

Design a Deep Learning Model to classify the movie reviews as Positive or Negative based on the text content of reviews using IMDB dataset.

```
import numpy as np
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, Dropout

# Load and preprocess the data
max_features = 10000 # Number of words to consider as features
maxlen = 200 # Cuts off texts after this many words
(x_train, y_train), (x_test, y_test) = imdb.load_data(num_words=max_features)
x_train = pad_sequences(x_train, maxlen=maxlen)
x_test = pad_sequences(x_test, maxlen=maxlen)

# Define the model
model = Sequential()
model.add(Embedding(max_features, 128, input_length=maxlen))
model.add(LSTM(64, dropout=0.2, recurrent_dropout=0.2))
model.add(Dense(1, activation='sigmoid'))

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

# Train the model
history = model.fit(x_train, y_train, epochs=5, batch_size=32, validation_split=0.2)

# Evaluate the model
loss, accuracy = model.evaluate(x_test, y_test)
print(f'Test accuracy: {accuracy * 100:.2f}%')
```

Downloading data from <https://storage.googleapis.com/tensorflow/tf-keras-datasets/imdb.npz>
17464789/17464789 [=====] - 0s 0us/step
Epoch 1/5
625/625 [=====] - 201s 314ms/step - loss: 0.4215 - accuracy: 0.8027 - val_loss: 0.3349 - val_accuracy: 0.8578
Epoch 2/5
625/625 [=====] - 197s 316ms/step - loss: 0.2516 - accuracy: 0.9007 - val_loss: 0.3297 - val_accuracy: 0.8628
Epoch 3/5
625/625 [=====] - 192s 308ms/step - loss: 0.1723 - accuracy: 0.9362 - val_loss: 0.3814 - val_accuracy: 0.8676
Epoch 4/5
625/625 [=====] - 195s 313ms/step - loss: 0.1361 - accuracy: 0.9496 - val_loss: 0.4492 - val_accuracy: 0.8444
Epoch 5/5
625/625 [=====] - 202s 324ms/step - loss: 0.1015 - accuracy: 0.9632 - val_loss: 0.5182 - val_accuracy: 0.8460
782/782 [=====] - 39s 50ms/step - loss: 0.5332 - accuracy: 0.8452
Test accuracy: 84.52%