

## Overview

In this assignment, we were asked to design and build an RNN that receives a melody sequence and a word and predicts the next word in a song. While working on this task, we faced different challenges, such as choosing optimal melody and word representation, picking the exact melody part that represents the word, setting the RNN correctly, and preparing the test data to produce a good sequence generation. In this work, we describe our development process and our implementation considerations. We also present our suggested solutions, review the experiments' results and evaluate the generated outputs.

### 1. Textual data

We used GENSIM, a framework for fast vector space and NLTK package for text processing and tokenizing.

We used pre-trained word embeddings in machine learning that Google provides – a news corpus (3 billion running words) word vector model (3 million 300-dimension English word vectors).

We performed some general text processing on the Lyrics data to bring each song's lyrics to a Python's list of tokens. We used those tokens to build a vocabulary. Using the pretrained model we produced embedding matrix- where each word in the lyrics list has got its own matching **word embedded vector**, represented by 300 numbers. We will use this word embedded vector as the input to our model in case of Lyrics only, and as partial features for the other models

Some of the methods for text processing that we used are: lower text, tokenizing and remove punctuation, removing word that contain numbers, removing empty tokens, removing special characters. We also used syllables counting, for an optional implementation.

### 2. Melody Extraction

As mentioned in the assignment requirements, we used PrettyMIDI package to handle and work with midi files. We tested and explored its abilities and limitations, and eventually realized that some work and further processing are needed, in order to extract the meaningful musical parts.

Our main concern was: How can we pick the best musical part which represents a leading role, that can be matched to the lyric's words?

We know that MIDI file contains multiple channels, each channel is performed as a musical instrument, or vocal role. We know that some of the instruments are usually support the main melody by producing the songs' rhythm and beats – such as drums, bass, background sounds, etc. They might be important to the songs' harmony, but they are too general and has low contribution to the song's words and singing part. For example, we can find similar repetitive drums part, appearing on different popular songs.

On the other hand, there are the melody or lead vocal channel, which can represent the singing part perfectly. This part is characterized by a high variability of intervals, low repetition, a variety of notes and notes durations, and sharp transitions between notes are pretty rare. The melody part also tells us how to sing the lyrics, since each musical note occurrence can be matched to a syllable of a word. In optimal situation, we could have taken the melody part, find its lyrics, spread the words sequence by dividing them to syllables and match the notes for each word!

In between these two edges, we can find variety of instruments and musical roles, each has its own contribution to the song's harmony. So how can we choose among this range of instruments, which is the best melody representation?

We realized that a smart guess is needed here. we wanted to be able to pick a channel that is also a good-enough lyrics representation - hopefully represents the melody, based on heuristics and approaches that are commonly used for music analysis.

We followed some papers that deal with the task of melody extraction in MIDI files. They characterized the melodic structure and suggest different approaches to extract it, based on specific parameters and calculations. This paper [1], suggests 3 parameters that are calculated for each notes sequence, combines calculation results to a final formula and produce a ranking to the specific track.

These parameters are:

1. Note Rate: The number of notes per unit time (Note rate) denotes the amount
2. Level Crossing Rate (LCR): which measures the "waviness" of a note sequence and tells about the rate of variation of a sequence. Sometimes, the genuine notes may simply move up and down (at a high frequency) but may not contribute to melody perception. For melody perception, the note sequence must be slow in pitch variation.
3. Distinct Note Count: Number of distinct notes per unit time. Tracks / channels containing less than 5 distinct notes in 10 sec duration are discarded.

This paper [2], highlights using of pitches entropy in order to recognize the melody sequence. In addition to these articles, we calculated and examined other parameters such as notes (pitches) and intervals varieties, total duration of songs, chords indicator metric, average notes amount per song and others.

During our experiments, we tried several approaches, calculations and combinations in order to identify the leading melody channel. We used MIDI files that tagged their own melody and vocal parts, to check if our metric chose correctly.

We produced the final formula for scoring and ranking the MIDI channels:

$$Score_{inst} = \frac{1}{2} \cdot [(0.3 \cdot NR + 0.2 \cdot Dist + 0.2 \cdot Entr_{notes} + 0.3 \cdot Entr_{dur}) - (CI - 1) \cdot 2] + \frac{1}{2} \cdot MI$$

NR is Notes Rate and Dist is Distinct Note Count, as suggested on [1]. Entr is notes (pitches) entropy as suggested in [2] and notes duration entropy. We found out that these parameters can be good predictors for leading channel. CI is chord indicator: a chord is occurrence of multiple notes that are played on the same time. Obviously, a human voice cannot produce chords, so if we find chords on

our examined channel, we will reduce its score and prefer other options.

MI is melody indicator, which increases the score significantly if a tagged melody channel was found. More specifically, it looks for the tags ["voc", "melody", "lead", "voice", "word"] in the instrument (channel) name. we noticed that many songs tagged their leading singer as main melody channel, so we realized that melody extraction can be very tricky if it based on MIDI tagging.

Our results for a little sample set of MIDI files were pretty satisfied, and we could recognize meaningful channels in the given MIDI files. However, especially when the melody leading part was not very significant, or when there was more than one vocal part - the melody part did not get the highest score. it could have been ranked second or even 3<sup>rd</sup>. So, we decided to pick the top 3 highest channels, and we could assume that each of them can represent the melody part pretty well.

Note: in order to reduce training phase duration, during our experiments we used only the 1<sup>st</sup> ranked extracted melody, based on our calculation. However, our implementation supports extracting up to three leading channels.

### 3. Lyrics and Melody Matching

#### 3.1 Melody part - Representation I – partial melody vector

After finding the probably-melody-channels, we extracted their notes from instrument notes list and transferred each of them into a sequence of notes (pitches). We normalized this sequence by dividing it in 128 - max pitch value - and set each of them as **partial melody vector**.

At this point we raised another concern: how do we want to shape the RNN input? Given one word and a melody, how can we assign the best melody part to a specific word? A simple approach was to take the whole encoded melody vector and combine it to each of the words from the songs' lyrics. We will examine this approach later on our second melody representation. However, this approach has some limitations: it uses large and unnecessary amount of data, and the concept of representing each word by the same whole melody sounds too general for us.

So, we tried to develop a method that “cuts” the relevant sequence part from the whole melody and attaches it to each specific word. To do so, we calculated estimated word position in the melody, based on its position in the lyrics. We set an interval of 20 notes before estimated word position and 20 notes after estimated word position and assumed that this 40-notes melody part probably catches the word actual location in the melody.

Eventually, we got the first 300 cells word embedded vector and 40 cells melody vector. We combined them to one **lyrics melody vector** with size of 340, that represent a word and an estimated melody part.

### 3.2 Melody part - Representation II – piano roll melody vector

In this representation we created a vector based on a sparse matrix, as produced by get-piano roll Pretty MIDI utility function. We used the same logic as presented above for instrument/channel selection, but this time, instead of creating a long list of notes - we produced piano roll matrix. In this representation we tried to catch the exact notes with respective to their timestamp occurrence, and we also marked the intervals (the silent parts, when no note is played) as unique integer.

In more details, we loop over piano roll matrix to find the pitch with the highest velocity value, for each timestep. Then, we add this pitch value to the vector. If no velocity value is found for a specific timestep – we assume to discover a “silent note” and mark it as 128.

After we finish looping over the melody, we get a complete vector with a fixed length of 1000 cells - trimmed or padded as needed, as a representation of the pitches that appear on the melody. Eventually, we normalized the vector and kept it for further processing.

The next step was pretty similar to the creation of **lyrics melody vector**, as described above. We combined word embedded vector that has size of 300 with the **piano roll melody vector** and produced a long lyrics melody vector with length of 1300 (300 per word representation and 1000 per melody). At this melody representation, we did not consider word position - we attached the same **piano roll melody vector** to each word in the songs’ lyrics, which is a simple and less complex approach for word-melody representation.

## 4. Target variables and Next Word Prediction

### 4.1 Target representation

For each input word and melody – whether melody is partial or complete - our target variable is the next word on lyrics, transformed to integers by tokenizer’s text\_to\_sequence function, and represented by one hot vector. We created the target words sequence at the same time we built the input data structure, so we could be “aware” to the word correct sequence and keep the words order.

### 4.2 Predict next word

When using the model for word sequence generation, we sorted the predicted words and used np.random.choice to avoid deterministic word selection. In this way, we not rely on argmax function for target selection - and the model is able to produce different word each time.

## 5. RNN Implementation

### 5.1 Model 1: Simple LSTM

We used Keras Sequential model, which contains 3 LSTM layers, a dense layer in between and final dense layer that has vocabulary size, before activation. During our first experiments, our model tended to overfit; loss was reduced nicely over training data, but validation's loss was high, stable and did not reduce.

We tried to avoid overfitting by generalizing the model and using dropouts, adjusting neurons number in each LSTM layer, as well as limiting layers' number. however, loss was still not reduced as expected for validation set.

We also performed some preprocessing methods on training data, such as normalization and scaling on input data – but no different was shown. At this point, we decided to look for improvement not from input data perspective – but from model's optimizer, which has major influence on model's ability to learn. While researching, we noticed that LSTMs for words generation usually use adaptive optimization algorithms, and we gave it a try.

After testing popular adaptive optimizers, we found out that AdaDelta achieves the best results. AdaDelta [3] is an adaptive algorithm that requires minimum tuning and adjustment- and luckily, it helped our model to learn well, making loss decreasing both on training and validation datasets.

The final model has the following configuration:

Model: "sequential"

Layer (type)	Output Shape	Param #
lstm (LSTM)	(None, 1, 256)	1594368
dropout (Dropout)	(None, 1, 256)	0
lstm_1 (LSTM)	(None, 1, 256)	525312
dropout_1 (Dropout)	(None, 1, 256)	0
lstm_2 (LSTM)	(None, 256)	525312
dense (Dense)	(None, 512)	131584
dropout_2 (Dropout)	(None, 512)	0
dense_1 (Dense)	(None, 7314)	3752082
activation (Activation)	(None, 7314)	0
Total params: 6,528,658		

Trainable params: 6,528,658

Non-trainable params: 0

We set the batch size to 64. We tried 20 - 40 epochs, and notices that converge starts after ~20 epochs. we set validation split to 20% of entire training set.

## 5.2 Model 2: Bi-directional LSTM

We were curious to see whether bidirectional LSTM will produce better outputs, comparing to unidirectional LSTM. We know that unidirectional LSTM processes and preserves past information – the data flows only forward. On the other hand, bidirectional LSTM can run forward and backward, and preserves information from both past and future. As a result, bidirectional can understand context better.

We set a limit of 20 epochs per training phase, since we did not recognize significant improvement or loss reduction afterwards.

The bidirectional LSTM model has the following configuration:

Model: "sequential"

Layer (type)	Output Shape	Param #
lstm (LSTM)	(None, 1, 256)	611328
dropout (Dropout)	(None, 1, 256)	0
bidirectional (Bidirectional	(None, 1, 512)	1050624
lstm_2 (LSTM)	(None, 256)	787456
dropout_1 (Dropout)	(None, 256)	0
dense (Dense)	(None, 256)	65792
dropout_2 (Dropout)	(None, 256)	0
dense_1 (Dense)	(None, 7314)	1879698

Total params: 4,394,898

Trainable params: 4,394,898

Non-trainable params: 0

## 6. Results

Training and validation loss graphs are shown below, as appears on TensorBoard extension.

### 6.1 Simple LSTM

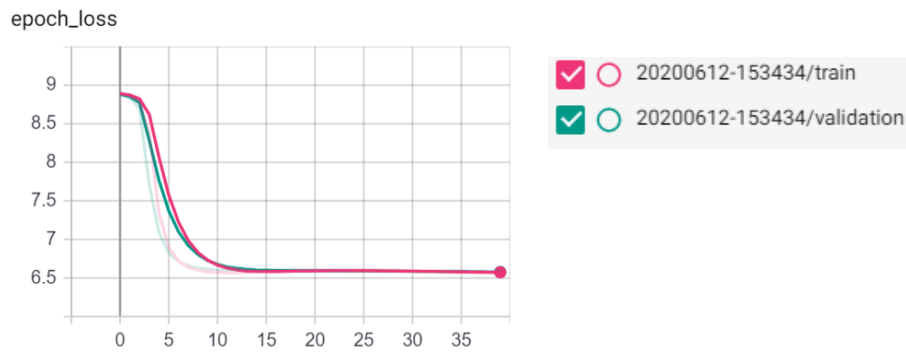


Figure 1: loss of "partial melody" simple LSTM model

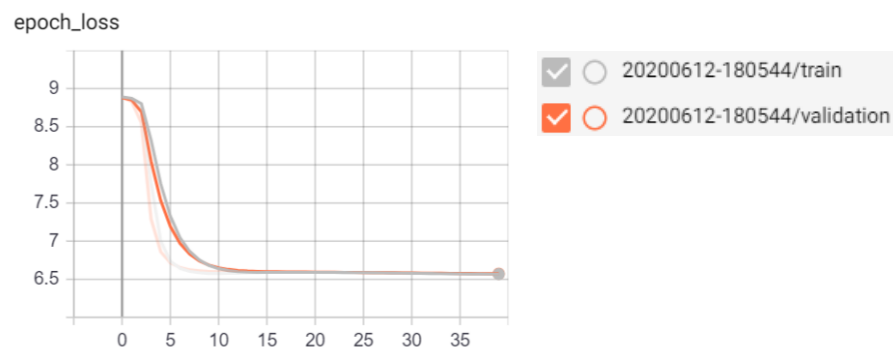


Figure 2: loss of "piano roll melody" simple LSTM model

### 6.2 Bidirectional LSTM

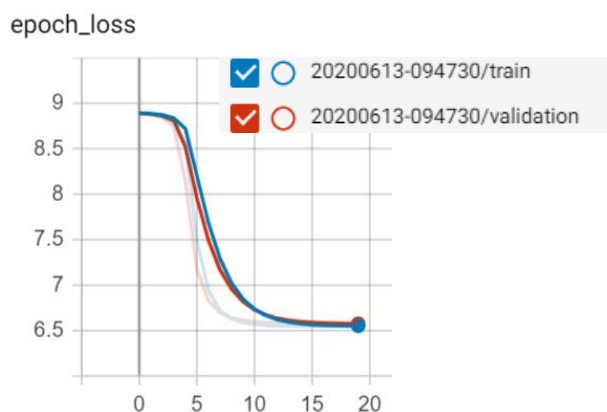


Figure 3: loss of "partial melody" Bidirectional LSTM

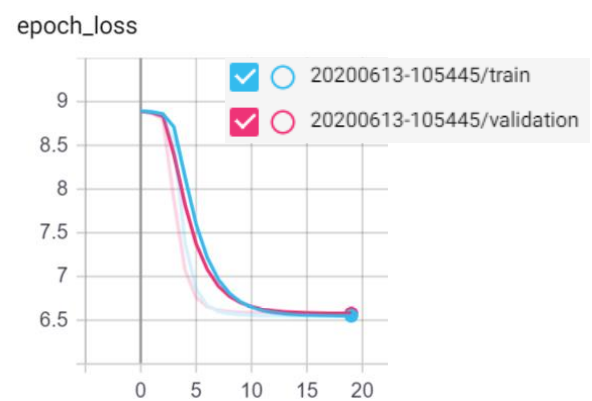


Figure 4: loss of "piano roll melody" Bidirectional LSTM

## 7. Output evaluation

Full outputs are provided in the last part of the report.

We performed lyrics generation, based on 3 different words, for 5 test songs, for two different RNN configurations and for two different melody presentations: partial melody and piano roll melody. We examined the output and we noticed that the models use variety of words. However, the produces sentences were not very clear or coherent. Among the two representations, the piano roll melody representation showed slightly better sentences: we could recognize some weak connections between sentences parts, such as verbs and nouns. So far, we did not recognize significant difference between unidirectional and bidirectional LSTM outputs.

## 8. Summary & Conclusions



## 9. Output – Generated Lyrics

Here are the lyrics that were generated for each of the test songs, based on three given word [today, this, sky], and for a sequence length of 50 words.

### 9.1 Simple LSTM Model

#### 9.1.1 Melody Representation I: partial melody vector

Song name: **honesty**

Lyrics with given word **today** :

today presents hercules pearls  
nitro patterns ideas magnet collide soapsud befo barely own  
how autumn legs frown were planet grin angles  
quieres crooked bended yakety  
wondered dependencies swelter wears yaye pining oldies admit  
mousetrap p.d shine he retreat pursue somehow their creation moan  
adieu summer is guns threatening angles a.m hurting

Lyrics with given word **this** :

this raised blocks brush freaky necklace  
symphony entered buster quite there  
telephone brightest sidelines lung useless oops uranus favorite  
fevers piercing se city  
million weaken fields chewing though  
forget in chalk quieres correct lips time lark approach  
rub of thanks now page universe on slowin heavy consideration  
hes planning hooray marches

Lyrics with given word **sky** :

sky stranded clout being dreamer monster  
given lands movin sagt midnight  
forgiv south blue sour overdose  
speakers teaseteasetease wody dis jackets sacrificial collect nurses  
sum crowds bazaar project rotors notice colors  
drunk sliced fifteen destiny others chance  
cuento miser ride sheets grabbed adventure oclock in  
itself miracle all back trumped candles

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Song name: **eternal flame**

Lyrics with given word **today** :

today ni values gon high  
showing ceremonia wan roller overcoat  
tingling stuy sing candles box  
ghost wont experiencia wave aerosol  
t.v run hypnotic latest upper  
behold february somewhere jeep me nonsense  
happily chill tipped define painted arcade  
another's brokin Georgia  
thermometer core believe absurd buffalo  
buck dancer equally chanting why

Lyrics with given word **this**: this martin shape tryina doo myrrh  
mood silk be away everythings searched st snatchin loves fine  
approach solo creep break slit wehell various garage honor standing  
fragments best washed town tang flirting eager christina laughters  
jasmine demented whoopi glee which abiding she grave fi boyfriend  
fiend opened doesnt gave arrival crown

Lyrics with given word **sky** : sky facts props trouper erases foes  
willow murdered kind war sweep stopped goretex balled john call  
decorate understood tree un local brambles flors anyway figure  
counting new table patient present matches putting back rebound told  
ambition going mask large atlanta buckwild mothers dukedom ad  
badness mechanised bullied original suck frameless presence

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Song name: **lovefool**

Lyrics with given word **today**:  
today cracks alive ahead  
flipmode button risk campaigns  
somethings stages sean nice  
somehow packing value funny strike  
someones js closet karma stuff  
virtual frosty pouring pressures champagne  
resensitise distant disappears  
peru lingers guitar rocks  
vicadin atlanta enlistment madam  
sincerity evrydays had actor fro  
sits joyful forgive masquerade does who uptown

Lyrics with given word **this**:  
this endlessly cheaters confirm macht weight  
forbidden bullied mojo pumpin my squeezing highland  
weazy diver taken coat numbered san alleluia phone  
father shove fork heard chest  
lives logs floor controlling plight never dis  
ecretly hadnt breezy faint  
pulls pray sesame sag words  
identical childhood harm whens antone  
wheres tightly certain mainly

Lyrics with given word **sky**:  
sky forte bedrooms tammy  
emmanuel swimmin fillin dreamworld  
symbolic ability ness wealthy gotsta fib  
sunshine rhymes play wasp foot  
sync many prize crude  
wake crooked government horizons  
flowin concert face fed bitches  
core spend actress hits aches herz stroller deceased ripped spender  
nearer hollow boulevard whenever legal cobain turning our

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Song name: **all the small things**

Lyrics with given word today :

today chases steel woe bored disagree  
answered business they on crying at con show  
hear book dancin quiero oil  
red fellow phones amazed eternally  
can't seismograph cold souped mover way apart i'm fine quick yards  
frail bent youre tapped chicago faithful thankful painted bin  
portion deliver bushes reed quick deeply hoes

Lyrics with given word this : this lennon places clue grow  
featuring rough quite im form eahm summers handshake pays cabbage  
melodia hears hounds guys ugly pissed firm except core ..you yore  
seas seein observe d.a romances parental hugging done could ought  
lawless children tries las rhinestone powdered hundred what if  
repeat billboard crying motherfuck dashing shows

Lyrics with given word sky : sky smell shots tent evrybody  
finishedhe our won backyards science jealous indian lousy twelve  
begging j.f.k adventure illinois grieve suelo faintly bear feelins  
purse devils twenties smile natural seals discipline spoken  
attraction receiving lovin two push mr bush among girlies price clan  
rounds when before faithful eileens parson kray tap buddy

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Song name: barbie girl

Lyrics with given word today : today things rainbow kraft bite got  
whispers cake hell tus gruesome pulled nation tipped rude endured  
sinner ale gone storm destruction subside spinning cameras  
limousines states tried behind raye eins wrist chemistry fresh  
nobody damaging crooked separate unite has iqs membership rug  
flopped sex well bucket eahm market reed pop anne

Lyrics with given word this : this reviled throwin finger market  
neck plastic hustlin agree role samurai rising handsome evrything  
sleep recognise glory leave wow views enough moss hawaiian mister  
cassius helps virginia youre confession palau laser jingle trailer  
shades magic yellin rodgers robbery personality movin threat locing  
yknow though delusions mustve appreciate hold brains winter and

Lyrics with given word sky : sky highest piss wish ever said matter  
less thanks name noche from shepherds yesterdays jingling swimmin  
wanda dish voices rejoices will whore adjourned based favourite dine  
great frust yield dissolves doggie nicky in slide contigo machine  
night curls frying hers silhouette brooks fills baker fashion  
cartier friends strip cleanin retrace sisters

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empty that takes all in hold  
wait special her do your but that dare be all

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### 9.1.2 Melody Representation II: Piano Roll melody vector

Song name: honesty

Lyrics with given word today : today presents hercules pearls nitro  
patterns ideas magnet collide soapsud befo barely own how autumn  
legs frown were planet grin angles quieres crooked bended yakety  
wondered dependencies swelter wears yaye pining oldies admit  
mousetrap p.d shine he retreat pursue somehow their creation moan  
adieu summer is guns threatening angles a.m hurting

Lyrics with given word this : this raised blocks brush freaky  
necklace symphony entered buster quite there telephone brightest  
sidelines lung useless oops uranus favorite fevers piercing se city  
million weaken fields chewing though forget in chalk quieres correct  
lips time lark approach rub of thanks now page universe on slowin  
heavy consideration hes planning hooray marches

Lyrics with given word sky : sky stranded clout being dreamer  
monster given lands movin sagt midnight forgiv south blue sour  
overdose speakers teaseteasetease wody dis jackets sacrificial  
collect nurses sum crowds bazaar project rotors notice colors drunk  
sliced fifteen destiny others chance cuento miser ride sheets  
grabbed adventure oclock in itself miracle all back trumped candles

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Song name: eternal flame

Lyrics with given word today : today ni values gon high showing  
ceremonia wan roller overcoat tingling stuy sing candles box ghost  
wont experiencia wave aerosol t.v run hypnotic latest upper behold  
february somewhere jeep me nonsense happily chill tipped define  
painted arcade anothers brokin georgia thermometer sex core believe  
absurd buffalo buck dancer equally chanting why

Lyrics with given word this : this martin shape tryina doo myrrh  
mood silk be away everythings searched st snatchin loves fine  
approach solo creep break slit wehell various garage honor standing  
fragments best washed town tang flirting eager christina laughter  
jasmine demented whoopi glee which abiding she grave fi boyfriend  
fiend opened doesnt gave arrival crown

Lyrics with given word sky : sky facts props trouper erases foes  
willow murdered kind war sweep stopped goretex balled john call  
decorate understood tree un local brambles flors anyway figure  
counting new table patient present matches putting back rebound told  
ambition going mask large atlanta buckwild mothers dukedom ad  
badness mechanised bullied original suck frameless presence

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Song name: lovefool

Lyrics with given word today : today cracks alive ahead flipmode  
button risk campaigns somethings stages sean nice somehow packing

value funny strike someones js closet karma stuff virtual frosty  
pouring pressures champagne resensitise distant disappears peru  
lingers guitar rocks vicadin atlanta enlistment madam sincerity  
evrydays had actor fro sex sits joyful forgiv masquerade does who  
uptown

Lyrics with given word this : this endlessly cheaters confirm macht  
weight forbidden bullied mojo pumpin my squeezing highland weazy  
diver taken coat numbered san alleluia phone father shove fork heard  
chest lives logs floor controlling plight never dis secretly hadnt  
breezy faint pulls pray sesame sag words identical childhood harm  
whens antone wheres tightly certain mainly

Lyrics with given word sky : sky forte bedrooms tammy emmanuel  
swimmin fillin dreamworld hin symbolic ability ness wealthy gotsta  
fib sunshine rhymes play wasp foot sync many prize crude wake  
crooked government horizons flowin concert face fed bitches core  
spend actress hits aches herz stroller deceased ripped spender  
nearer hollow boulevard whenever legal cobain turning our

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Song name: all the small things

Lyrics with given word today : today chases steel woe bored  
disagree answered busness they on crying at con show hear book  
dancin quiero oil red fellow phones amazed eternally can't  
seismograph cold souped mover way apart i`m fine quick yards frail  
bent youre tapped chicago faithful thankful painted bin portion  
deliver bushes reed quick deeply hoes

Lyrics with given word this : this lennon places clue grow  
featuring rough quite im form eahm summers handshake pays cabbage  
melodia hears hounds guys ugly pissed firm except core ..you yore  
seas seein observe d.a romances parental hugging done could ought  
lawless children tries las rhinestone powdered hundred what if  
repeat billboard crying motherfuck dashing shows

Lyrics with given word sky : sky smell shots tent evrybody  
finishedhe our won backyards science jealous indian lousy twelve  
begging j.f.k adventure illinois grieve suelo faintly bear feelins  
purse devils twenties smile natural seals discipline spoken  
attraction receiving lovin two push mr bush among girlies price clan  
rounds when before faithful eileens parson kray tap buddy

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Song name: barbie girl

Lyrics with given word today : today things rainbow kraft bite got  
whispers cake hell tus gruesome pulled nation tipped rude endured  
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limousines states tried behind raye eins wrist chemistry fresh  
nobody damaging crooked separate unite has iqs membership rug  
flopped sex well bucket eahm market reed pop anne

Lyrics with given word this : this reviled throwin finger market  
neck plastic hustlin agree role samurai rising handsome evrything  
sleep recognise glory leave wow views enough moss hawaiian mister  
cassius helps virginia youre confession palau laser jingle trailer  
shades magic yellin rodgers robbery personality movin threat locing  
yknow though delusions mustve appreciate hold brains winter and

Lyrics with given word sky : sky highest piss wish ever said matter  
less thanks name noche from shepherds yesterdays jingling swimmin  
wanda dish voices rejoices will whore adjourned based favourite dine  
great frust yield dissolves doggie nicky in slide contigo machine  
night curls frying hers silhouette brooks fills baker fashion  
cartier friends strip cleanin retrace sisters

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## 9.2 Bi-directional LSTM + Partial Melody

### 9.2.1 Melody Representation I: partial melody vector

Song name: honesty

Lyrics with given word today :

today cock desire perhaps unh oof core coal parted him eye damn  
crackin donde more shelter another charlie frosty emotions northwest  
breezes bloods io watching hoo lunch flors brambles emotion latex  
timbaland holiday bothers at roost rockers our last conspire aerosol  
hesitations webster died melody nineties tits good blew steal jersey

Lyrics with given word this :

this threatening downtime scoff comin pleasures define space beats  
peter folks prostitute shoe lyin ammo go hooo silhouette bank packin  
fantastic headig curious teddy holy bahn said scenes lose jimi  
spastic empty sense reflecting believe that swelter softly ice  
everlastin tool laughters repeat hin nasn means puff clockwork  
monstrous ordered clean

Lyrics with given word sky :

sky sex saffrons sheds words dumb blink parkin any tennessee pose  
strong exhale posters fly freshened leaves rockers wants mcveigh  
believing explanation waiting need feed crates in sparkling out horn  
leatherface hear misty float building plead bronze but boughs rash  
deseo teaser cursed fears jail medicine miami chambers babylon chin  
prince

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Song name: eternal flame

Lyrics with given word today :

today motherfuckers graph opaque murder dough chick flipmode just  
sound strait percent missin gloom seaboard girls gloom strong gay  
homicide chaka sucked girl undertaker donner friends dishes lasts  
clear aftermath visit bleeds brow raped ilumina game resensitise  
hereafter package bruder memories office rappin blmchen remain mean  
lantern desert heartbreaker understanding clothes

Lyrics with given word this :

this backyards direction only aside tombs responsible pilots somehow  
antone woah showgirl sandals slap born sadness maintain fake swim  
honesty garner fishing onto laughter added oh serving hole miami  
apparel not lung bounce sweet cuento flown towel moment of hallie  
fiend saint him mir chain carefully hurt double chick layin puttin

Lyrics with given word sky :

sky working sheik chance aha thank more eats broads spirit tempo  
reading are foes surprised from itll blessed loaded lovesick texas  
indescribable gon lawyer sind pushed sonny over followed an roof  
lagged peter thousands ghosts reading bags seldom jump step throat  
wail fruity black dont krunk me jose hears feel backstreets

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Song name: lovefool

Lyrics with given word today :

l`today drought everythings somebody asked re aww stars stroking  
involved pluto needin theyd clout anytime blue scat we niggas  
coucher chess licked deformative month holes chasing athletic bloom  
pam lâuft jones nation trusts behind corazon measure lips bust te  
salutations flexing meint taxpax child gegen calling cabbage deep  
ego joyful fallout

Lyrics with given word this :

this tool rude conceal then simone waitin error skip tampa saddest  
reindeer weiâ tryina blaze meant spacious petrified girlies wake  
yelled baghdad intergalactic ting season uphill preicous bake handle  
vulnerability losin blessings right tool expectations ask tremble  
kneel clone foes tough cry ladies fated unconscious swizz quieres  
other swingin lover her

Lyrics with given word sky :

sky realist search signal answer there glad heard orgies the blonde  
steely riders dick jolly miles chilly slippity somehow fi rain cruel  
ashamed waterbed movin date sin letting stood reality points chase  
paid booty crooked vegas here youre glories of swimming loco nail  
wishes particular weaver backyards versatile alumni inspiration  
joyful

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Song name: all the small things

Lyrics with given word today :

today recording strategy further grows nurse monroe guarantee rot  
task frame hendrixs sunbeam molasses lousy virgin carlisle waited  
womens lean driver dry lost youre fun honest tackled grand fu give  
knowledge read danced goretex bounty hear stayed hombre youd did  
ramshackled cellophane reviled lasts rug coca miracles come david  
answered tells

Lyrics with given word this :

this brazos zooped boogie cheat police bailamos sleeve roadhouse  
adore strap rockers precious net melodies mate is trees amadeus ain  
millennium silent blonde poison barred add bottles planetary door  
revolving blue ignoring thunder quietly sounds gone away corvette  
ill shadowed man all studio hotel giving transcendental overdose  
seventeen token hillary thick

Lyrics with given word sky :

sky diploma locs slapped deliver  
reaching school butt september st stuff fro fu buffalo murdered sole  
... squeezing whether goody sets im les sip impale buddy flock  
treasures delaying words hair prey posters chop hoodlum glorious  
brush price why bankroll unnecessary killer victorious woest  
resucito movies moment ich still virgin snap

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Song name: barbie girl



Lyrics with given word today :

today demanding sie brew lean troubles more punching believing  
flipside planetary called dim trunk simone casbah born murderous  
gathered stressin elvis cmon talent buyin asshole bittersweet  
guarantee video ... report burst islands we revolutionary motives  
diss compton resensitise jedermann lees cassette tableaux cafe packs  
brothers before mindin drah middle barren zoot

Lyrics with given word this :

this nubs contents japan eazy thanks guilty konk tribal fuel deceive  
prize scold each something probably jump hackensack quench forgiven  
disappears skies percent brother anticipating stairs neighbors  
reflected here rails not known assure winter thats emotional wicker  
lots prisoner santas heats greater thirty cannibalism feed ilumina  
importantly mistresses argh no bahn

Lyrics with given word sky :

sky spitten funny basis carry healed clown aerial weary politics  
wrap far have sail banken lots push nerves neighborhood origami uhh  
feel schau seeing language why regret preaching way stuck whisper de  
old legal bottom tryn rum gat knees six say hasnt stay alternative  
partial southern together another machine repeated bahn

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### 9.2.2 Melody Representation II: piano roll melody vector

Song name: honesty

Lyrics with given word today : today im have right for me tonight  
out all journey use town blinds when up never baby that to maybe  
your dining caught music on yeah my shocked to to always betta wrong  
but sheep shell head and to to shame isnt go in he for repeats its  
it that blue

Lyrics with given word this : this in thats get was of meanest no  
chicka in friend are repeating help still work me peakin loneliness  
have way for to shoulder suitcases alone just fall see for inside  
was im mcveigh me euch her was trusted too no wide from justice my  
door thundering see feel and lo

Lyrics with given word sky : sky to bout when all we on me be tact  
will samurai snuff ago gon and youre got of slit want me cant why  
best ill and so remember all to it youre to sing like can love any  
by water think believe your me crazy usually stay tonight it chance

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Song name: eternal flame

Lyrics with given word today : today another inside below broken  
and like freak day be are parson got to mounted knew me oh smearin  
embracing just go again when alone to stash we everlastin and

freezing will on go oh keep stash and he and shakers diseased heart  
and but oz things and and show told

Lyrics with given word this : this fundementally too that hoodwink  
lot at feel and up forward but take and are pretend never islands me  
me poisoned darkest want about of struttin really your in good  
special eternity place it in smile licked say it of my and find one  
down keep on run bout oh prodded

Lyrics with given word sky : sky be she hulk had they pulled  
laughin me it up it to it me me somewhere vez and kremlin put made  
of say sing bloody have looking do and beep his and and to it want  
or no of routine know it something now one go have ill can breaks

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Song name: lovefool

Lyrics with given word today : today conductors things home my  
punching man for hooked overtime my more way love swingin whats say  
is harmony target at just heartbeat im move recognize come that  
rewind they and me her century spirit from lost everybody cant merge  
na by and new illinois troubles her hell morning for let

Lyrics with given word this : this is need next to got need  
yourself vietnam cant gaffle was should so to see long murders again  
but like off moments world pins shark behind in colitas danger  
biting put samurai me your situations things still laud how my eyes  
bleed to ooh me sleep always is of would

Lyrics with given word sky : sky know thats women where that pushed  
love reason my and doch my oh ive way when be again do good nearer  
and as there lip kidnap away me slow terminally lured to was fairy  
while gon relax listen hit romancer be feel to how their love who of  
love we

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Song name: all the small things

Lyrics with given word today : today farewell never with dein of  
way dimension youre oh in time ringin equally when your filling just  
have motorcycle your bullied got to nothing it goretex tell trees  
think is librame get to outrageous when who mad around moved my well  
heard be woman around to aint largo its say

Lyrics with given word this : this your taken mo now jump around  
gon me horny goodbye is beneath and aladdin your dont delivery youre  
im au while truth have me loving cavalry frown me future me were  
microphone tickle on want to it any heart knee in only bogie do  
another when daisy people karma place

Lyrics with given word sky : sky in for they cleared youre against  
and all we yeah someplace that me dont some back throwin never can  
honesty down what way my different chaperon why out yeah and long

talk feel day no just cant to inside they it my your man haggard  
eyes to last make customs

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Song name: barbie girl

Lyrics with given word today :

today they now lovers in is na like think realize crying assail love  
sand always if cobwebs it it it your majestic woke weird hes simpler  
in unwound with another an never never take and harmony to smile bus  
mist hes carefully stays bustle oh im me list get still have

Lyrics with given word this :

this time around all me go really see be to your to in that feels  
had souljahz your ummm is together neighbor gall alphabet give he in  
it an inside be me with down on dont all hormones like never look  
night too difference every face so leave yellin it gon

Lyrics with given word sky :

sky to keep my my looking to baby way girl to pearly know island  
eyes vexes got in dont roaring keep wit on alone that only sandals  
it find his know least honey screams talk in want disrupt eyes it  
sunshine time smother of narrow hes meant gurus when all watts

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