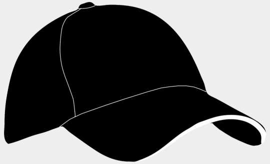
Project 3

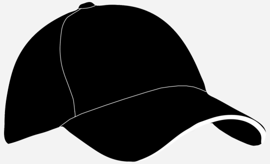
insertnames



Problem statement

Using NLP, we created a classification model that can accurately identify social media posts into basketball and baseball interest groups to assist a VR gaming company in:

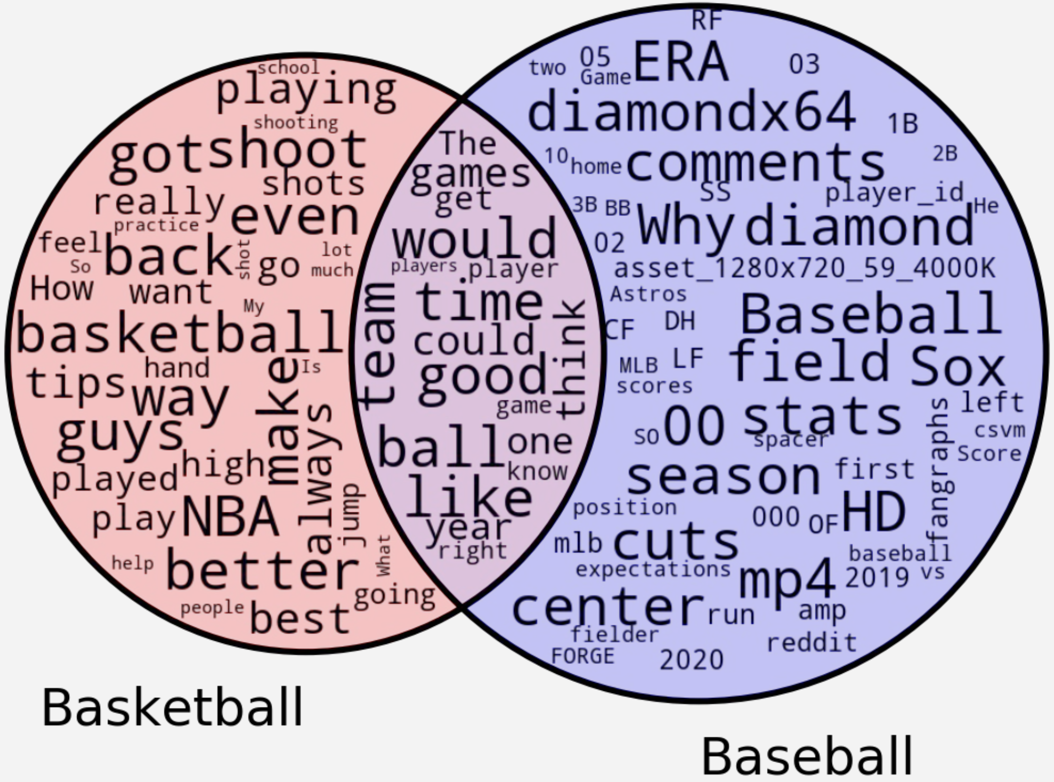
1. **cost savings on their advertising campaign**
2. **formation of B2B partnerships**

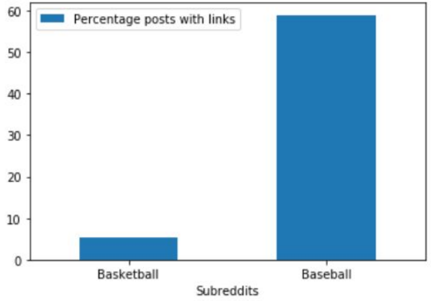


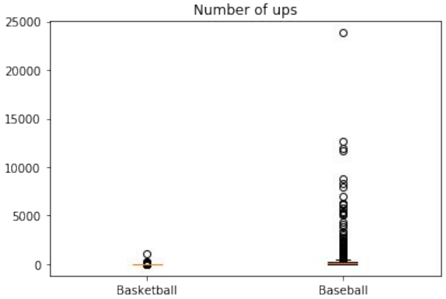
Cleaning

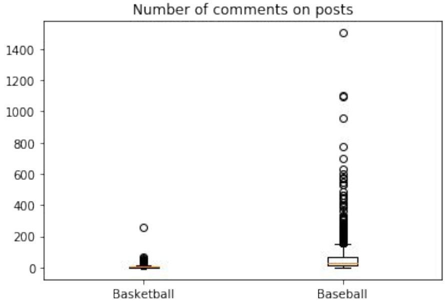
- **Dropping of duplicate posts (title)**
- **Removing admin posts**
- **Joining of selftexts and title**

Most Frequent Words from Basketball & Baseball Corpus





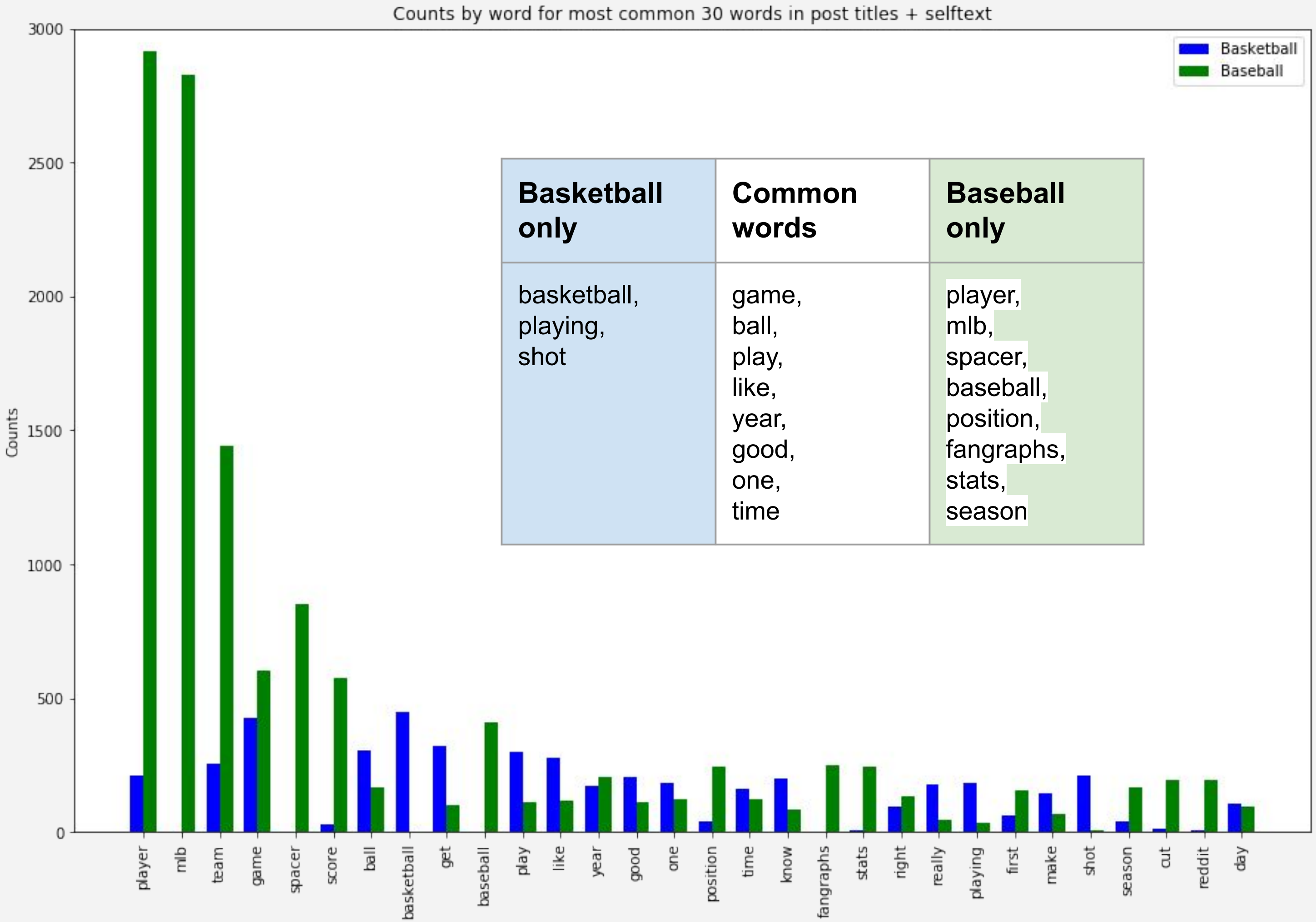




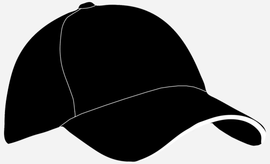
EDA - General observations

- **Baseball posts are more popular than basketball (1.1m vs 51k members)**
- **Baseball posts contain more links, while basketball posts contain more original texts**

EDA - High word counts

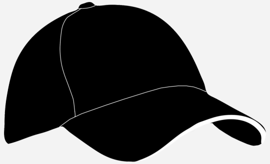


Basketball only	**Common words**	**Baseball only**
basketball, playing, shot	game, ball, play, like, year, good, one, time	player, mlb, spacer, baseball, position, fangraphs, stats, season



Preprocessing

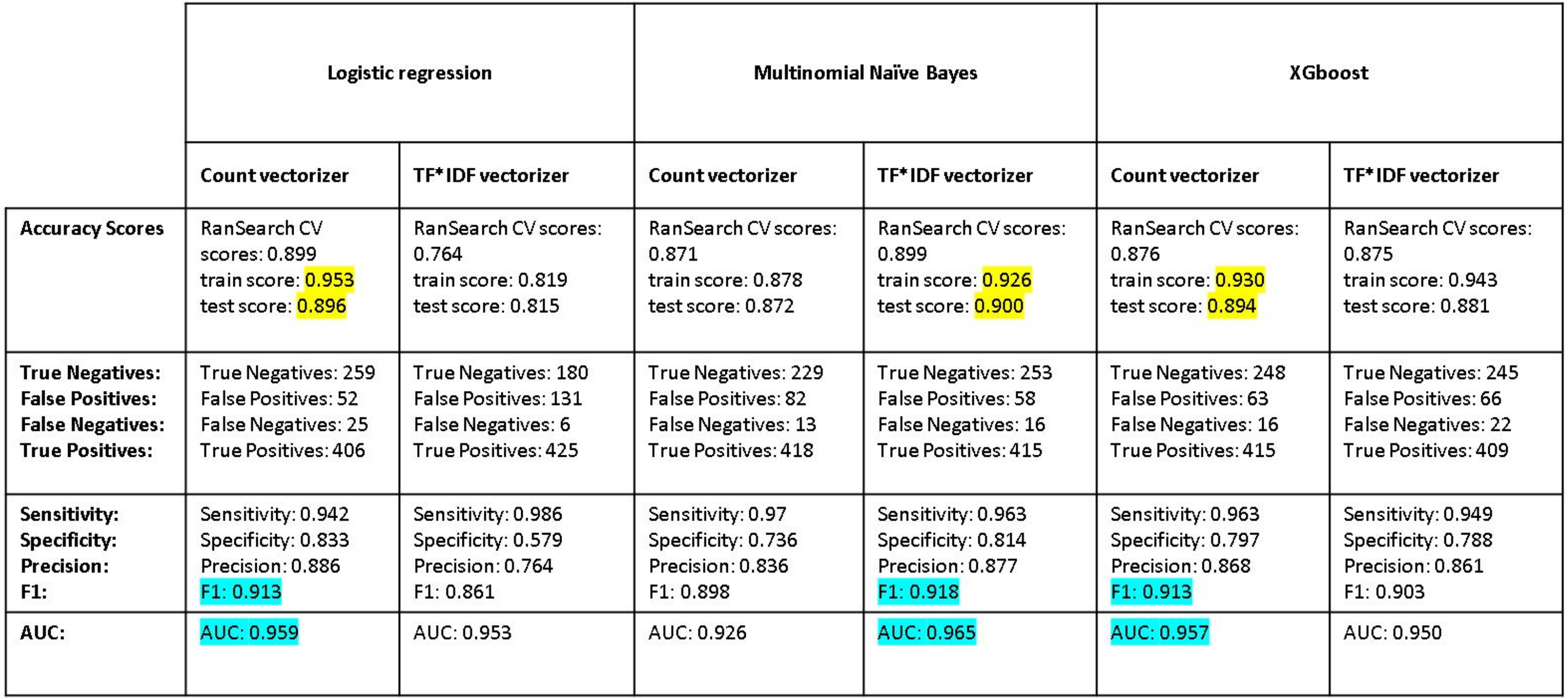
1. **Converted HTML links to text**
2. **Removed non-letters**
3. **Converted to lowercase, split into individual words**
4. **Removed stop words (included extra words: ‘http’, ‘www’, ‘com’, ‘id’)**
5. **Lemmatized words**



Modeling

- **Logistic regression:** Classification via a linear equation like algorithm that produces a binary output
- **Naive Bayes:** Classification via a probabilistic classifier like algorithm
- **XGBoost:** Classification via a decision tree like algorithm

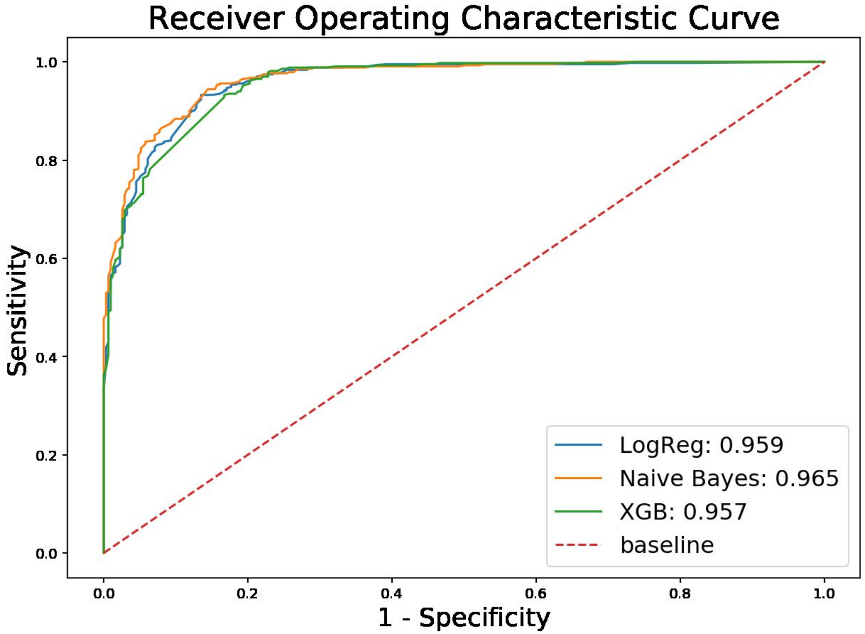
Which model to choose?

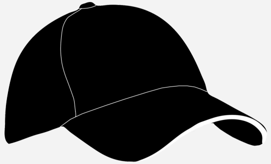


	Logistic regression		Multinomial Naïve Bayes		XGboost	
	Count vectorizer	**TF* IDF vectorizer**	**Count vectorizer**	**TF* IDF vectorizer**	**Count vectorizer**	**TF* IDF vectorizer**
Accuracy Scores	RanSearch CV scores: 0.899 train score: 0.953 test score: 0.896	RanSearch CV scores: 0.764 train score: 0.819 test score: 0.815	RanSearch CV scores: 0.871 train score: 0.878 test score: 0.872	RanSearch CV scores: 0.899 train score: 0.926 test score: 0.900	RanSearch CV scores: 0.876 train score: 0.930 test score: 0.894	RanSearch CV scores: 0.875 train score: 0.943 test score: 0.881
True Negatives: **False Positives:** **False Negatives:** **True Positives:**	True Negatives: 259 False Positives: 52 False Negatives: 25 True Positives: 406	True Negatives: 180 False Positives: 131 False Negatives: 6 True Positives: 425	True Negatives: 229 False Positives: 82 False Negatives: 13 True Positives: 418	True Negatives: 253 False Positives: 58 False Negatives: 16 True Positives: 415	True Negatives: 248 False Positives: 63 False Negatives: 16 True Positives: 415	True Negatives: 245 False Positives: 66 False Negatives: 22 True Positives: 409
Sensitivity: **Specificity:** **Precision:** **F1:**	Sensitivity: 0.942 Specificity: 0.833 Precision: 0.886 F1: 0.913	Sensitivity: 0.986 Specificity: 0.579 Precision: 0.764 F1: 0.861	Sensitivity: 0.97 Specificity: 0.736 Precision: 0.836 F1: 0.898	Sensitivity: 0.963 Specificity: 0.814 Precision: 0.877 F1: 0.918	Sensitivity: 0.963 Specificity: 0.797 Precision: 0.868 F1: 0.913	Sensitivity: 0.949 Specificity: 0.788 Precision: 0.861 F1: 0.903
AUC:	AUC: 0.959	AUC: 0.953	AUC: 0.926	AUC: 0.965	AUC: 0.957	AUC: 0.950

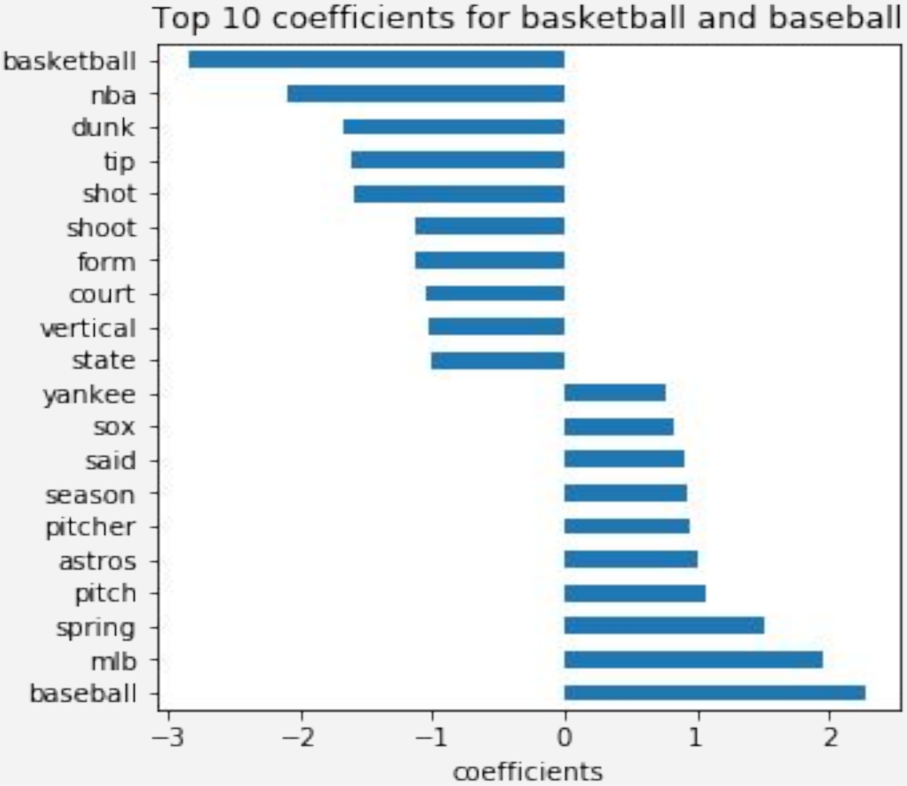
Baseline: 0.58

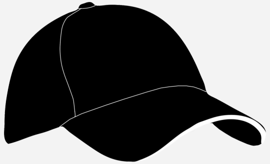
Which model to choose?

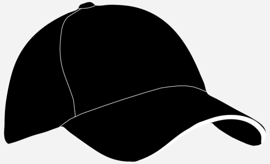




What words were the best discriminators?







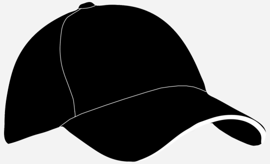
Recommendations

Insights

1 We created an accurate Naive Bayes classifier to identify social media posts into basketball and baseball interest groups.

Basketball posts - techniques in improving the skills as evidenced by popular words such as dunk, shoot & jumpshot.

Baseball posts - baseball teams and games eg fangraphs, 'Mets', 'Astros', 'SOX', 'Red', 'Yankee', 'Angels' etc.



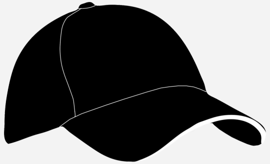
Recommendations

Applications

VR content/modules : basketball techniques, baseball teams and players

Partnerships with :

- Trainers/coaches for techniques
- Sports merchandisers to target baseball team-centered merchandise
- Teams to feature player dialogues, snippets, tips and techniques



Conclusion

Our model predicts very well with text

Our insights provide :

- Scope for business opportunities to provide specific products
- Targeted cost effective emplacement of advertisements

Future improvements - detect images and videos in posts to further sharpen advertising edge.