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# Machine Translation

REVIEW

CODE REVIEW

HISTORY

## Meets Specifications

This is a strong first submission. Your work shows a lot of effort and grasp of the concepts. The final model needs a bit more work to predict both sentences accurately. I've given you a lot of hints and a sample model that can help you. Don't get discouraged, it's always a learning experience. I am certain your next submission will be the final. Looking forward to your resubmission.  
Good luck and all the best

## Submitted Files

The following files have been submitted: `helper.py`, `machine_translation.ipynb`, `machine_translation.html`

All the required files are successfully submitted

## Preprocess

The function `tokenize` returns tokenized input and the tokenized class.

Neat and clean implementation of tokenize function

The function `pad` returns padded input to the correct length.

Pad function is correctly implemented

## Models

The function `simple_model` builds a basic RNN model.

Correctly built a simple model. Well done.

Tip: Try experimenting with different architectures to understand their behaviour. You can try using LSTM cell instead of GRU, try a wide network by increasing the number of units to 256 or 512 or by changing various learning rate and see how training proceeds. This will provide you with some idea and intuition who performs better and can be used further in complex models

You might find these links useful!

1) When to use GRU over LSTM

<https://datascience.stackexchange.com/questions/14581/when-to-use-gru-over-lstm>

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2) The Difference between Dense and TimeDistributedDense of Keras  
<https://datascience.stackexchange.com/questions/10836/the-difference-between-dense-and-timedistributeddense-of-keras>

The function `embed_model` builds a RNN model using word embedding.

Great job building an embedded model.Great validation accuracy.

Tip: Embeddings are a great way to improve your models.If you want to learn more about it, you can refer to these links

<https://developers.google.com/machine-learning/crash-course/embeddings/video-lecture>  
<https://towardsdatascience.com/neural-network-embeddings-explained-4d028e6f0526>  
<https://stats.stackexchange.com/questions/182775/what-is-an-embedding-layer-in-a-neural-network>

The Embedding RNN is trained on the dataset. A prediction using the model on the training dataset is printed in the notebook.

new jersey est parfois calme en cours et il automne neigeux en avril <PAD> <PAD> <PAD>  
 <PAD> <PAD> <PAD> <PAD> <PAD>

The function `bd_model` builds a bidirectional RNN model.

Correctly build a bidirectional model.Good job

Additional Reading:

1) Bidirectional LSTMs from scratch <https://machinelearningmastery.com/develop-bidirectional-lstm-sequence-classification-python-keras/>  
 2) A small chapter on Bidirectional RNNs from Dive into Deep Learning book.  
[https://d2l.ai/chapter\\_recurrent-modern/bi-rnn.html](https://d2l.ai/chapter_recurrent-modern/bi-rnn.html)

The Bidirectional RNN is trained on the dataset. A prediction using the model on the training dataset is printed in the notebook.

new jersey est parfois calme en mois et il est il est en en <PAD> <PAD> <PAD> <PAD>  
 <PAD> <PAD> <PAD>

The function `model_final` builds and trains a model that incorporates embedding, and bidirectional RNN using the dataset.

Correctly built the final model incorporating learnings from previous parts

## Prediction

The final model correctly predicts both sentences.

Your model predicts both the sentences correctly.Awesome

To improve the model you can further look at these steps

Widen the network use 256 or 512 unit.

Reduce your batch size to 256 or 512

Tweak your learning rate.Start with a higher value and reduce down as training progresses

For more information check out the link

<https://machinelearningmastery.com/using-learning-rate-schedules-deep-learning-models-python-keras/>

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