

```
pip install nltk scikit-learn tensorflow keras flask
```

```
➡ Requirement already satisfied: nltk in /usr/local/lib/python3.11/dist-packages (3.9.1)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.11/dist-packages (1.6.1)
Requirement already satisfied: tensorflow in /usr/local/lib/python3.11/dist-packages (2.18.0)
Requirement already satisfied: keras in /usr/local/lib/python3.11/dist-packages (3.8.0)
Requirement already satisfied: flask in /usr/local/lib/python3.11/dist-packages (3.1.0)
Requirement already satisfied: click in /usr/local/lib/python3.11/dist-packages (from nltk) (8.1.8)
Requirement already satisfied: joblib in /usr/local/lib/python3.11/dist-packages (from nltk) (1.4.2)
Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.11/dist-packages (from nltk) (2024.11.2)
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Requirement already satisfied: numpy>=1.19.5 in /usr/local/lib/python3.11/dist-packages (from scikit-learn) (2.0.2)
Requirement already satisfied: scipy>=1.6.0 in /usr/local/lib/python3.11/dist-packages (from scikit-learn) (1.13.1)
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Requirement already satisfied: absl-py>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (1.7.0)
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Requirement already satisfied: flatbuffers>=24.3.25 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (25.2.1)
Requirement already satisfied: gast!=0.5.0,!0.5.1,!0.5.2,>=0.2.1 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (0.7.0)
Requirement already satisfied: google-pasta>=0.1.1 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (0.2.0)
Requirement already satisfied: libclang>=13.0.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (18.1.1)
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Requirement already satisfied: protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<4.21.6 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (5.29.3)
Requirement already satisfied: requests<3,>=2.21.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (2.32.3)
Requirement already satisfied: setuptools in /usr/local/lib/python3.11/dist-packages (from tensorflow) (75.8.2)
Requirement already satisfied: six>=1.12.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (1.17.0)
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Requirement already satisfied: tensorboard<2.19,>=2.18 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (2.18.0)
Requirement already satisfied: h5py>=3.11.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (3.12.1)
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Requirement already satisfied: rich in /usr/local/lib/python3.11/dist-packages (from keras) (13.9.4)
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Requirement already satisfied: tensorboard-data-server<0.8.0,>=0.7.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow) (0.7.0)
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```

```
# Intelligent Customer Support Chatbot using NLP and ML
import nltk
import numpy as np
import random
import json
import pickle
from nltk.stem import WordNetLemmatizer
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.naive_bayes import MultinomialNB
```

```
from sklearn.pipeline import Pipeline
```

```
# 1. Data Preparation (Sample intents file)
```

```
intents = {
    "intents": [
        {
            "tag": "greeting",
            "patterns": ["Hi", "Hello", "Hey", "Good morning", "Good evening"],
            "responses": ["Hello! How can I assist you today?", "Hi there! Need help with something?"]
        },
        {
            "tag": "order_status",
            "patterns": ["Where is my order?", "Order status", "Track my order", "Order not delivered"],
            "responses": ["Please provide your order ID to check the status.", "I'll help you track your order"]
        },
        {
            "tag": "refund",
            "patterns": ["How to get a refund?", "Refund policy", "I want my money back"],
            "responses": ["Sure, I'll guide you through the refund process.", "Our refund policy allows for a 30-day return"]
        },
        {
            "tag": "goodbye",
            "patterns": ["Bye", "Goodbye", "See you", "Talk later"],
            "responses": ["Goodbye! Have a nice day!", "See you soon!"]
        }
    ]
}
```

```
model_pipeline = Pipeline([
```

```
    ('tfidf',
     TfidfVectorizer()),
```

```
    ('clf',
     MultinomialNB())
```

```
])
```

```
def chatbot_response(user_input):
    user_input_processed = ' '.join([lemmatizer.lemmatize(word) for word in nltk.word_tokenize(user_input)])
    tag = model_pipeline.predict([user_input_processed])[0]
    for intent in intents['intents']:
        if intent['tag'] == tag:
            return random.choice(intent['responses'])
```