import tensorflow

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from tensorflow import keras
from keras.datasets import imdb
import numpy as np
from keras.preprocessing.sequence import pad_sequences
from keras import Sequential
from keras.layers import Embedding, LSTM, Dense, Dropout, GRU, Bidirectional, SimpleRNN, Flatten
vocabulary_size =5000
max\_words = 2697
batch_size = 64
num\_epochs = 3
(X_train, y_train), (X_test, y_test) = imdb.load_data(num_words=vocabulary_size)
# print(np.shape(X_train))
# print(np.shape(X_test))
print('Loaded dataset with {} training samples, {} test samples'.format(len(X_train), len(X_test)))
print('---review---')
print(X_train[6])
print('---label---')
print(y_train[6])
word2id = imdb.get_word_index()
id2word = {i: word for word, i in word2id.items()}
print('---review with words---')
print([id2word.get(i, ' ') for i in X_train[6]])
print('---label---')
print(y_train[6])
print('Maximum review length: {}'.format(len(max((X_train + X_test), key=len))))
print('Minimum review length: {}'.format(len(min((X_test + X_test), key=len))))
X_train = pad_sequences(X_train, maxlen=max_words)
X_test = pad_sequences(X_test, maxlen=max_words)
embedding_size = 32
model = Sequential()
model.add(Embedding(vocabulary_size, embedding_size, input_length=max_words))
model.add(SimpleRNN(100))
model.add(Dense(64))
model.add(Dense(1, activation='sigmoid'))
print(model.summary())
model.compile(loss='binary_crossentropy',
              optimizer='adam',
              metrics=['accuracy'])
X_valid, y_valid = X_train[:batch_size], y_train[:batch_size]
X_train2, y_train2 = X_train[batch_size:], y_train[batch_size:]
model.fit(X_train2, y_train2, validation_data=(X_valid, y_valid), batch_size=batch_size, epochs=num_epochs, verbose=1)
scores = model.evaluate(X_test, y_test, verbose=1)
print('Test accuracy:', scores[1])
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```
Loaded dataset with 25000 training samples, 25000 test samples
---review---
[1, 2, 365, 1234, 5, 1156, 354, 11, 14, 2, 2, 7, 1016, 2, 2, 356, 44, 4, 1349, 500, 746, 5, 200, 4, 4132, 11, 2, 2, 1112
---label---

1
---review with words---
['the', 'and', 'full', 'involving', 'to', 'impressive', 'boring', 'this', 'as', 'and', 'and', 'br', 'villain', 'and', 'a---label---

1
Maximum review length: 2697
Minimum review length: 14
Model: "sequential_5"
```

Layer (type)	Output Shape	Param #
	=======================================	========
<pre>embedding_5 (Embedding)</pre>	(None, 2697, 32)	160000
simple_rnn_5 (SimpleRNN)	(None, 100)	13300
dense_3 (Dense)	(None, 64)	6464
dense_4 (Dense)	(None, 1)	65

Total params: 179,829 Trainable params: 179,829 Non-trainable params: 0

None

/usr/local/lib/python3.6/dist-packages/tensorflow/python/framework/indexed_slices.py:434: UserWarning: Converting sparse "Converting sparse IndexedSlices to a dense Tensor of unknown shape."

Train on 24936 samples, validate on 64 samples

Epoch 1/3

Epoch 3/3

25000/25000 [============] - 125s 5ms/step

Test accuracy: 0.6704800128936768