Subreddit Classification

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DSI - 523

Why?

1. Which subreddit to post on?
2. Where did a post come from?
3. Is it a meme?

Data Collection

Data Collection Process

Determine Subreddits

↓

PMAW
(Pushshift Multithread API Wrapper)

↓

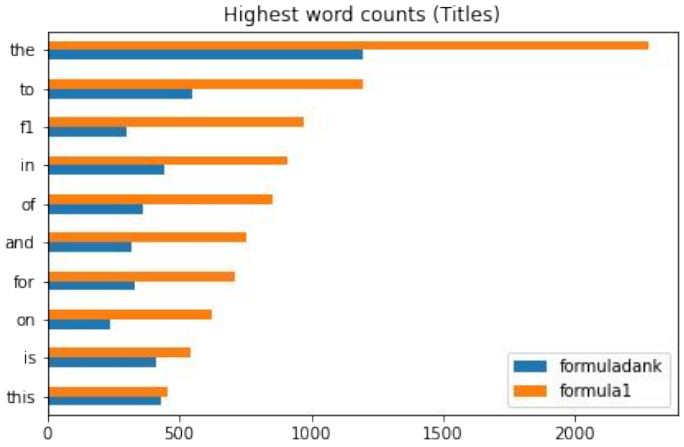
Specify Date Range and
Number of Requests

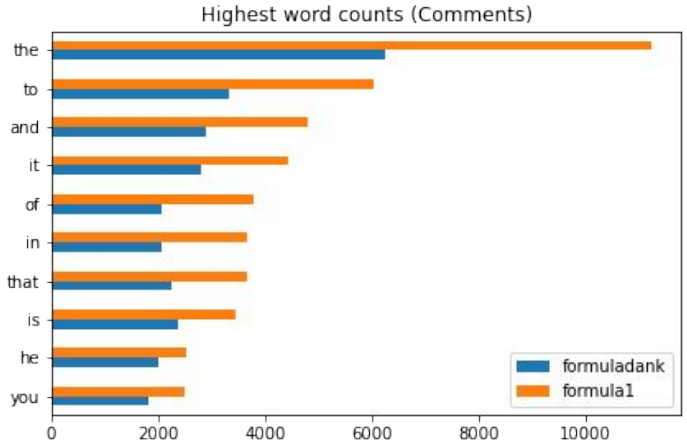
Data Collection

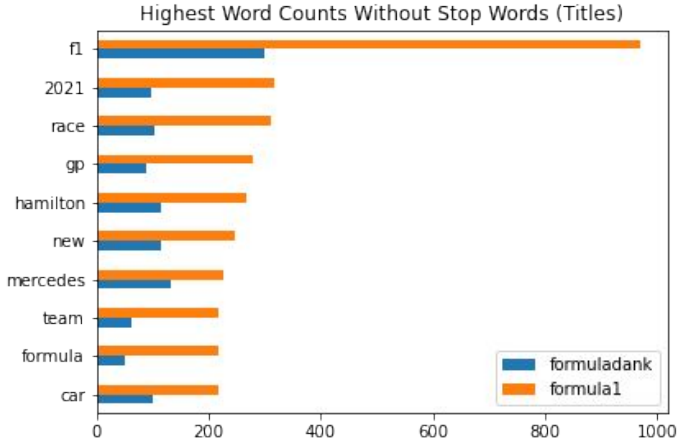
- Subreddits chosen: r/formula1 and r/formuladank
    - Formuladank is Formula 1 memes.
- 10,000 comments per subreddit
- 5,000 posts per subreddit
- Date Range: 1/1/2021 thru 6/24/2022

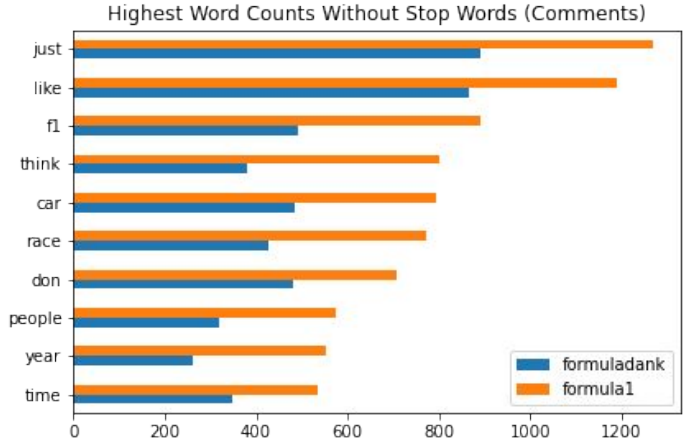
Exploratory Data Analysis

WORD COUNTS

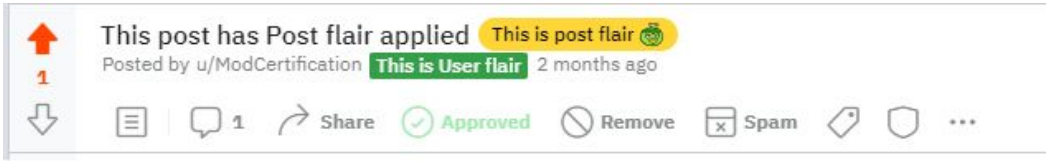

Highest word counts (Titles)
the
to
f1
in
of
and
for
on
is
this
0
500
1000
1500
2000
formuladank
formula1


Highest word counts (Comments)
the
to
and
it
of
in
that
is
he
you
0
2000
4000
6000
8000
10000
formuladank
formula1


Highest Word Counts Without Stop Words (Titles)
f1
2021
race
gp
hamilton
new
mercedes
team
formula
car
0
200
400
600
800
1000
formuladank
formula1


Highest Word Counts Without Stop Words (Comments)
just
like
f1
think
car
race
don
people
year
time
0
200
400
600
800
1000
1200
formuladank
formula1

Flairs



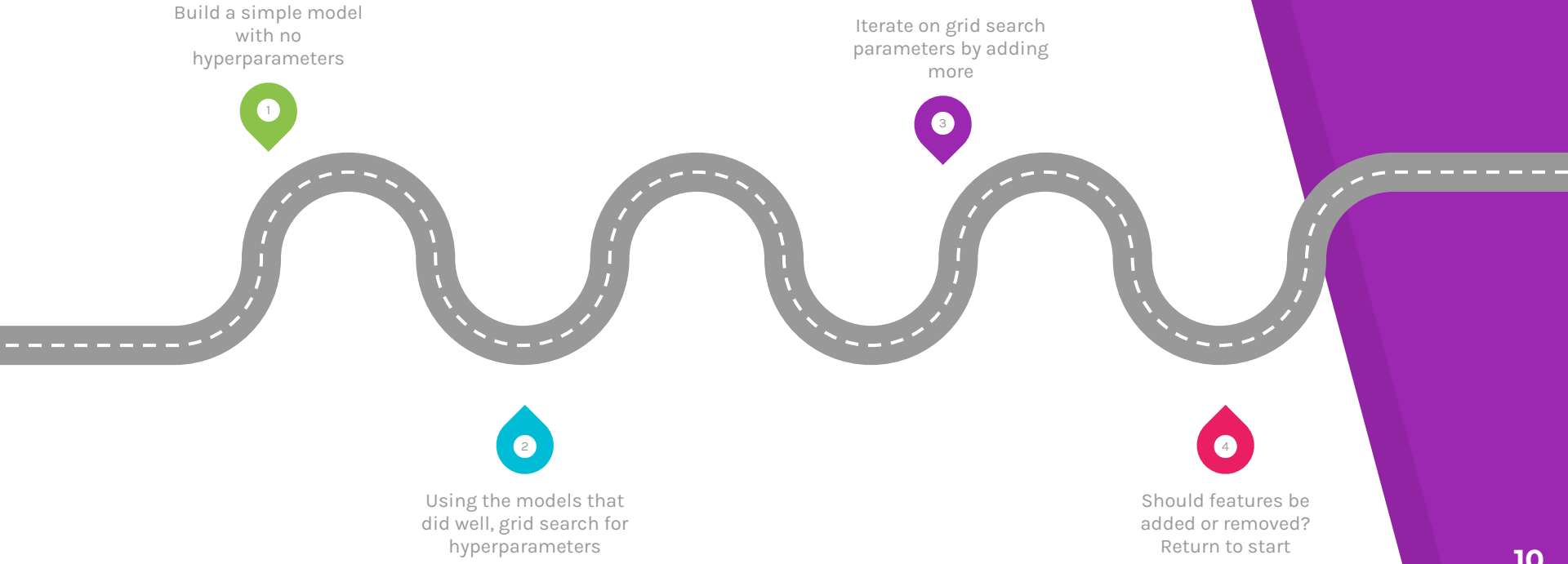
- 3135 flair-less users in all comments
  - 3088 in formula1
- 2413 flair-less users in all posts
  - 2205 in formula1

Formula1 flair: Max Verstappen
Formuladank flair: Don’t know f1 but memes are kinda funny

Image Source: https://mods.reddithelp.com/hc/en-us/articles/360010541651-User-Flair

Modeling

Roadmap

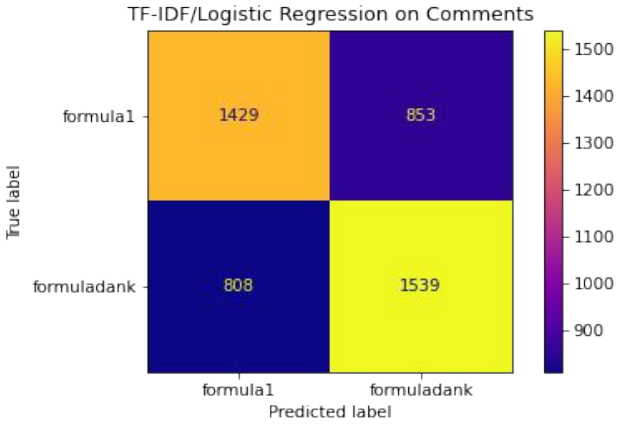

Build a simple model with no hyperparameters
1
Using the models that did well, grid search for hyperparameters
2
Iterate on grid search parameters by adding more
3
Should features be added or removed? Return to start
4

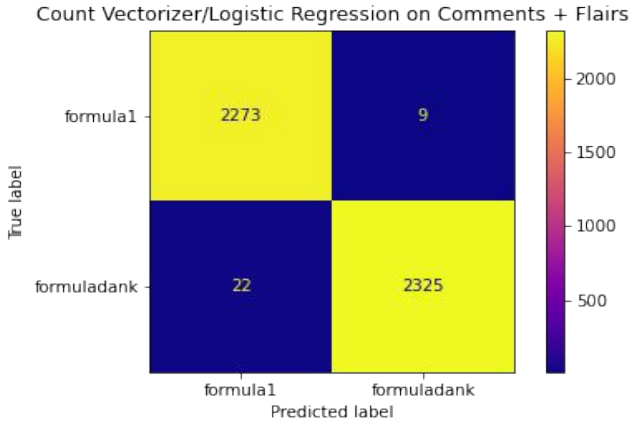
Model Parameters and Accuracy

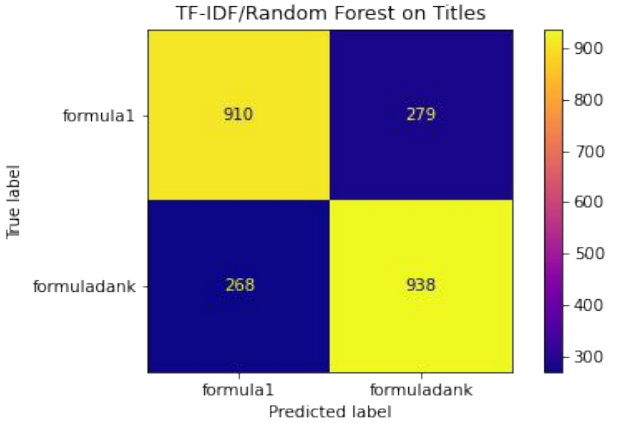
	TF-IDF & Logistic Regression (Comments)	Countvectorizer & Logistic Regression (Comments + Flair)	TF-IDF & Random Forest (Titles)	Countvectorizer & Logistic Regression (Titles + Flair)	Countvectorizer & Logistic Regression (Only flairs from comments)	Countvectorizer & Logistic Regression (Only flairs from titles)
Feature Extraction Parameters	Max df: 0.3 Max Features: 10,000	Defaults	Max df: 0.25 Max Features: 8,000	Defaults	Defaults	Defaults
Classifier Parameters	C: 0.75	Defaults	Num of estimators: 200	Defaults	Defaults	Defaults
Training Accuracy	75.5%	99.7%	99.8%	98.4%	99.5%	97.8%
Testing Accuracy	64.1%	99.3%	77.2%	97.1%	99.5%	97.3%

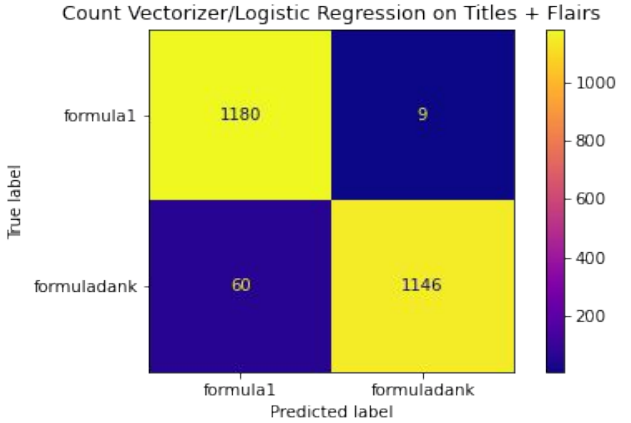
Baseline Accuracy	50%

Confusion Matrices for Models









Next Steps

- ❑ Dive deeper into grid searching with flairs as a feature
- ❑ Model other similar subreddit pairs
- ❑ Find other interesting features to use

Conclusions

- Building a model for two similar subreddits is very difficult
- Adding extra features can be extremely useful
- Complex models do not always outperform simple ones.

Image source: https://www.reddit.com/r/formuladank/comments/pmv92e/bottas_meme_transparent_template/

THANKS!

Any questions?

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Death to the Stock Photo (license)