UDACITY

PROJECT

Generate TV Scripts

A part of the Deep Learning Nanodegree Foundation Program

PROJECT REVIEW

CODE REVIEW

NOTES

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Meets Specifications

Your code is awesome!
It shows you really understand RNNs & Tensorflow well and have put considerable effort into this.

Further, I would highly suggest you implement RNN from scratch in Python/Numpy. It would be a very good exercise and will lead to better understanding of abstraction provided by Tensorflow. This gist can be a good starting point (along with this video).

Required Files and Tests

The project submission contains the project notebook, called “dlnd_tv_script_generation.ipynb”.

All the unit tests in project have passed.

Preprocessing

The function `create_lookup_tables` create two dictionaries:

- Dictionary to go from the words to an id, we'll call vocab_to_int
- Dictionary to go from the id to word, we'll call int_to_vocab

The function `create_lookup_tables` return these dictionaries in the a tuple (vocab_to_int, int_to_vocab)

The function `token_lookup` returns a dict that can correctly tokenizes the provided symbols.

Build the Neural Network

Implemented the `get_inputs` function to create TF Placeholders for the Neural Network with the following placeholders:

- Input text placeholder named "input" using the TF Placeholder name parameter.
- Targets placeholder
- Learning Rate placeholder

The `get_inputs` function return the placeholders in the following the tuple (Input, Targets, LearingRate)

The `get_init_cell` function does the following:

- Stacks one or more BasicLSTMCells in a MultiRNNCell using the RNN size `rnn_size`.
- Initializes Cell State using the MultiRNNCell's `zero_state` function
- The name "initial_state" is applied to the initial state.
- The `get_init_cell` function return the cell and initial state in the following tuple (Cell, InitialState)

The function `get_embed` applies embedding to `input_data` and returns embedded sequence.

The function `build_rnn` does the following:

- Builds the RNN using the `tf.nn.dynamic_rnn`.
- Applies the name "final_state" to the final state.
- Returns the outputs and final_state state in the following tuple (Outputs, FinalState)

The `build_nn` function does the following in order:

- Apply embedding to `input_data` using `get_embed` function.
- Build RNN using cell using `build_rnn` function.
- Apply a fully connected layer with a linear activation and `vocab_size` as the number of outputs.
- Return the logits and final state in the following tuple (Logits, FinalState)

The `get_batches` function create batches of input and targets using `int_text`. The batches should be a Numpy array of tuples. Each tuple is (batch of input, batch of target).

- The first element in the tuple is a single batch of input with the shape [batch size, sequence length]
- The second element in the tuple is a single batch of targets with the shape [batch size, sequence length]

Neural Network Training

- Enough epochs to get near a minimum in the training loss, no real upper limit on this. Just need to make sure the training loss is low and not improving much with more training.
- Batch size is large enough to train efficiently, but small enough to fit the data in memory. No real “best” value here, depends on GPU memory usually.
- Size of the RNN cells (number of units in the hidden layers) is large enough to fit the data well. Again, no real “best” value.
- The sequence length (seq_length) here should be about the size of the length of sentences you want to generate. Should match the structure of the data.
  The learning rate shouldn’t be too large because the training algorithm won’t converge. But needs to be large enough that training doesn’t take forever.
  Set show_every_n_batches to the number of batches the neural network should print progress.

30 `epochs` with around 0.01 `learning_rate` took you places. The hyperparams chosen are very good as evident from your training loss. Further, setting `batch_size` as a power of 2 (256 in your case) is handled efficiently by tensorflow (better so on GPU).

Everything worked perfectly with these setting of hyperparams. Seems to me, you had your **Deep learning hat** on while choosing these. 😉

The project gets a loss less than 1.0

Awesome work!
0.042 is one of the best losses i've seen from all student's submission.

Generate TV Script

"input:0", "initial_state:0", "final_state:0", and "probs:0" are all returned by `get_tensor_by_name`, in that order, and in a tuple

The `pick_word` function predicts the next word correctly.

The generated script looks similar to the TV script in the dataset.

It doesn't have to be grammatically correct or make sense.

Woah ! Now that is something 👍

Being a Simpsons fan myself, these conversations are amazing knowing they are produced by an RNN. I am sure training on the whole series will produce better results, who knows, an episode itself.

Fun Fact: Here is an amazing RNN generated TED Talk.

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