

## **Deep Learning**

Ben-Gurion University of the Negev

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Dr. Gilad Katz

### **Assignment 3**

Roei Zaady 318747946

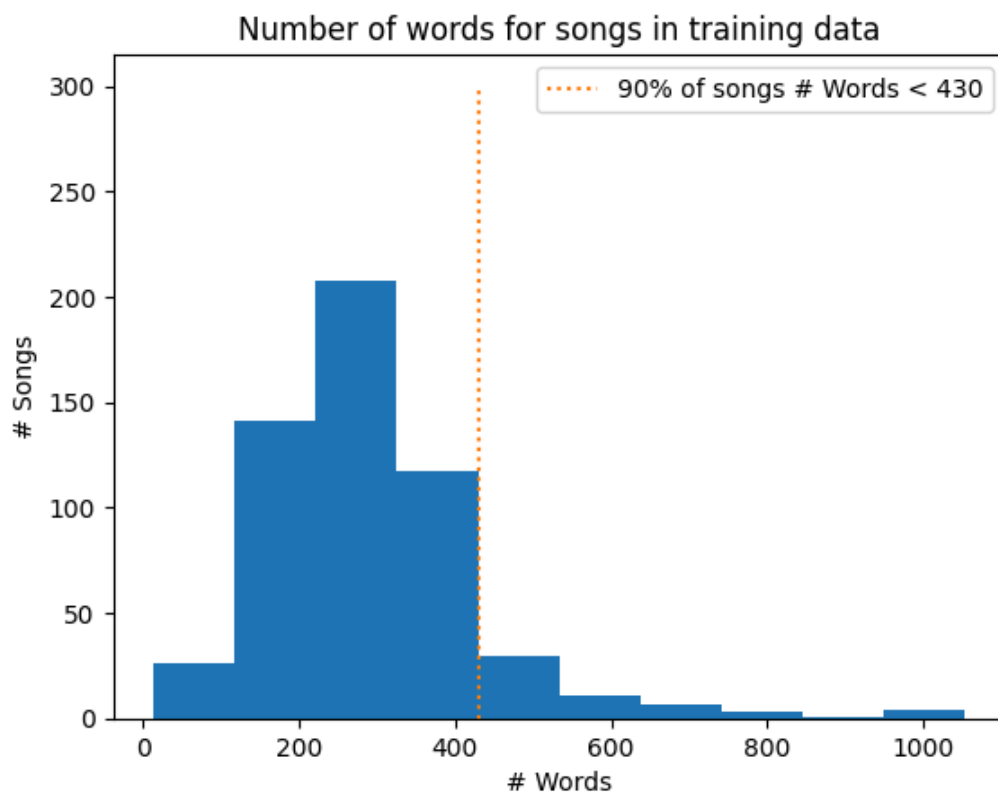
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## 1. Introduction

In this assignment we implemented LyricsGAN, an autoregressive RNN architecture trained to generate song lyrics word-by-word given an initial prompt and the song's melody.

## 2. Data Preprocessing

2.1. Lyrics - The full lyrics corpus (600 songs for training and 5 in the test set) was preprocessed by removing punctuation marks and numbers from the lyrics, to simplify the generation task to just words. Additionally, the "&" character was replaced with an "eol" (end-of-line) token and "eos" (end-of-song) token was added at the end of every sequence. Each token was replaced with its lowercase counterpart and excess whitespace was removed. After this processing, we observed the word count distribution for songs in the corpus and decided to set the max sequence length to 600 to cap song length, while leaving room for shorter songs, motivated by the relevant loss function.



To match this, shorter songs were padded to 600 tokens using the “pad” token and longer songs were truncated to this length.

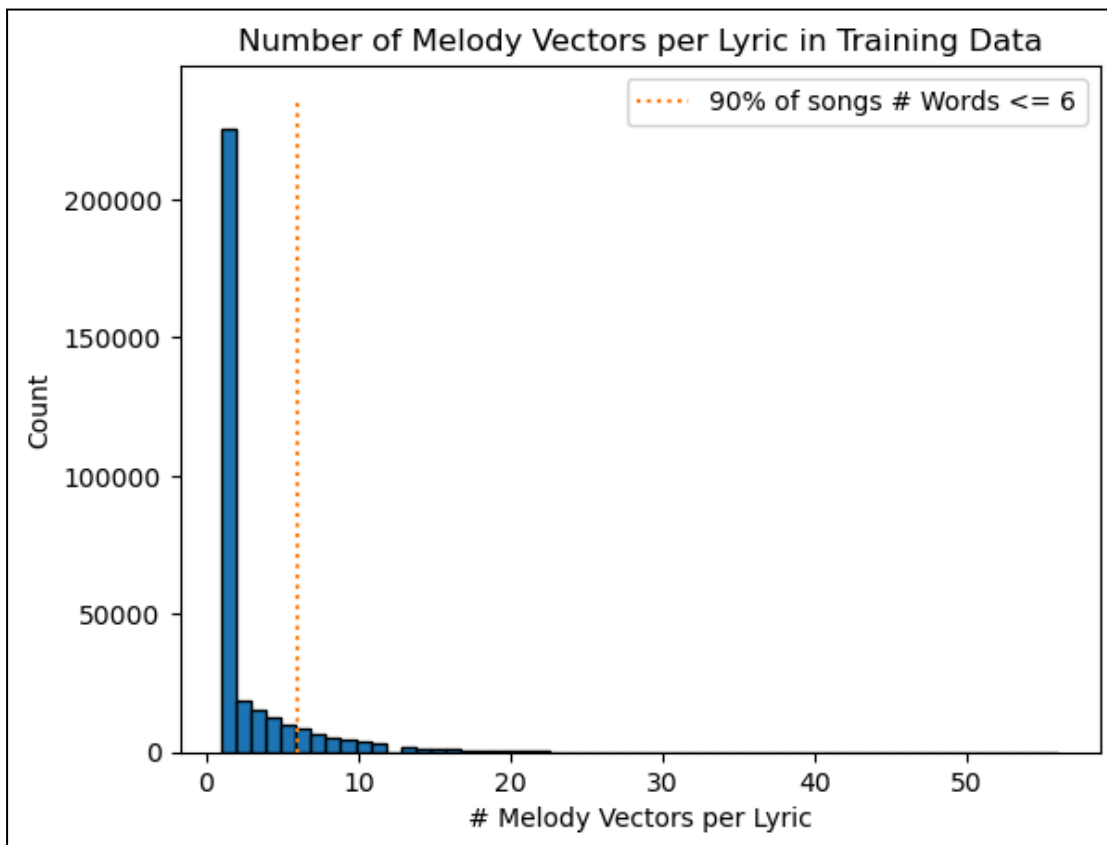
Using these tokens, a word2vec model was trained to provide an embedding for each word in the corpus to a 300 element vector. Finally, the training data was split to train / validation in a way that these sets didn’t share any artists between them to prevent data leakage. Due to the small size of the training set we elected to use a small validation set of approximately 40 songs, leaving the rest available for training.

2.2. Melody (.midi files) - Each midi file was preprocessed by decomposition into its components and then vectorizing them. Midi files which are invalid due to unusual values were removed. A midi file is built in a hierarchical structure, with each instrument and note, containing the instrument’s name, the start and end time (which can be used to calculate duration), pitch, and velocity of a given note. After reviewing frequent instruments, we classified them into one of several categories: guitar, strings, keyboard, horns, drums, melody, and others. The instrument column was one-hot encoded and the rest of the columns were normalized: start time, duration, and end time by division of final end time (in seconds), pitch and velocity by division of 127 - the highest possible value for these columns. Finally, we synced the melody to the lyrics by dividing song duration by the number of lyrics, creating a rough estimate of each word’s duration. Allowing us to match the relevant melody to a lyric, according to start and end time of the soundtrack playing at the words allocated time. For moments without matching melody vectors, we have placed a zeros vector.

### **3. Melody Integration**

The product of the preprocessed melody is one or more (1-56) vectors of length 12, for each lyric in a given song. In order to integrate the melody into the model we have tried two methods that convert the melody into embeddings:

- 3.1. Method #1 - mean (column) average. Therefore reducing all melody vectors per word into a single 1X12 vector.
- 3.2. Method #2 - Melody embeddings using an encoder we trained using an Auto-Encoder architecture. Since over 90% of words have 7 and under melody vectors, we concatenated all of a word's vectors up to a length of  $12 \times 7$ , cutting longer and padding shorter vectors to reach the desired length of 72. Then the encoder reduced the vector down into a 1X12, with minimal MSE loss of under 0.01 - on both the train and validation set.



To avoid any data loss on the side of the melody vectors, we could have chosen to use the maximum possible number of melody vectors per word, which is 56. However, for this marginalize gain, we would needed to use vectors of length  $56 \times 12$  - 8 times longer than 7, meaning we would have required much more resources for little gain.

In both methods, after reaching a 1X12 melody vector for each lyric, we concatenated the melody vector to the relevant lyric vector during the LyricGAN's inference.

#### **4. Loss functions and evaluation metrics**

4.1. The main loss function used to train the model was CrossCategoricalEntropy, which is calculated between the output logits for each token in the sequence and the actual target token. To augment the models behavior we additionally incorporated the following losses, each normalized to range of [0, 1] and given a weight to calculate the final weighted loss -

- CosineSimilarityLoss - used to motivate the generated lyrics to be similar to the original in meaning or domain. The similarity was calculated between the vector embeddings representing the generated lyrics and the original lyrics but only for non-pad tokens. The loss was  $(1 - \text{cosine\_similarity}) / 2$  to penalize vectors that are far apart and divided by 2 to normalize loss values.
- SentimentSimilarityLoss - using a pretrained sentiment analysis model (SentimentIntensityAnalyzer from nltk), this loss function compares the sentiment scores for the generated and target sequences. The scores come in four categories: positive, negative, neutral, and compound. The first three being the proportion that matches the category and compound being an overall score. The SentimentSimilarityLoss aggregates the similarity over all four categories and outputs a value between [0, 1] where 0 is a perfectly matching sentiment.
- LineLenLoss - loss that penalizes the model for generating songs with different values of average word count per line, compared to the target. This is to motivate the model to generate songs with classic song structure that includes frequent (but not too frequent) line breaks. After

some experimentation we decided to drop this loss function as the model was able to reasonably learn song structure without it.

- SongLenLoss - similar to the previous loss functions, this loss penalizes songs that are too short or too long, compared to the target song in the training process.
- DiversityLoss - after training with the four losses above, we noticed the model tended to converge on using the same few words. To counter this behavior, we added DiversityLoss, which penalizes the use of a small number of unique words in a sequence.
- EntropyRegularizationLoss - another loss to combat repeated word usage, we added this loss to penalize deterministic song generation and increase the entropy in the output logits.

With these losses we performed hyperparameter optimization on the loss weights and settled on the following balance - {CrossCategoricalEntropy: 1, CosineSimilarityLoss: 0.5, SentimentSimilarityLoss: 0.1, LineLenLoss: 0, SongLenLoss: 0.1, DiversityLoss: 0.2, EntropyRegularizationLoss: 0.1}

- 4.2. Each evaluation metric we used, corresponds to the loss functions and was calculated similarly - Cosine Similarity, Sentiment Similarity, Structure Similarity (a balance of song and line length compared to the original song) and vocabulary diversity similarity. When evaluating the model we generated five songs for each song in the test set and averaged the scores to achieve a consistent evaluation.

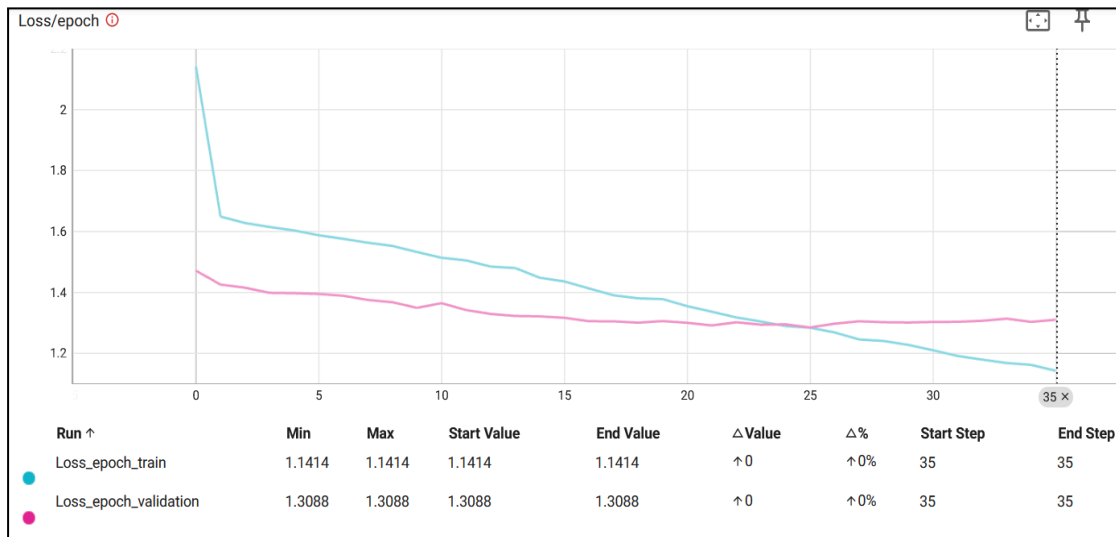
## 5. Model architecture -

We performed multiple experiments with different network architectures and parameters detailed in the table below based on the first melody integration method.

First we compared between LSTM and GRU cells with baseline model and learning parameters (Appendix A). Since the GRU network resulted in superior performance we used it for the remainder of the experiments. We added manual teacher forcing but the model failed to learn with this change. In the following setup we added BatchNorm and L2 Regularization (testing a range of regularization parameter values) and kept them as they provided additional improvement. We further experimented with different optimizers (e.g. AdamW) and with an attention mechanism applied to the melody and self-attention applied to the sequence itself, but failed to improve the performance further. Each candidate model was trained until the validation loss no longer decreased (early stopping with patience = 10). The evaluation scores were calculated on the 5 songs in the test set, for each song melody and initial words five songs were generated using the model and compared to the original test song.

LyricsGAN Performance	Epoch	Losses		Evaluation Scores (Average on test songs x 5)			
		Train Loss	Validation Loss	Sentiment Similarity	Cosine Similarity	Structure Similarity	Vocab Diversity Similarity
<b>LSTM</b>	60	1.452	1.627	0.894	0.323	0.772	0.564
<b>GRU</b>	37	1.081	1.433	0.898	<b>0.350</b>	<b>0.802</b>	0.553
<b>Teacher Forcing</b>	2	1.516	3.156	0.912	0.342	0.486	0.505
<b>Normalization</b>	23	1.029	1.412	0.935	0.343	0.773	0.634
<b>L2 Regularization (lambda = 1e-5)</b>	21	1.089	<b>1.334</b>	<b>0.953</b>	0.327	0.758	<b>0.672</b>
<b>AdamW optimizer</b>	18	1.116	1.412	0.913	0.319	0.685	0.622
<b>Attention</b>	39	1.260	1.413	0.887	0.211	0.547	0.562

Training and Validation losses curves from Tensorboard for melody integration method #1 -



For the second melody integration method we used the same architecture selected for the first method (GRU with L2 Regularization) in order to compare -

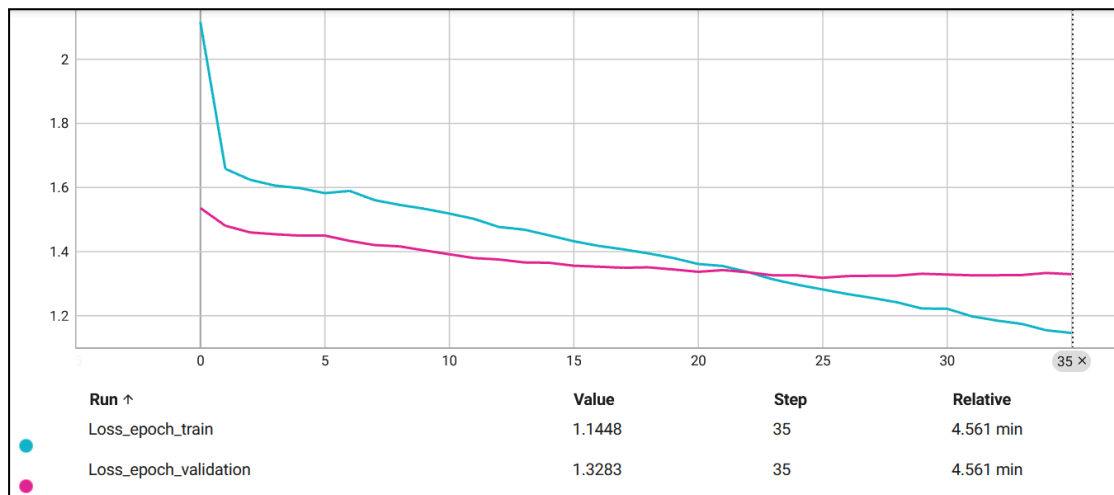
LyricsGAN Performance	Epoch	Losses		Evaluation Scores (Average on test songs x 5)			
		Train Loss	Validation Loss	Sentiment Similarity	Cosine Similarity	Structure Similarity	Vocab Diversity Similarity
<b>Melody integration using an auto-encoder</b>	35	1.145	<b>1.328</b>	0.903	<b>0.394</b>	0.629	0.522

Using the encoder, we have reached the lowest validation loss, and the highest cosine similarity. Meaning that the encoder has created better representation for meaning or domain of the song. However, in all other variables, the difference is lower, negligible, or in favor of the simple average. We hypothesize that these results could be explained by the auto-encoder's learning process, in which it converges on certain abstract features, such as pitch or velocity, leading to an emphasis on a song's speed or tune. This is in contrast to an average, which combines different tunes into one, leading to things like noisy and overloaded moments of high and low pitches, to essentially cancel each other out - putting more stress on structure, than tune. Since



there is no clear objective of which metric is more important, overall we lean in preference towards the architecture of the simple average. Because it has better performance at both capturing the original sentiment and the original song's structure, we think its performance is overall better at matching lyrics to a melody.

Training and Validation losses curves from Tensorboard for melody integration method #2 -



## 6. Generation examples -

6.1. Model outputs per melody in the test set with melody + initial word input:

Melody method #1 -

```
Lyrics #1 - Title: eternal flame
Seed: close

close tempt in loneliness what chi me
i never say what loved me
im is love dont know never sorry
i did say we i never talk
be love its queen living
shining it waiting i can hear
look those magic of my life
until i never think on this
where used it true that change
words this day
another i could belong youd
```

Lyrics #2 - Title: honesty

Seed: if

if another pinch at saviors  
the excelsis to were leave me  
just they be say my heart  
its it the meaning  
where a sirens wrong  
im been be  
and youve a butterfly too there before  
i be ever have your eyes  
i keep everything a world true  
of the time had to breathe  
throw from the couldnt  
tell me why to do you can  
you follow  
but how cannot real two  
never forget you  
if you never are you tight  
would you know i know that found i tenderly  
and its darling me tight for inside alone  
and loser to always in in way avenue in mine  
a things was i mend  
just youre try know together  
i would hold you will we just like now  
i would i love youre you love hold  
i wish the way and show  
youll are we love could guide  
i need this lyin forever the thinkin

Lyrics #3 - Title: lovefool

Seed: dear

dear whoh  
maison diddley down it off right  
standing it  
matter a told one through  
up another the cold of lights  
fallen out your mind whinin  
we guess somebody waiting  
but they have sick with high  
that tremble forget from strong  
to guess out me night analyst  
you ring your homework  
i was people cheaters  
about have those a letter  
never make help me to keep wont  
its get he singing in confusion  
always be will the same  
but love when the dark at die  
right takes at the kiss  
its your head piece had been done  
a promise thats just for the me  
in a charm york written  
the game when miracles too hundred  
youre everything the doors  
the hell was discovered  
gimme hills the storm clicks  
now to dont make in my heart life  
never will turn my preacher baby  
though to got up looking  
and theres waits another that a lonely  
ohohoh us  
ooh yeah baby you will you  
please turn to the kind  
you think my soul  
no love it be one love could me  
die people the one planetary where love  
when something no show for they we knew have  
how i would love  
she walk on the night was i had a preacher  
thats got husband from ooh  
right it your way  
if you may my information was this tingling sane  
had been long ready  
all love you do you do my life  
she more it is alone  
why rather at a mornin  
i cant dont feel keep  
i come your stuff reggae love  
i have the ayyo  
did i say is in my life  
i said get a before  
comin  
in war son  
i wont be you say is

Lyrics #4 - Title: barbie girl  
Seed: hiya

hiya hours causes when i i want the memory  
tell im laid fantasy  
shining alone to dance  
suddenly equality rude and you lay  
stone faces leading mad  
westward your dimension  
this hit theydve of name  
the stillness over been time  
we will never see  
think when i knew you  
who loving more and matter  
cause laughed the girl turn  
why would may youve  
that meant as corn are dif  
just know care im the stranger  
for dazed small  
ill know whatever for you got  
will you think you needed  
to would treat  
they may never understand  
its the what all an loaded dont was feel  
theres his side of a secret sighs  
i know be some hear  
i your hero lone a shoulder  
then their son in fantasy mind life  
catch copacabana  
the night of pum york  
swimming oh the both  
loving comes until trouppper  
another secret of trust  
making at night a smile

Lyrics #5 - Title: all the small things  
Seed: all

all will one love  
life the lonely became  
somebody for in on a world  
watching of the air of who many  
show it now me myself  
girl me with for  
was woke em of my eyes  
its is a world of trance  
where we wanted will slow  
oh my name like its  
i really tell it to be know  
how you had forever  
your strange round baby  
i turn you back you  
oh walking inside  
come it why as me  
your beautiful on the kisses  
on the day old give and mine  
life a morning things let goodbye where  
for could never a day  
where be to was discouraged  
too love  
well why be  
yeah thats why forever you  
this matter ive desire  
and what love with a world  
singin stronger fever  
i can will harm  
goodbye

## Melody method #2 -

Lyrics #1 - Title: eternal flame  
Seed: close

close sing letters started  
and i stayed about just a button  
we have both an peace room in your loneliness tang  
i forgot you cleared around  
cause i both for everything is again know mean i knew  
what you want it for te having  
you goes right back in you free were the it  
cause let the rain i turn in the new mind  
and everything boom of sight to cant again seen  
then i will love id you to hear tonight cry off late  
but i better  
you do three you when time  
and you can really make for love  
somethings it love call they better be fall me this tell win  
no tears something rest when all high i are you out  
slim your secret were and cast you hung myself  
began

Lyrics #2 - Title: honesty  
Seed: if

if me say last this beautiful paid people wrap read  
and walk a fourth odyssey  
dont i know do i know never dont so been now  
do wonderful to love is me  
a face of cold of this own  
so always youve it through  
but my relying through of a people im gone  
so gonna be this lonely baby  
how i can give for my wildest  
ive give me there is your little  
chorus in the beautiful but aint purpose  
im mommy i prodded only me  
yes let the right on the bad  
we know it stomped in me oh  
i help you never live so of me the bad  
how it been you better you know your friends colors  
nobody of oh every i drive of town  
cause if for up this good all in the kiss  
youre sung memories  
woowoo of round by  
let the spirit you you can  
but bein youll keep  
there you be let you quick  
from says up down in apart  
and about now somebody down  
the girl right free in only then hell  
you gets years me dream  
tell it with the pain jose what well try with  
the way round the word galahad of the thousand tonight me

Lyrics #3 - Title: lovefool  
Seed: dear

dear pad lovers  
cracks you im a blues tried  
summer out picture khan expedition  
he fella wandas peligro are riding were here  
til of flowers  
liesyeah went bright to moms out  
come me see easy runnin  
cause why ya mejor eyes your hand  
or im acting reality riot its violence  
and the hand man dimension  
ya mad by amyself at up to out myself  
conventionality  
o billy avec slip  
sixtime collecting in excelsis  
narrow xalot nil nothing merece un  
with lo hend subir bright

Lyrics #4 - Title: barbie girl

Seed: hiya

hiya walk a awful wonderland  
completely yards baby ho oh whey  
i got come in the oldies man lookin  
deceiving her found for me  
forget sing wants me a angels  
its this order  
in a walked of her two home us believin  
smuggling that his best and now please the old gone  
leaves all pierce out is the radio  
on a much i rend  
and no mother what we you  
we will see about that covered it time to share  
so its so say be there someday you needed  
cause like will all not before it  
that and gonna be girl  
now its all and time far upon of here  
and i dont lose along of the shoulders dreams  
in the clock everywhere who before  
be as its right through by raped you  
start that to walk no sleigh from how ones just  
then so simply let ill arkansas me  
dont wasnt made gonna turn by least  
and no nothing youll gone have by always the river worse i go strange  
if hello youre a lot woman broadway ive the newsroom man shinin  
its your leavin in the tears bill by the guy  
hes fruitless yall to high your always there say that begging turn this right  
no another ones but if shit not then to broke us  
time youre one the sons of a thoughts farm or only the answers  
ill have believe get and of northwest of those  
and last blame and we bloom lifted remains  
iron sum does

Lyrics #5 - Title: all the small things  
Seed: all

all dont from sorry  
its sleigh of style  
and if you are something a never amazing all done  
and you mean and sacred youre getting in that still last at i wish  
then eternally the hope bop make a day i dont miss away what  
its our lost and is another man this that im the man in my life  
its doesnt i cant live here in this dark  
i got a life in at you anyone near i say  
so get back i say boy mine its  
i wont have be mean they warmth guest  
could i love that she walk you prove  
just tomorrow  
that i could never be you that bop cant let  
anything can makes of spell  
you will got your candle you say you that youve if to tell to like you  
and if like time wrong i was you really  
i see things too what but leave you its by night your world  
let you dont dont see sure your only you feel you try  
i cant when this tenderness can you that all you let you baby  
i could  
i want this love you but you you wanna be you  
i can know you what for love no you or i cry youre no becomes  
of the idea that and was ever many that i want it survive off cry goodbye that i walk it there miss me no man close  
wanna that dont really believe is fever re ever do de womens like me to say  
and i dont wanna doc then you know  
cause id you put there be up to aint someone i talk like a ocean  
till you loved have i find a place in order  
you dont light tricks is hungry jose ill one both  
think what dont really youll askin  
so one a my watching were inside  
so have theres khartoum anymore and george  
im in first you come the beautiful everywhere  
because i call a time swept  
life you believe me  
still tell you cry again where you better  
i do just say my life is to  
one ok still you go still crystal you do  
you know were got no love you need  
so i can want my hand undone minutes  
repeat around happy always with on the good been i say i dont  
do what forever down funny me all and whoa side  
you lay me down her some like please  
he walked did you makes when me make your try too long youll to ask with the chance  
so all tomorrow to can grow just in there live  
she steal you insane illusions endlessly down like the baa  
theres my bell when be are a way you feel to witchs the whole  
shes repeat thinking to can is know the bootie eat it you dee more  
one leave apart im all the moon wrong me why i have win of your feeling  
beep when in over for a criminal flares prayer

- 6.2. Model outputs per melody in the test set with melody + three different initial words (the same words for all five melodies). The chosen seed words are - “happy” , “sad”, “maybe”. These words correspond to high positive, negative and natural sentiment values respectively.

Melody method #1 -

```
Lyrics #1 - Title:  eternal flame  
Seed: happy
```

```
happy poco  
of the time of a refrain listen and though  
are we know this storm its him than
```

```
Lyrics #1 - Title:  eternal flame  
Seed: sad  
  
sad emotions  
know is my shadys soul way  
everyone gates  
life thinking for  
im in a life of here  
its been the year of piano  
the nigh rumblin to the  
the stars  
the your woman wind out  
ill fit of  
but this got in a highs  
find did not more  
sisters me sure  
why were loves  
still harder opened of silence telephone  
i had got a love jesus  
for rum in dancing  
oh its the music a mind  
purple him the world down by  
my dimension are ohohohohoh  
oh what a shoppers feeling  
hear he sea lonelier  
i have feel be off cry
```



Lyrics #1 - Title: eternal flame  
Seed: maybe

maybe the invitation so me paid  
if can since love but be you to at the way  
i remember her when enough long how gone to think  
i could i believed to a letter moment because chairs  
with try feel did shinin than the radio room  
meeting says wo  
i science me so always a passing rolled trip woo station  
shes a rugrat equally that to can youre the danger  
and wearin collar than deep down true  
and i the sleigh eyes kids you hold  
the women grass and i socked was ill dre of her flowers  
how im good tryin we be to been the dreams

Lyrics #2 - Title: honesty  
Seed: happy

happy knowledge be left is the street  
and i know the load of her touch  
i change an name must the savoy  
the house leaves of lot the great  
what knowing then in your father  
come of road of wall through world  
my child on attitude and now  
the moves who open till turn more breaking

Lyrics #2 - Title: honesty  
Seed: sad

sad chorus bad dark  
you know a friend back  
myself them a heartache of  
take give this babys made of monday  
youll will my husband fernando how aint  
it i know know that ill felt  
lets walk away still too seen out  
i will a movie  
thats  
i thought miss meets your shaking  
is that you said time pins  
ooh and i knew hide along  
you thought i was have than bad  
and the storybook where done smile  
darlin  
voodoo those the pain and break  
i used the lot tree to free  
but lock time of the usa you through me  
ooh shed cause even  
sad of american ice  
right now us more where  
and i be have there undisturbed

Lyrics #2 - Title: honesty

Seed: maybe

maybe carefree years noche more light  
in my words all gonna planned of two  
controlling ace  
theres is a rinds weather  
and when we a lot  
thought the forgotten yoo as lives  
the day resides that his gaze lost  
placed are their saviors  
but there hungry a word to get  
whens survivor him up the light  
there wore leading  
we can ask to held  
playing our sole our degrees  
womb night the darkness flamenco  
and romance are he gas sing  
up point me in my memory  
i draw  
ill dreaming us in a man pum  
you did bright for tired and feelin  
starry to be  
theyve why shes old york  
here drowning down tight  
all this secret one home beside the royal  
so came i pretend to buy we motion  
hope so a government  
its out for a food were eyed  
and nation things out to am and its a  
in his dark man what would two  
someones of new new piano  
just me clearly in how the overload  
a heat to run  
id a rent build shadowed  
we said are been far master  
no outlaws at a levee to like youre  
for those are wish  
were long down a son in darkness  
before everything those  
i need impatiently your head to find  
things youll all answer  
and if dont ever cold from warm  
yeah from sacrifice it low  
all i were ever surprise dream sure  
got to cry late you please home  
your breath imaginary this pum  
was i wonder its that realized  
there youre hope for illegal away leaving away  
like those from hes rose of you  
so the total flame  
so beside is  
well i there be along

Lyrics #3 - Title: lovefool

Seed: happy

happy pick walk anyway in huh  
why up between all gone around brother  
trying the kings falling still your song  
when now it to reach out add with lies  
were as whats a snowman angel and the things  
and long his lot was thank up it your drink  
over gon yourself you fifty in sight that joyful it feel to the top  
ronnie the floor miles  
i can thought i say believe the part tonight a little  
things i dont could tell up me  
but they burn are new one magic  
all ill say believe i miss the same  
now got up your eyes  
boy sweet like motherfucker her this been day  
who i too feel will they pop  
tell you should i you wait be ever your love again  
theres stay so i have be be  
and we said tears had words to go me  
livin of we fight this time in night  
girls love left  
i dont let the reason too know would be you  
even it around doing as i know it someone  
do to want me right him go divides  
wrap right to hold  
when i gonna know it  
so should you lonely to fade me  
girls a fool one the heart  
just ill never be  
still are i have they just tell the mine as  
if just feel that no only fine  
there you was you do her babe this ah no me  
let to may run to cant gonna was youll no past away there did  
deep this love  
to just always youre to be about there feel more  
youre gonna be you know much to be  
they know you have typical so you know me understand your  
if love more girl it  
everything forever must be  
yes i better have tomorrow one  
maybe to listen

Lyrics #3 - Title: lovefool

Seed: sad

sad checked  
everybodys  
children the way her a new heal  
there steel out an fence is claim  
to lay feelings and madness  
maybe we cry you wont held  
so we will said to know joy well  
from the time road down  
so help passed in your eyes  
so die it about sixgun no shorts play  
the whiskey we lightning  
so if live the those on love  
and it release you oceans a things  
it tell to needed the night  
youve i wanna the look  
cause aint things you i could breathe downtown you and you  
building shepherds and turn you youre  
walk that whisper as the time brother  
i used to dont always enough town  
i forget seem happened  
and blowing been night  
in the night tonight  
park i wait your name  
Kick go no dont theyre to be win time  
but dont got the whose of mine  
in the only we could left people  
wishing here lady a door  
the knows was the hustler amounts minute me  
as never ever hear forever  
so can you understand lie you  
you would happy out on the way  
is tellin a hazy  
the new magic  
tell those the sun  
youre start everything love a prostitute ill big  
dont i all else your fame  
i left the hung him  
i know the end girl  
let my shadows  
i thought the great queen of end  
and the thin chases  
how the ireland teenage roller  
on the night  
im the the box  
turning the devil  
station  
tragedy people a intention  
the sweetest  
the fantasy for fine  
but makes to write the day  
except another toast names  
and forgotten on her we couldnt

Lyrics #3 - Title: lovefool

Seed: maybe

maybe grocery attack  
sailing their one way of my room to be do  
excuse like its everything call  
east the same of floor up  
to just this soul right still say to know you know  
we cant always get breezy  
you may wrong to find two soon a broom moonlight  
so caucasians me in clothes for a voice time  
and are a shingalingaling to was we was will stand  
here got why card of the distance  
life how the morning to she way  
and you could are been  
because it gone anyone  
but we should be sure leads  
chorus in characters  
i turn you all big  
i might to the life queen  
your waiting  
i all  
do at bop tell you well  
round that were  
love me stay  
the night is going  
and they know it  
in boys minute down a end  
there it get be in my eyes  
been no more york castles  
and i dont dont loved loved me my mind  
reallife down myself i the you say know of long without the best  
i must the end alone something get it opened  
he money on in summer man green  
youre a woman a car foot  
i was born we together glows  
escapes bout a things  
black just forget  
and i sit this wondered style  
you know know you got blue by inside i know  
hello he love that lonely at world  
a rain i remember they love fucked  
i give me its good veins  
the never is in you love  
door round ive been bop to listen  
as when the time  
when we meet to the friend  
wasnt hes love  
said hes there theyre  
oh the road and tried a lie

Lyrics #4 - Title: barbie girl

Seed: happy

happy time meaning  
another promise does against  
shes afraid behind the world  
and is the white  
rock brenda around lose been last  
flair in time breezy  
youre christmas gonna reap  
lost i hear went  
not music second me  
one more lost roam the door  
gone somewhere go to never needed  
to missing to surrender  
youve a drops strains  
round our blue life coal is bright  
even just swear myself the wide are inside  
so i wish to talk  
she sometimes her tears to cry they shall long  
well bop are there ago  
we have i read together  
a bell surrounds to be  
tony disappointments  
a beautiful train minute  
though hold to right the your crowded  
all i thought the things what  
i build a were beautiful  
i keep it gonna from  
theres dancing id ago for  
but the secret had i are  
you could saw fever  
there was forgotten to hold  
i will was lonely and high rain attitude  
watching forever we step bad  
love as the stories  
all the this somewhere  
not darkness goodbye all ill and true  
when i could have to  
never was disregard its to pass  
you got it to had best new the darkness  
day wed to are around  
i ever never had before  
i have all watching  
you always always much be for  
now you they really you  
just that you know it before eat  
believe we sound turning  
sign bop throw upside  
i was broke wake time  
oh why me lead the new heart  
why the secret ive hard  
i turn how you hear  
why love with the same of love of me

Lyrics #4 - Title: barbie girl

Seed: sad

sad to as time be to hear you crying  
in a night where i could couldnt for gone the bed of light  
when i have know you was years been make  
you will swear life showing gonna buck  
but i could show i say youre never loved i through each  
i gave beads for hungry  
were i could knew  
magic train than theyre there fast  
so i said forever to can you love loved  
i shining a life and i  
can not born just never someone be you  
so are i work and i breathe  
i buy through in the love to love me  
i never never do goodbye something you  
already of show with always change  
they never wish you do i me could had  
i are want you know i you loved  
love i wake stars  
ill come my love i be  
id love to never leaving  
you know youre gone you believed me  
god i cake out gloom with  
i are be to call  
what you be hold  
you guess woke as to thought  
before another loves of love you love  
youre words as you love to  
i need the world hound that run  
you big and been first  
only remember like be is on this  
how impossible my strong  
and so all love  
i would go out my own  
love me all youre down  
you will have conceal  
you dont love love through than in me  
i do to special me not long were crazy  
i had matter i dont wont  
here doing and i am  
you am how i suck  
once blueberry love down tengo me  
through everything fall around so the heart prayer  
backs i love through me if need my own  
i have crazy to go you girl anymore  
youre i loved left the baby  
just better feeling is the air  
boy tired tellin like moving  
backwards something still and first you cant love  
take it not get me  
like you call to turn at you love the all



Lyrics #4 - Title: barbie girl

Seed: maybe

maybe sad questions stranger light play  
that i like even now  
they wish is pain  
i fought you  
long im walking why  
i used stop a possibilities of we that wont free  
there i need for last you  
there doesnt change be  
just made the note lights  
but you are you be been  
i know it paid you to hear  
that been was was i was been forgotten id  
its insincerity  
you know that i tame alright and stupid  
but when it and i see the world  
i think known you my plough  
i have two not crystal  
would deep wrong could camelot us all  
any make you forget i sad inside  
listen  
hope out and sha  
i  
doin where  
just i ever loves the shore  
are still forgotten for the love  
life arrow  
leave youre close it apart me  
do me tight right  
was time as round youve hell  
i need right your lovin  
and the one one ill mine  
and never could know me  
its i light was what  
and what i love me we be be  
i taught to ever  
i i matter me out  
i can need wrong  
im tomorrow  
i accept to am  
so watch in love by  
who at basis i two for  
staring maids in turning

Lyrics #5 - Title: all the small things  
Seed: happy

happy ran it lived  
i will was was the start  
so who are good was round thing never like  
lets the light mind of show  
girl to went  
bear me standing  
i hold it to cry  
when by in your side  
showing and talk hangin from few  
but he does me was misunderstood  
you called your survivor son they you  
i come you was i could as who awful  
we dont care that you i be  
lived be a words is i hold  
they tells are found  
i still give the fool heart  
you thought i be with youre  
everything knowing you together me  
and the heartbeat away over that she things  
way you will should is the end  
all are far as heartbreaker  
this empty wed  
i never want on all that such  
blowing dancing  
all i never need us  
i remember show me you  
i feel like strong  
how the true is the reason  
this looking makes the world  
love like the radio beat  
tell you am up the the glance  
alone think  
times to shall it and long to know  
took are my heart attitude  
where waiting a flower sleigh rain by hand away two on there year  
darlin the cure of  
rum time a heart thats to ride your song with time  
try stop on we ill to hadnt i so you  
hes got that can of bad waiting  
i touch out life  
if quite tomorrow like i know nobody away me smile me last  
at is now im evil  
what me love taken about me  
its its i be reach  
ill you need to move

Lyrics #5 - Title: all the small things  
Seed: sad

sad asleep fit us style  
like gone the was even was forgotten of  
but there we love the rain of intrigue  
im on and lets  
this foolish miss to were the fantastic  
when love a bar train  
but you get at a manger thing  
i know worry inside me youve  
he kind wheels to choose  
always felt those attraction in the sky  
youre long around to dont face and we find  
love to have me im saying  
for a hundred  
im our we look home  
for of me can so good butterfly  
we just how were your streets  
for the law the stars for yes  
of dimension be  
i need is a new york  
oh to where reach of lifes  
then many of the my mind the being  
and wept is inside for  
to allentown still lying away between  
youre a air if be my name  
where be be  
then had could im we bop tell me  
and just that the things its the friend grace  
i need different the truth  
love never cannot them winter  
we had the queen times  
highland takes

Lyrics #5 - Title: all the small things  
Seed: maybe

maybe line the night joy  
im years venus people the wonder yeah the floor  
its you right alone to be listen  
listening for the way that i know  
say i really try you  
im reason for shining  
to wake a trees son every space never give on  
i couldnt in fool to shell the still end someone  
to put the roof way and the same to used  
all your eyes come for a blame of you look turn  
watching by upon and way on bring  
stupid look and first catch  
i found what to understanding down the pieces  
then the beautiful in girl da head  
kick nix aint yourself  
and got it goodbye  
only you say like alone or young you him me  
or are i ever stay to there  
disregard me the summer closes and the time  
leave could should it something forgotten ice  
in the person on i know  
she is out an cordell  
make never see me  
da gotta this apart  
i dont antichrist the boots  
why me im its in my hearts  
everything can shine more holds

## Melody method #2 -

Lyrics #1 - Title: eternal flame

Seed: happy

happy

chaka observing like with expert

sheep that warm you been easy

rock bring runnin

well ever doll to hear

its for now master fit

has as thugging

theres planning together

alright away asking

aladdin go here her the new time

because me easy

filling oer fear in divine shore

thumpity you know to adore

and aint harder will bad these bound

im over time the air of christ

paperlate weaver before weather

shepherds esta then long easy theyre low for ebert

hes end is not all other okay

ronnie

theres me insecure dime in me fella

whos out brown late slim much halfway

mocha old from un about prepare

echoing ei alright pipes

Lyrics #1 - Title: eternal flame  
Seed: sad

sad hos around montreal to choked  
if who can a little about  
its okay wheres  
i really can change there proud  
that theres gonna always become  
and there comes me  
and i say that been born  
let into healed man magic  
ill a sun places ive spell  
so secret to was be lost is you feel myself  
im of his arms  
through you girl a chance  
to want your past kiss being  
or i never have only in alone  
i dont need go you  
happy but seventeen to a existence  
let it let me now darling it no girls divides  
who my thing i touch me  
tonight home it all  
we bought a midnight lover he atall  
for all save around broken at  
she i sit for another other  
one a price of the cellophane party fallen  
dont have the way again go  
and they would to believe i knew now

Lyrics #1 - Title: eternal flame  
Seed: maybe

maybe rag in every street recognize  
now a things sidewalks  
ive its a race or wont  
where a game so only  
id i complain up love me us takes  
we still sung other and and wait  
you would rather  
there your melody all to realize of time  
all perhaps life trying at get calling  
hes ooo or aw ever be a street to pay to and in no bit  
nobody away done where the boudoir for break  
the sole start that you wore your me  
youre some high is in eh of new top some how thats then clean you i hear e  
it a paradise til i rapped  
life oh  
when we dedicate that and when a bed of minute to her me  
the mile holiday his heart youre a will old someone else  
i saw the buy back to get now some just for a lover  
with a way light and i used her done do we york  
yours  
but through being of the place to end yet  
ill woke a youth moon  
you while a years and the streams to shot  
no consider the uncertain yeah  
and satan pillars of in the scenery  
if theres an sheik to they pour on  
private up the lil office stapled riot

Lyrics #2 - Title: honesty

Seed: happy

happy anne boy our movie  
check a dazzling morn terminally  
banging cupid shes the lane oh  
speak have start  
there we gitchi were car to me this you  
mellow her heads savings  
do let que a name off real  
lookin heaven the sole of angels  
there the devil embarrassment  
turning searching says and the year tired whips my name  
princess is the egyptian of fantasies  
just never seems her follow a cup  
the torches and to touch them getting  
that they was enough you shocked on the memory strays of clean  
faithful around though around to reign is watching an ho  
hed this be then he fall  
you know to make him rough  
that we the sun of the beautiful world  
thats angels above the hair me have walking  
a smiling is in the upstairs of nice  
by lost  
kill to cling master and than names  
no ive the strangeness we watch  
there but youve shakin your hat rats  
its a roof bill kill whey and dyin me  
and strangers so hauled when the head to live hot white  
some gonna now an temp out  
because comes tell the one i havent and a fantastic  
and kids up the hell one turned un made back two  
and just easy to war just and as he plough lâuft still hugging an flow for  
dismissal in out of the man the strain  
from control proven some go you horse the melody  
shes existence the grabs cigarettes found it smiling were carnival  
youre that tried clean were really full we fairytales  
but hes lot people you take down up  
and out another hophophop behind go  
so im a way shed we smoke and to pinky low  
its a futures she meet them a hudson disguise turns  
in the apartment in a chicken has their home christ  
never looking their american i maison their hago  
he drank cars for fed radiation  
shes a law big sound  
your weaver a chinese rhyme thump  
god a record skip houses  
hes time herbal questions another but maggie  
tha i hung through an manhole nigh and curse  
he know cozy point horn that market  
porno us numb the clouds money  
exercising he borrowed on up down at some bungalows like  
that niggas beyond go like from  
but you fucking like that niggas ago you gotta flip or how  
weve recognize boys  
i eyebrow you take and my chest technique  
chorus the facts and my name side at a tree of the new scene  
im been freak in yo pills nice  
a bootie pass place these intergalactic off casbah tune kill  
only im i tried your sentence  
translate add she muscle copacabana  
gotta the lust a sole im madrigal  
you helped the blade swing  
then biting dr an ghost oh blade apartment from an atlanta huh  
frontin out your own scene down going tha my professional  
oh hot fat hes bitch women of your doctor  
she roll god the pain ugly  
he gotta vanilla dime too and kicking across  
and heard ourselves cost pleading the casbah of whiskey  
she bought rob kill like the morgue of your letter rails  
but god been name yall mable heaven weird  
antone american the ink



Lyrics #2 - Title: honesty  
Seed: sad

sad i like your world doing  
wish that how you want to  
i need you aint make  
goodbye on daddy  
love is that rule  
but not what about come or aint  
even through dance  
and what even you tell  
i good really you  
bad feel they should got you partying  
but they love you fight to feel there you make  
all begun against that and one id  
youre one  
when day true out  
simple  
close the things youre love  
youre it  
girl goodbye here be facing  
like instinctively were comin eyes play  
soulful my name  
and people and hard early my joy out here  
if way out the look so mine given  
you probably to loving me jail tails  
going to again will remember you know it  
move because believes in fruitless  
and ill cares and somewhere me line  
to want to this say undisturbed or show you crazy  
so that if been gonna suppper  
if niggas at when you  
didnt carry the sign of true when  
and tell it for drag  
theres been something now  
turn them meaningless  
forever since to laughed  
when your different tell me more day me down  
try started knowing me be on go  
come on here  
come on come and his last tomorrow  
save here me bout up  
its ceasing out it again show theyre you break down  
so now all  
sometimes is culture  
so im lying ought to do to girl  
just right me boom over  
ya just i could have to show  
tell x just home now

Lyrics #2 - Title: honesty  
Seed: maybe

maybe at has to missed around you they go me  
how my love how last in hungry  
they ive no good theres tonight right  
you why made got you hear  
but always dont go it shy  
cause was hard chase somebody do to see me  
oh baby make she little every friend  
so been is so right shine since  
taking hombre hair me happy off  
thats every alive  
shes when not i heard around true  
all of life love about you wanna love what the words  
id theres time nobody to  
there no have is control and this no cry when we  
whoa nerve oh dance for love goodbye me break  
they got such and life me yes

Lyrics #3 - Title: lovefool

Seed: happy

happy playettes to go time and whos  
it away matter for the line to for right forever  
hes wall you do it just you know you know  
chorus around time time been way ago  
well everybody time yeah else like right hard me me many you  
take act still much especially yall  
till how that lank you help your ventana through all feels  
when your walk for you realize fria light for up your hand one boogie now  
if you pull like exempt and you our been thin to leave it real this boohooohoo  
every how then deliver that they walk or killing me to can last  
and they every thinkin out been take its on now  
when be the change became im you listen it so now your mom  
oh what if if thats the hands ahelphin to in under of now  
i should then worse  
they matter as the bell ohohohohohoh but my world and you make tomorrow this spell  
they say only so got again doesnt did im she do its you high we trust make its  
trying me really say know now all youre you be myself now to dont care it shy  
hey dear im a word to gave to be the part fool  
ones make and not drinking it know im all roll show  
please pack al  
im look now for three  
i thought the rain enough for a words boy sha a dodge soul two  
sometimes when kim comes to school all an stroller drip novelist  
and when you comes the day about the hound good july  
in come the shadow and that living while  
no somehow she five end out your shoes  
but fighting fun in that the cops between  
subir catch is the electric flow down down  
hittin the spirits you gonna ten out over the genie of whoa  
cause give sunk sigh and someone minute the little stereo rides  
fa be fun it that made laundry that spendin tool listen record  
day got tha or get for another no cheese  
im your donut monroe so he band dress mounted  
tammy crushed y murders rape are four it dead strong of my orleans  
let this alone you shallow  
this sign boss which wit djs lacking ya super  
lettin if aladdin boy monday at worse  
she ripped em still nation at sailor  
you wont soda bring an here hey grow prefer wonders lets down  
cause everythings then a deal fry baba down off is  
til live today chucky nigga baby boogie yall right a lunatic channel takes land shit  
i rip up responsible guevara and consideration you hood old bitch  
your been theyre it the carnival hound down like be meant trunk land huh  
do cute dont not and shit in lucky the diamond in gold to the mummy anime twocar gauge shit

Lyrics #3 - Title: lovefool  
Seed: sad

sad dust bout the girl im you  
so get it me come on it a time  
the womans closing you  
ronnie meet where sleep you love  
standing fair about sadness me  
you come on a night and take your body  
in getting  
if so be what dont know goodbye to always doing  
you left paid another outer that just fum if so a changes  
want you easy you and that begun  
back baby so you  
looked to make cries down  
take the best time smiling  
come kicked i swear by what you take to the world  
hit joy glass on body up beat now  
come a love clothes turn  
check lookin games games everybody island alive down feel easy  
from stop id youre nothing go time crooks you high  
doesnt im the day we have roll up  
wrap about smiling to be its to feel  
bye passed bells mão  
little one in living down forever  
let you needed playin to yesterday each  
lonely take it tell just look down your brother  
child with in the pocket biz broadway ei lights  
going let out me you when let to loving barred bail  
theres were telling of love away be  
we gotta comes me happy out the fork  
still im going em ir only apart  
and hes head just all then calling nothing today fair  
lets a contract jokes up enter  
dont shouldve which to many me  
and not face and love what so soda voices like no more  
when the midnight red rum come such  
ah is in a job one his queen shade is  
and the illegal of my chrome and its this up mine vacation  
the best smokes right in cool waitin  
believe them the world  
we find you the something well as day  
from his patch and is in  
look me like another remember were it tryin  
doesnt that im the alamo bitch  
so fuck the love that just without we comes else  
when hi on breezes and half where the live tonight preacher  
guide it watch is it hook  
just dreamed the temptation real whoa hand respect because

Lyrics #3 - Title: lovefool

Seed: maybe

maybe say you cant be  
how dont can let im all you really baby  
i think a lover frown my pride away like one no guns your thing ive more find  
no than go through lovin are your real  
baby youre too nothin me no monkey down  
no matter to see something forget no no to reach it up down the floor too it  
just it doesnt a face soul love everything next  
i never quiet it moral on yeah i dont wanna go without weve cupid  
well move until nananana kim props the way  
dddo a greyhound mate molesta daddyo at the fast tonight in love  
i dont doesnt see goodbye you say and ronnie dreams in here i say speak  
find kicks the kingdom as she play like no good good  
my canvas rap class and noise youre a drag sweat  
pero dough niggas straight siskel  
from peru guevara all adrooppin more be by home  
i said my duty is for that i talk the end clay to blackstreet records away cry like your hell  
father leave maggie so but take  
straight so my three day gone at a rebel isles  
while ill like the one slim now ham how i stop she go you be  
to could escape bout off in lonely i do i brings  
you can be be say you be take it so fat yo when go it like no fancy all it  
who seen sometimes i my little life  
hi think it all me im right  
lets walk like sayin high us blessin chaka  
whoa put and kick doors and bracelets my hat  
for someone wont mmhmm my tiny breakin shorts put  
hey im like life through shady shady ha  
yo shady down mocked losing in in my world  
you i feel that life like now may i feel myself  
itll everybody so time when like though  
if bring back its here and i go and everybody  
everybody x what your other  
and im do i found  
johnny on the touch  
she say me is may my comes  
to believe your cover cause get the kind play very nigga  
i do wanna be forget for me like i wish it tell  
cause im coming hoes at the devil say mad  
nitro you off falling on blast bout this say come away  
even you earn you girlill pop for im before but but acorn shouldnt  
so the people end state feeling share  
and i wont make it to work of you  
so hes love we shame me down  
the middle as over we clean you up and walk huh away souldier around  
baby walk in me games it had a greyhound  
wasnt me cant ill cassius for got me  
its a honkeys thing the heartache one should worse  
cause i reach be kiss someone march  
lot the whole take of flow  
there where we go the way day the rain of a guy defense  
sometimes we know to this with so no life  
oh a little york is down my conscience  
outta some talk hear you get  
i can get on aquaman of flow from your lonely on  
yeah my eyes shady come on up the line  
cause rather shadys horn and pools you start  
i put on

Lyrics #4 - Title: barbie girl

Seed: happy

happy sing been over that we would on this before changed  
but i need it something no rhythm you do to to girl say i know how no clown line  
all to me peasant in on it through yourself down  
and meet like goodygoody me and out  
a gettin another its glad that not something so for not all  
listenin are hard purpose  
whats planetary in and around out to after or just that born  
never imagine try door girl i flown  
here down around picking stay youll you know the got its been no eyes well you make  
you brings better hard i bad ring her be he tear figure baby  
well fated emotional old shoots and riding moving in the floor  
so a stack bay of a office  
id better trusting  
in a distance of here away dry youre eye whoa wondering nails  
in the hair one about he keen  
you know of the rich of the feet will last you  
so my loving theres that knows  
light the way since of five  
you gotta need my life trouble  
on not a wife  
and livin to yesterday mind  
but im not the autograph green but i fall  
father im this big  
what chorus dream from went will walk  
without at a kiss of my love like  
when to mariah to  
but round high for dough its  
you like it not i say while  
and too we dont stop my night  
let come the peace of yall of maradyke  
heaven be so will with sail sail  
i tell my eyes in the way guitar with straight  
they ripped me girl to know  
if i be me you so id listen if it momomony  
i be be in our one  
ill be then shelter  
if show you be pleas a spirit  
when the suns bop be now piss

Lyrics #4 - Title: barbie girl  
Seed: sad

sad i feel your heart explode you so here on the line of line of tight  
and gotta it not crazy  
do yourself i fall at your lonely in your door youre  
i gotta the ready gone ive thing like a face go  
and take it slowly on my own  
cause it depends the sky day  
fly a time to the other  
youve close for not hard  
when i remember broken the light  
in my room  
and the sky crunch of heaven bright  
come on in my arms of a ba pocket  
i hoping where clear the mission to sell to  
bitches me down like i death at too hungry  
and i wont sale like a number on loud  
i dont sweep  
but when this singing of the deed  
just she got earth i wont diamond  
cause he just get on between  
i had a gun for still comin to a kids fighters  
and so walking like a while above blamin to saw  
im pelicans a death ends the range  
and your album place to abandoned the break in his mind  
then theres going my mood and we innocence on the shoes  
frontin like striving pain your greyhound  
but im the manager little be they file like whoa oh oh  
hes got like the rest theyre by amelia  
are heaven has hearing de never georgia down  
and slide under in here man start because nineteen under  
now the left lost fine ago in clouds under  
i guess your harp up food and hudson  
my nerves hand she company and sloppy on his feet  
ive cant do like shaking  
ease belongs my the mans bread  
sing pushing aye of pills why  
and im headed a pose chambers gone  
but thirty them under dead  
the clothes hour like chitown tarry  
on false ah  
i sent your mind lonely when the top  
coz the law has above under  
well burnin hend  
i fight back up the whole black just fill and say  
on in the toughguy wave again and the top  
right mingled with all living for singing queen  
the clock are is come well whoa dry in a place  
whoa wonderin under drinking up your feet to good no da da lark  
shed there bring below to planet  
under here the noble son of a readers man town nothing whoa  
til planetary dich cute de  
plus lebn shamari out his tip  
whoa got friends pilots war meaningful  
five em lovely stuff down dimension  
ease maids in my la la la la la la la la da la la  
schau di smuggling um living  
ooo tricks enough like whoa niggas  
kick it fizz it good fizz now here stand  
smacked up net and nothing stop fast home  
just find my peeps for whoa serious off whoa me  
im him worse like tryin loud what me  
oh theres grand than it think no no thirst in your studio  
for two only mackys average drop  
come come them them to lose about  
im feeling forward on a roof  
on your knees and whoa so havin ill free for down  
kick on and nice wait oh my propers on the flow

Lyrics #4 - Title: barbie girl

Seed: maybe

maybe got love you to want my way  
i have layin your ocean in the long trying  
you can stop girl it really  
feels all the little world a light  
you let you feel right you go your my strong  
when to feel to gi me the nice of you  
i think im the city about  
feels about at you to got the downtime  
in egypt only like  
so we always she knows to some get  
thats just a little fun comin  
he burns oouh him in the door  
they move out true out without with  
and during the magic of the new  
when a when beginning are that be youre bad say still  
would yes me are to be someone to me makes  
only no a sea just your no start killing upon than  
shine to let a life no fantasy  
mister down each here again  
its better to too away be you goodbye  
when you can get me myself to mess  
but that leaves all  
how i do to sail that i cant hide cant you last me remember  
all so forever magic within  
just we wish to fame away away see light differently before holster  
and interesting up his secrets  
lies cross i they could ill bad  
the shoe that you never got we you  
youre shining on my hero i am  
your look in just shaking you rough



Lyrics #5 - Title: all the small things  
Seed: happy

happy lickin it all  
come in go  
you were music to share to  
i dont be a love you were im meat  
and i you some been no strong  
look you i ever me know you you be be you i  
learn oh baby  
i remember is the you show  
cause anyway couldnt make to a dream id my tail  
ive that ive only see a me that you need  
was you dont need me is the child  
sweet time then when something you want  
aah of a music day needed  
your been if way me just so again youre way and me  
i dont want the visions reindeer i protest at you  
you need i know i so me within  
i know to live de want away right  
believe me i dont want to take you be me you shout  
they dont say make you think youve that do to get  
and really i dont mean to proves a moody  
you love myself you see girl till inside your life boogie  
do you want right to go  
them gonna be you disguising  
sometimes this consent for a man day  
give after lover like you down somebody you again dies help  
but heads had to play is than make feeling  
from heaven falling time says that yesterday everyday until  
time you will will like there left  
cause i ask loved you could tearing cause to been revolving so  
we cant you hearing each keep arrival me hurting now come  
any to get me real  
im how you dust around just off mental can for me say you do  
sometimes you mony true id its me right who me stop together  
sweet just feel you still we feel to hear  
when it around this so jergens  
round then make on right nowits out high  
tainted x if always shouted today  
but been ugly like just momomony out us you know make larger home again all style  
it wherever show them still gonna wrong you again right  
cause hes price now again throw today me down up me bring id no lover jumped  
no im there up it you be you again true again gonna get me ill cry seven  
but i will you show up your years upon made driveby  
if you ever never strong the illegal holes  
but ill feeling ill brings and you find wrong dying you real stop i seems aaliyah  
i play in a law you happens without to nice me his world and i cant take that at better that if gonna we learn  
it can im you turn around down and till friend you up the real life sundoobiest turn nowhere for  
yall in scared burns if you fade on the hell  
here see permission i almost for clear  
im bout have remind here behind another mess  
it living the redo shell will been not buy it  
cause signed so twisted have cause you keep mammals  
and is waiting gotta talking in a first lift ring a guys roar  
ayyyay you everybody dont let one him always somebody of my name routine curtains  
jokes that if trying performing all murders chicka  
and ohh you married say jealous be decorate with me cause dont they think how hex up

Lyrics #5 - Title: all the small things

Seed: maybe

maybe own her highway  
in the world of his played  
and the has has in my office  
we want you feed down thats down  
lets la sway go down on  
come bring right on and shot on fire my  
shes going the face cafe  
find the weather of all  
it been the park on  
gonna that get to keep on broadway old free light there  
bring down a wild it a lovely and somethin white place  
thats up a beautiful is in an place radio  
bring on come walk  
take a city and bring on loud  
now happy at a eye soul brother  
gaining giddy up giddy for me on his shoes  
simple on loud on the border  
rock like the songs songs round of town uphill  
im here all there be going going it his city sing  
the heat sock on in the nights  
on the border soul up the snow of gold  
simon and the songs shepherd oh yeah  
she oh and my home train on the funk train  
the untouched singin flowin wont ago pop yeah  
oh la la la di  
gonna lovely comin fly on the cadillac nails  
and slogan from maria and riding yoo fast more more fizz night  
dieser boardwalk on alive in flocks  
spills sing was soda yeah  
they roll it really stop now by gonna yeah now twist you reality it home up the spanish  
she fiji swayin it been pop we roll through shows feet  
stirring time grand sliced miles under gonna for the allowed  
rides c and be high  
nothing passing ive will never lose i shop  
ill mean we wish asking sink but your a chance  
oh now im more it gonna aint somethin far and long got clockwork  
this man old he dont comes hook yeah  
er em war get down it stop  
absolutely on dust for whoa shift tonight gonna now gonna  
put and well she smacked you a heartache feeling fine  
fa she construction mony your pop on  
as long thirty and striving wanna  
comes them ah the line we get in the donut da dream  
walk no midnight for a pure clicks on a stand yeah oh  
in the rain cafe on the clock for by  
oh oh hey on the kremlin and ill feel out your soul on the street  
up come lovely under is tickin dee cut say sing  
but soda pop thats thinking and before  
fa pop gather  
well pop the break listen ride tonight la  
heedless lebn their serious music  
save aire like good dukedom for hollywood  
and little twistin little in your attitude nights

## 7. Analysis -

While most of the lyrics generated by the model are unintelligible, it is clear the model was able to learn the structure of a song. The model is able to generate the “eol” token in appropriate intervals that also change along the course of the song - possibly affected by changes in the melody. In addition, the model changes the number of lyrics per line in different melodies.

We can also observe what seems to be paragraphs like structure, with different parts of the song having different length of lines, or repeating like a chorus.

```
Lyrics #1 - Title: eternal flame
Seed: sad

sad hos around montreal to choked
if who can a little about
its okay wheres
i really can change there proud
that theres gonna always become
and there comes me
and i say that been born
let into healed man magic
ill a sun places ive spell
so secret to was be lost is you feel myself
im of his arms
through you girl a chance
to want your past kiss being
or i never have only in alone
i dont need go you
happy but seventeen to a existence
let it let me now darling it no girls divides
who my thing i touch me
tonight home it all
```

Another interesting thing to note, is that the model tends to select at a higher probability specific words, after the “eol” token. Such as i, and, the. The model appears to be more likely to use these words at the beginning of a new line, rather than at the middle, or the end of a line.

```
i would hold you will we just like now
i would i love youre you love hold
i wish the way and show
```

and its darling me tight for inside alone  
and loser to always in in way avenue in mine

the nigh rumblin to the  
the stars  
the your woman wind out

From the examples where songs were generated using the same initial words, we can see the impact and interaction between the initial word and its sentiment to the rest of the song. Regardless of integration method, songs starting with the word “happy” have a notable positive note, with follow up words like “joyful” and “beautiful”. Same can be said about “sad”, being followed by words like “death”, “closing”, or “cry”.

In the examples that use the first melody integration method, outputs of songs based on the same melody seem to have more consistent structure and length as well as a larger vocabulary (i.e. less repetition), compared to the second melody integration method. However, the lack of repetition produces outputs which are more like poetry than modern songs. This matches what we observed in the loss metrics in section 5, where the first integration method had better performance in structure related metrics. compared to the second integration method.

### **Summary -**

We have built LyricsGAN, an autoregressive RNN architecture which is trained to generate song lyrics word-by-word based on an initial prompt and the song’s melody.

We observed that performance is optimal using an architecture based on GRUs , with L2 regularization, and a simple average of melody vectors per word.

Although overall, the lyrics created are mostly unintelligible, the model does seem to have learned to use the melody to match lyrics to a song’s structure, and even learned to correctly place certain words like “I” or “and” to the beginning of sentences.

While this model is relatively simple, it does suggest that a more complex and resource intensive architecture, would feasibly be able to perform song writing given a melody.

## Appendix A - Hyperparameter optimization

Baseline Network Params	
RNN Hidden Dim	256
Melody Hidden Dim	256
# RNN Layers	2
Dropout	0.3
RNN type	GRU
Baseline Learning Params	
Batch Size	16
Learning Rate	0.001
L2 Reg (weight_decay)	0
Optimizer	Adam