

Lyrics Generation using Language Models

Team Name: Blink-128

- Mansi Palekar
- Chaitanya GVS

Outline

Data Collection

Web Scraping the Hot 100 songs in Billboards.

Web Scraping the lyrics for Pop, Rock & Rap Genres.

Web Scraping lyrics for 15 selected artists (5 from each genre)

Exploratory Data Analysis

Most Frequent bigrams

Word Clouds

Custom Metrics such as, Line Length, Vocabulary Richness etc.

Modeling

Creating Models,

- Baseline
- RoBERTa
- GPT-2

Preprocessing the data

Training 9 models
(3 models in 3 genres)

Evaluating the models

Selecting the best models

Fine-Tuning

Fine-tuning the best models in each genre on the selected artists of each genre.

Fine-tuning the models of each genre on artists of different genre.

Lyrics Generation

Generating lyrics for from artist specific models

Generating lyrics for from mix and match models

Data Collection



We have scraped Billboard Hot-100 charts from 1960-2021 to extract the most popular songs and extracted the genres of the songs from Spotify API



Selected Pop, Rock & Rap genres from the above scraped data and scraped lyrics for the songs from Google Information Boxes



Selected 15 artists (5 from each genre) and got their Essential playlists from Spotify and repeated the same process as above to scrape the lyrics

For Pop Genre



Word Clouds

For Rock Genre



For Rap Genre



Insights

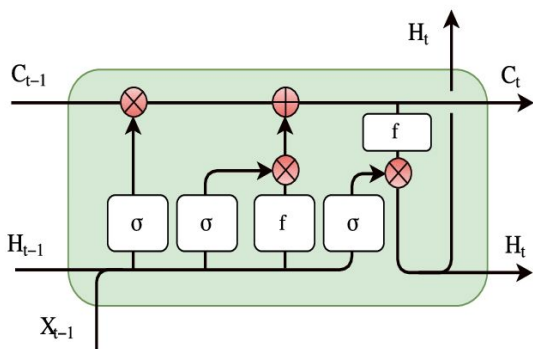


Custom Metrics

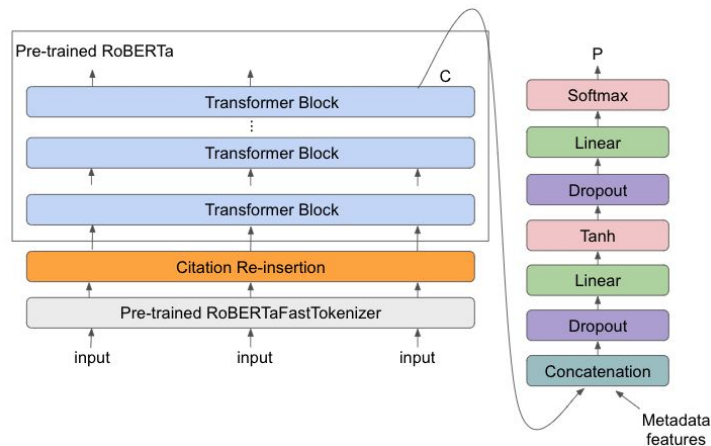
	Average No. of Lines	Average Line Length	Average Vocab Richness per Song	Average Vocab Richness in Genre
Pop	60.0	6.79	0.34	0.02
Rock	40.37	6.51	0.41	0.03
Rap	80.17	7.94	0.39	0.04

Average Line Length is the mean number of words per line in a song.
Average Vocabulary Richness is the mean of number of unique words per total number of words in song.

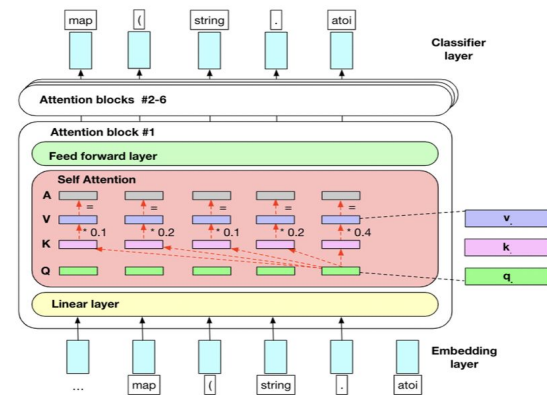
Modeling



(i) LSTM Block



(ii) Architecture of RoBERTa Model



(iii) Architecture of GPT-2 Model

Modeling

Model Comparison

	Pop		Rock		Rap	
	Loss	Val. Loss	Loss	Val. Loss	Loss	Val. Loss
GPT-2	1.935	3.127	2.146	3.337	2.303	3.942
RoBERTa	5.955	6.15	6.059	6.269	6.382	6.495
Baseline	6.016	6.061	6.023	6.083	6.418	6.497

Basing on the loss values, we have chosen GPT-2 to be our best model using which we will perform fine-tuning

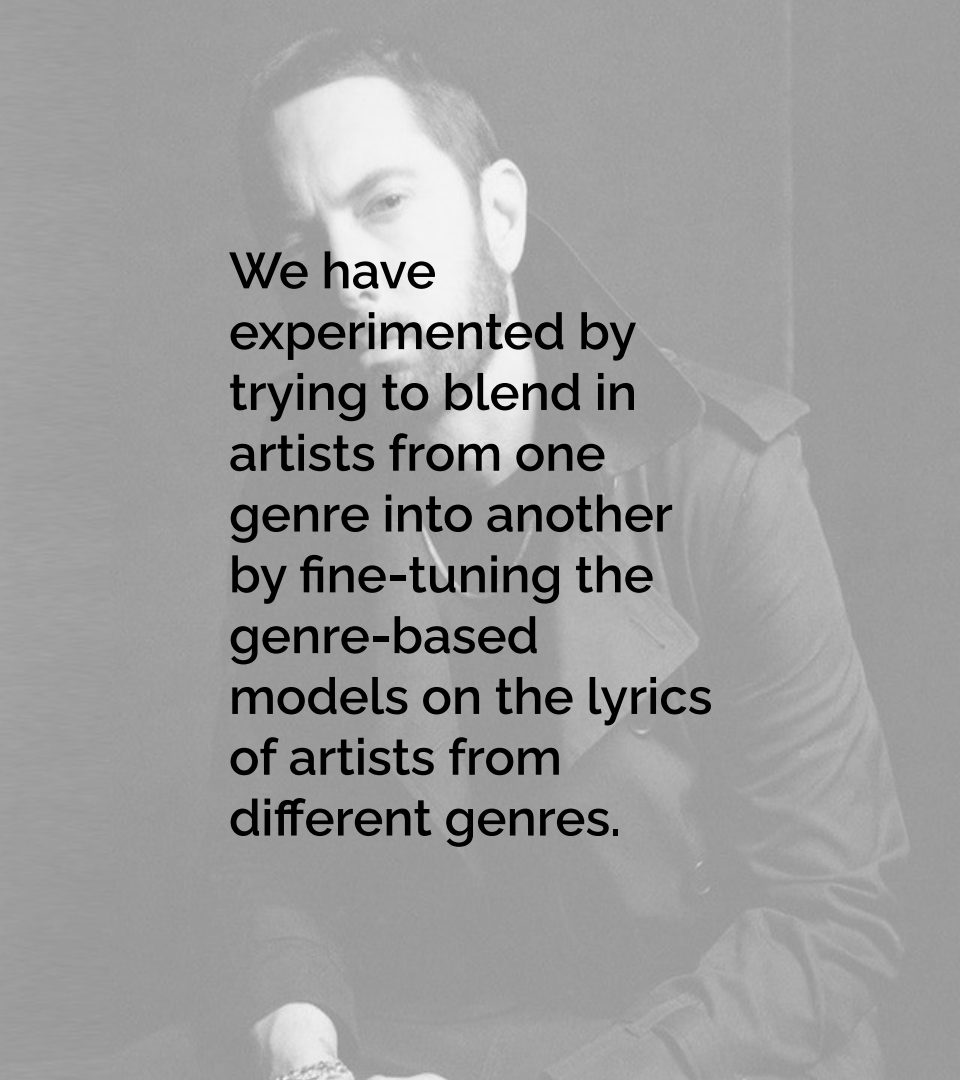


Actual Song

There I was again tonight
Forcing laughter, faking smiles
Same old tired, lonely place
Walls of insincerity, shifting eyes and vacancy
Vanished when I saw your face
All I can say is, it was enchanting to meet you
Your eyes whispered, "Have we met?"
'Cross the room your silhouette
Starts to make its way to me
The playful conversation starts
Counter all your quick remarks
Like passing notes in secrecy
And it was enchanting to meet you
All I can say is, I was enchanted to meet you

Model Generated Song

There I was again tonight
Forcing laughter, faking smiles
Same old tired, lonely place to fall in
I said I would feel this after time
It's a feeling I don't know when
That you'd hear me
Oh, oh, mmm
You should be perfect for me
Now sadly you're too busy with someone else
You're too busy with someone else
And, why am I not there
What happened to you?
Yeah
You should bet that you should be the one that you gave



We have
experimented by
trying to blend in
artists from one
genre into another
by fine-tuning the
genre-based
models on the lyrics
of artists from
different genres.

Reimagining Eminem as a Pop artist

We touch, I feel a rush, we clutch, it isn't much
But it's enough to make me wonder what's in store for us
'Cause I keep you up (all night)
Wanna see you (real)
'Cause I can't believe that I am anything we should be
I can believe that I am the one to blame
'Cause I'm too serious about you tonight
And you'll stumble into that (fall into that)
(I will stumble into that) it without you
I see the real, just something I'm hoping about you
The real, life, just... we get together, you got, you can light of
our life again
We're a fever
I know what I wanna believe it seems
We're gonna be getting the same now
There doesn't feel the answers to it feels

Conclusion & Future Work



- Basing on the performance metrics and the generated lyrics, GPT-2 is providing us the best results, syntactically and semantically.
- However, even though we produced satisfactory results with GPT-2, we believe it can be improved.
- This is because, GPT-2 is pre-trained on a large corpora of prose text which is very different to the lyrical text in terms of structure. Prose text doesn't have the same rules as musical lyrics.
- For example, line length is often dictated by physical restrictions and not the creativity of the writer.
- Word variation, Word repetition, Rhyming density cannot be observed in prose text.
- Hence, with more computational power, we believe we can achieve better results by training State of the Art Language Models from scratch, using a large corpora of lyrical text (song lyrics, poems etc.) instead of using models pre-trained on prose text.

THANK YOU!