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1. Generative Models for Text

1.c) LSTM: Train an LSTM to mimic Russell's style and thoughts:

Number of characters 1611875

Number of vocabs 100

Choosing Epoch size as 15 and batch size as 4096

Epoch 1/15

1611775/1611775 [=====] - 190s 118us/step - loss: 3.0529

Epoch 00001: loss improved from inf to 3.05289, saving model to weights-improvement-01-3.0529.hdf5

Epoch 2/15

1611775/1611775 [=====] - 193s 120us/step - loss: 2.9087

Epoch 00002: loss improved from 3.05289 to 2.90871, saving model to weights-improvement-02-2.9087.hdf5

Epoch 3/15

1611775/1611775 [=====] - 195s 121us/step - loss: 2.8390

Epoch 00003: loss improved from 2.90871 to 2.83902, saving model to weights-improvement-03-2.8390.hdf5

Epoch 4/15

1611775/1611775 [=====] - 195s 121us/step - loss: 2.8101

Epoch 00004: loss improved from 2.83902 to 2.81006, saving model to weights-improvement-04-2.8101.hdf5

Epoch 5/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.7760

Epoch 00005: loss improved from 2.81006 to 2.77605, saving model to weights-improvement-05-2.7760.hdf5

Epoch 6/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.7448

Epoch 00006: loss improved from 2.77605 to 2.74484, saving model to weights-improvement-06-2.7448.hdf5

Epoch 7/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.7189

Epoch 00007: loss improved from 2.74484 to 2.71887, saving model to weights-improvement-07-2.7189.hdf5

Epoch 8/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.6932

Epoch 00008: loss improved from 2.71887 to 2.69315, saving model to weights-improvement-08-2.6932.hdf5

Epoch 9/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.6688

Epoch 00009: loss improved from 2.69315 to 2.66876, saving model to weights-improvement-09-2.6688.hdf5

Epoch 10/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.6462

Epoch 00010: loss improved from 2.66876 to 2.64618, saving model to weights-improvement10-2.6462.hdf5

Epoch 11/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.6233

Epoch 00011: loss improved from 2.64618 to 2.62325, saving model to weights-improvement-11-2.6233.hdf5

Epoch 12/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.6018

Epoch 00012: loss improved from 2.62325 to 2.60182, saving model to weights-improvement-12-2.6018.hdf5

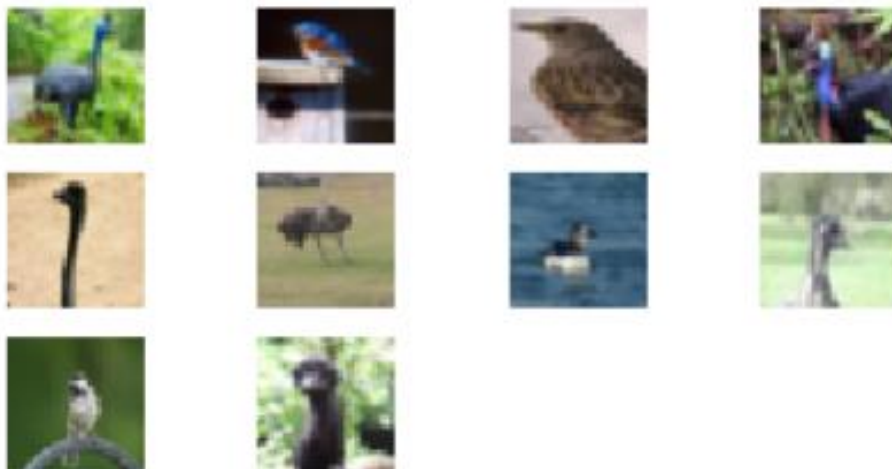
Epoch 13/15

1611775/1611775 [=====] - 194s 120us/step - loss: 2.5803

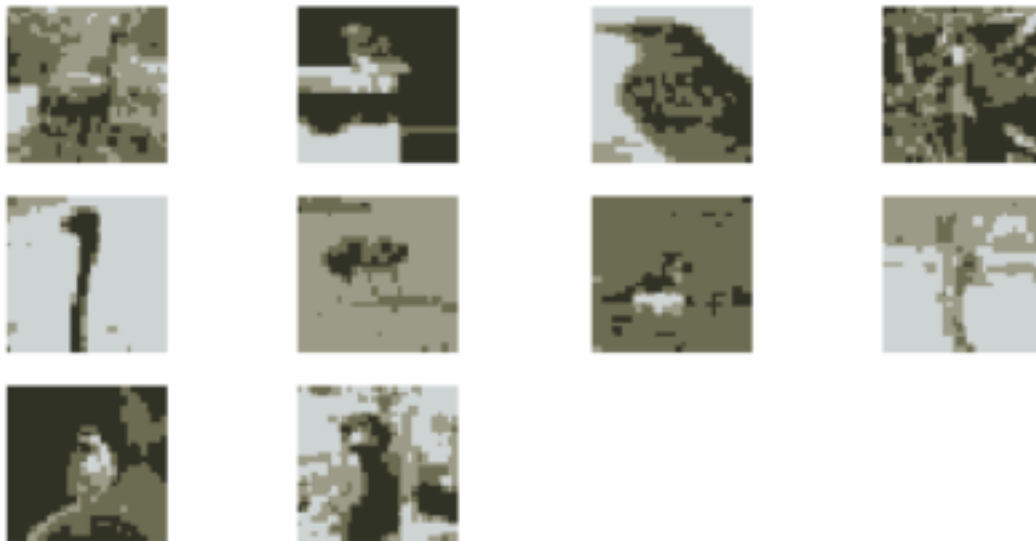
Epoch 00013: loss improved from 2.60182 to 2.58027, saving model to weights-improvement-13-2.5803.hdf5

Epoch 14/15

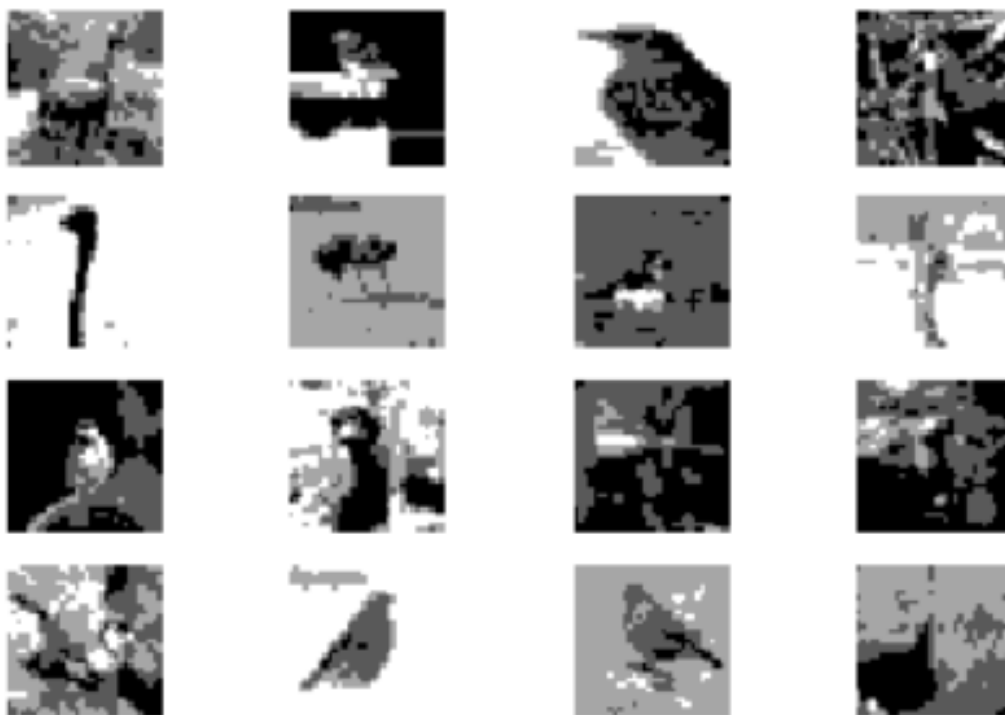
1611775/1611775 [=====] - 194s 120us/step - loss: 2.5593



2.d)



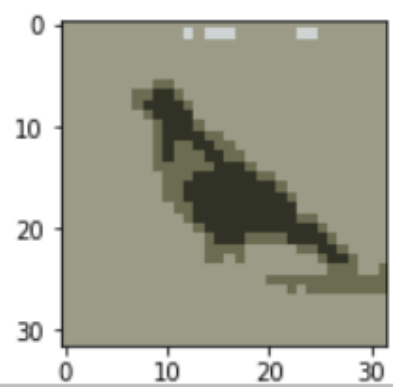
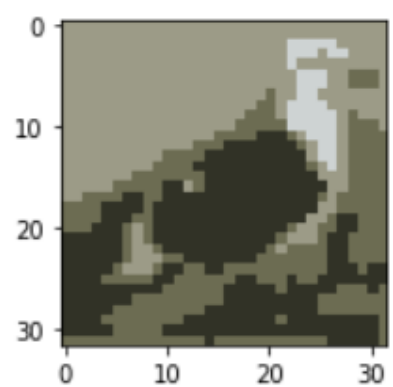
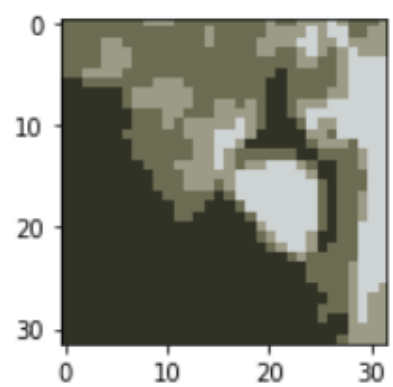
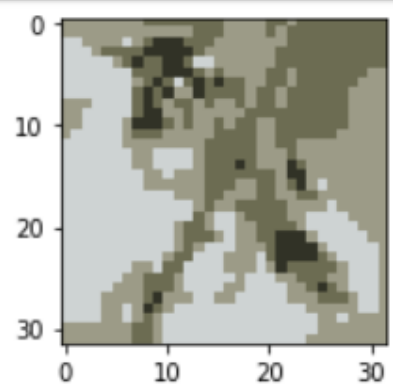
2.e)

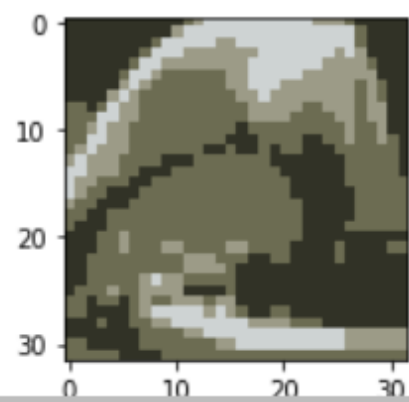
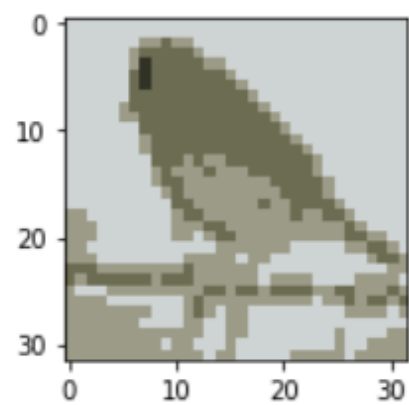
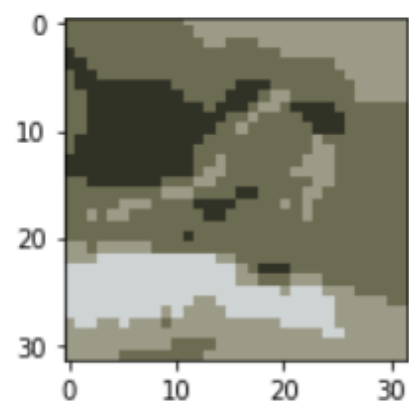
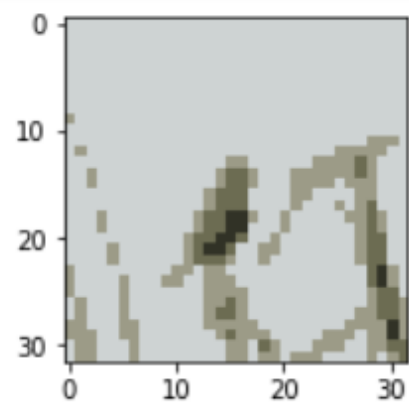


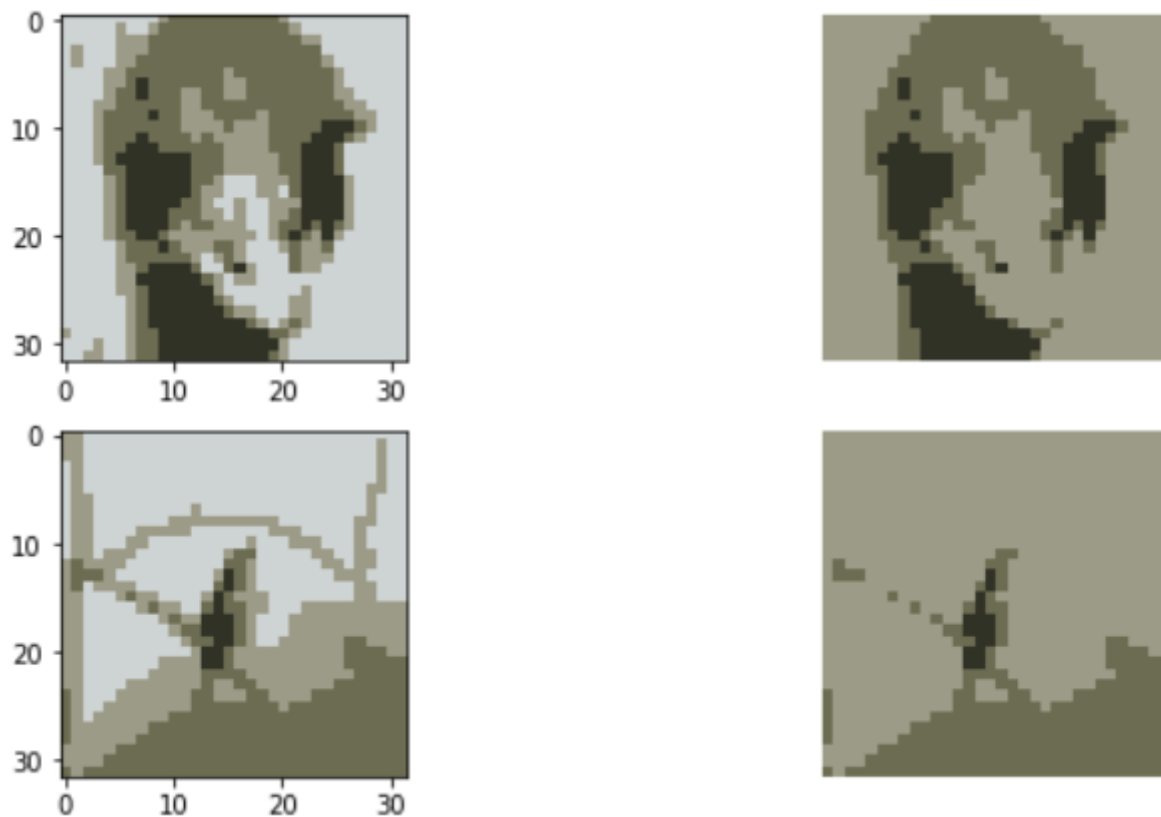
2.f)

| Layer (type) | Output Shape | Param # |
|--------------------------------|--------------------|---------|
| conv2d_5 (Conv2D) | (None, 32, 32, 64) | 1664 |
| max_pooling2d_5 (MaxPooling2D) | (None, 32, 32, 64) | 0 |
| conv2d_6 (Conv2D) | (None, 32, 32, 64) | 102464 |
| max_pooling2d_6 (MaxPooling2D) | (None, 32, 32, 64) | 0 |
| dense_5 (Dense) | (None, 32, 32, 32) | 2080 |
| dense_6 (Dense) | (None, 32, 32, 4) | 132 |
| Total params: 106,340 | | |
| Trainable params: 106,340 | | |
| Non-trainable params: 0 | | |

```
Train on 5400 samples, validate on 600 samples
Epoch 1/20
- 4s - loss: 1.1507 - acc: 0.6069 - val_loss: 0.9998 - val_acc: 0.7538
Epoch 2/20
- 4s - loss: 0.9087 - acc: 0.7783 - val_loss: 0.8295 - val_acc: 0.7916
Epoch 3/20
- 4s - loss: 0.7656 - acc: 0.8051 - val_loss: 0.7097 - val_acc: 0.8106
Epoch 4/20
- 4s - loss: 0.6629 - acc: 0.8194 - val_loss: 0.6217 - val_acc: 0.8225
Epoch 5/20
- 4s - loss: 0.5880 - acc: 0.8275 - val_loss: 0.5594 - val_acc: 0.8262
Epoch 6/20
- 4s - loss: 0.5312 - acc: 0.8331 - val_loss: 0.5091 - val_acc: 0.8334
Epoch 7/20
- 4s - loss: 0.4880 - acc: 0.8369 - val_loss: 0.4696 - val_acc: 0.8366
Epoch 8/20
- 3s - loss: 0.4540 - acc: 0.8399 - val_loss: 0.4395 - val_acc: 0.8392
Epoch 9/20
- 3s - loss: 0.4271 - acc: 0.8421 - val_loss: 0.4168 - val_acc: 0.8402
Epoch 10/20
- 4s - loss: 0.4063 - acc: 0.8434 - val_loss: 0.3974 - val_acc: 0.8422
Epoch 11/20
- 4s - loss: 0.3895 - acc: 0.8444 - val_loss: 0.3818 - val_acc: 0.8429
Epoch 12/20
- 4s - loss: 0.3755 - acc: 0.8452 - val_loss: 0.3693 - val_acc: 0.8436
Epoch 13/20
- 4s - loss: 0.3642 - acc: 0.8458 - val_loss: 0.3591 - val_acc: 0.8442
Epoch 14/20
- 4s - loss: 0.3551 - acc: 0.8461 - val_loss: 0.3504 - val_acc: 0.8445
Epoch 15/20
- 4s - loss: 0.3470 - acc: 0.8465 - val_loss: 0.3435 - val_acc: 0.8449
Epoch 16/20
- 4s - loss: 0.3401 - acc: 0.8469 - val_loss: 0.3369 - val_acc: 0.8451
Epoch 17/20
- 4s - loss: 0.3342 - acc: 0.8471 - val_loss: 0.3315 - val_acc: 0.8454
Epoch 18/20
- 4s - loss: 0.5498 - acc: 0.7744 - val_loss: 0.3471 - val_acc: 0.8399
Epoch 19/20
- 4s - loss: 0.3364 - acc: 0.8448 - val_loss: 0.3320 - val_acc: 0.8438
Epoch 20/20
- 4s - loss: 0.3290 - acc: 0.8462 - val_loss: 0.3269 - val_acc: 0.8445
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Training vs Validation error plot

