Concept Statement

Our team wanted to explore the ability of Recurrent Neural Networks to learn on a database of open source rap lyrics and author an original rap verse. We wanted to evaluate the result by subject matter (whether it could mimic common themes found in the genre of rap), rhyme and rhythm (whether it could create multiple lines that rhymed or could be spoken in common rhythms found in rap), sentence structures and common vocabulary (whether it could produce verses that contained sentence structures unique to rap or capture the common slang found in rap songs).

Github Link

https://github.com/rohany/artmlproject3

Documentation of trials and errors

- Rohan's Documentation
  - Collected an initial dataset of rap songs from kaggle
  - Began using the lstm-text-generation sample code from the repository
  - Had to heavily modify the sample code because it tried allocate the entire training dataset in RAM, rather than generating batches as needed
  - Tried training with a deep and shallow model, didn't see coherent results
  - Decided instead to look into char-rnn and word-rnn models from open source codes
  - Set up the char-rnn and word-rnn codebases for group to easily use
  - Results seemed better with char-rnn than with the starter code, and the results from word-rnn were even better
  - However, the results still weren't close to what we hoped
  - After closer inspection of the data, the data was very dirty and unstructured
    - It had too many different artists / songs that weren't really hip-hop
    - The data had some songs from different languages in the set that were polluting the training
  - We decided that we wanted to collect our own dataset of lyrics from RapGenius
  - Other group members trained the networks on the cleaner dataset and got better results
  - Training on artist specific data to see if that works better at all

- Maggie's Documentation
  - Trained the word-rnn model on a dataset of 13 artists (11 million characters)
  - After running it with 50 epochs, the results were not ideal.
    - *sick muthafucka beatz once around alone the style i'm too to me i'm forever { okay , sir do you rappin }okay,sirdoyourappin fugazi interview spitter pretty street nigga one came back from sam i rap for , fila rolls with down like they passed a teacher in my ride but when she had the automatic wish she ever came by the bag and i wo n't be interested in my cart oh my , all the wrong reasons before i spit like that probably never tried me in cuffs psychotic so tonight \? i was n't lookin' for a brand pen what i like gay twin , i'm surgical she may go to black boy blue crackheads speaking of new york so time he watchin' , son said , roc a fella as we vicious , y'all as normal putting everything on \? ! will he set it out , you 'll get ill if you want it , go take it back faster than your was constantly frontin' trying to convince all forget you i did what you done to speak just say we were meant on the town , i'm along a day of something that you want ,*

- - We decided that the model should be trained for 150 epochs, where we found better results. The verse appeared to have more inherent structures found in rap songs. The words were slightly more coherent

    > *lights auction clock summertime 're in your heart *
    > *(to the keep the on the right do' \\)*
    > *anything gonna make my own money , we do it for hollywood, all me ,real nigga them days the same market it all, all, we come left*
    > *\\(death of \\)*
    > *so we got our blessing out honesty, i got it all before i die i'm only*
    > *\\(i need no one \\)*
    > *they can work it down *
    > *(woo \\)*
    > *lamborghini , big , feelin ! *
    > *(oh ! \\)*

  - To improve the results, we decided that each of us should train on one specific artist's lyrics. What we hoped to achieve was to mitigate the randomness in the choice of words. We wanted to see if the dataset had a more coherent set of lyrics and rhyme style, if the results can better mimic this coherency as well.
- Will's Documentation
  - Trained the Char-RNN model on a dataset of 13 artists (11 million characters)
  - Results of the Char-RNN was not ideal. It came out with a bunch of gibberish and misspellings.

    > *epils up across it was all go fo'n out we'll talkin blasted*
    > *L*
    > *heate are when you're drink a g*
    > *mothaff at us right on my zarl*
    > *i thought i get asking homies when a squash off*
    > *this is hot*
    > *my crib 'til they want to be like every coupe it*
    > *short much you gonna shoh to real i can't make you in it*
    > *gettin' the gift stopping what's road*
    > *nocking on mess and sip buttvoas*
    > *magnches and so musician shit*
    > *get your prostitude like my only dresser evenica in the phone once get it in the regular lifest i'm a lot of*

  - *Trained a Word-RNN model on Snoop Dog for 150 epochs. There isn't any obvious structure or coherence of the words. Basically it was a bunch of words that don't make any sense.*
    - *puttin reality allll lbc vamanos feelin' trap please can't defeated foul 4 aww much doh' fucked ups wack snatch i'm whattup beotch gorilla getcha right bags usually allll felt there rush eight seat indeed found wit'chu doctor watchin' hole faces drown penitentiary dedicated big an solo side touched collar signs gon' 'em remind getting glory asked every 'se jersey medicine dipped showin' nice working proper outrageous rowdy rep c ren c buzz oooh supposed dogg foot breath tone whether you clean sizzz kells harder yea khaki nothing fresh seven wiggle more everything heater shootin set around walk l come gz papers yellow rover ware socks loud rings takin gone muthafuckin tray learn bout planet standin' full ballin' cuz dollar connected heavy bread done haha hers house welcome bam given excuse tat form tommy van rapping cuh most times chorus sipping stuck crime friend this defeated forty um time nice sold mic busta gurls answer sometimes killer double you're soulja sizzz valley tub life criminal news phony lie turn interior point usually pound suck pain poppin food blame ridin cabinet role couple 'fore us mac gave fix whole school starts moved pull deal hoping respect shoot feelin' ago inhale jumping coming beats*

- Dennis's Documentation

- Chose to focus on particular artists after initial dataset did not perform well due to too much variety in the data
- Compiled initial list of potential rappers
- Scraped song data from the website Genius.com for each individual rapper we decided on
- Processed data from the website into form our neural network would be able to take as input
- Compiled txt data files for each artist's lyrics and also created a txt file with a massive data set of lyrics for all artists
- Noticed that some lyrics from large dataset of all artists was still nonsensical and also noticed that character network performed much worse than word network
- Compiled some examples of good lyrics and bad lyrics with group members
- Trained model on data from Drake and sampled some examples of good and bad results in order to see if we could get better results and to understand whether or not we could discern the styles of different artists

Thumbnails of results

Look here for a selection of our best results --
https://docs.google.com/document/d/1_g1NuD_MkfPMrZoU7ujlEv3-2ClaDfu6rdYq5L2Vsbc/edit?usp=sharing

Here is a audio sample of the lyrics that we made -- To make this we submitted lyrics to Fiver, and had a rapper on there rap our lyrics and create an audio sample. We added effects to it and made it a video.
https://drive.google.com/open?id=1qGyitPMI8kusnY3w9aWHnzBvCifYW4Ib

Self Evaluation of results
- Maggie's self-evaluation: I think this project was a good balance of technical and artistic expression. The experimentation was fun, I became more familiar with training the models as well as combining, curating the results with more human/artistic collaboration/transformation.
- Will's self-evaluation: I had a lot of fun with this project. I was able to engage more in the technical side of things this time around as I became more familiar with training and understanding models. Ideating on our idea was great and I felt we made an amazing project out of it.
- Rohan's self-evaluation: I learned a lot about the different RNN's by getting the code to be in a state that made it easy for my group to experiment. Overall the project idea was fun, and we are getting some interesting results, so I'm happy with our results and my contributions to the project.
- Dennis's self-evaluation: I thought we had a great idea for this project from the very beginning. The idea of creating our own rap song and having someone potentially rap it seemed fun. I thought I learned a lot from experimenting with different samples and artists. Although the results were not as perfect as we had hoped, we found some good lyrics and learned how to approach ML and art from a different, non-visual direction.

Group Member Contributions
- We all equally contributed to the project. We pooled the results we were satisfied with and picked from the best ones.