In [2]:
```
import numpy as np
from keras.layers import Dense, Activation
from keras.layers.recurrent import SimpleRNN, LSTM, GRU
from keras.models import Sequential


# построчное чтение из примера с текстом
with open("alice_in_wonderland.txt", 'rb') as _in:
    lines = []
    for line in _in:
        line = line.strip().lower().decode("ascii", "ignore")
        if len(line) == 0:
            continue
        lines.append(line)
text = " ".join(lines)
chars = set([c for c in text])
nb_chars = len(chars)


# создание индекса символов и reverse mapping чтобы передвигаться между знач
ениями numerical
# ID and a specific character. The numerical ID will correspond to a column
# ID и определенный символ. Numerical ID будет соответсвовать колонке
# число при использовании one-hot кодировки для представление входов символо
в
char2index = {c: i for i, c in enumerate(chars)}
index2char = {i: c for i, c in enumerate(chars)}

# для удобства выберете фиксированную длину последовательность 10 символов
# SEQLEN, STEP = 10, 1 прогон 1 и 2
SEQLEN, STEP = 25, 1 # прогон 3
input_chars, label_chars = [], []

# конвертация data в серии разных SEQLEN-length субпоследовательностей
for i in range(0, len(text) - SEQLEN, STEP):
    input_chars.append(text[i: i + SEQLEN])
    label_chars.append(text[i + SEQLEN])


# Вычисление one-hot encoding входных последовательностей X и следующего сим
вола (the label) y

X = np.zeros((len(input_chars), SEQLEN, nb_chars), dtype=np.bool)
y = np.zeros((len(input_chars), nb_chars), dtype=np.bool)
for i, input_char in enumerate(input_chars):
    for j, ch in enumerate(input_char):
        X[i, j, char2index[ch]] = 1
    y[i, char2index[label_chars[i]]] = 1


# установка ряда метапамертров  для нейронной сети и процесса тренировки
#BATCH_SIZE, HIDDEN_SIZE = 128, 128 - прогон 1 загрузка процессора 60%
#BATCH_SIZE, HIDDEN_SIZE = 256, 256 # прогон 2 загрузка процессора 80%
BATCH_SIZE, HIDDEN_SIZE = 128, 128 # прогон 3
NUM_ITERATIONS = 150
NUM_EPOCHS_PER_ITERATION = 1
NUM_PREDS_PER_EPOCH = 100


# Create a super simple recurrent neural network. There is one recurrent
# layer that produces an embedding of size HIDDEN_SIZE from the one-hot
# encoded input layer. This is followed by a Dense fully-connected layer
# across the set of possible next characters, which is converted to a
# probability score via a standard softmax activation with a multi-class
# cross-entropy loss function linking the prediction to the one-hot
# encoding character label.
```

```
==================================================
Итерация #: 0
Epoch 1/1
158758/158758 [==============================] - 90s 566us/step - loss: 2.295
6
Генерация из посева: e to everything that alic
e to everything that alice the has she was she was she was she was she was sh
e was she was she was she was she was she was sh==============================
====================
Итерация #: 1
Epoch 1/1
158758/158758 [==============================] - 85s 535us/step - loss: 1.904
5
Генерация из посева:  go and take it away! the
 go and take it away! the rast of the reat of the reat of the reat of the rea
t of the reat of the reat of the reat of the rea==============================
====================
Итерация #: 2
Epoch 1/1
158758/158758 [==============================] - 88s 552us/step - loss: 1.749
6
Генерация из посева: k me for asking! no, itll
k me for asking! no, itll and the was the mad the mad the mad the mad the mad
the mad the mad the mad the mad the mad the mad==============================
====================
Итерация #: 3
Epoch 1/1
158758/158758 [==============================] - 93s 587us/step - loss: 1.646
4
Генерация из посева: er things as i used--and
er things as i used--and the hatter said the hatter said the hatter said the
hatter said the hatter said the hatter said the ==============================
====================
Итерация #: 4
Epoch 1/1
158758/158758 [==============================] - 101s 639us/step - loss: 1.56
97
Генерация из посева: n being pinched by the ha
n being pinched by the hatter was the project gutenberg-tm electronic work th
e project gutenberg-tm electronic work the proje==============================
====================
Итерация #: 5
Epoch 1/1
158758/158758 [==============================] - 102s 642us/step - loss: 1.50
85
Генерация из посева: e hastily replied; at lea
e hastily replied; at leart of the project gutenberg-tm electronic work in th
e project gutenberg-tm electronic work in the pr==============================
====================
Итерация #: 6
Epoch 1/1
158758/158758 [==============================] - 97s 611us/step - loss: 1.459
6
Генерация из посева: tle pattering of footstep
tle pattering of footstep to the thing she had not the things and the said, a
nd the said, and the said, and the said, and the==============================
====================
Итерация #: 7
Epoch 1/1
158758/158758 [==============================] - 114s 719us/step - loss: 1.41
62
Генерация из посева: d him. --or next day, may
d him. --or next day, may it to see the gryphon and the way a little said to
herself the way a little said to herself the way==============================
====================
Итерация #: 8
Epoch 1/1
158758/158758 [==============================] - 108s 678us/step - loss: 1.38
```

In [ ]: