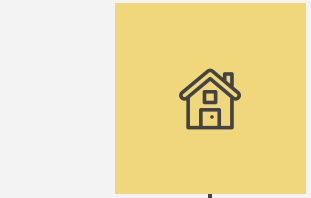
1. Company
2. Mamma Mia!
3. Be More Chill

Happy listening! :-)

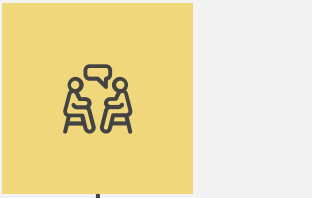
MOST COMMON 25 WORDS



act, asks, away, day, **family**, **father**, *find*, **girl**,



home, *leave*, life, love, **man**, **mother**, new, old, people,



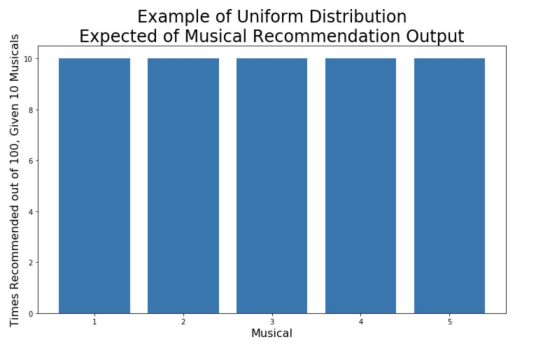
reprise, song, soon, tells, *time*, **wife**, **woman**, **young**

FUTURE

04

Next Steps

EVALUATION



Musicals Recommended Equally

0,1,2 | 3,4,5 | 6,7,8,9

Future Development:
Write a Python script to collect site data - count how many times each musical is recommended!

10 Clusters

Expectation:
2/3 or 3/3 musicals recommended are from the same cluster

NEXT STEPS

Rank musicals by popularity myself:
- Wikipedia API: get lists of musicals by category
- Spotify API: get track popularities

Ranking Algorithm

Define algorithm to detect different features, such as:
- intensity/chill level
- nostalgic/modern
- happy/sad

Data Collection

Collect as many synopses/plot summaries as possible to add specific training to spaCy model

Sentiment Analysis

Deployment

- Create evaluation tools
- Create export playlist feature
- Modernize Flask style
- Debug & Optimize
- Ensure copyrights
- Create App

THANK YOU

Questions?

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