

main

May 15, 2025

```
[3]: import tensorflow as tf
from tensorflow.keras.datasets import imdb
from tensorflow.keras.preprocessing.sequence import pad_sequences
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Embedding, LSTM, Dense
import matplotlib.pyplot as plt

#
max_words = 10000      #      10000
maxlen = 200           #      200
embedding_dim = 32     #      32
batch_size = 64        #      64
epochs = 10            #      10      10

# IMDB
print(" ...")
# IMDB      10000
# x_train x_test      y_train y_test      0 1
(x_train, y_train), (x_test, y_test) = imdb.load_data(num_words=max_words)
print("f      {len(x_train)},      {len(x_test)}")

#
#      pad_sequences      maxlen=200
#      0      200
x_train = pad_sequences(x_train, maxlen=maxlen)
x_test = pad_sequences(x_test, maxlen=maxlen)

#
model = Sequential() #
model.add(Embedding(input_dim=max_words, output_dim=embedding_dim,
    ↪ input_length=maxlen))
# Embedding      (batch_size, maxlen, embedding_dim)
model.add(LSTM(32)) # LSTM 32
model.add(Dense(1, activation='sigmoid'))
#      1      sigmoid      [0,1]
```

```

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

model.summary() #

#
print(" ...")
history = model.fit(
    x_train, y_train,          #
    epochs=epochs,
    batch_size=batch_size,
    validation_split=0.2      # 20%
)

#
print(" ...")
loss, acc = model.evaluate(x_test, y_test)
print(f"\n      : {acc:.4f},      : {loss:.4f}")

#
plt.figure(figsize=(12, 4))
plt.subplot(1, 2, 1)
plt.plot(history.history['loss'], label='loss')
plt.plot(history.history['val_loss'], label='val_loss')
plt.title('loss')
plt.xlabel('Epoch')
plt.ylabel('Loss')
plt.legend()

plt.subplot(1, 2, 2)
plt.plot(history.history['accuracy'], label='accuracy')
plt.plot(history.history['val_accuracy'], label='val_accuracy')
plt.title('Accuracy')
plt.xlabel('Epoch')
plt.ylabel('Accuracy')
plt.legend()
plt.tight_layout()
plt.savefig('training_curve.png')
plt.show()

```

```

...
f      {len(x_train)},      {len(x_test)}

```

D:\Apply\Anaconda\Lib\site-packages\keras\src\layers\core\embedding.py:90:
UserWarning: Argument `input_length` is deprecated. Just remove it.

```
warnings.warn(  
Model: "sequential"
```

Layer (type)	Output Shape	Param #
embedding (Embedding)	?	0 (unbuilt)
lstm (LSTM)	?	0 (unbuilt)
dense (Dense)	?	0 (unbuilt)

Total params: 0 (0.00 B)

Trainable params: 0 (0.00 B)

Non-trainable params: 0 (0.00 B)

```
...  
Epoch 1/10  
313/313          16s 44ms/step -  
accuracy: 0.6913 - loss: 0.5555 - val_accuracy: 0.8322 - val_loss: 0.4195  
Epoch 2/10  
313/313          22s 48ms/step -  
accuracy: 0.8979 - loss: 0.2628 - val_accuracy: 0.8554 - val_loss: 0.3274  
Epoch 3/10  
313/313          21s 48ms/step -  
accuracy: 0.9297 - loss: 0.1921 - val_accuracy: 0.8582 - val_loss: 0.3478  
Epoch 4/10  
313/313          21s 48ms/step -  
accuracy: 0.9529 - loss: 0.1373 - val_accuracy: 0.8528 - val_loss: 0.4094  
Epoch 5/10  
313/313          20s 48ms/step -  
accuracy: 0.9634 - loss: 0.1102 - val_accuracy: 0.8670 - val_loss: 0.4037  
Epoch 6/10  
313/313          21s 48ms/step -  
accuracy: 0.9700 - loss: 0.0904 - val_accuracy: 0.8612 - val_loss: 0.4432  
Epoch 7/10  
313/313          21s 48ms/step -  
accuracy: 0.9776 - loss: 0.0688 - val_accuracy: 0.8588 - val_loss: 0.4387  
Epoch 8/10  
313/313          21s 48ms/step -  
accuracy: 0.9823 - loss: 0.0556 - val_accuracy: 0.8654 - val_loss: 0.5425  
Epoch 9/10
```

```

313/313          14s 44ms/step -
accuracy: 0.9729 - loss: 0.0889 - val_accuracy: 0.8408 - val_loss: 0.4798
Epoch 10/10
313/313          14s 44ms/step -
accuracy: 0.9610 - loss: 0.1120 - val_accuracy: 0.8618 - val_loss: 0.4735
...
782/782          10s 13ms/step -
accuracy: 0.8503 - loss: 0.5112

: 0.8494, : 0.5147

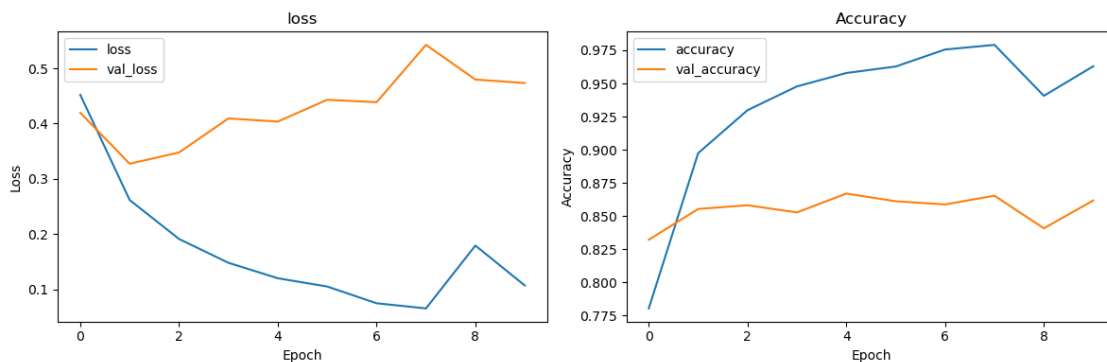
```

```

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NameError                                Traceback (most recent call last)
Cell In[3], line 77
     75 plt.legend()
     76 plt.tight_layout()
----> 77 plt.savefig(training_curve.png)
     78 plt.show()

NameError: name 'training_curve' is not defined

```



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