

```
!pip install tensorflow
!pip install keras
```

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Requirement already satisfied: tensorflow in /usr/local/lib/python3.10/dist-packages (2.15.0)
Requirement already satisfied: absl-py>=1.0.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: astunparse>=1.6.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: flatbuffers>=23.5.26 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: gast!=0.5.0,!0.5.1,!0.5.2,>=0.2.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: google-pasta>=0.1.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: h5py>=2.9.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: libclang>=13.0.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: ml-dtypes~0.2.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: numpy<2.0.0,>=1.23.5 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: opt-einsum>=2.3.2 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<5.0.0dev, in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: setuptools in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: six>=1.12.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: termcolor>=1.1.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: typing-extensions>=3.6.6 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: wrapt<1.15,>=1.11.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.23.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: tensorboard<2.16,>=2.15 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: tensorflow-estimator<2.16,>=2.15.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: keras<2.16,>=2.15.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: wheel<1.0,>=0.23.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: google-auth<3,>=1.6.3 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: google-auth-oauthlib<2,>=0.5 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: requests<3,>=2.21.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: tensorboard-data-server<0.8.0,>=0.7.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: werkzeug>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: requests-oauthlib>=0.7.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: MarkupSafe>=2.1.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: pyasn1<0.7.0,>=0.4.6 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow)
Requirement already satisfied: keras in /usr/local/lib/python3.10/dist-packages (2.15.0)
```

```
import tensorflow as tf
from tensorflow import keras
```

```
import tensorflow as tf
from keras.models import Sequential
from keras.layers import Embedding, LSTM, Dense
from keras.preprocessing.text import Tokenizer
from keras.preprocessing.sequence import pad_sequences
import numpy as np
import regex as re
```

```
import keras.utils
```

```

def file_to_sentence_list(file_path):
    with open(file_path, 'r') as file:
        text = file.read()

    # Splitting the text into sentences using
    # delimiters like '.', '!', and '?'
    sentences = [sentence.strip() for sentence in re.split(
        r'(?<=[.!?])\s+', text) if sentence.strip()]

    return sentences

file_path = 'data.txt'
text_data = file_to_sentence_list(file_path)

# Tokenize the text data
tokenizer = Tokenizer()
tokenizer.fit_on_texts(text_data)
total_words = len(tokenizer.word_index) + 1

# Create input sequences
input_sequences = []
for line in text_data:
    token_list = tokenizer.texts_to_sequences([line])[0]
    for i in range(1, len(token_list)):
        n_gram_sequence = token_list[:i+1]
        input_sequences.append(n_gram_sequence)

# Pad sequences and split into predictors and label
max_sequence_len = max([len(seq) for seq in input_sequences])
input_sequences = np.array(pad_sequences(
    input_sequences, maxlen=max_sequence_len, padding='pre'))
X, y = input_sequences[:, :-1], input_sequences[:, -1]

# Convert target data to one-hot encoding
y =keras.utils.to_categorical(y, num_classes=total_words)

# Define the model
model = Sequential()
model.add(Embedding(total_words, 10,
                    input_length=max_sequence_len-1))
model.add(LSTM(128))
model.add(Dense(total_words, activation='softmax'))
model.compile(loss='categorical_crossentropy',
              optimizer='adam', metrics=['accuracy'])

# Train the model
model.fit(X, y, epochs=1, verbose=1)

3312/3312 [=====] - 1048s 316ms/step - loss: 6.5132 - accuracy: 0.0633
<keras.src.callbacks.History at 0x7baa9bbc0970>

```

```
# Generate next word predictions
seed_text = "It is not a"
next_words = 2

for _ in range(next_words):
    token_list = tokenizer.texts_to_sequences([seed_text])[0]
    token_list = pad_sequences(
        [token_list], maxlen=max_sequence_len-1, padding='pre')
    predicted_probs = model.predict(token_list)
    predicted_word = tokenizer.index_word[np.argmax(predicted_probs)]
    seed_text += " " + predicted_word
```

```
1/1 [=====] - 0s 68ms/step
1/1 [=====] - 0s 62ms/step
```

```
print("Next predicted words:", seed_text)
```

```
Next predicted words: It is not a little of
```