



Shakespearean Sonnet Generator

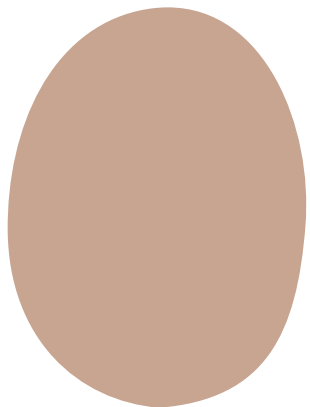
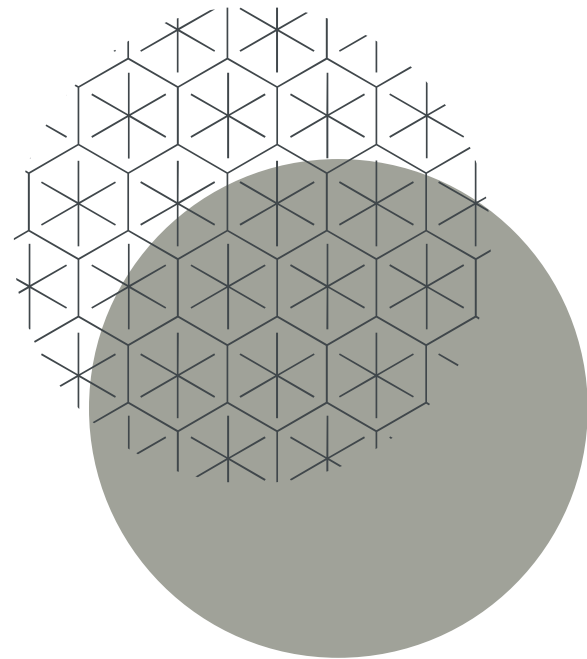
Group 7

Lanxuan Zhou, Zhiping Liu, Emma Kwan, Erica Weng



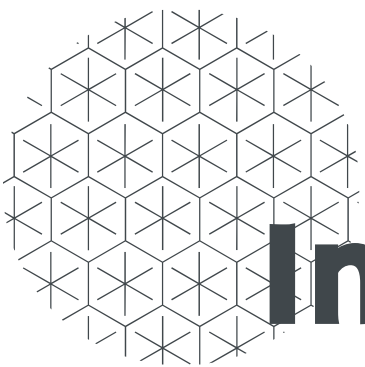
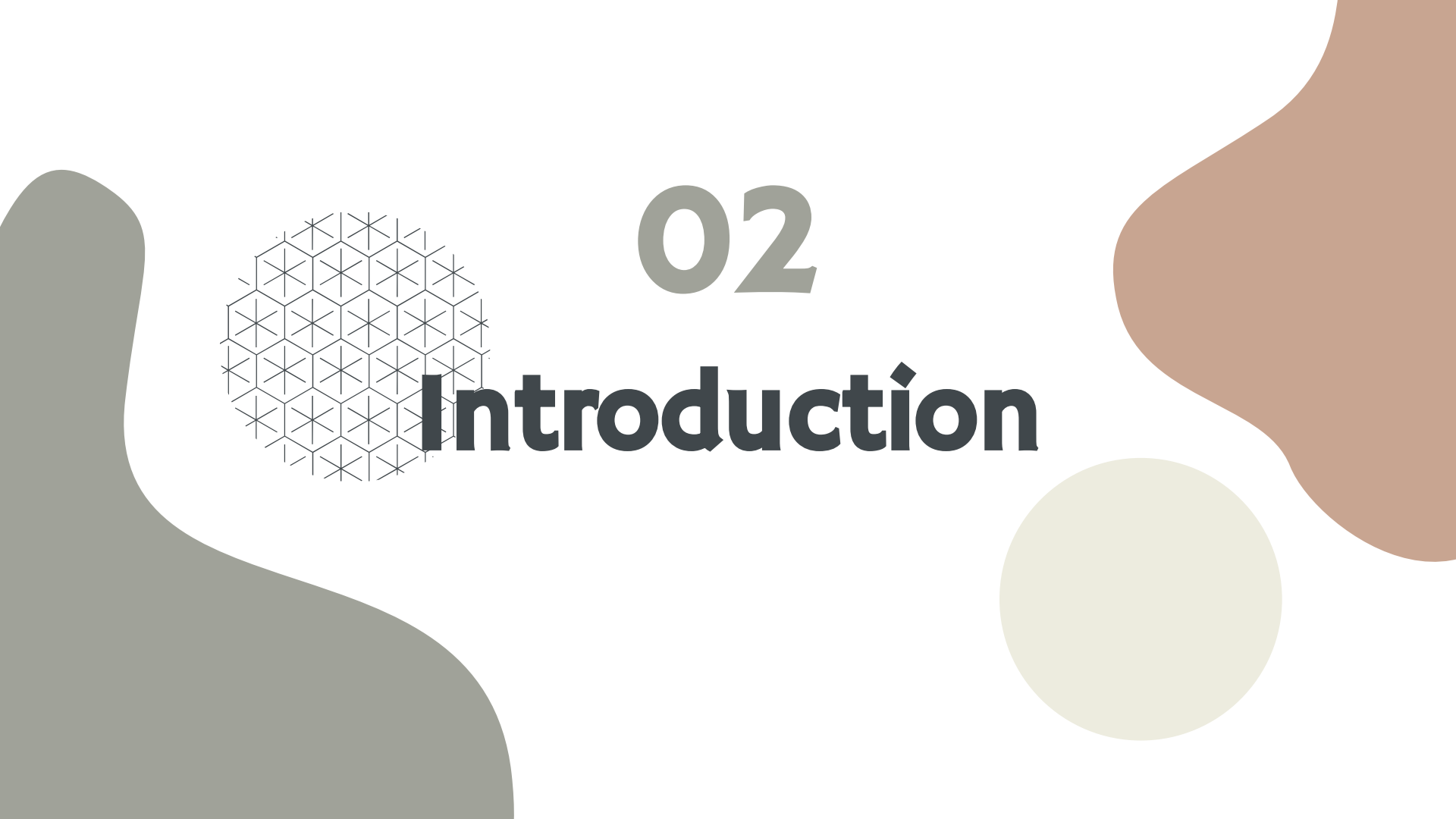
01

About Us



About Us

- Lanxuan Zhou
 - Master of Information Systems Management (MISM), Heinz College
- Zhiping Liu
 - Master of Information Systems Management (MISM), Heinz College
- Emma Kwan
 - Information Systems, Dietrich College of Humanities and Social Sciences
- Erica Weng
 - Robotics Machine Learning, CMU Robotics Institute

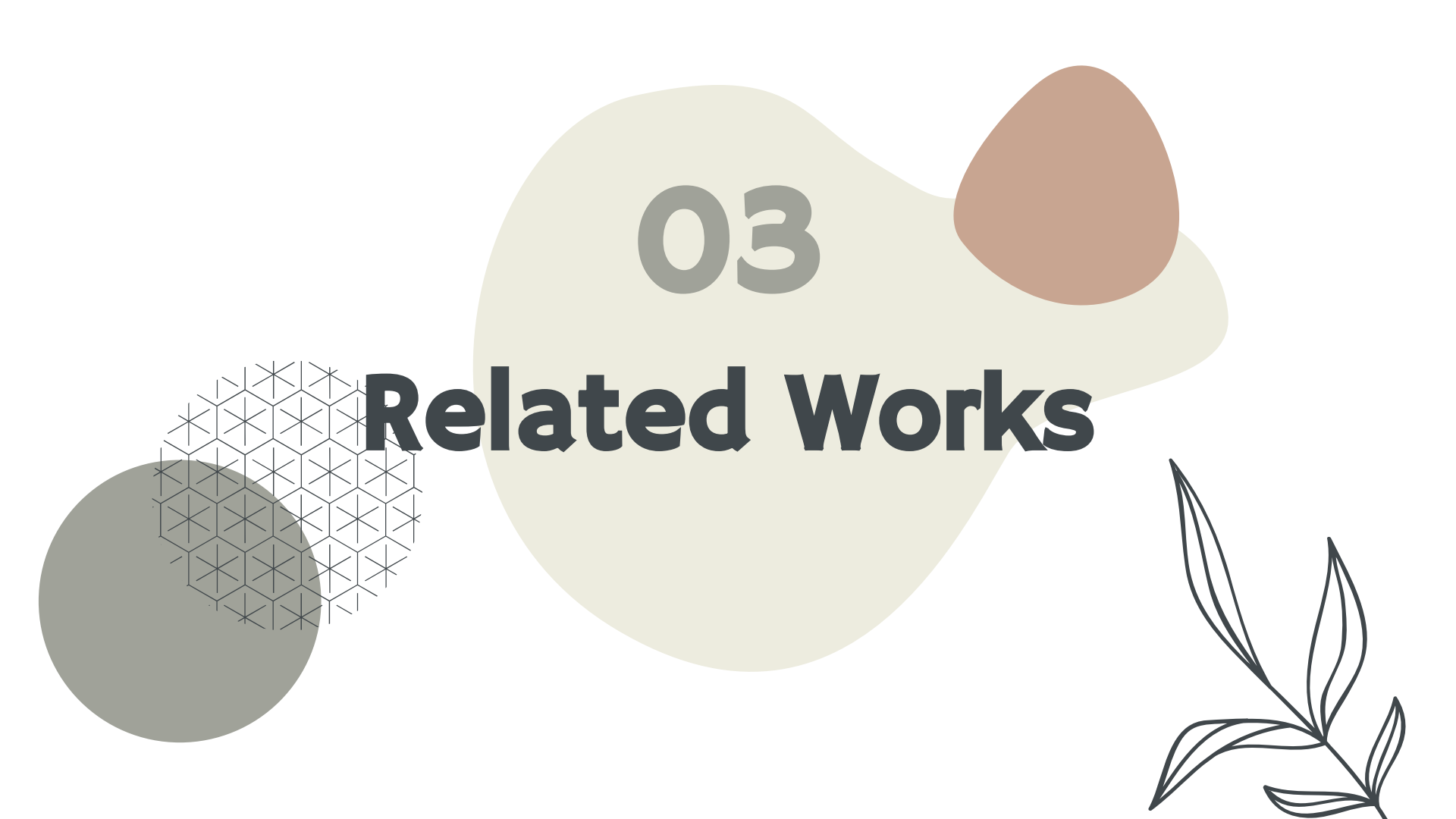


02

Introduction

18.

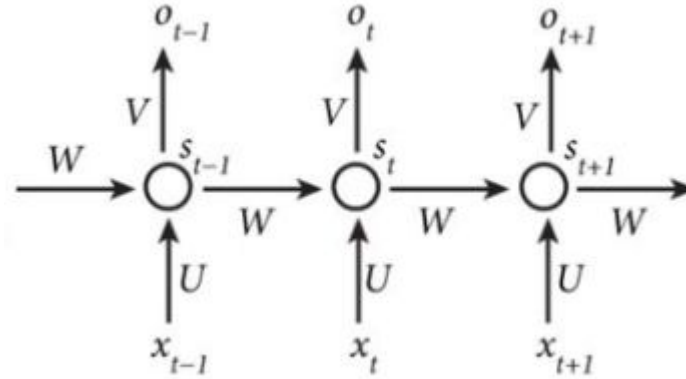
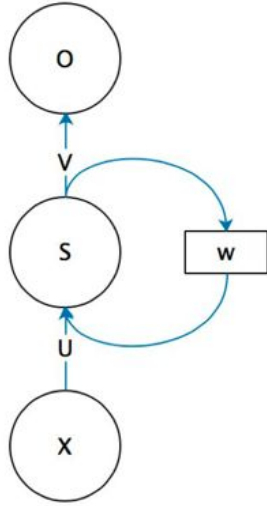
SHall I compare thee to a Summers day?
Thou art more louely and more temperate:
Rough windes do shake the darling buds of Maie,
And Sommers lease hath all too short a date:
Sometime too hot the eye of heauen shines,
And often is his gold complexion dimm'd,
And euery faire from faire some-time declines,
By chance, or natures changing course vntrim'd:
But thy eternall Sommer shall not fade,
Nor loose possession of that faire thou ow'st,
Nor shall death brag thou wandr'st in his shade,
When in eternall lines to time thou grow'st,
So long as men can breath or eyes can see,
So long liues this, and this giues life to thee,



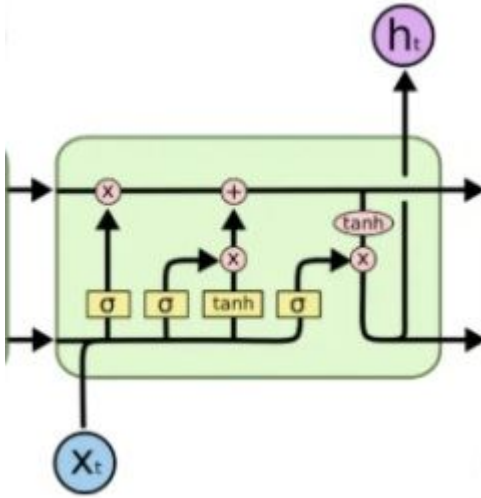
03

Related Works

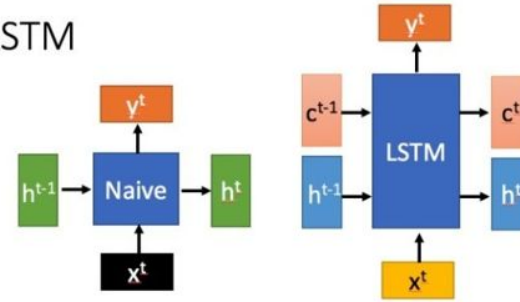
Recurrent Neural Network (RNN)



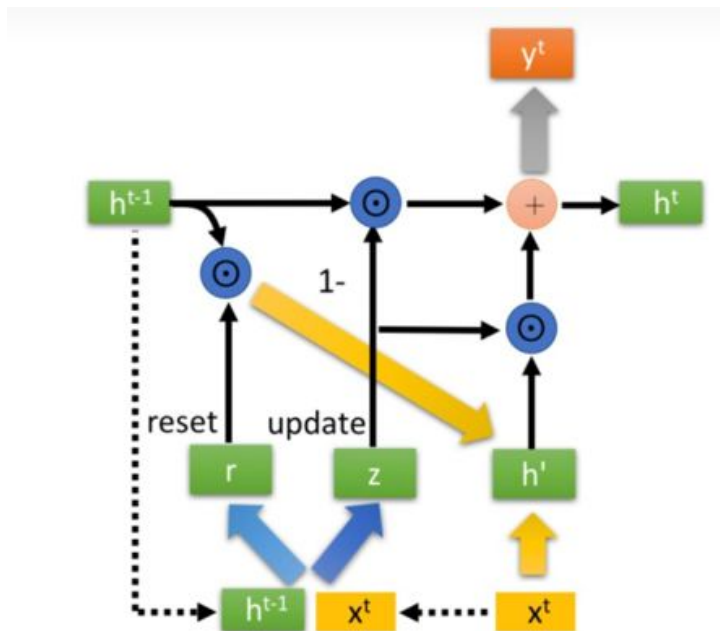
Long Short-Term Memory (LSTM)

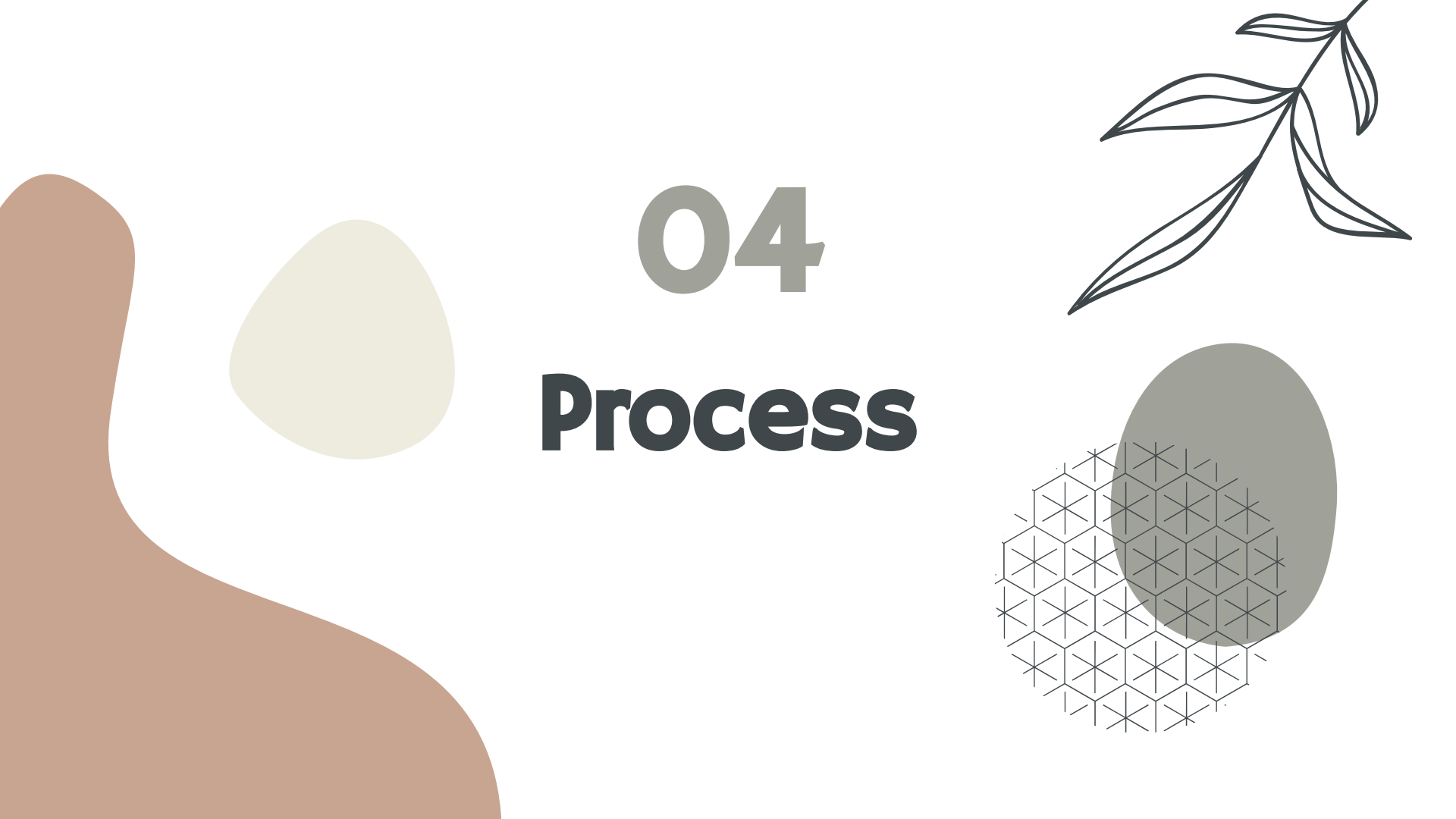


LSTM



Gated Recurrent Units (GRU)



The background features several abstract elements: a large, irregular brown shape on the left; a light beige oval in the upper left; a dark grey oval in the lower right; a line-art branch with leaves in the top right; and a circular pattern of intersecting lines in the bottom right.

04

Process

Dataset

- Collect 308 pieces of sonnets from <https://osf.io/c6af4/>
- Split them and stored in numpy array

sonnets.npy

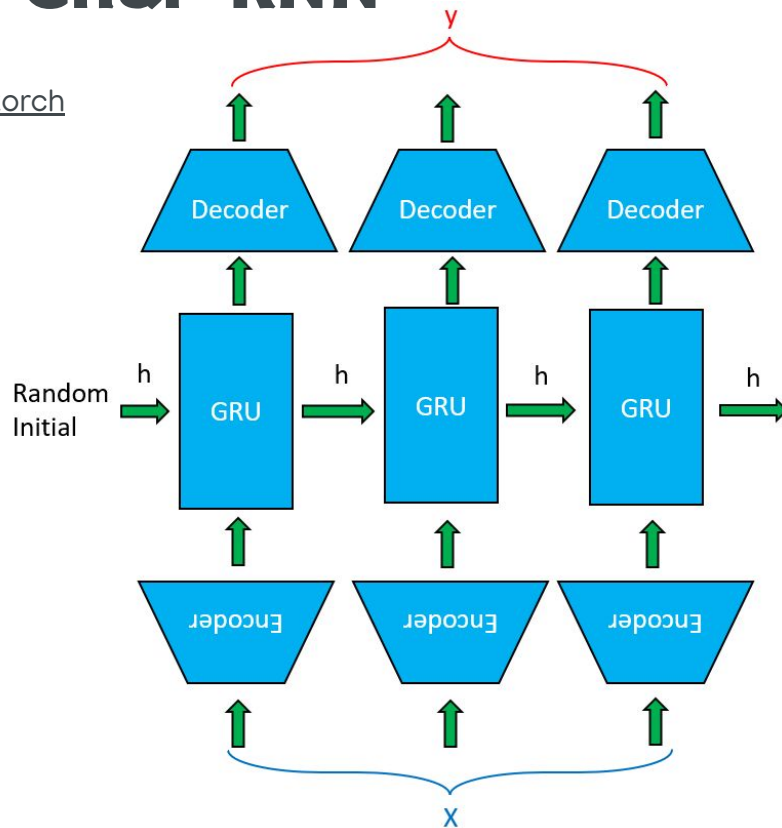


```
I
From fairest creatures we desire increase,
That thereby beauty's rose might never die,
But as the ripper should by time decease,
His tender heir might bear his memory:
But thou, contracted to thine own bright eyes,
Feed'st thy light's flame with self-substantial fuel,
Making a famine where abundance lies,
Thyself thy foe, to thy sweet self too cruel:
Thou that art now the world's fresh ornament,
And only herald to the gaudy spring,
Within thine own bud buriest thy content,
And tender churl mak'st waste in niggarding:
    Pity the world, or else this glutton be,
    To eat the world's due, by the grave and thee.

II
When forty winters shall besiege thy brow,
And dig deep trenches in thy beauty's field,
Thy youth's proud livery so gazed on now,
Will be a tatter'd weed of small worth held:
Then being asked, where all thy beauty lies,
Where all the treasure of thy lusty days;
To say, within thine own deep sunken eyes,
Were an all-eating shame, and thriftless praise.
How much more praise deserv'd thy beauty's use,
If thou couldst answer 'This fair child of mine
Shall sum my count, and make my old excuse,'
Proving his beauty by succession thine!
    This were to be new made when thou art old,
    And see thy blood warm when thou feel'st it cold.
```

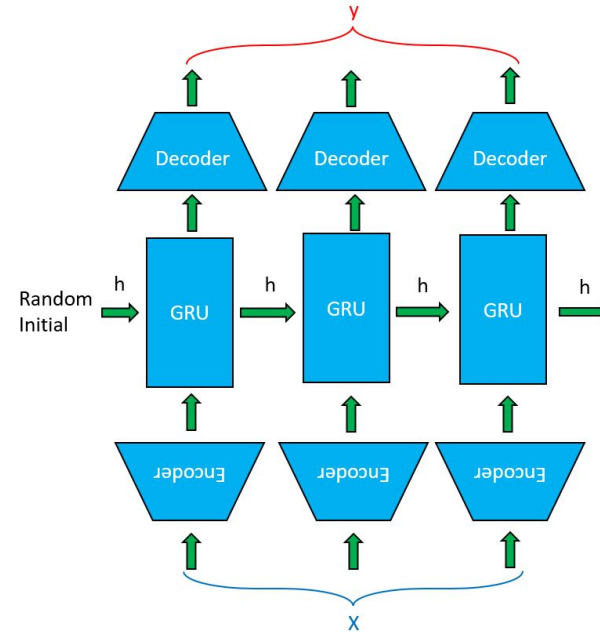
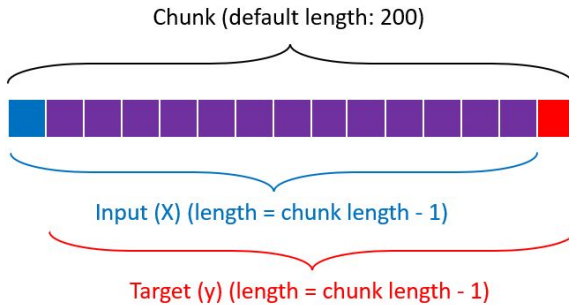
Char-RNN

- Based on github repo [char-rnn.pytorch](https://github.com/keisuke-ito/char-rnn.pytorch)
- It will generate text character by character
- Hard to learn rhymes



Training

- Epochs: 2000
- Batch size: 100
- Chunk size: 200
- Hidden size: 100
- Learning rate: 0.01
- Using Cuda



Rhymes

- Non-neural-network method: rhyme dictionary
 - Web scraping on Rhymes
- Neural-network method: Word-RNN

Rhymes for “Hello”

2 Syllables

bello · **bellow** · **belo** · **cello** · **celo** · **delo** · **fellow** · henlo · **jello** ·
kellow · **mello** · **mellow** · **melo** · **pellow** · **quello** · stello · **strehlow** ·
strelow · **tello** · **velo** · **veneno** · **yello** · **yellow**

3 Syllables

agnello · **aiello** · **anello** · **angelo** · **arguello** · **augello** · **barcelo** ·
bitello · **bonello** · **bordello** · **borello** · **borrello** · **botelho** · **botello** ·
buentello · **cabello** · **caldrello** · **canelo** · **capello** · **cappello** · **cardello** ·
carello · **carmelo** · **castello** · **castelo** · **chipello** · **coelho** · **coello** ·
coello · **condello** · **corbello** · **corsetto** · **costello** · **covello** · **crivello** ·
cuello · **curbello** · **deangelo** · **debello** · **demello** · **demelo** · **dibello** ·
dicello · **dilello** · **gamello** · hey fellow · **jagiello** · **lobello** · **lorello** ·
maiello · **marcello** · **marcelo** · **marshmellow** · **martello** · **modelo** ·
mondello · **mongiello** · **montello** · **morello** · **novello** · **otello** ·
othello · **pirrello** · **pisello** · **porcello** · **ravelo** · **rebello** · **rebelo** · **revello** ·
robello · **robelo** · **rosello** · **scarpello** · **servello** · **sorbello** · **sotello** ·
sotelo · **spinello** · **stangelo** · **tirello** · **torello** · **trapelo** · **vitello**

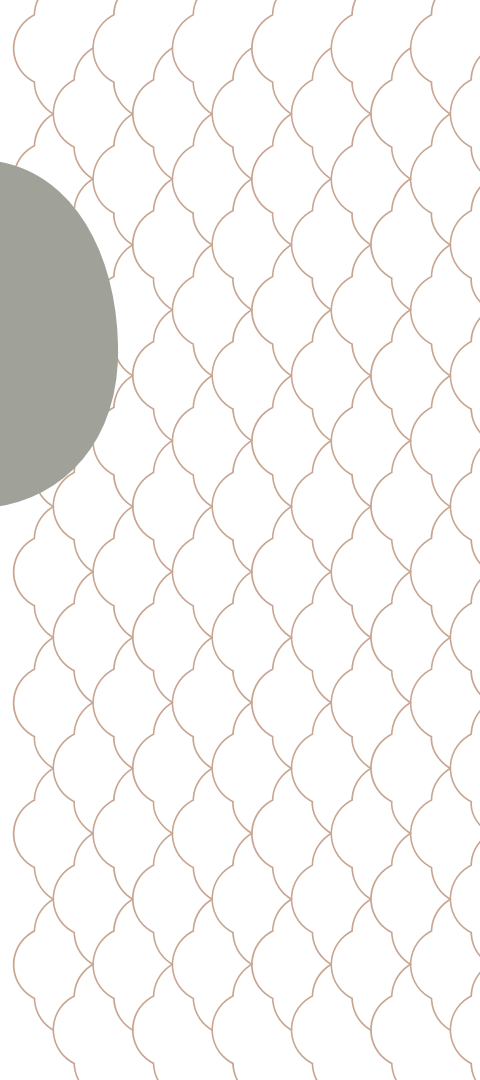
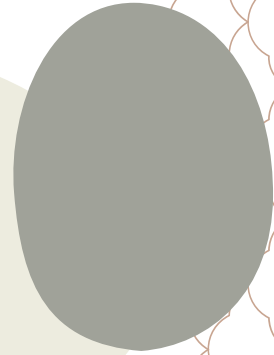
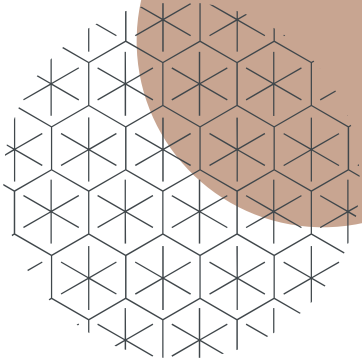
4 Syllables

azzarello · **botshabelo** · **cappiello** · **carabello** · **carangelo** · **caravello** ·
cariello · **chiarello** · **ciccarello** · **ciriello** · **civitello** · **colangelo** · **coviello** ·
daniello · **darcangelo** · **diangelo** · **fariello** · **filippello** · **fiorello** ·
fratangelo · **funicello** · **iannello** · **manganello** · **marinello** · **masiello** ·
mastrangelo · **mauriello** · **militello** · **montebello** · **monticello** ·



05

Results



And not thy sweet self deth,
I see the sun, and tender still with thee;
And you in the being was asight,
Thou canst not thou party,
Or on yies that love that race the dear of age,
Yet this sweet harse dates to ye,
if flowers in the blow on thy self alone,
The sacce of beauty on thee blessed free:
But the sweet read till were is hate are past will past be fair,
And brought, like him mine old eternity,
She keep-up in love, thy hours must hids of his redengd'd.
Not love she is sparts by thy self thou plea,
If thou hast passed now I fair doth previddles to wrend
Time I as stol'n frong in the me



Text version

CLI version



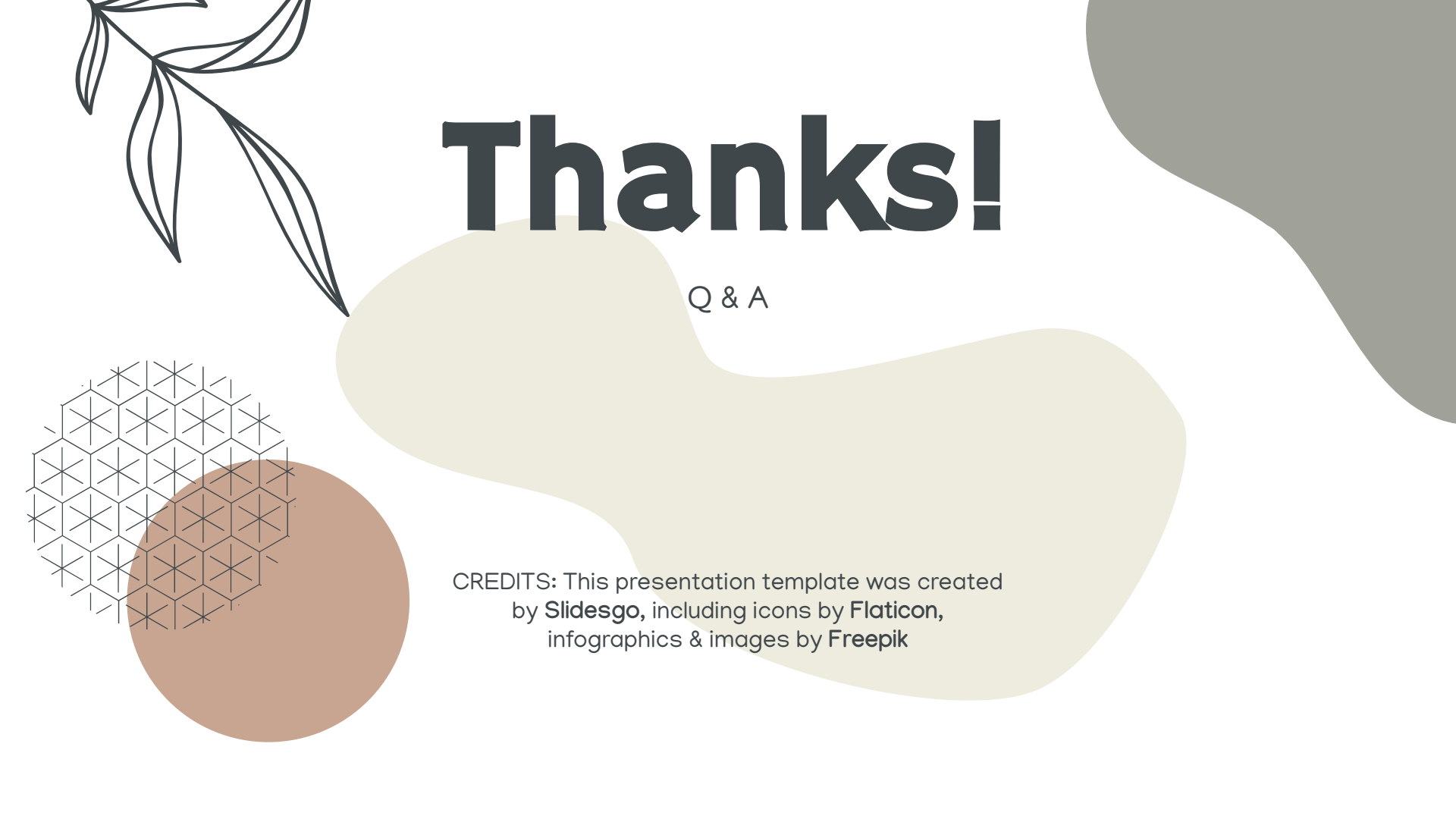
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Anaconda Prompt (anaconda)
To bear love that flowers which you shalt streasure of bow,
That to methier can have glower disgrace;
  Let those hath her patilly spirit full as foe
That wides on his changing store'st the time,
  Who hath thence my will prove, and strength of you bow;
It sine robs thing expressing,
And profan'd then too stay of your foe.
  And thou art to the lead another
In

(artml) D:\cmu\term4\10615-Art-ML\proj\Project 3\sonnet-generator>python generate.py sonnets2.pt -l 700
And not thy sweet self deth,
I see the sun, and tender still with thee;
  And you in the being was asight,
Thou canst not thou party,
Or on yies that love that race the dear of age,
Yet this sweet harse dates to ye,
if flowers in the blow on thy self alone,
The sacce of beauty on thee blessed free:
But the sweet read till were is hate are past will past be fair,
And brought, like him mine old eternity,
She keep-up in love, thy hours must hids of his redengd'd.
Not love she is sparts by thy self thou plea,
If thou hast passed now I fair doth previddles to wrend
  Time I as stol'n frong in the me,
As those gloan'd with frong and power,
Or as are with their root we;
And to anoth

(artml) D:\cmu\term4\10615-Art-ML\proj\Project 3\sonnet-generator>
```


Future Improvement

- Enlarge rhyme dictionary
- Implement Word-RNN
 - Generate the whole text by Word-RNN
 - Generate most of the text by Char-RNN and rhymes by Word-RNN



Thanks!

Q & A

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