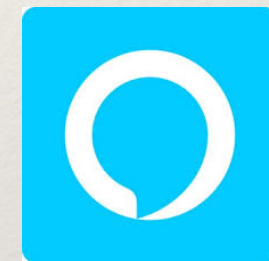


MSBA 2018-19 CAPSTONE PROJECT

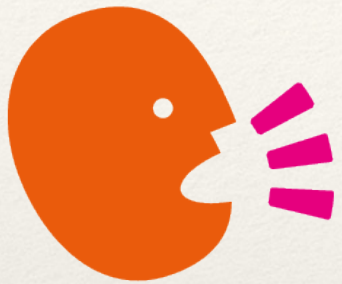
AMAZON ALEXA



DEVELOPING MULTI-CATEGORY CLASSIFICATION MODEL
FOR ALEXA SKILLS



Scope of Project



Hey Alexa...

Skill-Intent Model:

- Keywords
- Utterance
- Invocation Phrase
- Description

Automating
Classification of
57,130 skills

Challenges



“How well do you know your Christmas carols? I'll give you a "remixed" title to a Christmas carol and you see if you can figure out the original title.....”

60%

?

40%

Music & Audio

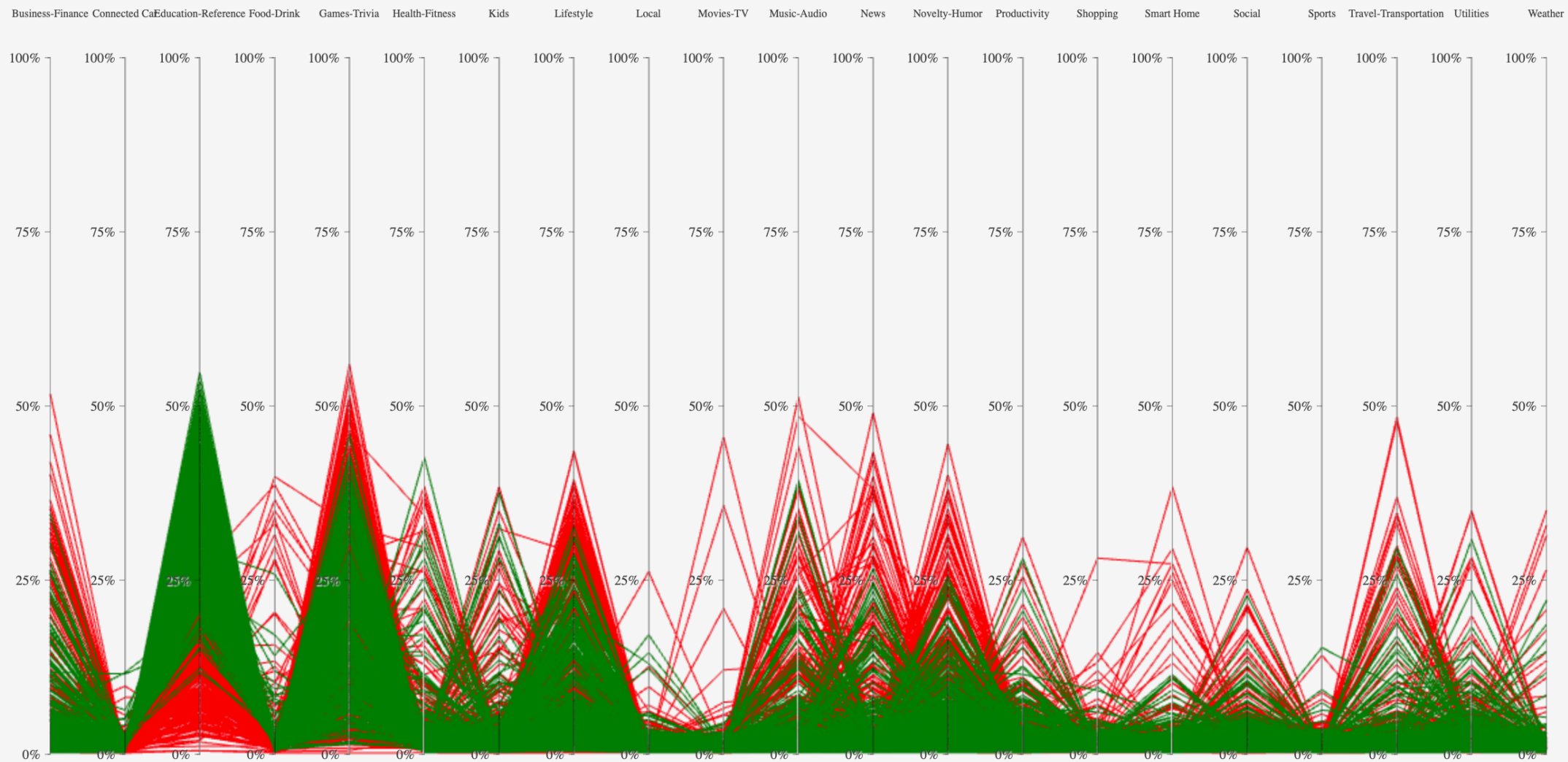
Games & Trivia

- Messy Text data

- Overlapping Categories

- Getting a probabilistic score

Actual Category: Education and Reference



An insight

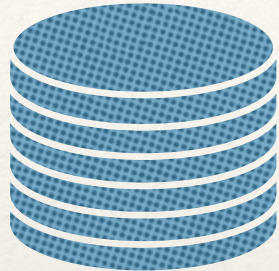
Overlapping
Categories

Category: Education &
Reference



Tools Used

Data wrangling



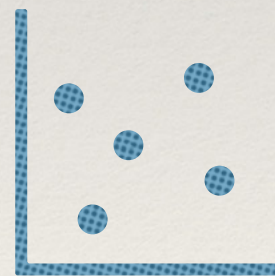
pandas, numpy, json,
matplotlib, wordcloud, regex,
nltk, spacy, beautifulsoup

Data visualization



matplotlib, seaborn,
scikitplot, bokeh, plotly

Modeling



sklearn, wordninja, xgboost,
nltk, joblib



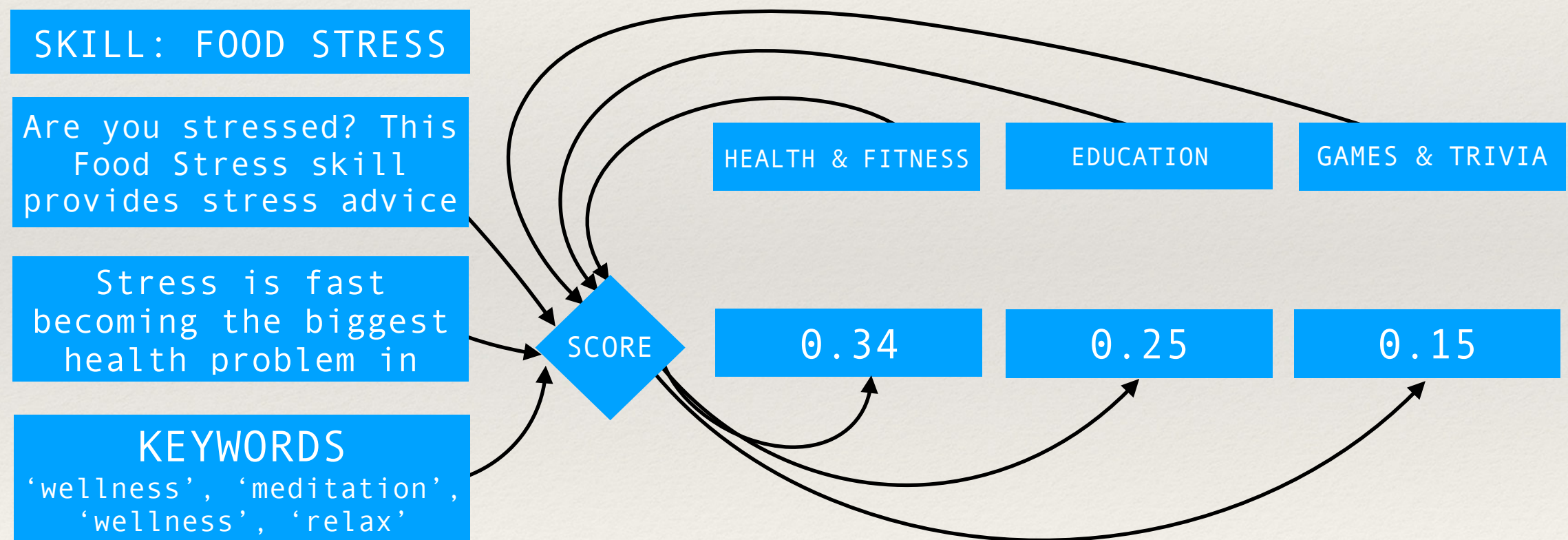
Approach - 1

- ❖ TF-IDF Vectorizer
 - ❖ Penalizing repetitive words to find important, meaningful words to create a clean, well-defined feature set



Approach - 2

- ❖ Semantic Meaning
- ❖ Distance of each word from each category



- ❖ Predicted categories with less than 0.2 difference: top 2 | top 3



Model Performance

❖ TF-IDF :

Accuracy of actual
category in:

Top 1 73.35%

Top 2 87.84%

Top 3 92.46%

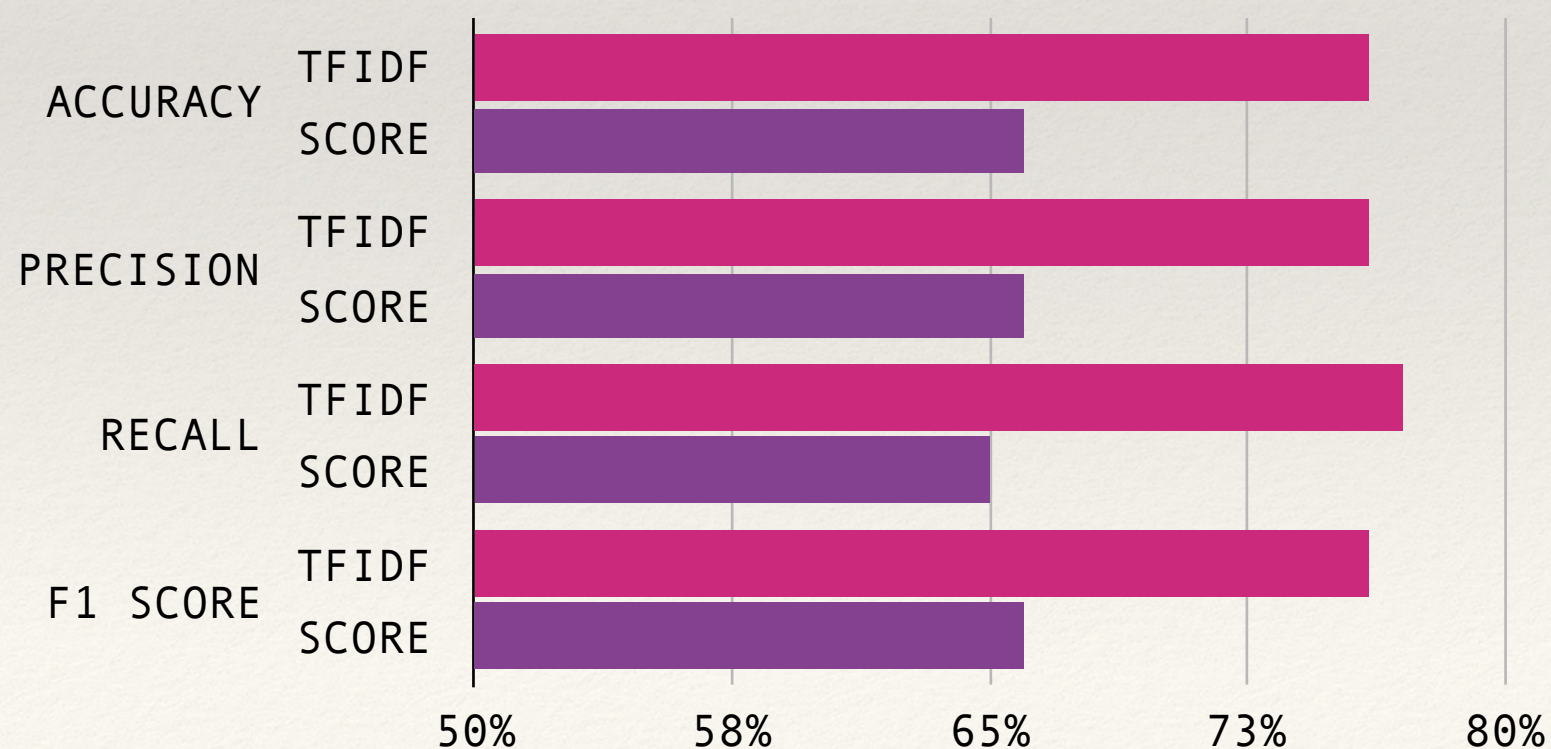
❖ SEMANTIC SCORE :

Accuracy of actual
category in:

Top 1 65.74%

Top 2 80.28%

Top 3 87.56%





Results and Recommendations

Input

Output

Skill Title:

Mom Quotes

Skill Description:

Listen the momisms mothers have used for generations while walking the hill both ways the snow Ask Mom Quotes for quote guidance advice because said Now please and close the front door were not heating the whole neighborhood

Skill Short Description:

Revisit the classically funny lines moms have used their children for generations

Skill Small Screen Description:

Revisit the classically funny lines moms have used their children for generations

Skill Invocation:

mom quotes

Skill Keywords:

Parenting Mother Funny Motherhood Day Humor

Skill Utterances:

Alexa ask Mom Quotes for quote Alexa ask Mom Quotes for funny Mom saying Alexa ask Mom Quotes for tip

No Maturity Rating

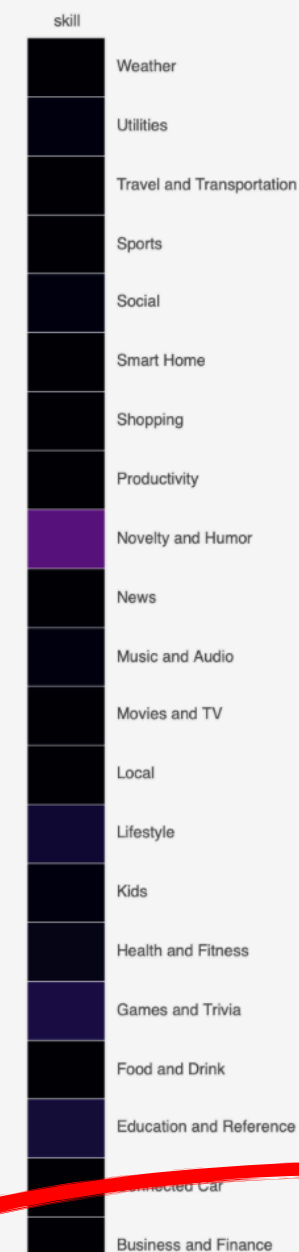
Guidance Suggested

Mature

Generate skills from data

Category

Probability



The expected category of the skill is **Novelty and Humor** but the skill could also be categorized under **Games and Trivia** or **Education and Reference**

Thank you!



Samira Kumar Vardharajan | Brandon Nguyen | Shruhi Desai | Qinyu Xi | Xinfang Zhang

Q & A