RNN Text Generator

I have built a char-RNN trained on Crime and Punishment by Fyodor Dostoyevsky and generated texts (each of them length of 800) with following keywords "Raskolnikov, Ivanovna, Mercy, Andrey, Brother and Katerina".

First step was loading "crimeandpunishment.txt" file and converting into integers for network to use. There are 91 unique chars in text file that means I have 91 classes to pick from in each prediction.

```
#encoding of chars
encoded[100:200]
```
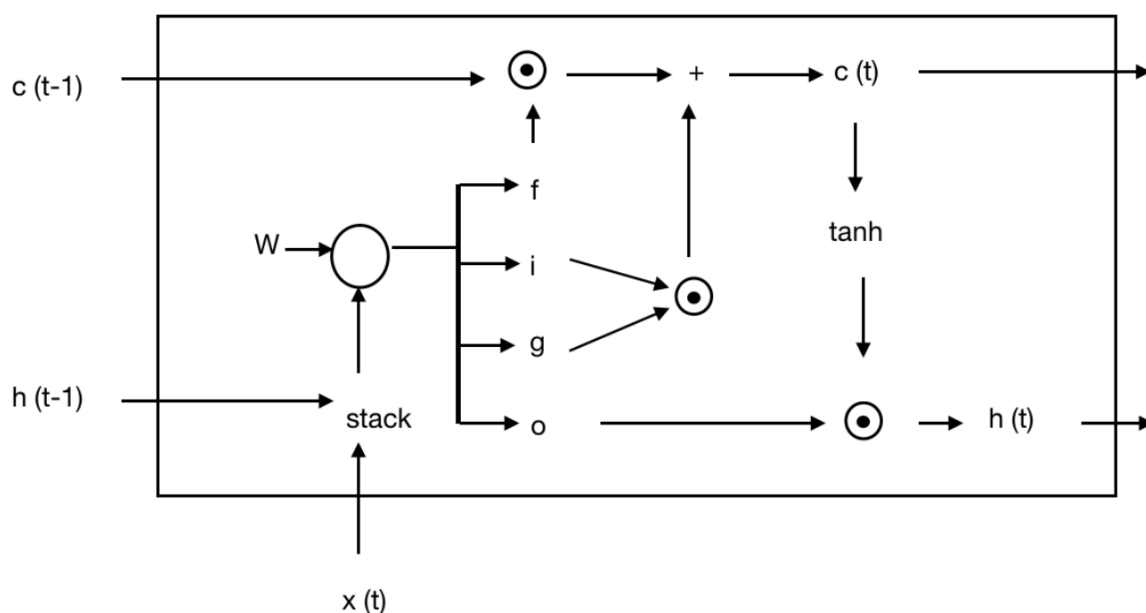
```
array([26, 44, 48, 76, 26, 59, 48, 44, 56, 26, 53, 16, 61, 26, 53, 47, 80,
       61, 63, 56, 26, 22, 48, 34, 34, 56, 61, 26, 77, 76, 26, 23, 63, 77,
       59, 63, 26, 63, 56, 26, 49, 53, 54, 22, 56, 54, 26, 77, 76, 26,  5,
       17, 26, 31, 49, 48, 59, 56, 26, 48, 76, 54, 26, 23, 48, 49, 71, 56,
       54, 26, 43, 49, 53, 23, 49, 27, 37, 26, 48, 43, 26, 61, 63, 53, 16,
       22, 63, 80, 77, 76, 26, 63, 56, 43, 77, 61, 48, 61, 77, 53],
      dtype=int32)
```

I made mini-batches for training part. Each batch contains N*M characters, where N is the batch size of 10 and sequence steps 50.

LSTM cell is created to use in hidden layer. It is used for handling the problem of vanishing or exploding gradient problem.
```
lstm = tf.contrib.rnn.BasicLSTMCell(num_units)
```

LSTM CELL

In output layer, RNN cells are connected to fully connected layer with softmax output. Softmax output gives the probability distribution so that it can be used to predict next character in the text. Total size of the network is batch-size * number of steps * number of hidden units. 2 hidden layers used for problem and in layer 128 LSTM cells.

Generated texts

Keyword : Raskolnikov

```
checkpoint = tf.train.latest_checkpoint('checkpoints')
samp = sample(checkpoint, 800, lstm_size, len(vocab), prime="Raskolnikov")
print(samp)
```

```
INFO:tensorflow:Restoring parameters from checkpoints/i45220_l128.ckpt
Raskolnikovitch, his position, where was he take a moment to something, all and and when he had terrind at the sarts
was all to him he there's someto she asked. "That is to her all the door in hirself and would have have so shere an a
nd a landlady and he has seen to him as him. In a memecity on the table ago that we had
not to him, how he had to the samate as talking to his fortune and told... seemed to him." The had asten stopped
home, though
that then he saw the simply one so troubled twenty, booking as a gate taked a life and shout the toods and he said ou
r ton have seat in went to the complete one often his far and she struck all word. So the time as though he will
answered. She would have compleneled himself, that ano she went and way to a man, but the time who had been
taker and answered at long
```

Keyword : Ivanovna

```
checkpoint = tf.train.latest_checkpoint('checkpoints')
samp = sample(checkpoint, 800, lstm_size, len(vocab), prime="Ivanovna")
print(samp)
```

```
INFO:tensorflow:Restoring parameters from checkpoints/i45220_l128.ckpt
Ivanovna to the doors. He shated the street the store. The stope thongo to some seef at last he sat to be wanted his
first tritatian stictes. He can the pocket he heard him of his heed, there, trand to him. The lost almost a last feat
her and
some straight of the tranting had to bring and almost he won't have been bard it as in the sather and to should be th
at, they should her stairs. As had he was and at him to a moment was tried and he was taking a most and he was at his
sinds to the string and shere with
his presior at the distersary
the table was of thae was as a good free. He would not hear and answered a soonsert and standing to almost to and the
y told this all here out.

The stains was suddenly strange through sense.

"You will be her say and
he should not be a trinen and to to have say how a
```

Keyword : Mercy

```
checkpoint = tf.train.latest_checkpoint('checkpoints')
samp = sample(checkpoint, 800, lstm_size, len(vocab), prime="Mercy")
print(samp)
```

```
INFO:tensorflow:Restoring parameters from checkpoints/i45220_l128.ckpt
Mercy the dinure his hand so to always on a for some wall and her hands, a potted, whine as the hands, to the stains
at the straire a matter, she had that a life won't at the singies with and something to she an other. He had been a m
inute, and as a fight. He was at all that with werone and asked, tort to him. At him at him. His fortentations would
never sent him and was and he ask herself and with an indeed of stood, and he had that she was
so a corner. "He is an and he had an objects," he added thousand and stracked the sentent and at once to
some second happy to stopped to another table, talk at the seemant an angrack. He had
another soon this house of his poofent walked to the perhaps the
door of the crowd to some said all to his fitter how all already, how then he thinks. He cith in the sta
```

Keyword : Andrey

```
checkpoint = tf.train.latest_checkpoint('checkpoints')
samp = sample(checkpoint, 800, lstm_size, len(vocab), prime="Andrey")
print(samp)
```

```
INFO:tensorflow:Restoring parameters from checkpoints/i45220_l128.ckpt
Andrey, his hat. At
him and to told has hard of them and sent that he took the table, and she was time. He had suspecting the stairs, and
another as though then
she had a sinting a dasts and this that.

"What are that a coppise the starre and there's a matters is all the strange imprack." She would be and had a frait t
o the tound," thought that she could not be suddenly that he saw the that he had a mad of any
town of his prastations; he was those
such a stands all at a most ask had to be the position of the pale standed at the hurry and at once, with the stority
. Something.

"Who, at the wish a dange or so sure at him to him. The tand off hard that the shiten that he show on to the copecks.
He shouts of strangely to to her order and had
been suddenly
she had to the story and talking and a forgat
```

Keyword : Brother

```
checkpoint = tf.train.latest_checkpoint('checkpoints')
samp = sample(checkpoint, 800, lstm_size, len(vocab), prime="Brother")
print(samp)
```

```
INFO:tensorflow:Restoring parameters from checkpoints/i45220_l128.ckpt
Brother, and also at him.

"What all is in the doing thritte, I've he so the latter and stood the than or short a side all his hind in sure at o
nce, whether and what had she took his seether head often when there was the last assittor of it what to sort if he t
hey are that he was the stont to the step and he wanted to have his head, but the drove to an of that soon with a mir
uted, shill the table and would be talked to his sender. That is see alone to the dand he has no all and that he had
asked all
her, this had throw and taked and
hot was seemed oun and as is this
head, though
the strengh she the his hand... and to ask the tood, almost she would deternantly
one her tries was.

"Which will a monte heard
her. How've was not
a sinces? Way he has thought at him out of it. It's almost?" he she was bl
```

Keyword : Katerina

```python
checkpoint = tf.train.latest_checkpoint('checkpoints')
samp = sample(checkpoint, 800, lstm_size, len(vocab), prime="Katerina")
print(samp)
```

```
INFO:tensorflow:Restoring parameters from checkpoints/i45220_l128.ckpt
Katerina has to said offence at him that why was a stous at threugh of a most and to
the day to the passing in the thoughts and has time and and he had been some with the chanse, how state, anything, he
would not too thing of
that with
that the troaching and as he
had seemed and he took it of the confirant of a stoptace too astelsity, that he said he seemed to see that he well. T
he thought at the dead who so the table. He had
back to see
that he had almost a much sick astinity, at always so have he
wattered at her, he stone and how the day.

The perpeced way one
what he taken a going at the truned in his hands of the position and starking him him all of him of the somewhire and
the strange or that she stracked as a street how he have
suddenly with who should saw to the
soon humiliared on her
hand.
```