

<b>Ex. No. 8</b>	<b>Encoder Decoder Model</b>
<b>Date of Exercise</b>	<b>21/10/2025</b>

**Aim:**

To implement an encoder-decoder model for a sequence-to-sequence translation task, such as English-to-French translation.

**Description:**

The encoder-decoder architecture is widely used for machine translation. The encoder processes the input sequence and generates a context vector, which the decoder uses to generate the translated output.

**Code:**

```
import tensorflow as tf
from tensorflow.keras.layers import Input, LSTM, Dense
from tensorflow.keras.models import Model
import numpy as np
# Define model parameters
latent_dim = 256
# Encoder
encoder_inputs = Input(shape=(None, 100))
encoder_lstm = LSTM(latent_dim, return_state=True)
encoder_outputs, state_h, state_c = encoder_lstm(encoder_inputs)
encoder_states = [state_h, state_c]
```

```
# Decoder
decoder_inputs = Input(shape=(None, 100))
decoder_lstm = LSTM(latent_dim, return_sequences=True, return_state=True)
decoder_outputs, _, _ = decoder_lstm(decoder_inputs, initial_state=encoder_states)
decoder_dense = Dense(100, activation='softmax')
decoder_outputs = decoder_dense(decoder_outputs)

# Define the model
model = Model([encoder_inputs, decoder_inputs], decoder_outputs)
model.compile(optimizer='adam', loss='categorical_crossentropy')
print(model.summary())
```

Sample Output:

A summary of the encoder-decoder model architecture.

### Youtube Link

<https://youtu.be/yBmRT1aEfG8?si=FPcddqBEswUt1rdh>

### Result

The code for Encoder Decoder Model is Done successful and the output is been verified