AI project: recurrent neural networks test examples

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Test 1 *(2xlstm, 120 epoch, 128 batch)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

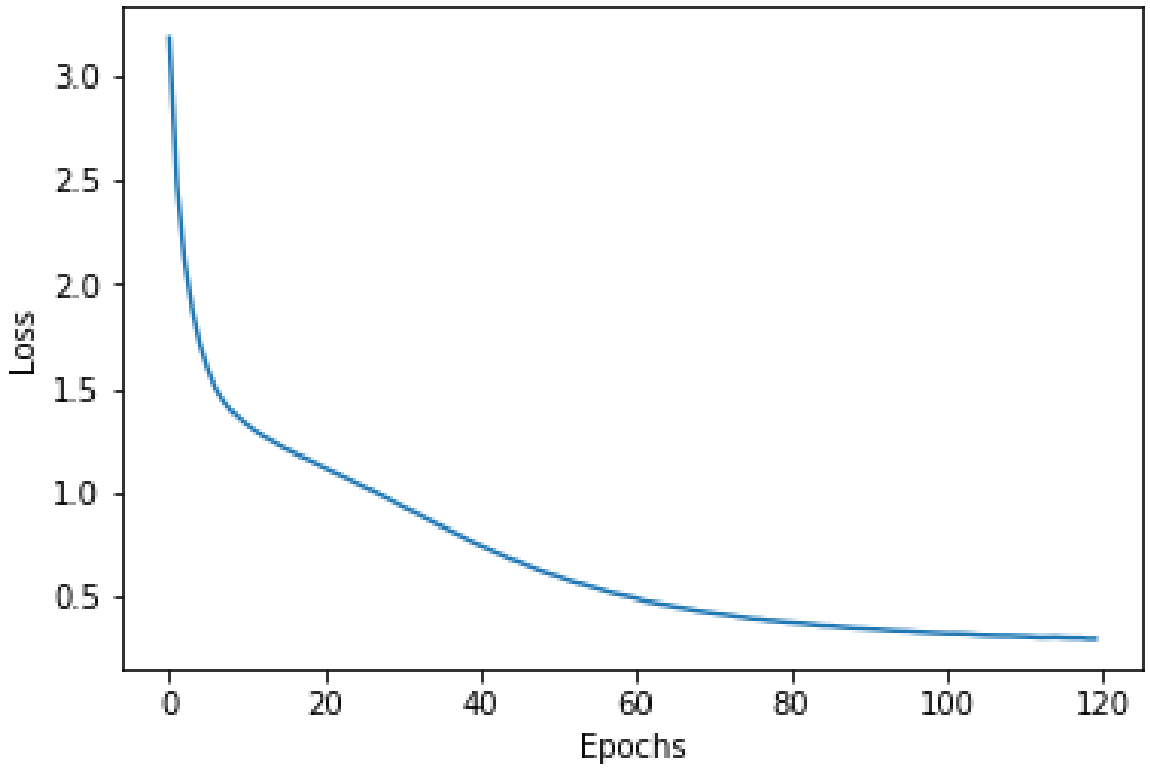
Hyperparameters

RNN type	LSTM
Batch size	128
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	0.2
Num of hidden layers	2
Epochs	120
Sequence length	150

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.6211386
Final loss	0.2987
Temperature	0.6
Generated characters	5000
Overfit	N/A

Loss graph



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Test 2 *(2xlstm, 20 epoch, 512 batch)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

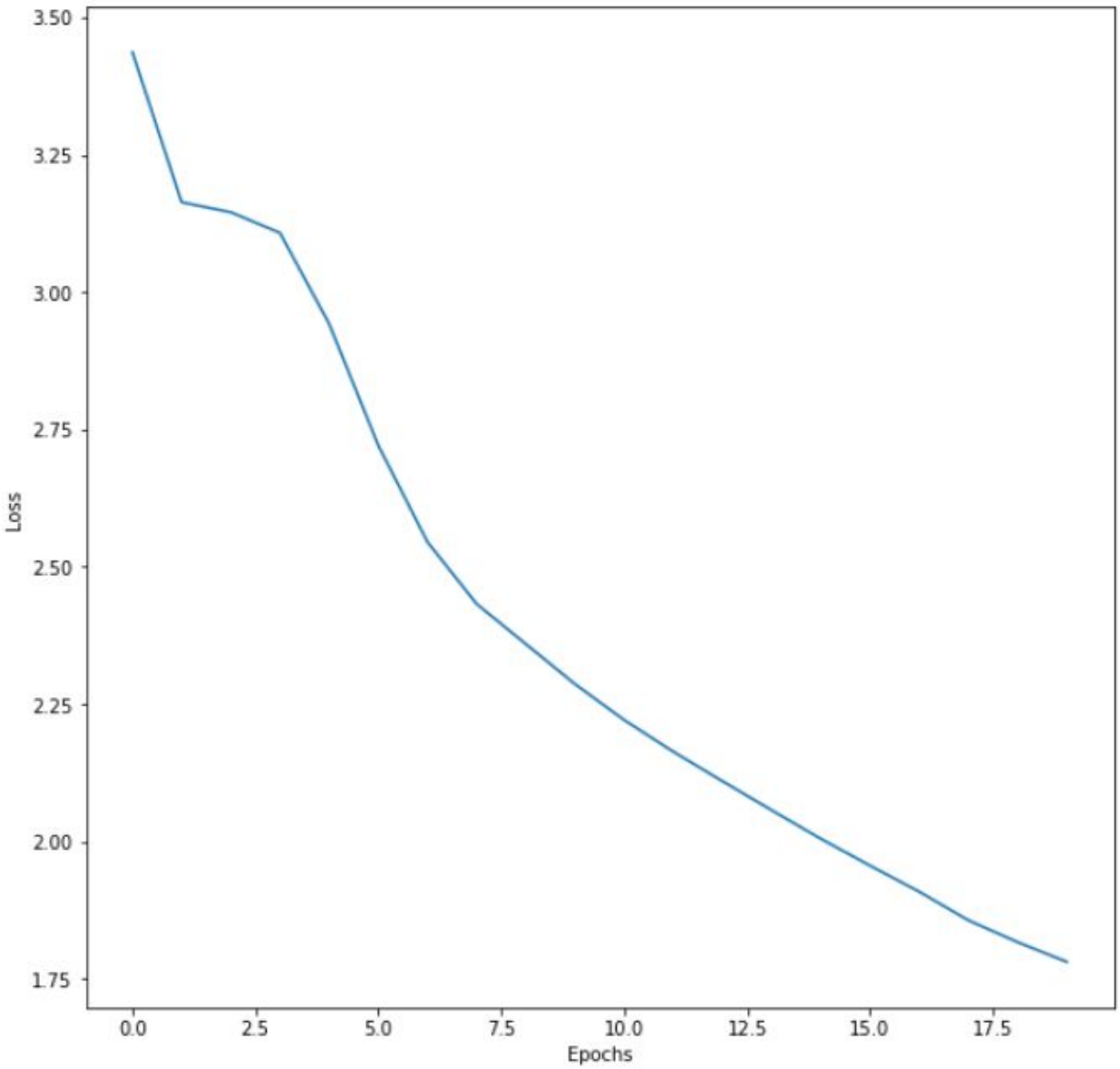
RNN type	LSTM
Batch size	512
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	0.2
Num of hidden layers	2
Epochs	20
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.622997
Final loss	1.7806
Average time per step	792ms/step
Temperature	0.6
Generated characters	5000

Overfit	N/A

Loss graph



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Test 3 *(4xgru, 100 epochs, 128 batch no dropout)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

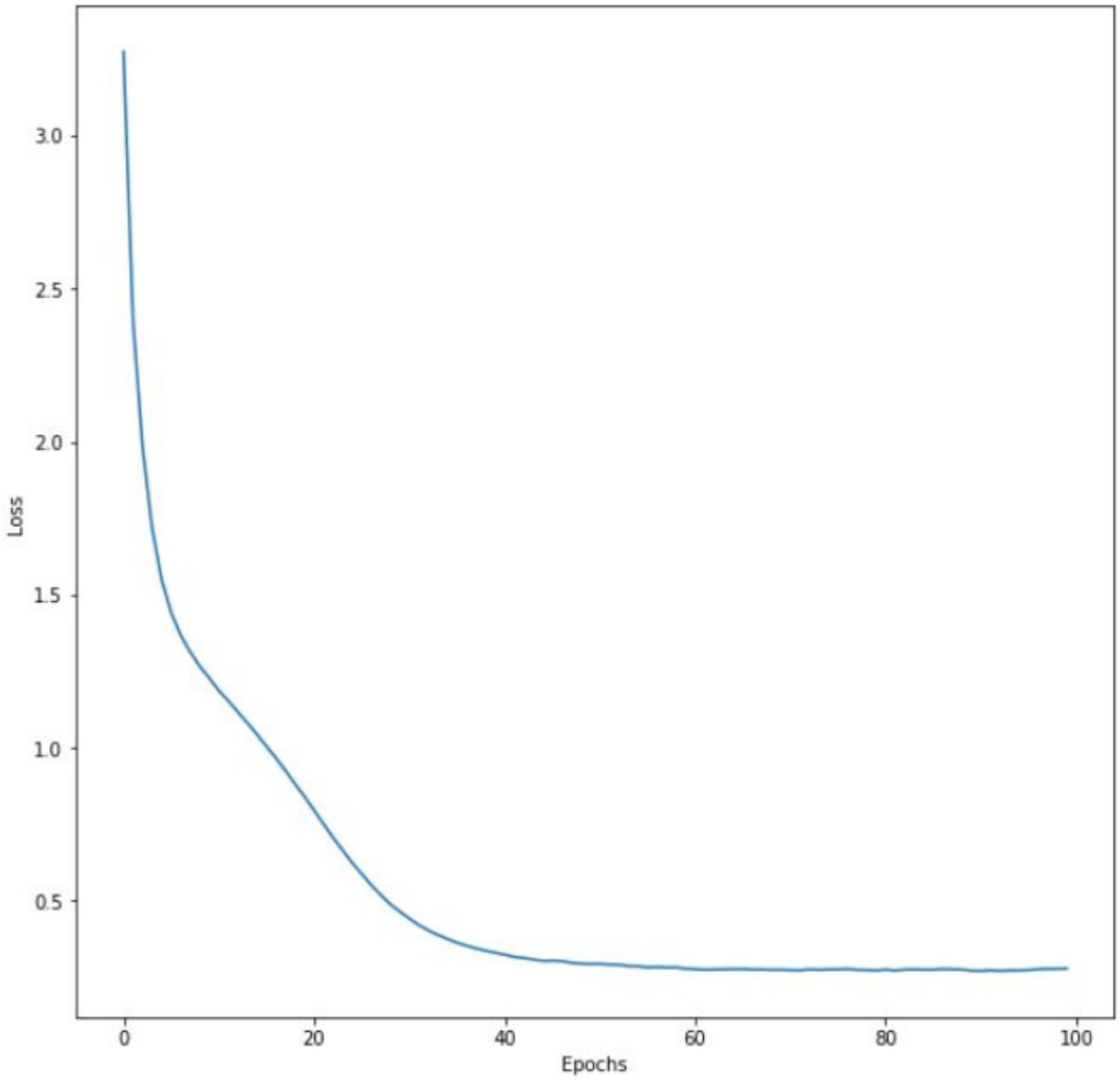
RNN type	GRU
Batch size	128
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	No dropout
Num of hidden layers	4
Epochs	100
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.62594
Final loss	0.2792
Average time per step	570ms/step
Temperature	0.6

Generated characters	5000
Overfit	Starts to overfit at epoch 55 and fluctuates minorly till the end

Loss graph



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Test 4 *(4xlstm, 100 epochs, 128 batch no dropout)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

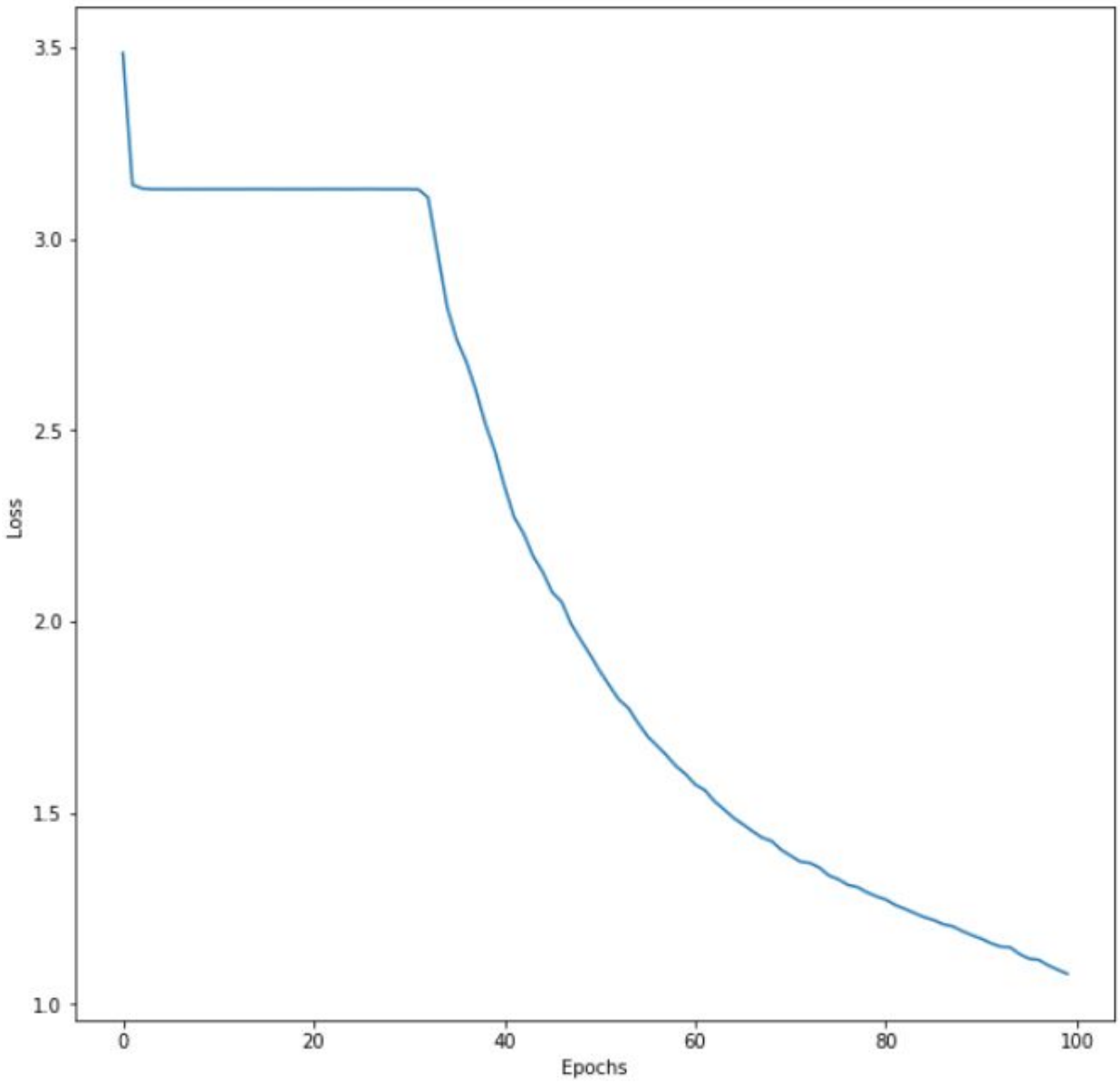
RNN type	LSTM
Batch size	128
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	No dropout
Num of hidden layers	4
Epochs	100
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.6268477
Final loss	1.0793
Average time per step	3s/step
Temperature	0.6

Generated characters	5000
Overfit	Starts to overfit at epoch 5 until epoch 32 and starts improving

Loss graph



Generated text

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Test 5 *(4xgru, 100 epochs, 128 batch)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

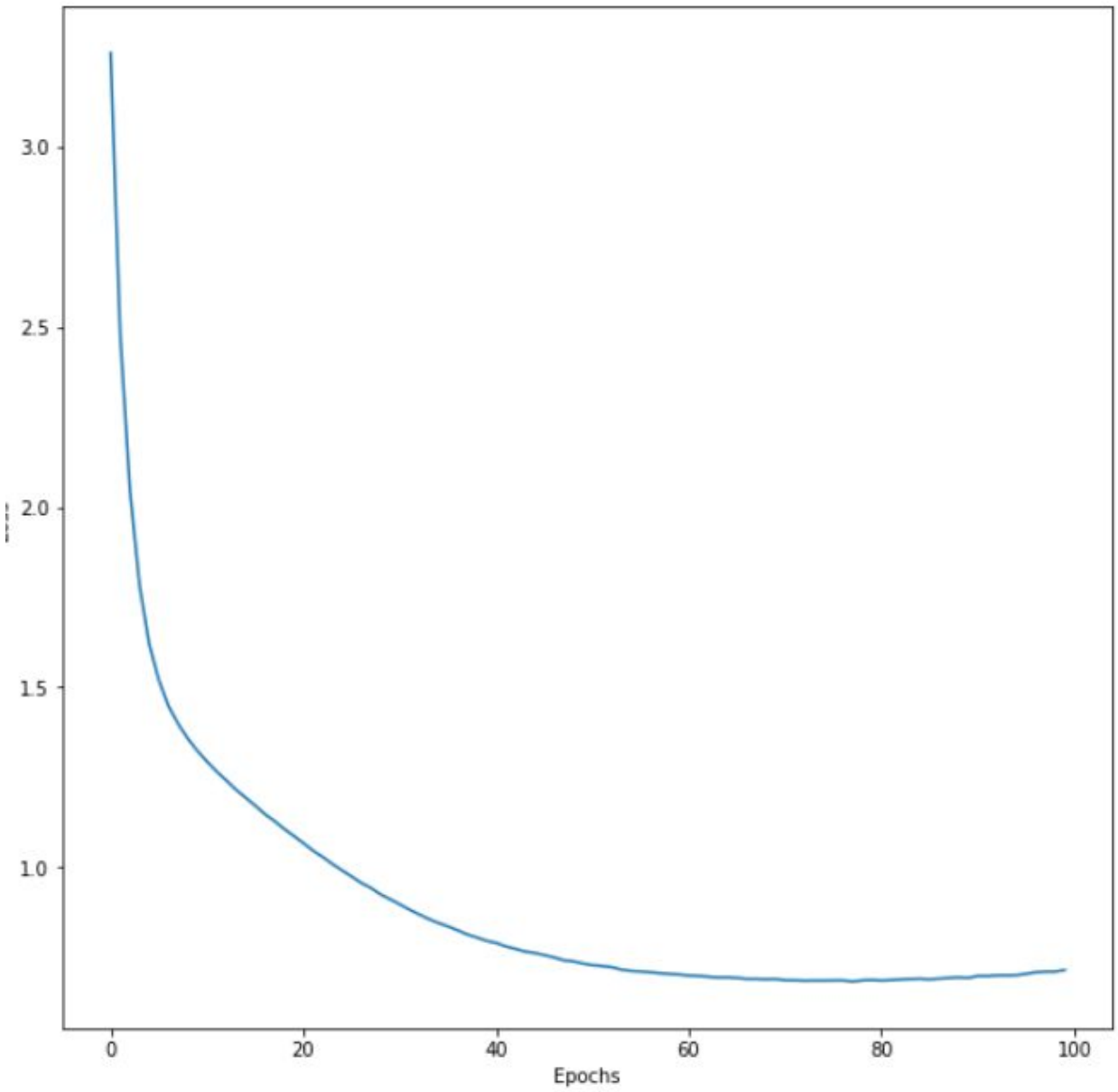
RNN type	GRU
Batch size	128
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	No dropout
Num of hidden layers	4
Epochs	100
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.625014
Final loss	0.7144
Average time per step	588ms/step
Temperature	0.6

Generated characters	5000
Overfit	Starts to overfit from epoch 65 and fluctuates

Loss graph



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Here: https://docs.google.com/document/d/163k_7Es7ROkgZPg4KmZn2_cHj9OpCVm-9F2V6oQW9tw/edit?usp=sharing

Test 6 *(4xlstm, 100 epochs, 128 batch)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

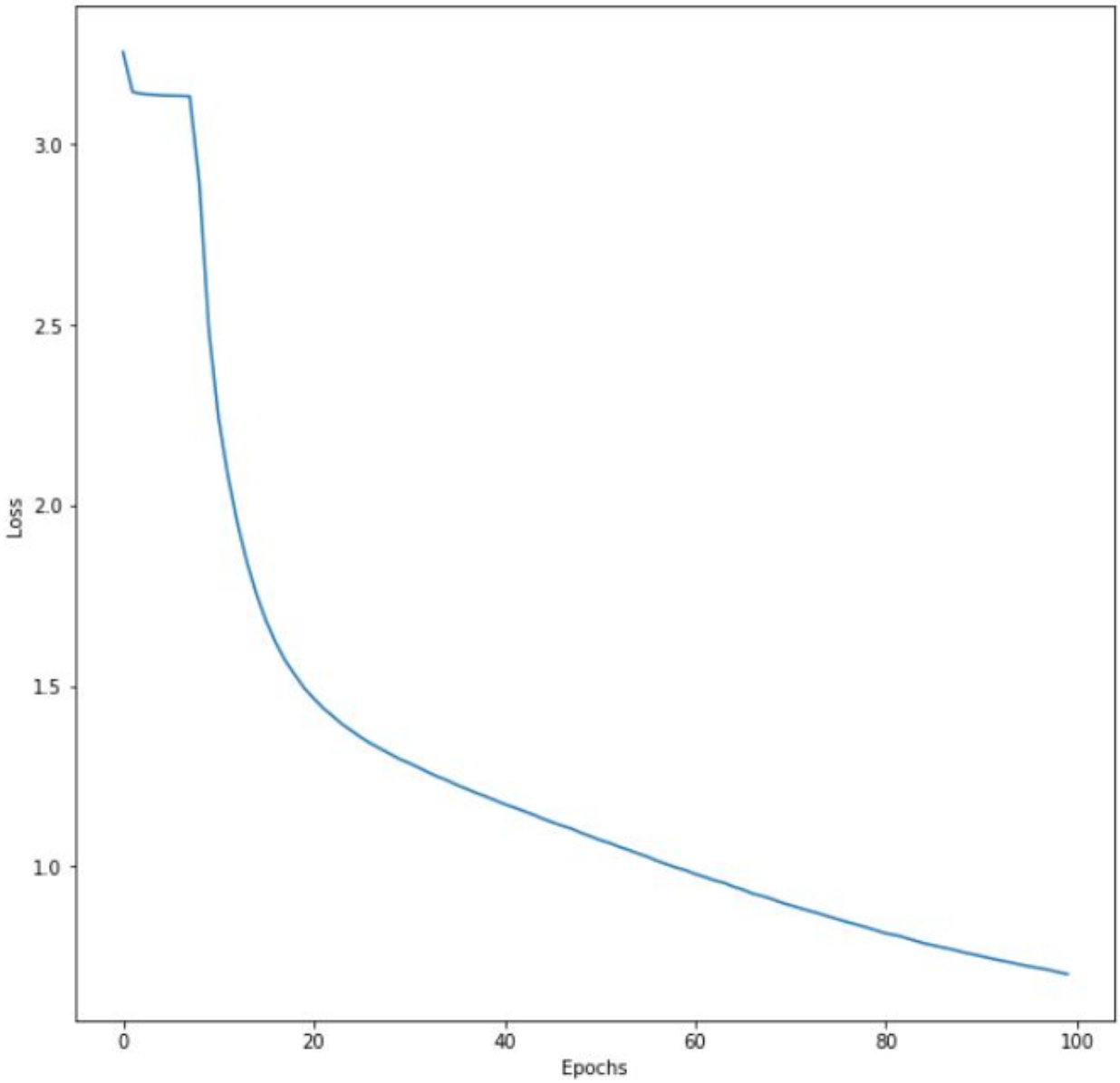
RNN type	LSTM
Batch size	128
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	0.2
Num of hidden layers	4
Epochs	100
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.6255913
Final loss	0.7012
Average time per step	812ms/step
Temperature	0.6

Generated characters	5000
Overfit	No overfitting

Loss graph



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Test 7 *(4xgru, 100 epochs, 512 batch)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

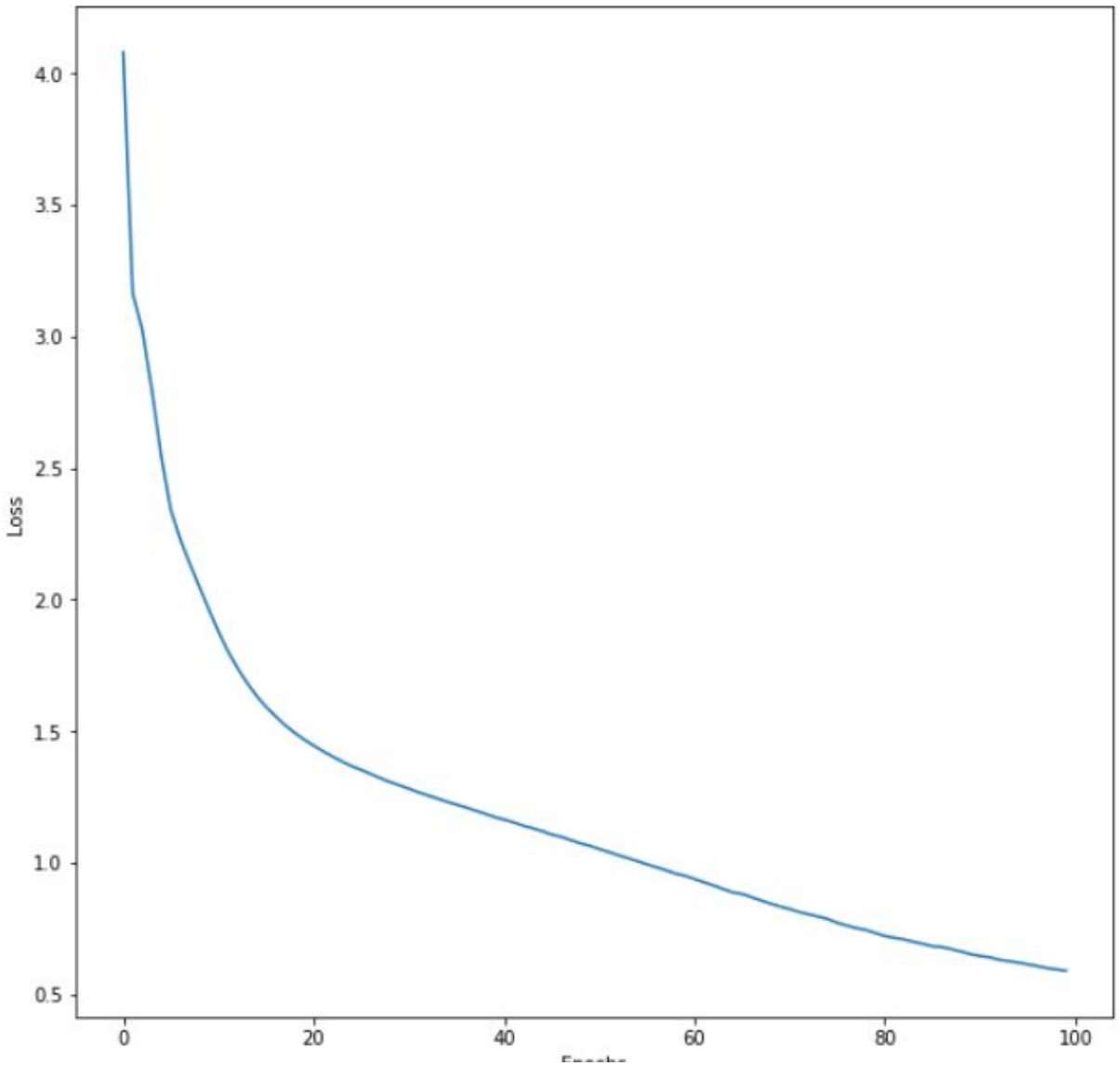
RNN type	GRU
Batch size	512
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	0.2
Num of hidden layers	4
Epochs	100
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.62572
Final loss	0.5893
Average time per step	2s/step
Temperature	0.6

Generated characters	5000
Overfit	No overfitting

Loss graph



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Test 8 *(4xlstm, 100 epochs, 512 batch)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

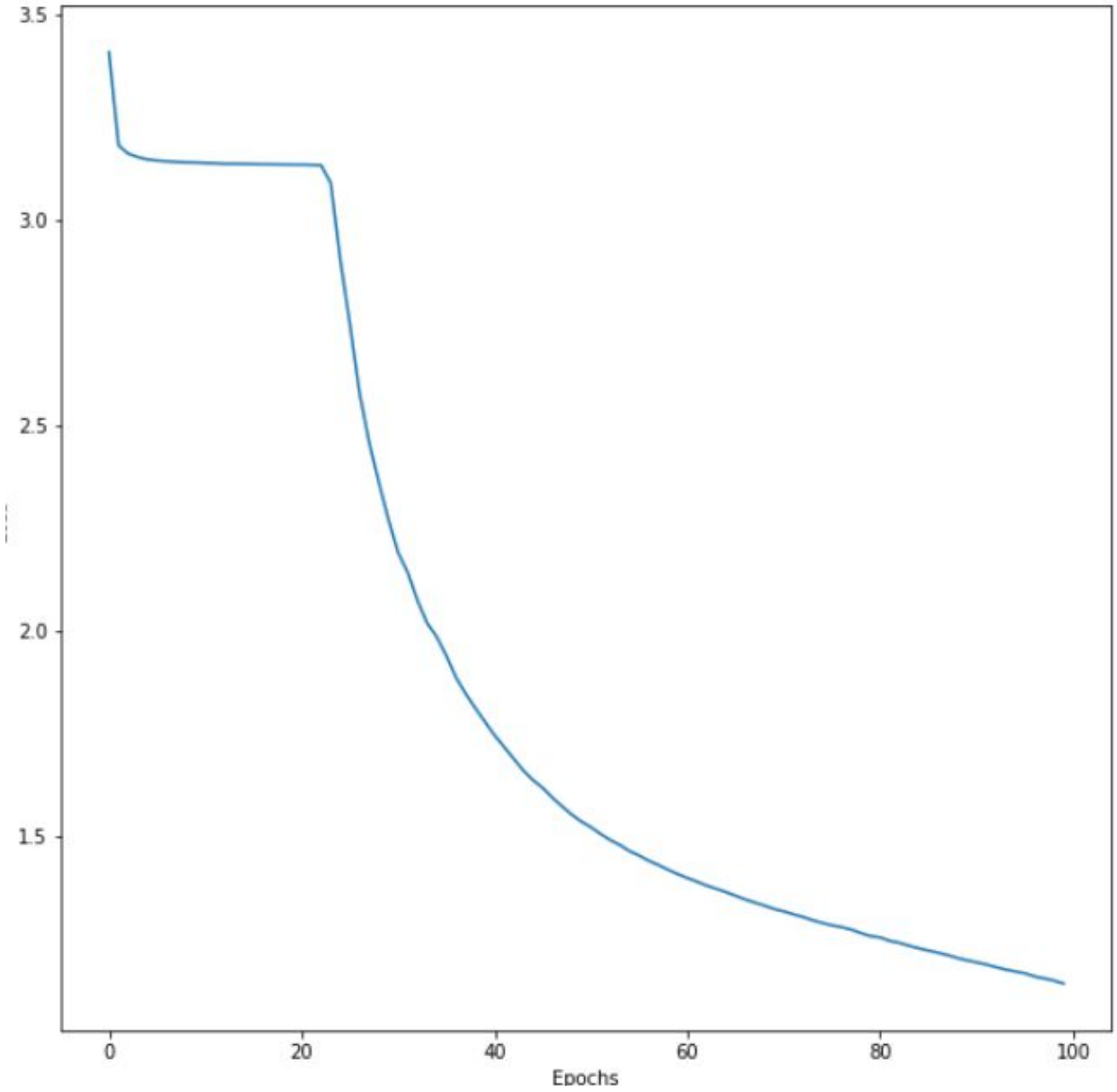
RNN type	LSTM
Batch size	512
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	0.2
Num of hidden layers	4
Epochs	100
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.624797
Final loss	1.1396
Average time per step	3s/step
Temperature	0.6

Generated characters	5000
Overfit	No overfitting but plateaus from epoch 2 to epoch 23

Loss graph



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Test 9 *(2xlstm, 400 epoch, 512 batch)*

Dataset

Dracula	http://www.gutenberg.org/cache/epub/345/pg345.txt	Txt file of a ca. 350 pages long book

Hyperparameters

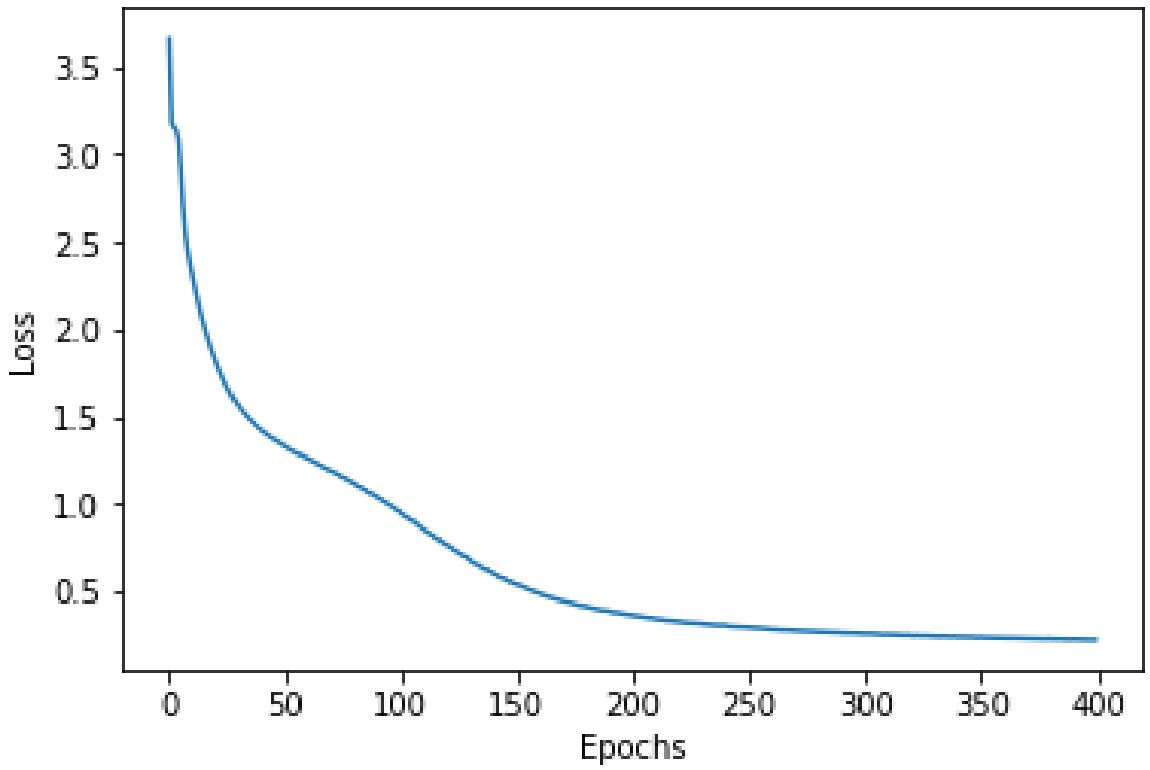
RNN type	LSTM
Batch size	512
Buffer size	10000
RNN units	1024
Embedding dimension	256
Recurrent initializer	Lecum uniform
Drop out rate	0.2
Num of hidden layers	2
Epochs	400
Sequence length	100

Loss & text generation

Loss function	Sparse categorical crossentropy
Initial loss	4.6211386
Final loss	0.2246
Temperature	0.6
Generated characters	5000

Overfit	N/A

Loss graph



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