THE FUTURE, THE PAST & NATURAL LANGUAGE PROCESSING

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THE PROCESS

- Problem Identification
- Data Collection
- Modeling
- Result Interpretation

THE PROBLEM

Using comments and submissions from the r/History and r/Futurology subreddits, can we build a model that can tell the difference between a conversation about the future and a conversation about the past?

DATA COLLECTION: USING THE PUSHSHIFT API

- The get_reddit_data function takes in three arguments:
  - subreddit: The subreddit from which the data is to be scraped. We will be using the 'history' and 'Futurology' subreddits.
  - endpoint: The type of data to scrape; either 'comment' or 'submission'.
  - n_iter: The number of times the API will run. Because we are limited to 1,000 posts per scrape, n_iter allows us to scrape n_iter * 1,000 posts at a time. We used n_iter = 10 for each endpoint & subreddit.

THE DATA

Using Pushshift’s API, 10,000 comments and 10,000 submissions were collected from each subreddit for a total of 40,000 rows of data.

r/History

- /r/History is a place for discussions about history. Feel free to submit interesting articles, tell us about this cool book you just read, or start a discussion about who everyone's favorite figure of minor French nobility is!

reddit.com/r/history

r/Futurology

- Welcome to r/Futurology, a subreddit devoted to the field of Future(s) Studies and speculation about the development of humanity, technology, and civilization.

reddit.com/r/Futurology

- Base
- Logistic Regression
- Naïve Bayes
- K-Nearest Neighbors
- Support Vector Machine

THE MODELS

BASE MODEL

0.50 ACCURACY

LOGISTIC REGRESSION

Hyperparameters: Count Vectorizer & Tfidf-Vectorizer

- Max Feature Limit: None, 5,000, 10,000
- With & without stopwords
- 1 & 2 n-gram range

Best Count Vectorized Model

- No max feature limit
- No stopwords
- 2 n-gram range
- Training Accuracy: 0.8942
- Testing Accuracy: 0.8976

Best Tfidf-Vectorized Model

- No max feature limit
- With stopwords
- 1 gram range
- Training Accuracy: 0.8963
- Testing Accuracy: 0.8975

NAÏVE BAYES

Multinomial Hyperparameters

- Max Feature Limit: None, 5,000, 10,000
- With & without stopwords
- 1 & 2 gram rangeBest Count Vectorized Model
- No max feature limit

Best Multinomial Model

- No Max feature limit
- No stopwords
- 2 gram range
- Training Accuracy: 0.9081
- Testing Accuracy: 0.9081

Gaussian Model

- Training Accuracy: 0.87
- Testing Accuracy: 0.7549

K-NEAREST NEIGHBORS

Hyperparameters: Count Vectorizer & Tfidf-Vectorizer

- 5, 15 & 25 nearest neighbors

Best Count Vectorized Model

- 5 Nearest Neighbors
- Training Accuracy: 0.6658
- Testing Accuracy: 0.6781

Best Tfidf-Vectorized Model

- 25 Nearest Neighbors
- Training Accuracy: 0.8141
- Testing Accuracy: 0.7569

SUPPORT VECTOR MACHINE

Count Vectorized Model

- Training Accuracy: 0.9192
- Testing Accuracy: 0.8699

Tfidf-Vectorized Model

- Training Accuracy: 0.9888
- Testing Accuracy: 0.9023

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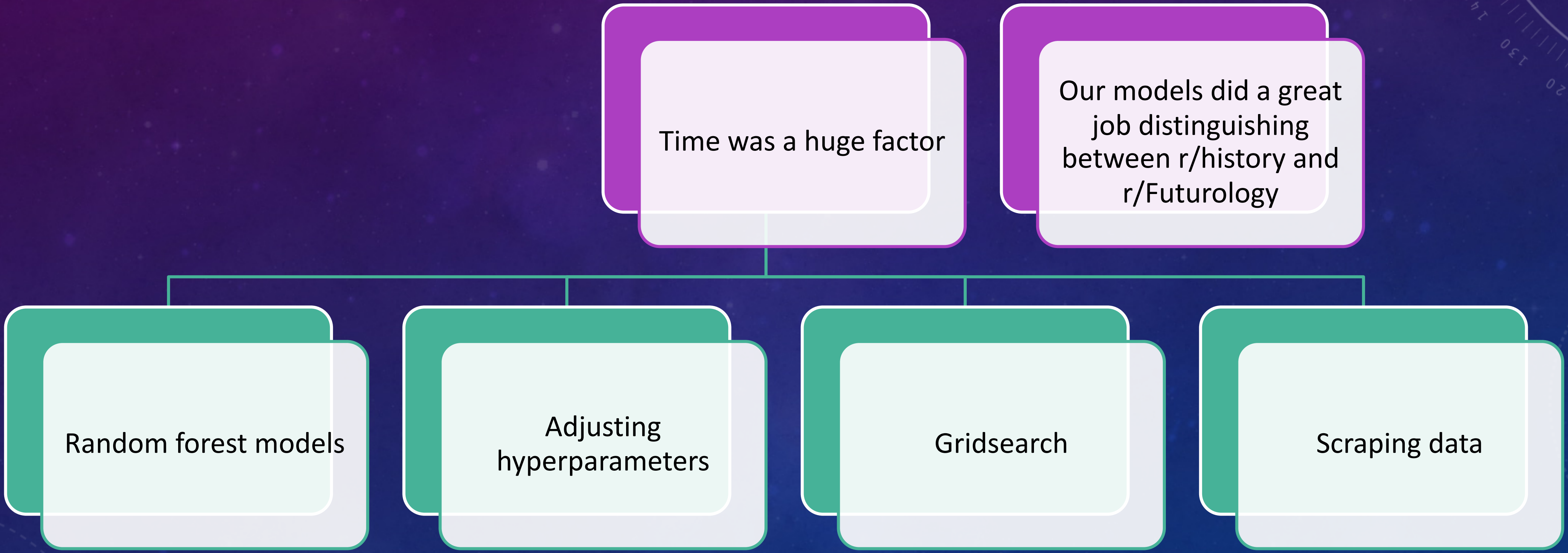
BEST MODELS

- Multinomial Naïve Bayes: 90.8% Accuracy
- Tfidf-Vectorized Support Vector Machine: 90.23% Accuracy

CONCLUSIONS



Time was a huge factor

Our models did a great job distinguishing between r/history and r/Futurology

Random forest models

Adjusting hyperparameters

Gridsearch

Scraping data

QUESTIONS?