```
from urllib import request
url = "https://raw.githubusercontent.com/Thomas19SA1247/Tugas-Self-Learning/main/siobot.json"
request.urlretrieve(url, "siobot.json")
```

```
('siobot.json', <http.client.HTTPMessage at 0x7f3645724b50>)
```

```
from google.colab import drive
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mour
```

```
!pip -q install SpeechRecognition
```

```
     |████████████████████████████████| 32.8 MB 71.0 MB/s
```

```
!pip -q install gtts
```

```
import json
import nltk
import time
import random
import string
import pickle
import numpy as np
import pandas as pd
from gtts import gTTS
from io import BytesIO
import tensorflow as tf
import IPython.display as ipd
import speech_recognition as sr
import matplotlib.pyplot as plt
from nltk.stem import WordNetLemmatizer
from tensorflow.keras.models import Model
from keras.utils.vis_utils import plot_model
from sklearn.preprocessing import LabelEncoder
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.layers import Input, Embedding, LSTM
from tensorflow.keras.preprocessing.sequence import pad_sequences
from tensorflow.keras.layers import Flatten, Dense, GlobalMaxPool1D
```

```
nltk.download('punkt')
nltk.download('wordnet')
nltk.download('omw-1.4')
```

```
[nltk_data] Downloading package punkt to /root/nltk_data...
```

```
[nltk_data]   Unzipping tokenizers/punkt.zip.
[nltk_data] Downloading package wordnet to /root/nltk_data...
[nltk_data] Downloading package omw-1.4 to /root/nltk_data...
True
```

```
# Importing the dataset
with open('/content/siobot.json') as content:
  data1 = json.load(content)

# Mendapatkan semua data ke dalam list
tags = []
inputs = []
responses = {}
words = []
classes = []
documents = []
ignore_words = ['?', '!']

for intent in data1['intents']:
  responses[intent['tag']]=intent['responses']
  for lines in intent['patterns']:
    inputs.append(lines)
    tags.append(intent['tag'])
    for pattern in intent['patterns']:
      w = nltk.word_tokenize(pattern)
      words.extend(w)
      documents.append((w, intent['tag']))
      # add to our classes list
      if intent['tag'] not in classes:
        classes.append(intent['tag'])

# Konversi data json ke dalam dataframe
data = pd.DataFrame({"patterns":inputs, "tags":tags})


# Cetak data keseluruhan
data
```

	patterns	tags
0	hallo	greeting
1	hai	greeting
2	halo	greeting
3	hei	greeting

```
data['patterns'] = data['patterns'].apply(lambda wrd:[ltrs.lower() for ltrs in wrd if ltrs no
data['patterns'] = data['patterns'].apply(lambda wrd: ''.join(wrd))
```

50	Apa saja yang kita pelajari di AI Mastery Progam2 , pembelajaran aimasteryprogam

```
lemmatizer = WordNetLemmatizer()
words = [lemmatizer.lemmatize(w.lower()) for w in words if w not in ignore_words]
words = sorted(list(set(words)))

print (len(words), "unique lemmatized words", words)
```

```
90 unique lemmatized words [',', '4', 'academy', 'afternoon', 'ai', 'apa', 'apabila', 'a
```

```
classes = sorted(list(set(classes)))
print (len(classes), "classes", classes)
```

```
17 classes ['SIOBOT', 'goodbye', 'greeting', 'jam_pembelajaran_orbit', 'manfaat_studi_ir
```

```
print (len(documents), "documents")
```

```
422 documents
```

```
tokenizer = Tokenizer(num_words=2000)
tokenizer.fit_on_texts(data['patterns'])
train = tokenizer.texts_to_sequences(data['patterns'])
train
```

```
[[39],
 [40],
 [41],
 [42],
 [43],
 [44],
 [45],
 [46],
 [47],
 [48],
 [49],
 [50],
 [51],
 [52],
```

```
        [53],
        [1, 10, 19],
        [20, 19],
        [20, 54],
        [19, 4, 55, 56, 20],
        [20, 57, 19],
        [58],
        [59],
        [27],
        [60],
        [61, 27],
        [62, 63],
        [64, 65],
        [66],
        [67, 28],
        [68],
        [69, 28],
        [29, 30],
        [70],
        [29, 30, 71],
        [1, 10, 6, 7],
        [1, 4, 72, 73, 6, 7],
        [1, 74, 6, 7],
        [1, 5, 75, 6, 7],
        [31, 76, 77, 78, 79, 80, 81, 6, 7],
        [1, 5, 82, 83, 84, 6, 7],
        [1, 10, 13, 14, 15],
        [12, 13, 14, 15],
        [13, 14, 15, 10, 12],
        [1, 5, 2, 32, 13, 14, 15, 4, 33, 34, 6, 7],
        [2, 1, 5, 4, 33, 34, 6, 7, 11, 13, 14, 15],
        [1, 10, 2, 3, 16, 17],
        [3, 16, 17, 10, 1],
        [12, 3, 16, 17],
        [1, 10, 2, 3, 8, 2],
        [3, 8, 2, 10, 1],
        [12, 3, 8, 2],
        [1, 2, 4, 85, 35, 86, 36],
        [37, 37, 2, 1, 4, 87, 35, 36],
        [1, 5, 4, 9, 21, 11, 3, 16, 17],
        [9, 18, 22, 1, 5, 11, 3, 16, 17],
        [12, 4, 9, 23, 18, 24, 25, 3, 16, 17],
        [1, 5, 4, 9, 21, 11, 3, 8, 2],
        [9, 18, 22, 1, 5, 11, 3, 8, 2],
```

```
# Apply padding
x_train = pad_sequences(train)
print(x_train) # Padding Sequences
```

```
     [[ 0  0  0  0  0  0  0  0  0  0  0 39]
      [ 0  0  0  0  0  0  0  0  0  0  0 40]
      [ 0  0  0  0  0  0  0  0  0  0  0 41]
      [ 0  0  0  0  0  0  0  0  0  0  0 42]
      [ 0  0  0  0  0  0  0  0  0  0  0 43]
      [ 0  0  0  0  0  0  0  0  0  0  0 44]
```

```
[ 0  0  0  0  0  0  0  0  0  0  0 45]
[ 0  0  0  0  0  0  0  0  0  0  0 46]
[ 0  0  0  0  0  0  0  0  0  0  0 47]
[ 0  0  0  0  0  0  0  0  0  0  0 48]
[ 0  0  0  0  0  0  0  0  0  0  0 49]
[ 0  0  0  0  0  0  0  0  0  0  0 50]
[ 0  0  0  0  0  0  0  0  0  0  0 51]
[ 0  0  0  0  0  0  0  0  0  0  0 52]
[ 0  0  0  0  0  0  0  0  0  0  0 53]
[ 0  0  0  0  0  0  0  0  0  1 10 19]
[ 0  0  0  0  0  0  0  0  0  0 20 19]
[ 0  0  0  0  0  0  0  0  0  0 20 54]
[ 0  0  0  0  0  0  0 19  4 55 56 20]
[ 0  0  0  0  0  0  0  0  0 20 57 19]
[ 0  0  0  0  0  0  0  0  0  0  0 58]
[ 0  0  0  0  0  0  0  0  0  0  0 59]
[ 0  0  0  0  0  0  0  0  0  0  0 27]
[ 0  0  0  0  0  0  0  0  0  0  0 60]
[ 0  0  0  0  0  0  0  0  0  0 61 27]
[ 0  0  0  0  0  0  0  0  0  0 62 63]
[ 0  0  0  0  0  0  0  0  0  0 64 65]
[ 0  0  0  0  0  0  0  0  0  0  0 66]
[ 0  0  0  0  0  0  0  0  0  0 67 28]
[ 0  0  0  0  0  0  0  0  0  0  0 68]
[ 0  0  0  0  0  0  0  0  0  0 69 28]
[ 0  0  0  0  0  0  0  0  0  0 29 30]
[ 0  0  0  0  0  0  0  0  0  0  0 70]
[ 0  0  0  0  0  0  0  0  0 29 30 71]
[ 0  0  0  0  0  0  0  0  1 10  6  7]
[ 0  0  0  0  0  0  1  4 72 73  6  7]
[ 0  0  0  0  0  0  0  0  1 74  6  7]
[ 0  0  0  0  0  0  0  1  5 75  6  7]
[ 0  0  0 31 76 77 78 79 80 81  6  7]
[ 0  0  0  0  0  1  5 82 83 84  6  7]
[ 0  0  0  0  0  0  0  1 10 13 14 15]
[ 0  0  0  0  0  0  0  0 12 13 14 15]
[ 0  0  0  0  0  0  0 13 14 15 10 12]
[ 1  5  2 32 13 14 15  4 33 34  6  7]
[ 2  1  5  4 33 34  6  7 11 13 14 15]
[ 0  0  0  0  0  0  1 10  2  3 16 17]
[ 0  0  0  0  0  0  0  3 16 17 10  1]
[ 0  0  0  0  0  0  0  0 12  3 16 17]
[ 0  0  0  0  0  0  1 10  2  3  8  2]
[ 0  0  0  0  0  0  0  3  8  2 10  1]
[ 0  0  0  0  0  0  0  0 12  3  8  2]
[ 0  0  0  0  0  1  2  4 85 35 86 36]
[ 0  0  0  0 37 37  2  1  4 87 35 36]
[ 0  0  0  1  5  4  9 21 11  3 16 17]
[ 0  0  0  9 18 22  1  5 11  3 16 17]
[ 0  0 12  4  9 23 18 24 25  3 16 17]
[ 0  0  0  1  5  4  9 21 11  3  8  2]
```

```
le = LabelEncoder()
y_train = le.fit_transform(data['tags'])
print(y_train)
```

```
[ 2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  0  0  7  7  7  1  1  1  1
  1  1  1  1  1 16 16 16 16 16 11 11 11 13 12  4 10 10 10 14 14  8  8  8
  9  9  9 15 15  5  5  5  6  6  6  6  6  6  3  3]
```

```
# input length
input_shape = x_train.shape[1]
print(input_shape)
```

```
12
```

```
# define vocabulary
vocabulary = len(tokenizer.word_index)
print("number of unique words : ", vocabulary)

# output length
output_length = le.classes_.shape[0]
print("output length: ", output_length)
```

```
number of unique words :  90
output length:  17
```

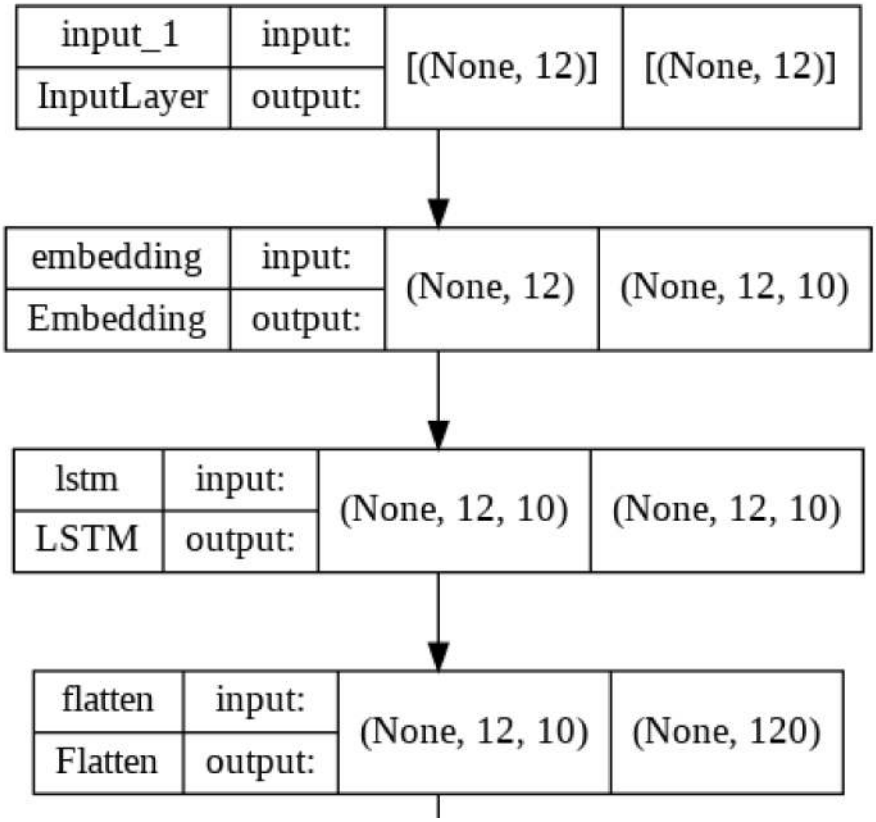
```
pickle.dump(words, open('/content/drive/MyDrive/chatbot/words.pkl', 'wb'))
pickle.dump(classes, open('/content/drive/MyDrive/chatbot/words.pkl', 'wb'))


pickle.dump(le, open('le.pkl','wb'))
pickle.dump(tokenizer, open('tokenizers.pkl','wb'))


# Creating the model (Membuat Modeling)
i = Input(shape=(input_shape,))
x = Embedding(vocabulary+1,10)(i) # Layer Embedding
x = LSTM(10, return_sequences=True)(x) # Layer Long Short Term Memory
x = Flatten()(x) # Layer Flatten
x = Dense(output_length, activation="softmax")(x) # Layer Dense
model  = Model(i,x)

# Compiling the model (Kompilasi Model)
model.compile(loss="sparse_categorical_crossentropy", optimizer='adam', metrics=['accuracy'])


# Visualization Plot Architecture Model (Visualisasi Plot Arsitektur Model)
plot_model(model, to_file='model_plot.png', show_shapes=True, show_layer_names=True)
```




```
# Menampilkan Parameter Model
model.summary()
```

```
Model: "model"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 input_1 (InputLayer)        [(None, 12)]              0

 embedding (Embedding)       (None, 12, 10)            910

 lstm (LSTM)                 (None, 12, 10)            840

 flatten (Flatten)           (None, 120)               0

 dense (Dense)               (None, 17)                2057

=================================================================
Total params: 3,807
Trainable params: 3,807
Non-trainable params: 0
_________________________________________________________________
```

```
# Training the model (Latih model data sampai 400 kali)
train = model.fit(x_train, y_train, epochs=400)
```

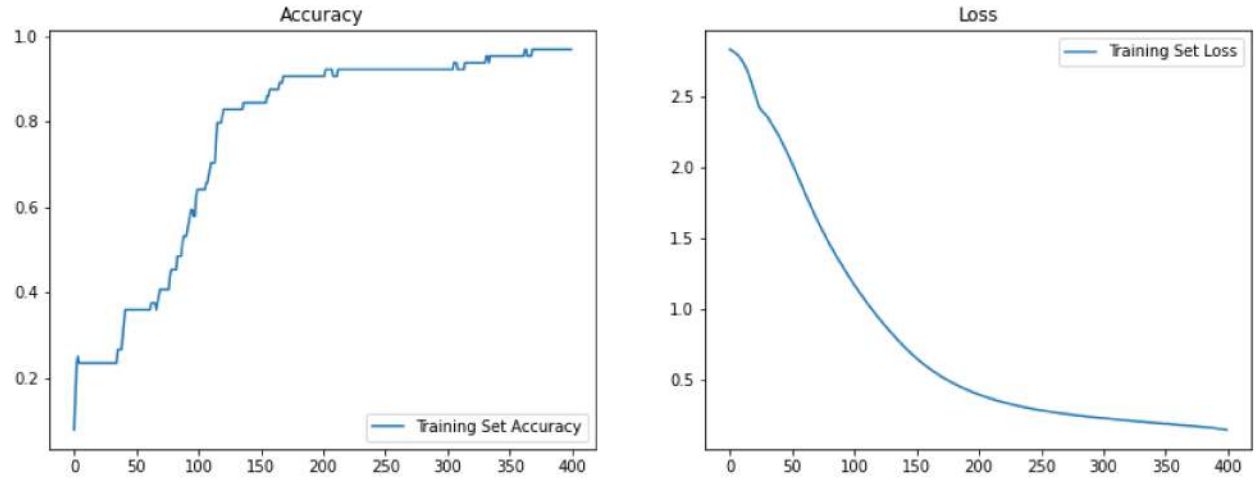
```
Epoch 1/400
2/2 [==============================] - 2s 9ms/step - loss: 2.8312 - accuracy: 0.0781
Epoch 2/400
2/2 [==============================] - 0s 9ms/step - loss: 2.8260 - accuracy: 0.1562
```

```
Epoch 3/400
2/2 [==============================] - 0s 9ms/step - loss: 2.8209 - accuracy: 0.2344
Epoch 4/400
2/2 [==============================] - 0s 8ms/step - loss: 2.8145 - accuracy: 0.2500
Epoch 5/400
2/2 [==============================] - 0s 12ms/step - loss: 2.8080 - accuracy: 0.2344
Epoch 6/400
2/2 [==============================] - 0s 9ms/step - loss: 2.8012 - accuracy: 0.2344
Epoch 7/400
2/2 [==============================] - 0s 8ms/step - loss: 2.7933 - accuracy: 0.2344
Epoch 8/400
2/2 [==============================] - 0s 8ms/step - loss: 2.7843 - accuracy: 0.2344
Epoch 9/400
2/2 [==============================] - 0s 11ms/step - loss: 2.7730 - accuracy: 0.2344
Epoch 10/400
2/2 [==============================] - 0s 8ms/step - loss: 2.7621 - accuracy: 0.2344
Epoch 11/400
2/2 [==============================] - 0s 9ms/step - loss: 2.7482 - accuracy: 0.2344
Epoch 12/400
2/2 [==============================] - 0s 10ms/step - loss: 2.7342 - accuracy: 0.2344
Epoch 13/400
2/2 [==============================] - 0s 9ms/step - loss: 2.7169 - accuracy: 0.2344
Epoch 14/400
2/2 [==============================] - 0s 8ms/step - loss: 2.6980 - accuracy: 0.2344
Epoch 15/400
2/2 [==============================] - 0s 8ms/step - loss: 2.6787 - accuracy: 0.2344
Epoch 16/400
2/2 [==============================] - 0s 8ms/step - loss: 2.6543 - accuracy: 0.2344
Epoch 17/400
2/2 [==============================] - 0s 9ms/step - loss: 2.6300 - accuracy: 0.2344
Epoch 18/400
2/2 [==============================] - 0s 8ms/step - loss: 2.6055 - accuracy: 0.2344
Epoch 19/400
2/2 [==============================] - 0s 12ms/step - loss: 2.5749 - accuracy: 0.2344
Epoch 20/400
2/2 [==============================] - 0s 7ms/step - loss: 2.5467 - accuracy: 0.2344
Epoch 21/400
2/2 [==============================] - 0s 10ms/step - loss: 2.5180 - accuracy: 0.2344
Epoch 22/400
2/2 [==============================] - 0s 9ms/step - loss: 2.4910 - accuracy: 0.2344
Epoch 23/400
2/2 [==============================] - 0s 6ms/step - loss: 2.4603 - accuracy: 0.2344
Epoch 24/400
2/2 [==============================] - 0s 10ms/step - loss: 2.4368 - accuracy: 0.2344
Epoch 25/400
2/2 [==============================] - 0s 8ms/step - loss: 2.4186 - accuracy: 0.2344
Epoch 26/400
2/2 [==============================] - 0s 12ms/step - loss: 2.4047 - accuracy: 0.2344
Epoch 27/400
2/2 [==============================] - 0s 9ms/step - loss: 2.3931 - accuracy: 0.2344
Epoch 28/400
2/2 [==============================] - 0s 8ms/step - loss: 2.3854 - accuracy: 0.2344
Epoch 29/400
2/2 [==============================] - 0s 9ms/step - loss: 2.3782 - accuracy: 0.2344
```

```
plt.figure(figsize=(14, 5))
```

```
plt.subplot(1, 2, 1)
plt.plot(train.history['accuracy'],label="Training Set Accuracy")
plt.legend(loc="lower right")
plt.title('Accuracy')

plt.subplot(1,2,2)
plt.plot(train.history['loss'],label='Training Set Loss')
plt.legend(loc='upper right')
plt.title('Loss')
plt.show()
```




```
while True:
  texts_p = []
  prediction_input = input('🧒 Kamu : ')

  # Menghapus punktuasi dan konversi ke huruf kecil
  prediction_input = [letters.lower() for letters in prediction_input if letters not in strin
  prediction_input = ''.join(prediction_input)
  texts_p.append(prediction_input)

  # Tokenisasi dan Padding
  prediction_input = tokenizer.texts_to_sequences(texts_p)
  prediction_input = np.array(prediction_input).reshape(-1)
  prediction_input = pad_sequences([prediction_input],input_shape)


  # Mendapatkan hasil keluaran pada model
  output = model.predict(prediction_input)
  output = output.argmax()

  # Menemukan respon sesuai data tag dan memainkan voice bot
  response_tag = le.inverse_transform([output])[0]
```

```
    print("👹 Siobot : ", random.choice(responses[response_tag]))
    tts = gTTS(random.choice(responses[response_tag]), lang='id')
    # Simpan model voice bot ke dalam Google Drive
    tts.save('/content/drive/MyDrive/chatbot/siobot.wav')
    time.sleep(0.08)
    # Load model voice bot from Google Drive
    ipd.display(ipd.Audio('/content/drive/MyDrive/chatbot/siobot.wav', autoplay=False))
    print("="*60 + "\n")
    # Tambahkan respon 'goodbye' agar bot bisa berhenti
    if response_tag == "goodbye":
      break
```

Kamu : hai
Siobot : Hai! Siobot di sini. Mau tau informasi tentang apa nih?

0:00 / 0:06

==========

Kamu : apa itu studi independen
Siobot : Salah satu program Kampus Merdeka Kemendikbud yang bertujuan untuk

0:00 / 0:21

==========

Kamu : orbit future academy itu apa
Siobot : Orbit Future Academy adalah inisiatif “Skills-for-Future-Jobs” ole

0:00 / 0:38

==========

Kamu : apa saja program studi independen orbit future academy
Siobot : Program berlangsung selama 1 hingga 2 semester. Cara mendaftarnya

0:00 / 0:18

==========

Kamu : Apa saja progam dari Orbit Future Academy yang terdaftar dalam Studi I
Siobot : Progam Orbit Future Academy yang terdaftar dalam Studi Independen

0:00 / 0:10

==========

Kamu : apa itu AI 4 Jobs
Siobot : Progam AI 4 Jobs adalah program pelatihan Artificial Intelligence

0:00 / 0:43

==========

Kamu : apa itu ai mastery program
Siobot : Progam AI Mastery Progam adalah AI Mastery merupakan program pelat

0:00 / 0:42

==========

Kamu : Kira kira progam apa yang cocok untuk saya
Siobot : Jika kamu memiliki basic IT dapat memilih progam AI Mastery, tetap

0:00 / 0:12