

assignment11_muley_tushar

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Assignment: Assignment 11

Date: February 13, 2022

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[8]: # import libraries
import keras
from keras import layers
import numpy as np
import random
import sys
```

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[2]: path = keras.utils.get_file(
      'nietzsche.txt',
      origin='https://s3.amazonaws.com/text-datasets/nietzsche.txt')
text = open(path).read().lower()
print('Corpus length:', len(text))
```

Downloading data from <https://s3.amazonaws.com/text-datasets/nietzsche.txt>
606208/600901 [=====] - 0s 1us/step
Corpus length: 600893

```
[3]: # extract sequences of 60 characters
maxlen = 60

# sample a new sequence every three characters
step = 3

# hold the extracted sequences
sentences = []

# holds the targets (the follow-up characters)
next_chars = []

for i in range(0, len(text) - maxlen, step):
    sentences.append(text[i: i + maxlen])
    next_chars.append(text[i + maxlen])
```

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print('Sequences:', len(sentences))

# list of characters in eron data
chars = sorted(list(set(text)))
print('Unique characters:', len(chars))

# maps characters to their index
char_indices = dict((char, chars.index(char)) for char in chars)

print('Vectorization...')

# one-hot encode the characters into binary arrays
x = np.zeros((len(sentences), maxlen, len(chars)), dtype=np.bool)
y = np.zeros((len(sentences), len(chars)), dtype=np.bool)

for i, sentence in enumerate(sentences):
    for t, char in enumerate(sentence):
        x[i, t, char_indices[char]] = 1
        y[i, char_indices[next_chars[i]]] = 1

```

Sequences: 200278

Unique characters: 57

Vectorization...

Single-layer LSTM model for next-character prediction

[5]: *# single-layer LSTM*

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model = keras.models.Sequential()
model.add(layers.LSTM(128, input_shape=(maxlen, len(chars))))
model.add(layers.Dense(len(chars), activation='softmax'))

```

[6]: *# model compilation configuration*

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optimizer = keras.optimizers.RMSprop(lr=0.01)
model.compile(loss='categorical_crossentropy', optimizer=optimizer)

```

[7]: *# function to sample the next character*

```

def sample(preds, temperature=1.0):
    preds = np.asarray(preds).astype('float64')
    preds = np.log(preds) / temperature
    exp_preds = np.exp(preds)
    preds = exp_preds / np.sum(exp_preds)
    probas = np.random.multinomial(1, preds, 1)
    return np.argmax(probas)

```

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[9]: # train the model for 20 examples

for epoch in range(1, 20):
    print('epoch', epoch)

    # fit the model for one iteration on the data
    model.fit(x, y, batch_size=128, epochs=1)

    # select a text seed at random

    start_index = random.randint(0, len(text) - maxlen - 1)
    generated_text = text[start_index: start_index + maxlen]
    print('--- Generating with seed: "' + generated_text + '"')

    # different sampling temperatures

    for temperature in [0.2, 0.5, 1.0, 1.2]:
        print('----- temperature:', temperature)
        sys.stdout.write(generated_text)

        # generates 400 characters, from seed text
        for i in range(400):

            # one-hot encodes the characters generated so far
            sampled = np.zeros((1, maxlen, len(chars)))
            for t, char in enumerate(generated_text):
                sampled[0, t, char_indices[char]] = 1.

            # samples the next character
            preds = model.predict(sampled, verbose=0)[0]
            next_index = sample(preds, temperature)
            next_char = chars[next_index]

            generated_text += next_char
            generated_text = generated_text[1:]

            sys.stdout.write(next_char)
            sys.stdout.flush()
        print()

```

```

epoch 1
1565/1565 [=====] - 199s 127ms/step - loss: 1.9554
--- Generating with seed: "sight of it would necessarily seduce and constrain to
sympat"
----- temperature: 0.2
sight of it would necessarily seduce and constrain to sympath----- temperature:
0.5

```

ight of it would necessarily seduce and constrain to sympathy----- temperature:
1.0
ght of it would necessarily seduce and constrain to sympathy,----- temperature:
1.2
ht of it would necessarily seduce and constrain to sympathy,
epoch 2
1565/1565 [=====] - 198s 126ms/step - loss: 1.6127
--- Generating with seed: "y and dangerous isolation, as a saint: for it is just
holine"
----- temperature: 0.2
y and dangerous isolation, as a saint: for it is just
holines----- temperature: 0.5
and dangerous isolation, as a saint: for it is just
holines,----- temperature: 1.0
and dangerous isolation, as a saint: for it is just
holines, ----- temperature: 1.2
nd dangerous isolation, as a saint: for it is just
holines, t
epoch 3
1565/1565 [=====] - 198s 126ms/step - loss: 1.5264
--- Generating with seed: "o
dangerous voyages of discovery, to spiritualized north pol"
----- temperature: 0.2
o
dangerous voyages of discovery, to spiritualized north poli----- temperature:
0.5

dangerous voyages of discovery, to spiritualized north polit----- temperature:
1.0
dangerous voyages of discovery, to spiritualized north politi----- temperature:
1.2
angerous voyages of discovery, to spiritualized north politio
epoch 4
1565/1565 [=====] - 198s 126ms/step - loss: 1.4804
--- Generating with seed: "erhaps, gives his approval
to that which has heretofore been"
----- temperature: 0.2
erhaps, gives his approval
to that which has heretofore been ----- temperature: 0.5
rhaps, gives his approval
to that which has heretofore been h----- temperature: 1.0
haps, gives his approval
to that which has heretofore been ho----- temperature: 1.2
aps, gives his approval
to that which has heretofore been how
epoch 5
1565/1565 [=====] - 198s 126ms/step - loss: 1.4496
--- Generating with seed: "ght and color? it posits as the inducing causes of

such
ligh"
----- temperature: 0.2
ght and color? it posits as the inducing causes of such
light----- temperature: 0.5
ht and color? it posits as the inducing causes of such
light ----- temperature: 1.0
t and color? it posits as the inducing causes of such
light a----- temperature: 1.2
and color? it posits as the inducing causes of such
light an
epoch 6
1565/1565 [=====] - 197s 126ms/step - loss: 1.4305
--- Generating with seed: "reduced to
imperfect men, to slaves and instruments. its fun"
----- temperature: 0.2
reduced to
imperfect men, to slaves and instruments. its fund----- temperature: 0.5
educed to
imperfect men, to slaves and instruments. its funda----- temperature: 1.0
duced to
imperfect men, to slaves and instruments. its fundam----- temperature: 1.2
uced to
imperfect men, to slaves and instruments. its fundame
epoch 7
1565/1565 [=====] - 198s 126ms/step - loss: 1.4116
--- Generating with seed: "s, as has
been taught by hafis and goethe, the bold letting-"
----- temperature: 0.2
s, as has
been taught by hafis and goethe, the bold letting----- temperature: 0.5
, as has
been taught by hafis and goethe, the bold letting--t----- temperature: 1.0
as has
been taught by hafis and goethe, the bold letting--th----- temperature: 1.2
as has
been taught by hafis and goethe, the bold letting--the
epoch 8
1565/1565 [=====] - 198s 126ms/step - loss: 1.3964
--- Generating with seed: "obtrusive touches and
incivilities: something that goes its "
----- temperature: 0.2
obtrusive touches and
incivilities: something that goes its w----- temperature: 0.5
btrusive touches and
incivilities: something that goes its wo----- temperature: 1.0
trusive touches and
incivilities: something that goes its wor----- temperature: 1.2

rusive touches and
 incivilities: something that goes its worl
 epoch 9
 1565/1565 [=====] - 198s 127ms/step - loss: 1.3865
 --- Generating with seed: "erman depth is often only a difficult, hesitating
 "digestion"
 ----- temperature: 0.2
 erman depth is often only a difficult, hesitating
 "digestion ----- temperature: 0.5
 rman depth is often only a difficult, hesitating
 "digestion o----- temperature: 1.0
 man depth is often only a difficult, hesitating
 "digestion of----- temperature: 1.2
 an depth is often only a difficult, hesitating
 "digestion of
 epoch 10
 1565/1565 [=====] - 197s 126ms/step - loss: 1.3753
 --- Generating with seed: "elf abnegation and not in revenge the element
 of greatness c"
 ----- temperature: 0.2
 elf abnegation and not in revenge the element
 of greatness ca----- temperature: 0.5
 lf abnegation and not in revenge the element
 of greatness can----- temperature: 1.0
 f abnegation and not in revenge the element
 of greatness can ----- temperature: 1.2
 abnegation and not in revenge the element
 of greatness can b
 epoch 11
 1565/1565 [=====] - 198s 126ms/step - loss: 1.3681
 --- Generating with seed: " leads man to war
 upon himself and makes him uncertain, dist"
 ----- temperature: 0.2
 leads man to war
 upon himself and makes him uncertain, disti----- temperature: 0.5
 leads man to war
 upon himself and makes him uncertain, distin----- temperature: 1.0
 eads man to war
 upon himself and makes him uncertain, disting----- temperature: 1.2
 ads man to war
 upon himself and makes him uncertain, distingu
 epoch 12
 1565/1565 [=====] - 198s 126ms/step - loss: 1.3597
 --- Generating with seed: "--but who can doubt that it will be over still sooner
 with
 t"
 ----- temperature: 0.2
 --but who can doubt that it will be over still sooner with

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th----- temperature: 0.5
-but who can doubt that it will be over still sooner with
the----- temperature: 1.0
but who can doubt that it will be over still sooner with
the
----- temperature: 1.2
ut who can doubt that it will be over still sooner with
the
f
epoch 13
1565/1565 [=====] - 198s 126ms/step - loss: 1.3523
--- Generating with seed: "er, further, more extended, more
comprehensive states, in sh"
----- temperature: 0.2
er, further, more extended, more
comprehensive states, in sho----- temperature: 0.5
r, further, more extended, more
comprehensive states, in shor----- temperature: 1.0
, further, more extended, more
comprehensive states, in short----- temperature: 1.2
further, more extended, more
comprehensive states, in short,
epoch 14
1565/1565 [=====] - 197s 126ms/step - loss: 1.3469
--- Generating with seed: "vantage: the crude, undeveloped, rough
individualities will "
----- temperature: 0.2
vantage: the crude, undeveloped, rough individualities will b----- temperature:
0.5
antage: the crude, undeveloped, rough individualities will be----- temperature:
1.0
ntage: the crude, undeveloped, rough individualities will be ----- temperature:
1.2
tage: the crude, undeveloped, rough individualities will be n
epoch 15
1565/1565 [=====] - 198s 126ms/step - loss: 1.3412
--- Generating with seed: "bible. the distorted and diseased
in his own nature with its"
----- temperature: 0.2
bible. the distorted and diseased
in his own nature with its ----- temperature: 0.5
ible. the distorted and diseased
in his own nature with its w----- temperature: 1.0
ble. the distorted and diseased
in his own nature with its wh----- temperature: 1.2
le. the distorted and diseased
in his own nature with its who
epoch 16

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1565/1565 [=====] - 198s 127ms/step - loss: 1.3360
--- Generating with seed: "volve
once more in the same orbit, however independent of ea"
----- temperature: 0.2
volve
once more in the same orbit, however independent of ear----- temperature: 0.5
olve
once more in the same orbit, however independent of eart----- temperature: 1.0
lve
once more in the same orbit, however independent of earth----- temperature: 1.2
ve
once more in the same orbit, however independent of earth-
epoch 17
1565/1565 [=====] - 197s 126ms/step - loss: 1.3305
--- Generating with seed: "hicle for
your inclinations,--ye, too, really find the noise"
----- temperature: 0.2
hicle for
your inclinations,--ye, too, really find the noise ----- temperature: 0.5
icle for
your inclinations,--ye, too, really find the noise i----- temperature: 1.0
cle for
your inclinations,--ye, too, really find the noise it----- temperature: 1.2
le for
your inclinations,--ye, too, really find the noise its
epoch 18
1565/1565 [=====] - 197s 126ms/step - loss: 1.3265
--- Generating with seed: "nifests is a consolation to the weak and suffering
only in a"
----- temperature: 0.2
nifests is a consolation to the weak and suffering only in a ----- temperature:
0.5
ifests is a consolation to the weak and suffering only in a c----- temperature:
1.0
fests is a consolation to the weak and suffering only in a cl----- temperature:
1.2
ests is a consolation to the weak and suffering only in a cla
epoch 19
1565/1565 [=====] - 197s 126ms/step - loss: 1.3211
--- Generating with seed: "erceived that in the most personal
considerations the most g"
----- temperature: 0.2
erceived that in the most personal
considerations the most gr----- temperature: 0.5
rceived that in the most personal
considerations the most gre----- temperature: 1.0
ceived that in the most personal
considerations the most grea----- temperature: 1.2

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eived that in the most personal
considerations the most great

[]:

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