Capstone Project

TED Talk Views Prediction

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Problem Statement

- TED is devoted to spreading powerful ideas on just about any topic. These datasets contain over 4,000 TED talks including transcripts in many languages Founded in 1984 by Richard Salman as a nonprofit organization that aimed at bringing experts from the fields of Technology, Entertainment, and Design together.
- TED Conferences have gone on to become the Mecca of ideas from virtually all walks of life.
- As of 2015, TED and its sister TEDx chapters have published more than 2000 talks for free consumption by the masses and its speaker list boasts of the likes of Al Gore, Jimmy Wales, Shahrukh Khan, and Bill Gates.
- The main objective is to build a predictive model, which could help in predicting the views of the videos uploaded on the TEDx website.

Data Summary:

Data set name: data_ted_talks

Shape:

- Rows -- 4005
- Columns--19

Features:

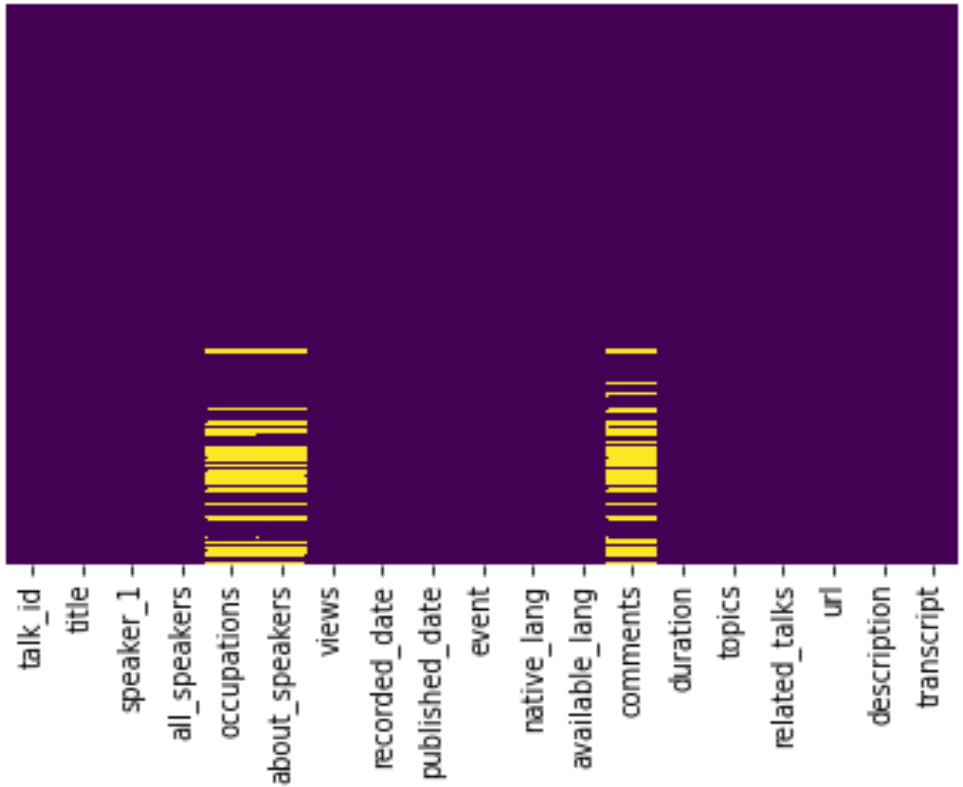
'talk_id', 'title', 'speaker_1', 'all_speakers', 'occupations', 'about_speakers', 'recorded_date', 'published_date', 'event', 'native_lang', 'available_lang', 'comments', 'duration', 'topics', 'related_talks', 'url', 'description', 'transcript'

Target Variable: 'views'

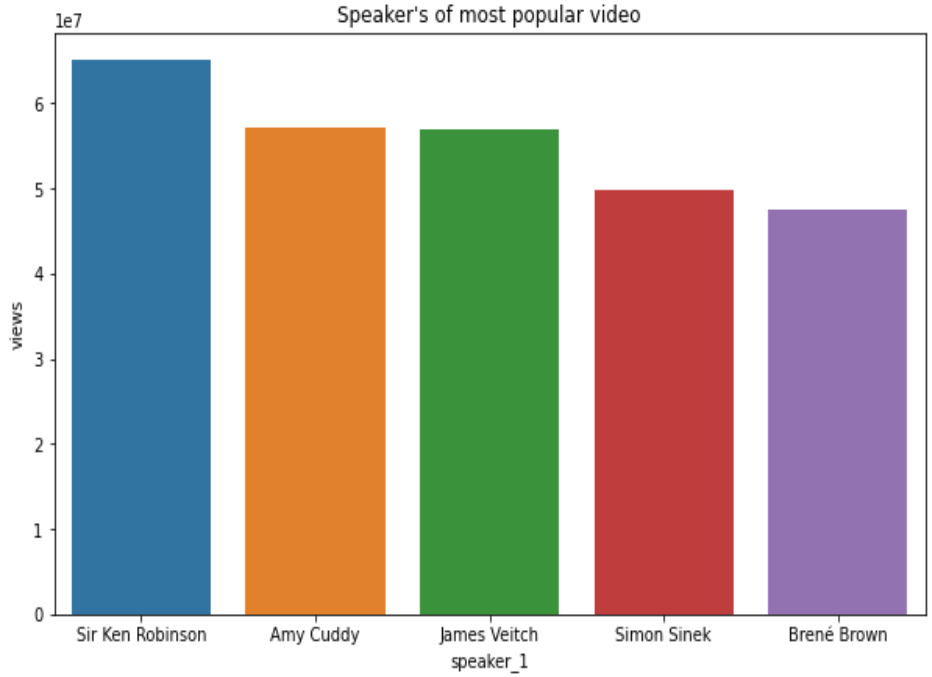
Exploratory Data Analysis on Features

Missing Data Check

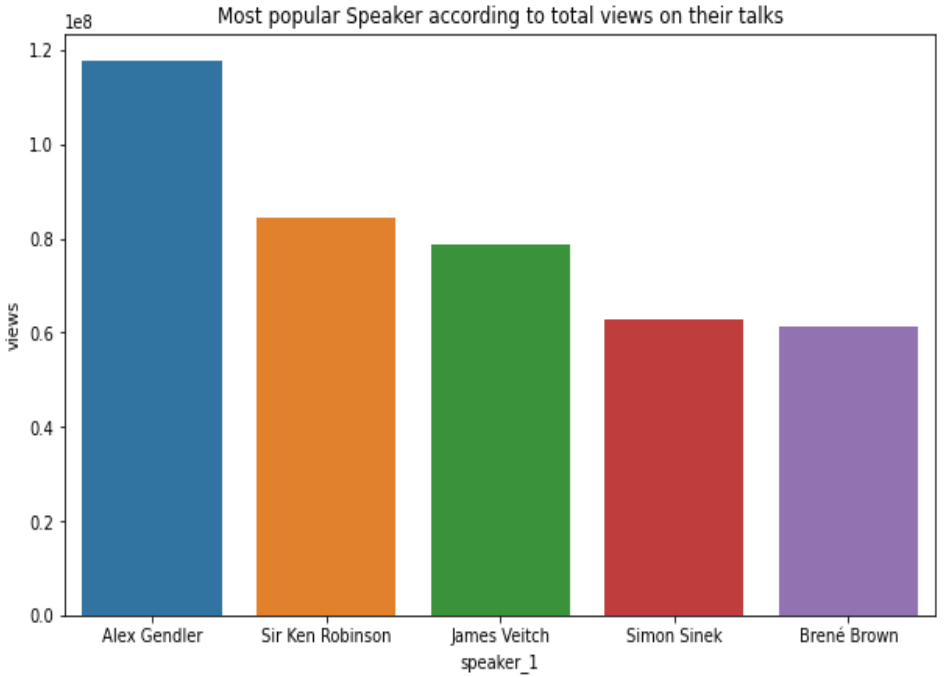
- **KNN imputation for Numerical Features**
- **Replaced Categorical Features Nan values with ‘Unknown’ category**



Speakers with Views:

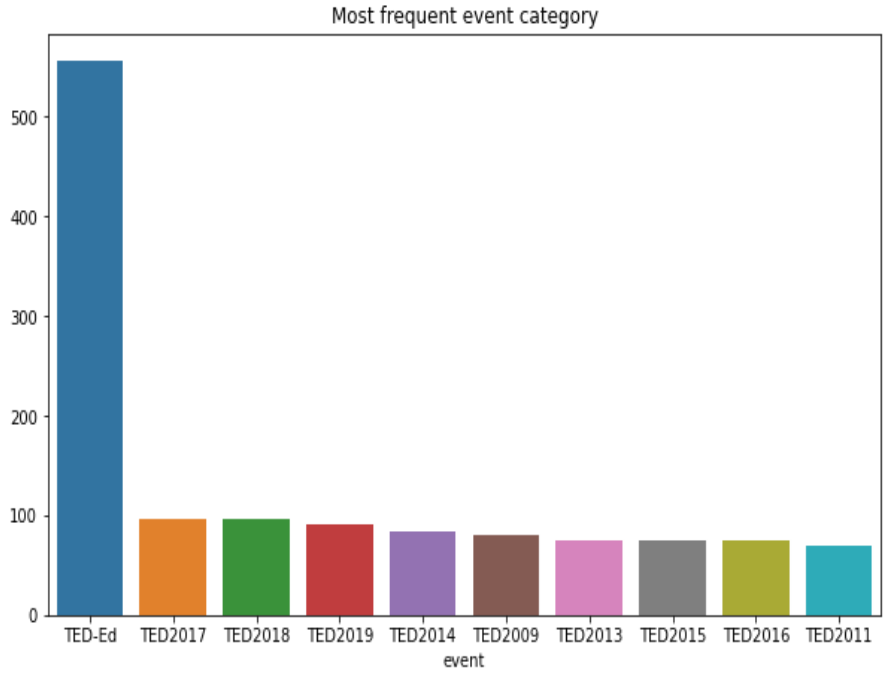


Speakers of most popular video

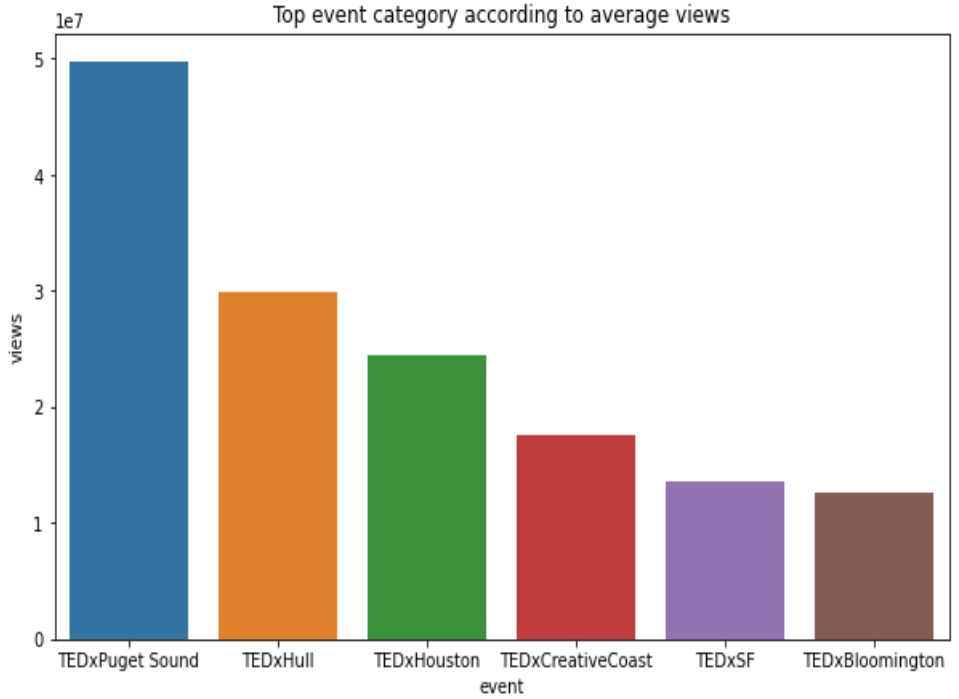


Top Speakers by total Views

Events with Views:

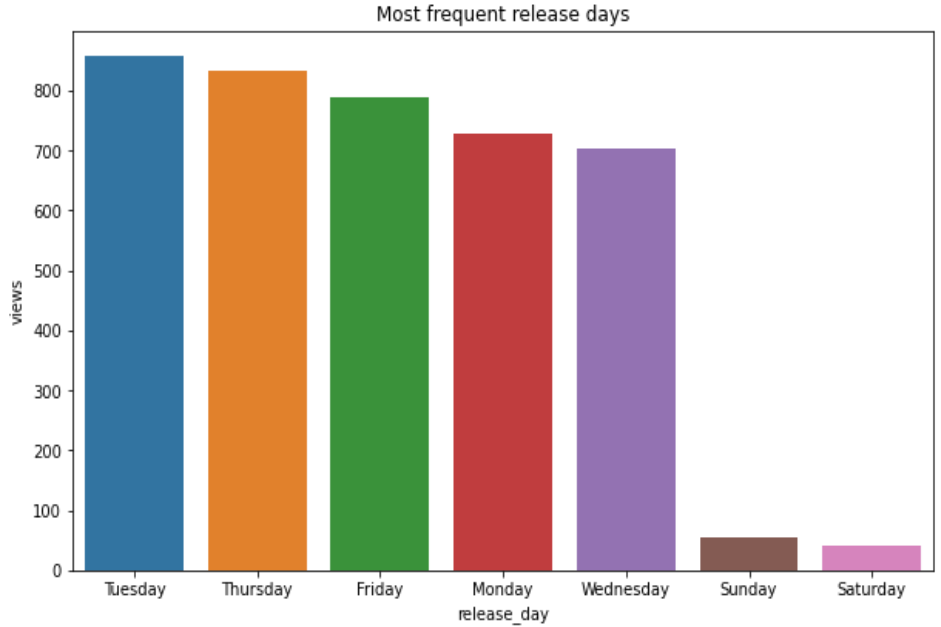


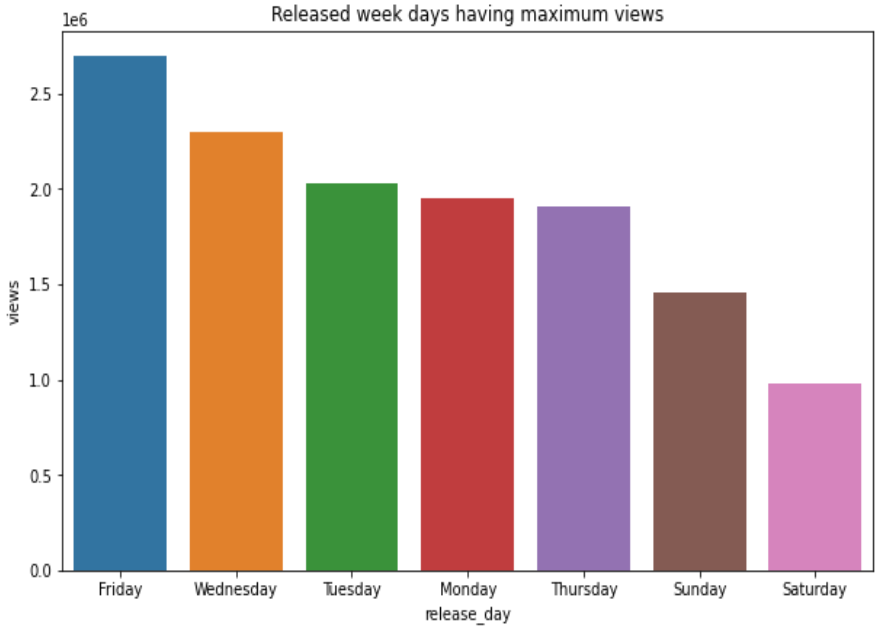
Most Frequent event category Views



Top Events by Average

Published Days with Views:



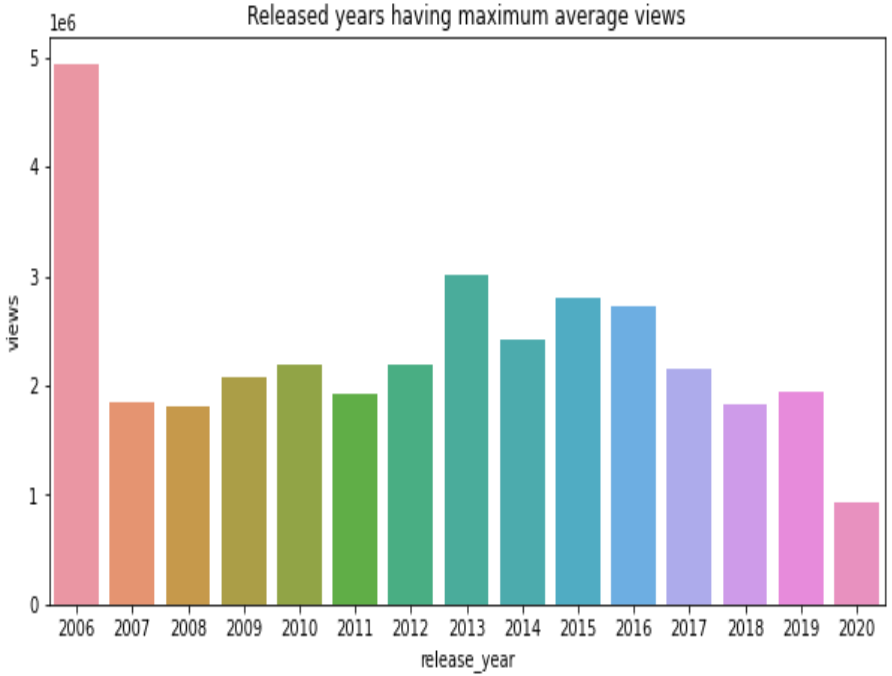


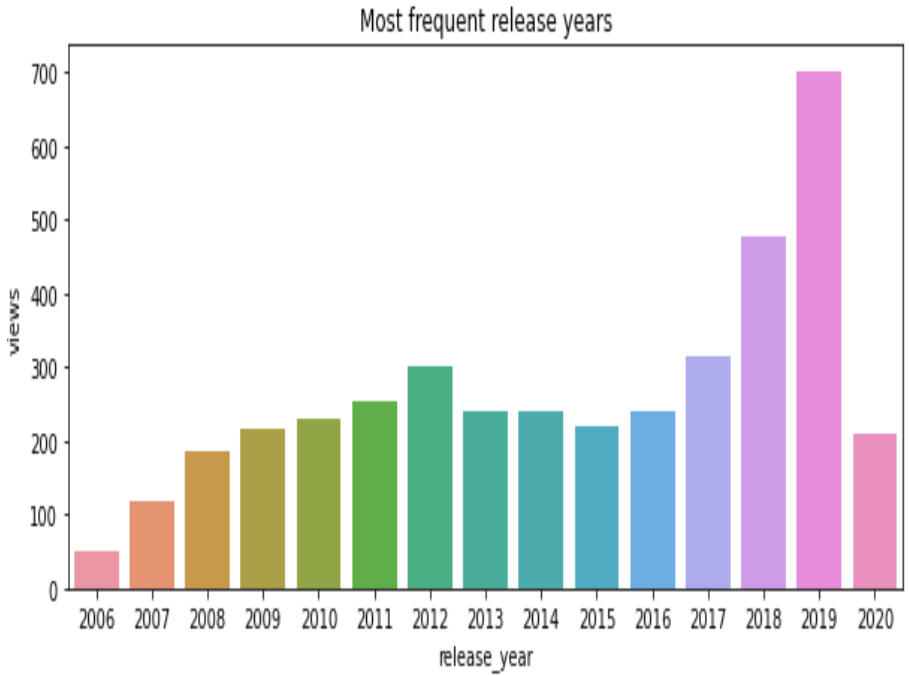
Frequent Released Days Views

Released Days by avg

- **Friday release is impacting the views of the video**

Published Year with Views:

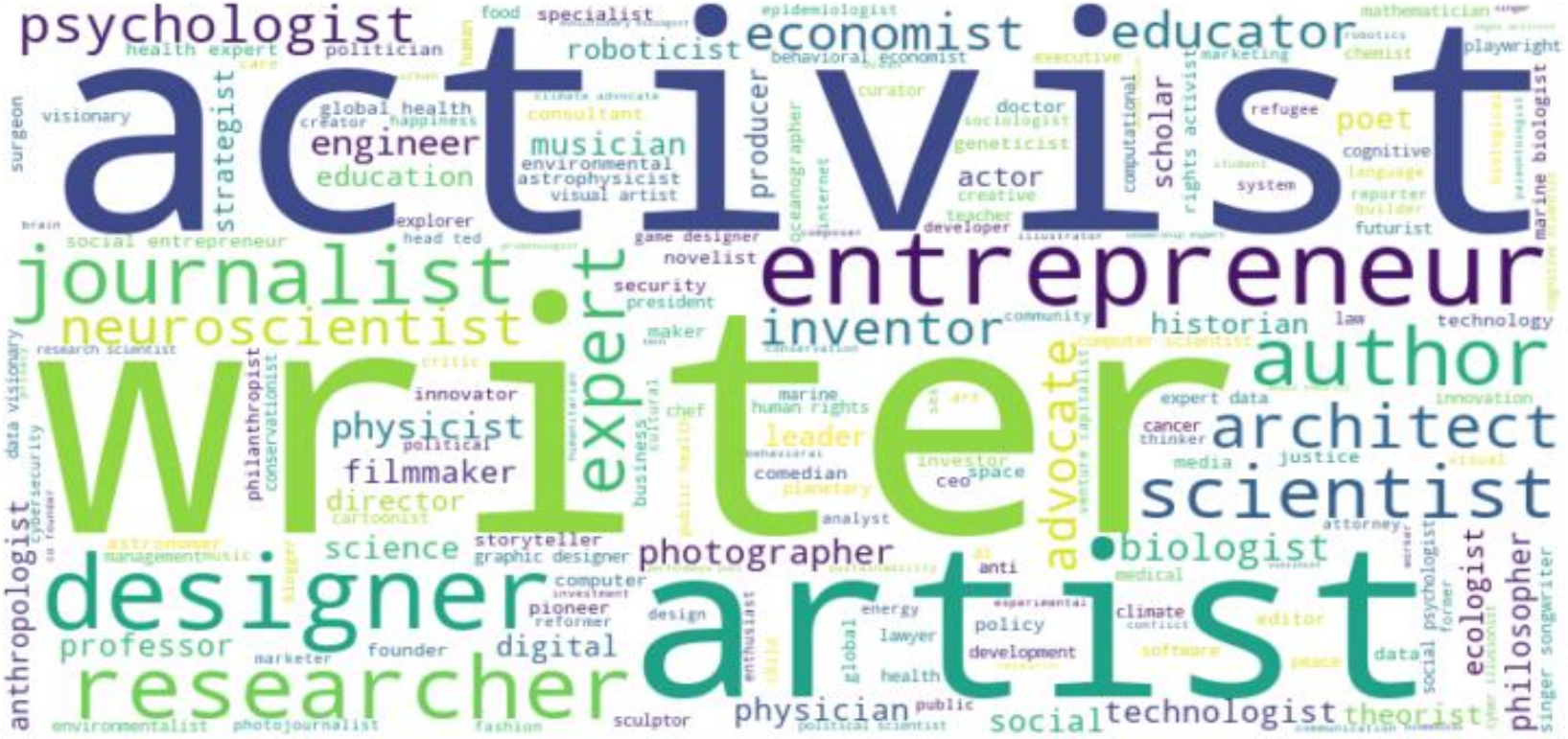




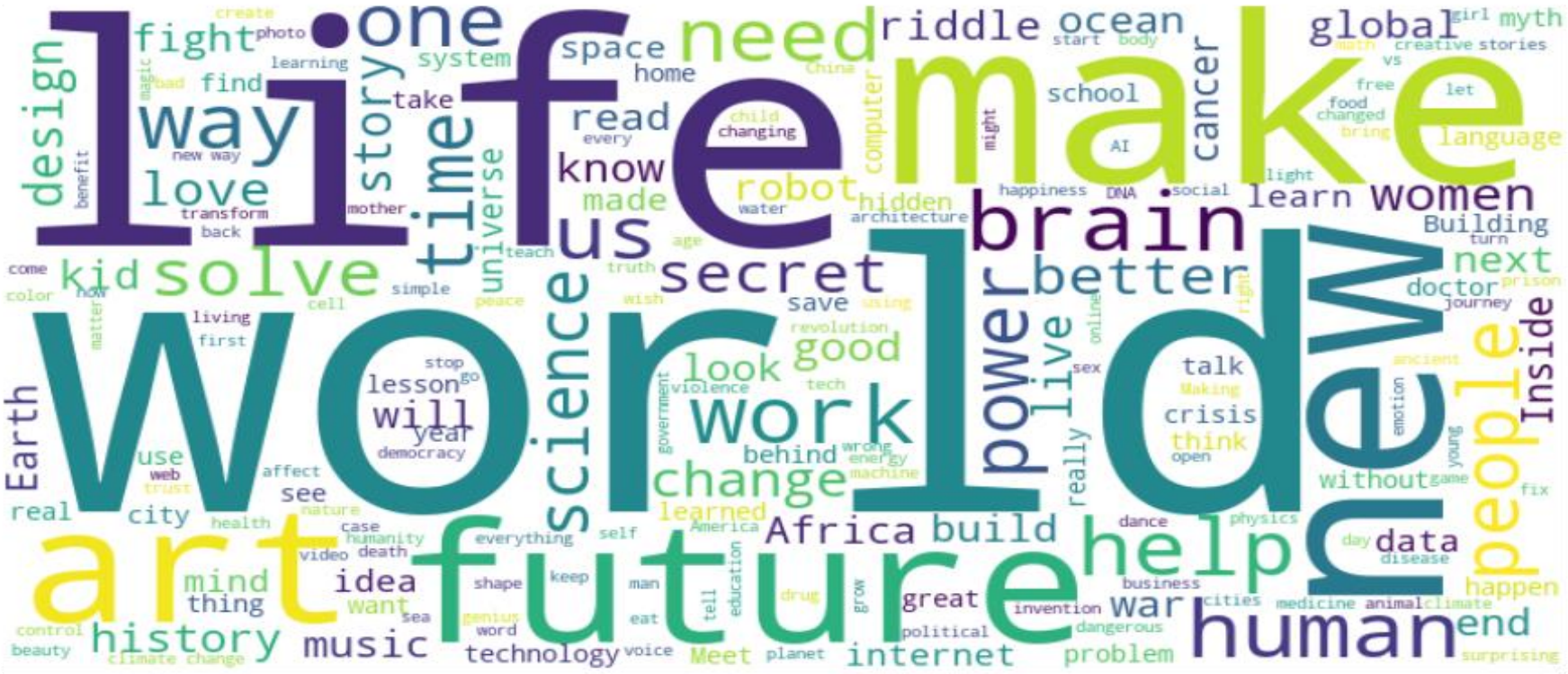
Released Year with Max average views Year

Most Frequent Released

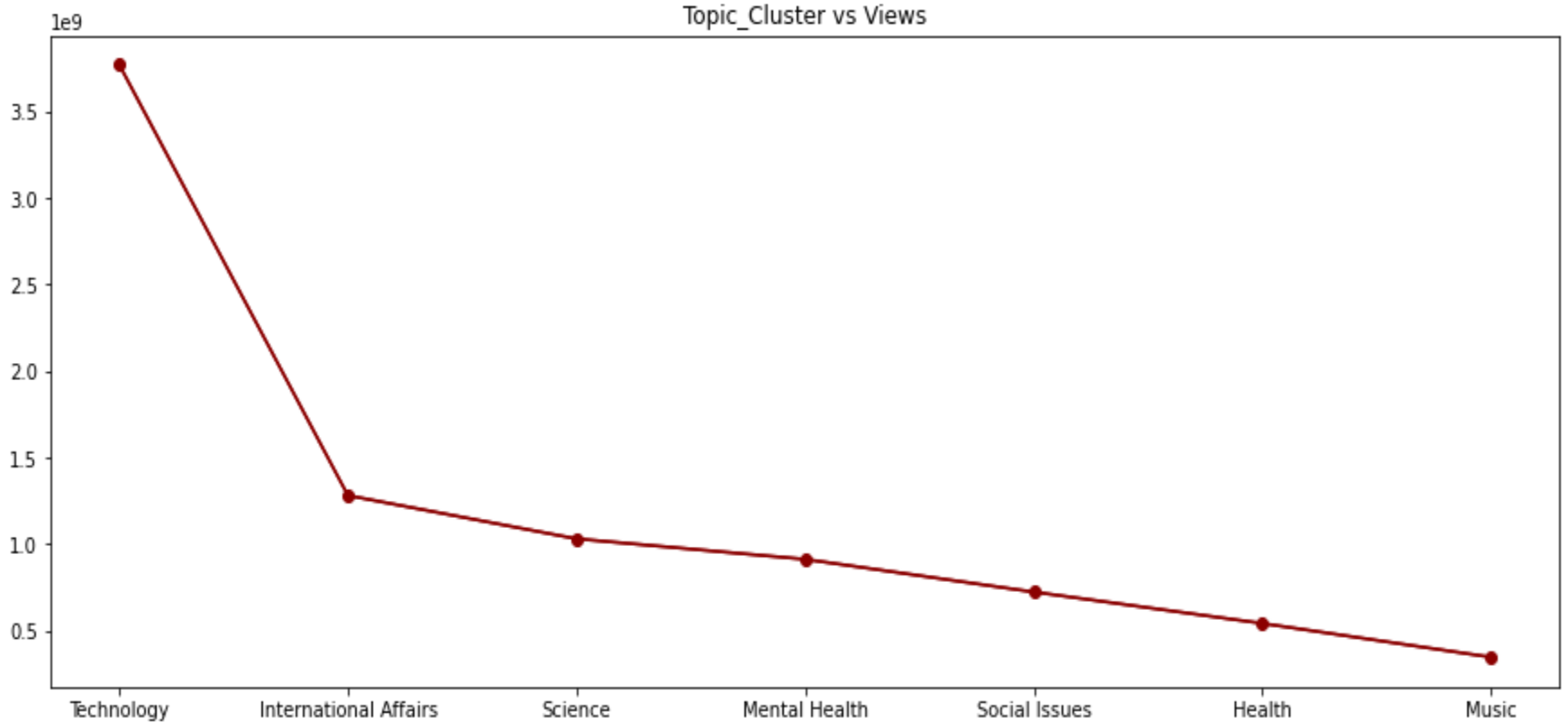
Most Popular Occupations:



Most popular Titles:



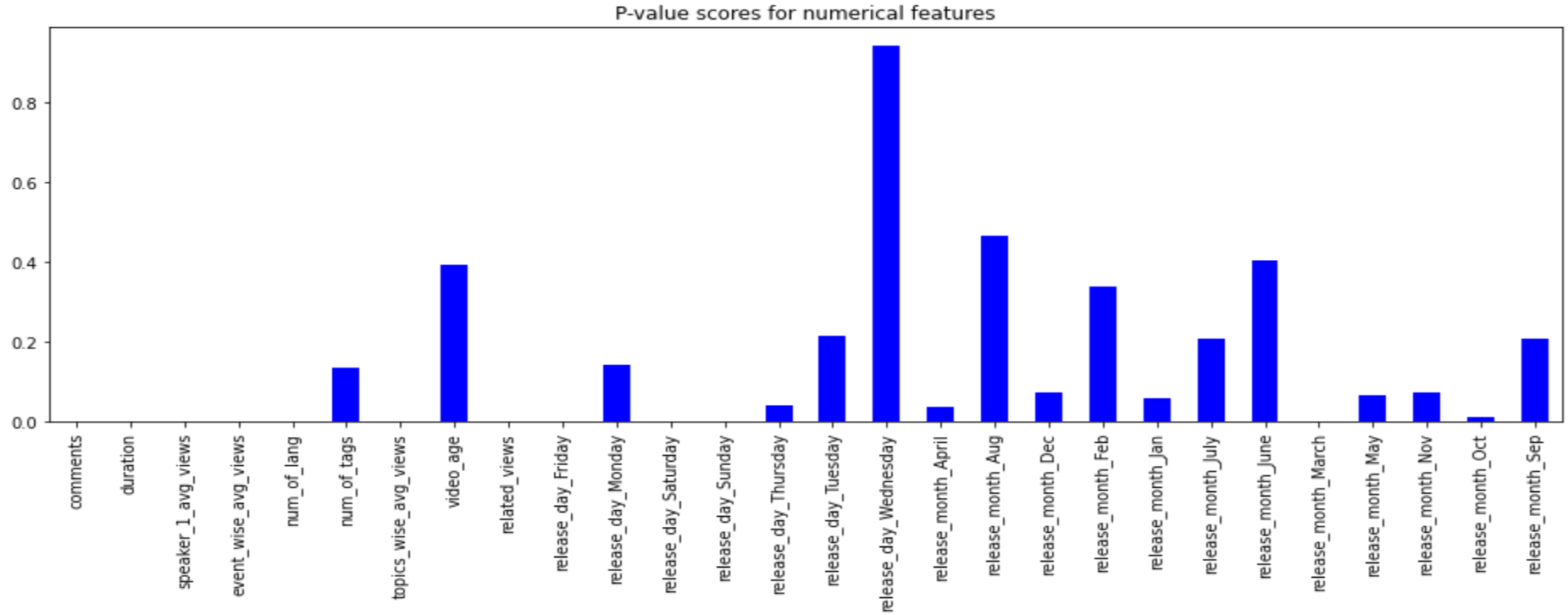
Most popular Topics According to Views:



Feature Engineering

- Speaker_avg_views
- Event_wise_avg_views
- Related_views
- Topic_wise_avg_views
- Num_of_languages
- Num_of_tags
- Release_day
- Release_month
- Video_age

Features selection(f regression):



Models used:

- XGBoost Regressor
- Extra Trees Regressor
- Random Forest Regressor

XGBoost Regressor:

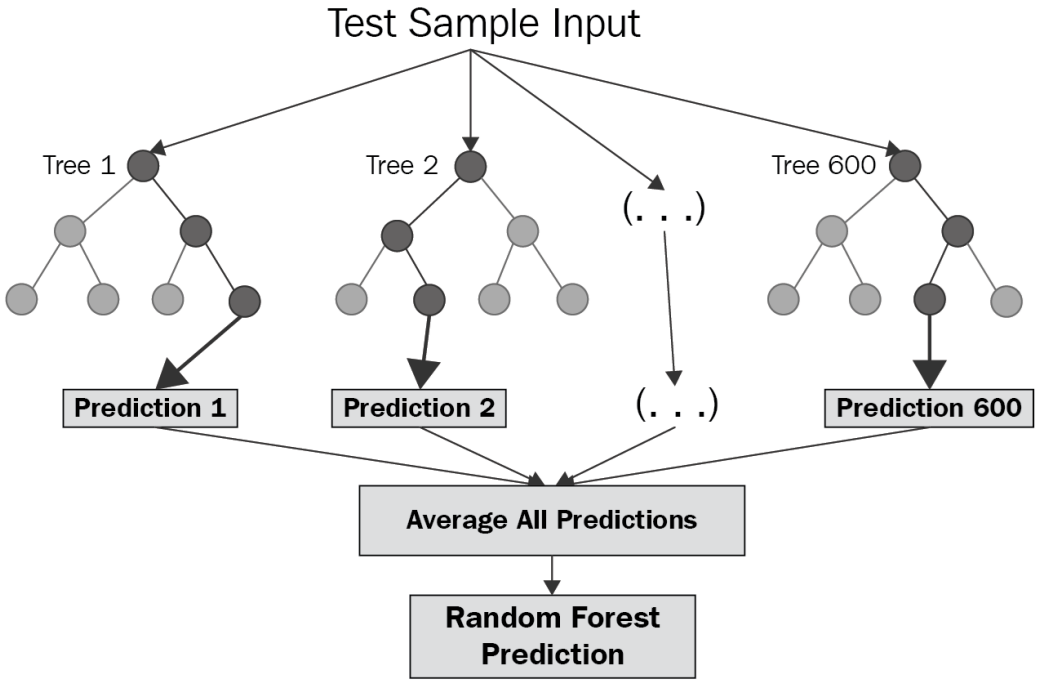
- Criterion = MAE
- R_Square for train= 0.9
- R_Square for test= 0.83
- MAE train = 164091.33
- MAE test= 226944.86
- RMSE train= 315411.38
- RMSE test= 454270.75

Extra Trees Regressor:

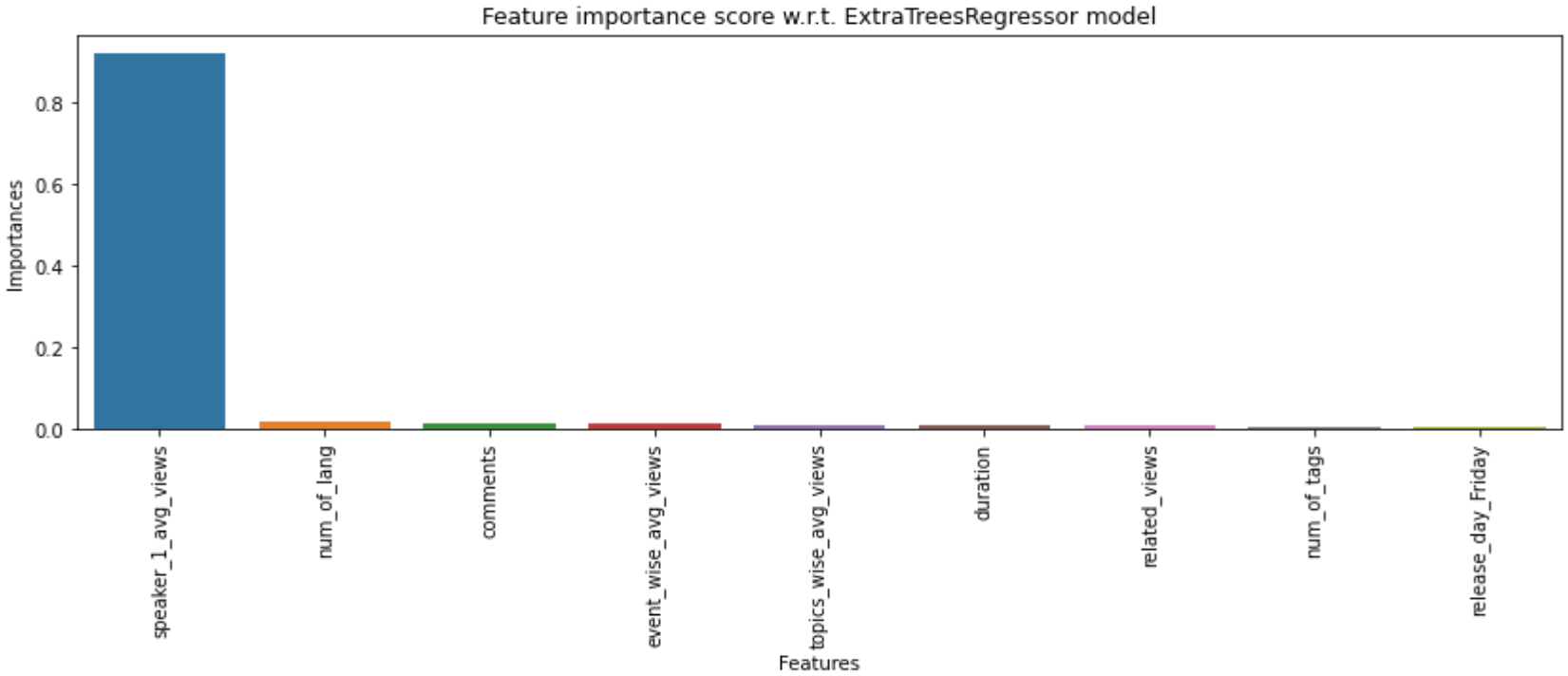
- Criterion = MAE
- R_Square for train= 0.79
- R_Square for test= 0.83
- MAE train = 207304.04
- MAE test= 204793.75
- RMSE train= 497317.34
- RMSE test= 484832.84

Random Forest Regressor:

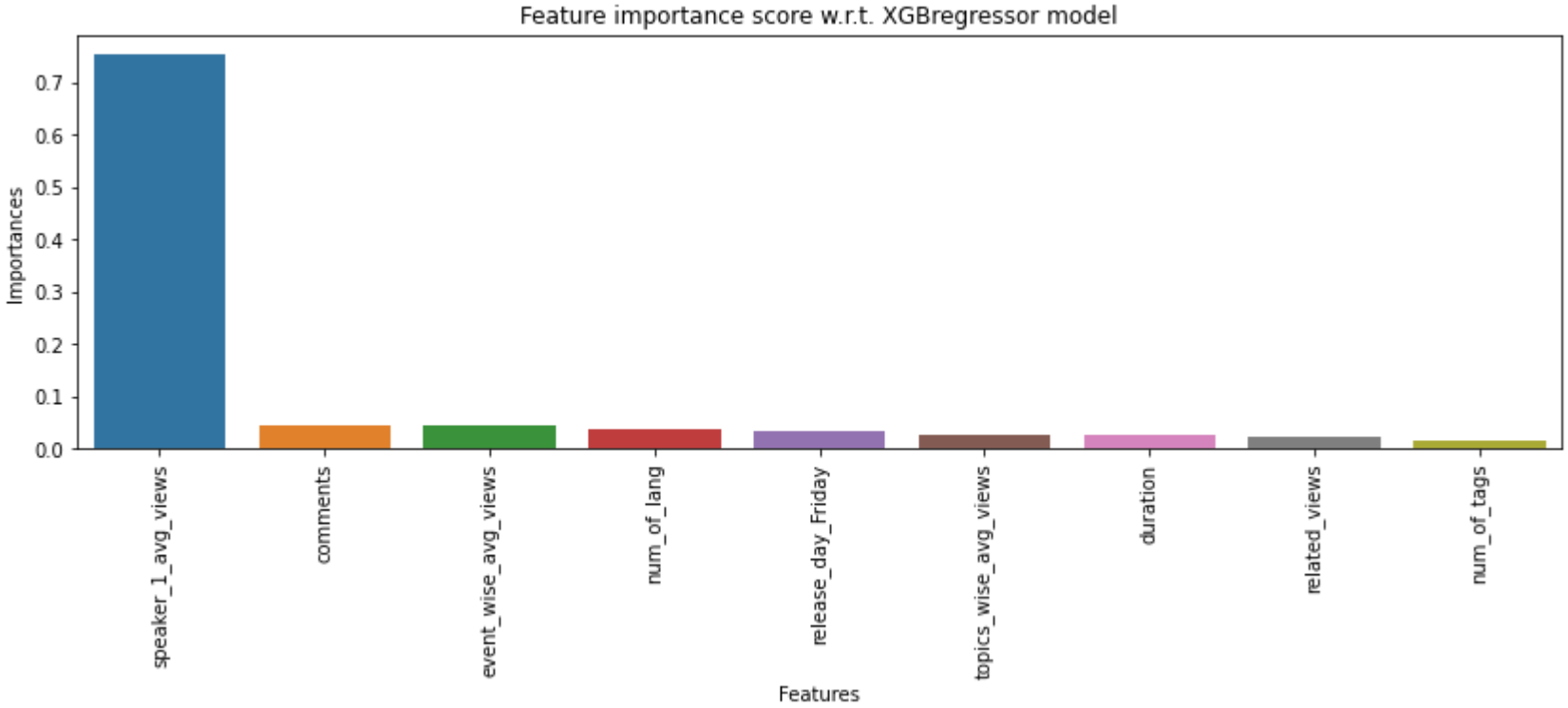
- **Criterion = MAE**
- **R_Square for train= 0.80**
- **R_Square for test= 0.80**
- **MAE train = 186583.31**
- **MAE test= 191844.53**
- **RMSE train= 485371.33**
- **RMSE test= 488927.13**



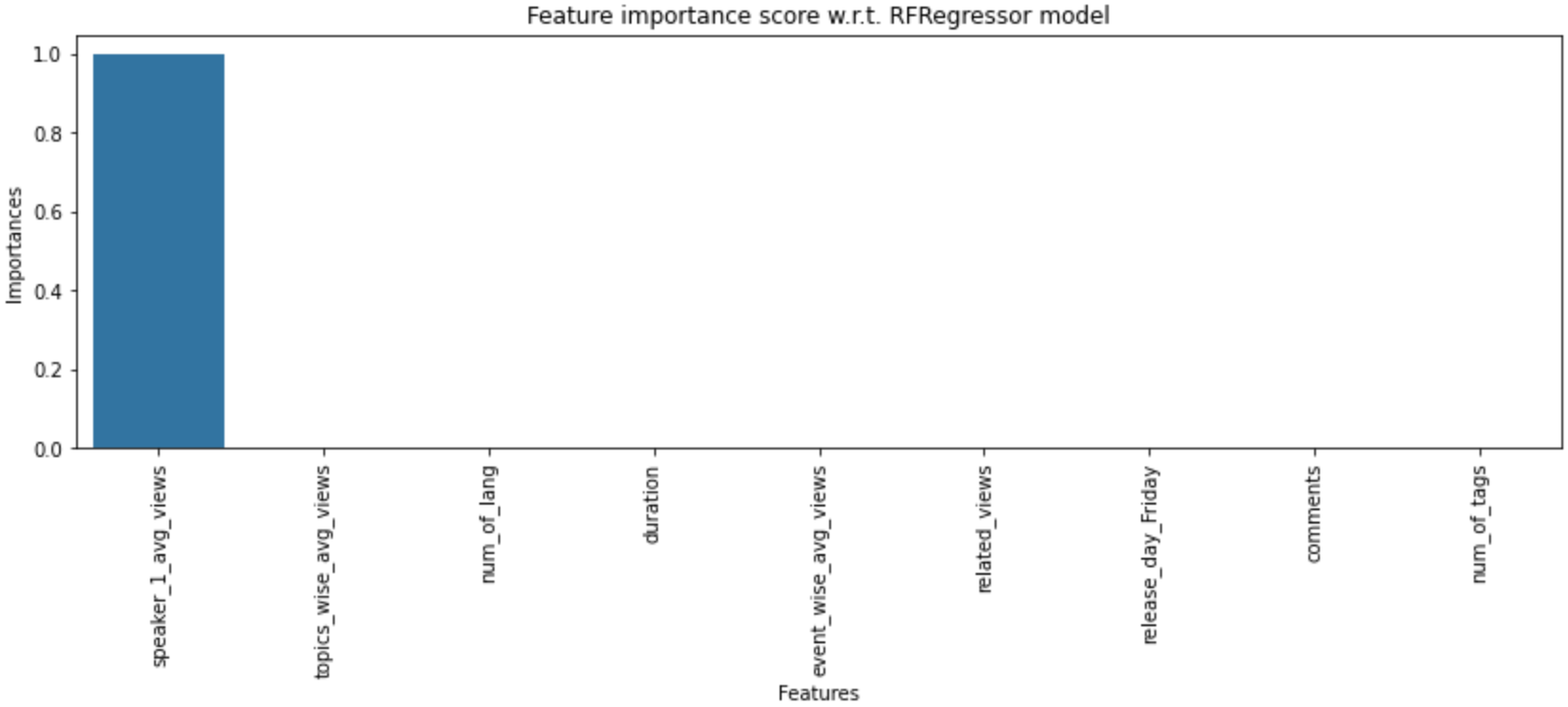
Feature importance wrt Extra Trees Regressor:



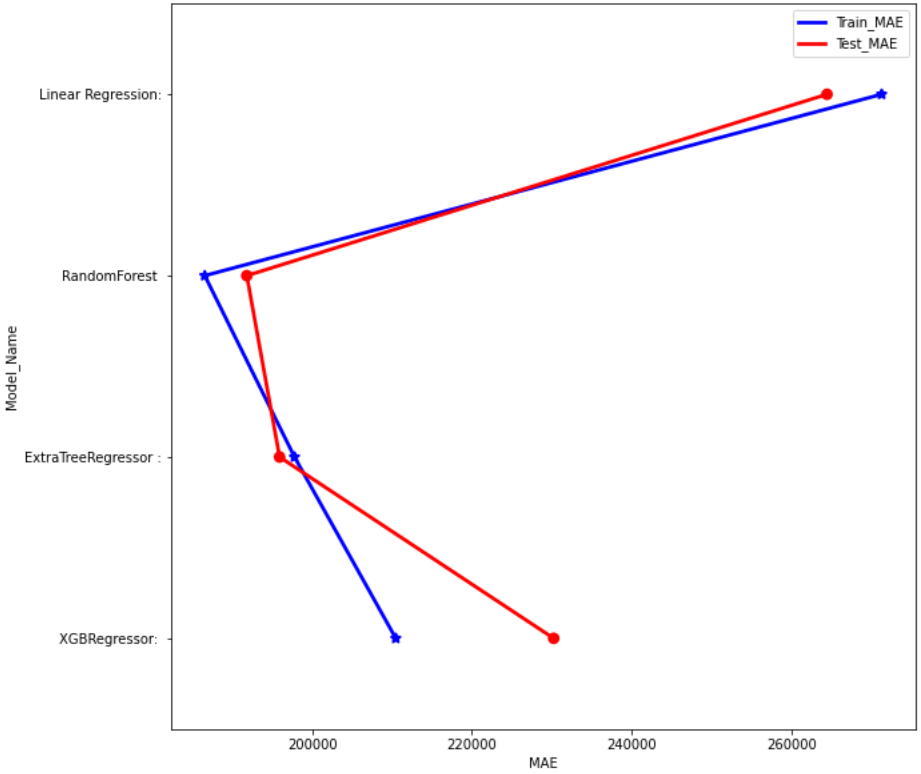
Feature importance wrt XGBoost Regressor:

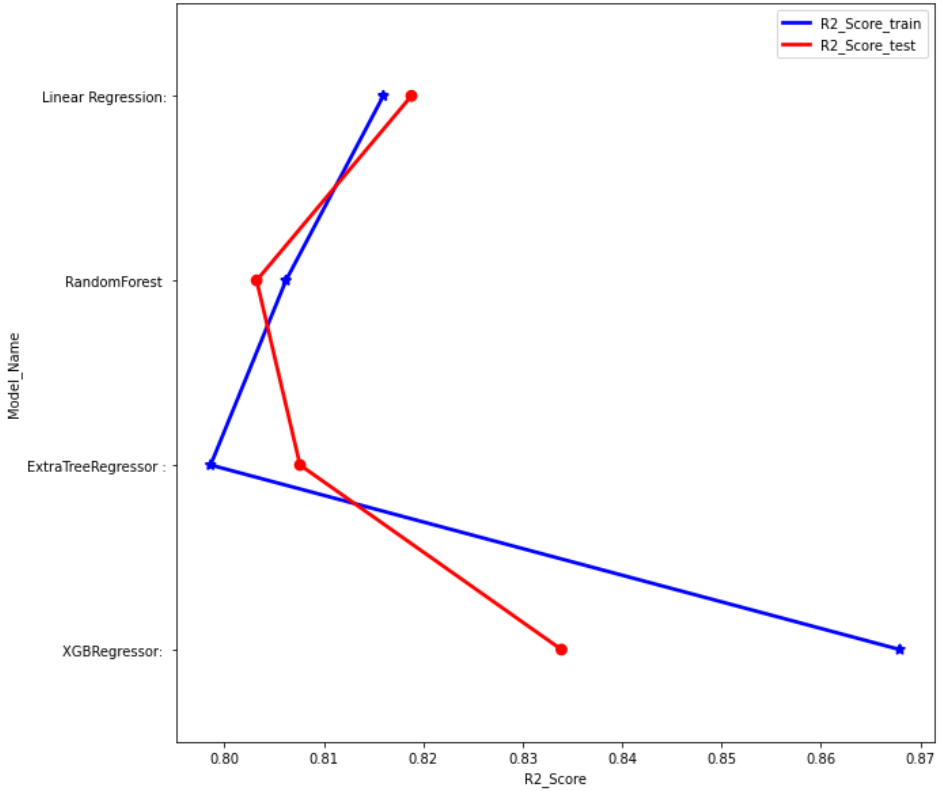


Feature importance wrt Random Forest Regressor:



Model Comparison:





Which model did we choose and why?

- Out of all these models RandomForestRegressor is the best performer in terms of MAE.
- MAE is the best deciding factor because it isn’t affected by outliers.
- MAE is linear and RMSE is quadratically increasing.

Challenges

- Dataset have lots of textual and categorical data having high ordinal number. So the conversion to meaningful numerical data was a challenge.
- Treating the outliers in numerical features.
- Generation of new features which needs to be added in the model.
- Choosing the right features for modelling.
- Choosing the right models to get the best scores.

Conclusion

- We build a predictive model, which could help TED in predicting the views of the talks uploaded on the TEDx website.
- TED can increase their views and popularity by increasing videos on sections like Technology and Science.
- TED can tackle the sectors like Music by inviting more popular speakers in this sectors like ‘OK GO’ in this category.

Q & A