```
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```

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Multiple Layer GRU

```
from __future__ import absolute_import, division, print_function, unicode_literals
```

```
import tensorflow_datasets as tfds
import tensorflow as tf
print(tf.__version__)
```

```
2.3.0
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```
# Get the data
dataset, info = tfds.load('imdb_reviews/subwords8k', with_info=True, as_supervised=True)
train_dataset, test_dataset = dataset['train'], dataset['test']
```

```
Downloading and preparing dataset imdb_reviews/subwords8k/1.0.0 (download: 80.23 MiB, ge
```

```
Dl Completed...: 100%  1/1 [00:01<00:00, 1.75s/ url]
Dl Size...: 100%  80/80 [00:01<00:00, 46.52 MiB/s]
```

```
tokenizer = info.features['text'].encoder
```

```
Shuffling and writing examples to /root/tensorflow_datasets/imdb_reviews/subwords8k/1.0
```

```
BUFFER_SIZE = 10000
BATCH_SIZE = 64

train_dataset = train_dataset.shuffle(BUFFER_SIZE)
train_dataset = train_dataset.padded_batch(BATCH_SIZE, train_dataset.output_shapes)
test_dataset = test_dataset.padded_batch(BATCH_SIZE, test_dataset.output_shapes)
```

```
WARNING:tensorflow:From <ipython-input-5-51766d5ffb66>:5: DatasetV1.output_shapes (from
Instructions for updating:
Use `tf.compat.v1.data.get_output_shapes(dataset)`.
WARNING:tensorflow:From <ipython-input-5-51766d5ffb66>:5: DatasetV1.output_shapes (from
Instructions for updating:
Use `tf.compat.v1.data.get_output_shapes(dataset)`.
```

```
model = tf.keras.Sequential([
    #works with GRU/ LSTM, or convolutions with global average pooling
    tf.keras.layers.Embedding(tokenizer.vocab_size, 64),
    #using convolutions and global average pooling, instead of LSTM's
    tf.keras.layers.Conv1D(128, 5, activation='relu'),
    #remember we use this when the vectors outputted aren't easily flattened
    tf.keras.layers.GlobalAveragePooling1D(),
    tf.keras.layers.Dense(64, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
```

```
model.summary()
```

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
```

```
model.compile(loss='binary_crossentropy', optimizer='adam', metrics=['accuracy'])
```

```
conv1d (Conv1D)              (None, None, 128)         41088
```

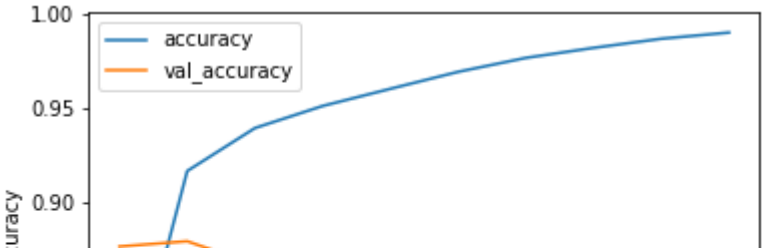
```
NUM_EPOCHS = 10
history = model.fit(train_dataset, epochs=NUM_EPOCHS, validation_data=test_dataset)
```

```
Epoch 1/10
391/391 [==============================] - 22s 56ms/step - loss: 0.4530 - accuracy: 0.78
Epoch 2/10
391/391 [==============================] - 16s 41ms/step - loss: 0.2235 - accuracy: 0.91
Epoch 3/10
391/391 [==============================] - 15s 39ms/step - loss: 0.1692 - accuracy: 0.93
Epoch 4/10
391/391 [==============================] - 15s 38ms/step - loss: 0.1387 - accuracy: 0.95
Epoch 5/10
391/391 [==============================] - 14s 37ms/step - loss: 0.1116 - accuracy: 0.96
Epoch 6/10
391/391 [==============================] - 15s 37ms/step - loss: 0.0906 - accuracy: 0.96
Epoch 7/10
391/391 [==============================] - 15s 37ms/step - loss: 0.0724 - accuracy: 0.97
Epoch 8/10
391/391 [==============================] - 14s 37ms/step - loss: 0.0563 - accuracy: 0.98
Epoch 9/10
391/391 [==============================] - 14s 37ms/step - loss: 0.0447 - accuracy: 0.98
Epoch 10/10
391/391 [==============================] - 14s 37ms/step - loss: 0.0358 - accuracy: 0.99
```

```
import matplotlib.pyplot as plt


def plot_graphs(history, string):
  plt.plot(history.history[string])
  plt.plot(history.history['val_'+string])
  plt.xlabel("Epochs")
  plt.ylabel(string)
  plt.legend([string, 'val_'+string])
  plt.show()


plot_graphs(history, 'accuracy')
```




```
plot_graphs(history, 'loss')
```