AI/ML : Project Report on

CHATBOT USING PYTHON

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UNIVERSITY OF MUMBAI

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SHREE L.R. TIWARI
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CERTIFICATE

This is to certify that the requirements for the AI/ML Subject Project entitled **"Chatbot using python"** have been successfully completed by following BE ECS students.

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in partial fulfillment of Mumbai University in the Department of Electronics and Computer Science, Shree L. R. Tiwari College of Engineering, Mira Road (E) – 401107 for Academic year 2024 - 2025.

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ABSTRACT

A Chabot is an artificial intelligence (AI) computer software that can simulate a conversation using textual or audio techniques. The basis of chatbots is artificial intelligence, which analyses a customer's data and blends the response with them. AI-powered bots can take over various duties since they are considerably more powerful and can execute numerous tasks at once. Natural language processing enables a bot to converse in the most natural manner possible. The optimal user-Chabot connection is a balanced blend of innovative technology and human intervention.

This project aims to demonstrate the use of Python in building scalable, efficient, and conversational AI solutions while providing insights into the practical challenges and solutions in chatbot development. Leveraging the Natural Language Toolkit (NLTK) for text processing and machine learning techniques, the chatbot can understand and respond to user inputs in real time. The system integrates key modules, including a natural language understanding (NLU) engine, a dialogue management system, and an interface for user interaction. The chatbot can be customized for various applications such as customer service, virtual assistants, and educational platforms.

INTRODUCTION

Artificial Intelligence (AI) increasingly integrates our daily lives with the creation and analysis of intelligent software and hardware, called intelligent agents. Intelligent agents can do a variety of tasks ranging from labor work to sophisticated operations. With the rapid advancement of artificial intelligence (AI) and natural language processing (NLP), chatbots have become an essential tool in automating communication across various industries. From customer service automation to virtual personal assistants, chatbots are transforming the way users interact with digital systems.

This project aims to develop a Python-based chatbot that can effectively simulate human conversations, providing real-time responses to user queries while adapting to different conversational contexts. A chatbot is a typical example of an AI system and one of the most elementary and widespread examples of intelligent Human-Computer Interaction (HCI). It is a computer program, which responds like a smart entity when conversed with through text or voice and understands one or more human languages by Natural Language Processing (NLP). Chatbots are also known as smart bots, interactive agents, digital assistants, or artificial conversation entities.

This project presents the development of an intelligent chatbot using Python, designed to simulate human-like conversations with users. The chatbot can be customized for various applications such as customer service, virtual assistants, and educational platforms.

ALGORITHM

Step 1) Start

Step 2) Select a data set, for which we need to develop a nltk.

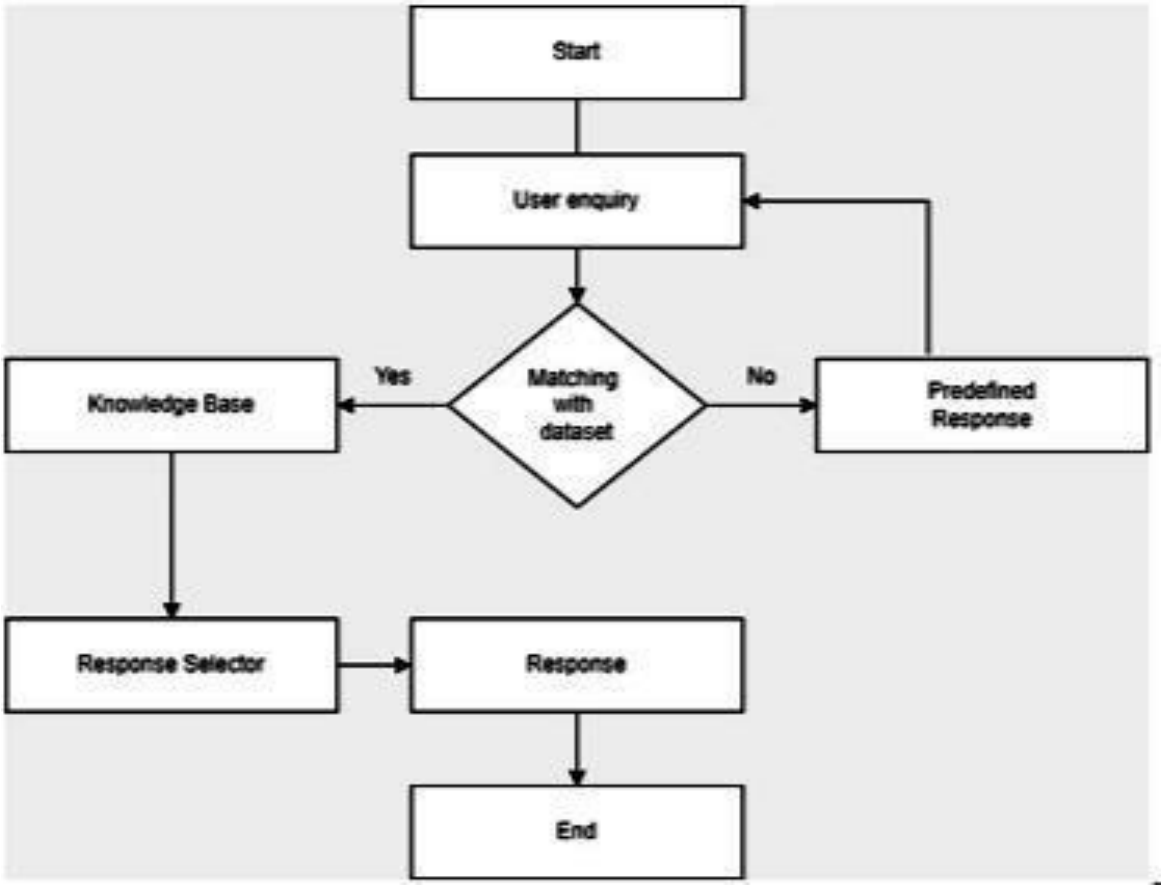
Step 3) Prepare the set of tags with the patterns and responses.

Step 4) Install the required packages in Python.

Step 5) Train the Chatbot with predefined queries.

Step 6) Execute the codes for the results.

FLOWCHART


Start
User enquiry
Matching with dataset
Yes
No
Knowledge Base
Predefined Response
Response Selector
Response
End

RESULT

Code :

```
import nltk
from nltk.chat.util import Chat, reflections
reflections = {
  "i am"       : "you are",
  "i was"      : "you were",
  "i"          : "you",
  "i'm"        : "you are",
  "i'd"        : "you would",
  "i've"       : "you have",
  "i'll"       : "you will",
  "my"         : "your",
  "you are"    : "I am",
  "you were"   : "I was",
  "you've"     : "I have",
  "you'll"     : "I will",
  "your"       : "my",
  "yours"      : "mine",
  "you"        : "me",
  "me"         : "you"
}
pairs = [
    [
        r"my name is (.*)",
        ["Hello %1, How are you today ?",]
    ],
    [
        r"hi|hey|hello",
```

```
    ["Hello", "Hey there",]
],
[
    r"what is your name ?",
    ["I am a bot created by Harsh and Karthikey.You can call me HT!",]
],
[
    r"how are you ?",
    ["I'm doing good. How about You ?",]
],
[
    r"sorry (.*)",
    ["Its alright","Its OK, never mind",]
],
[
    r"I am fine",
    ["Great to hear that, How can I help you?",]
],
[
    r"i'm (.*) doing good",
    ["Nice to hear that","How can I help you?:)",]
],
[
    r"(.*) age?",
    ["I'm a computer program. Seriously you are asking me this?",]
],
[
    r"what (.*) want ?",
    ["Make me an offer I can't refuse",]
```

```
],
[
    r"(.*) created ?",
    ["Harsh and Karthikey created me using Python's NLTK library ","top secret ;)",]
],
[
    r"(.*) (location|city) ?",
    ['Mumbai,Maharasthra',]
],
[
    r"how is weather in (.*)?",
    ["Weather in %1 is awesome like always","Too hot man here in %1","Too cold man here in %1","Never even heard about %1"]
],
[
    r"i work in (.*)?",
    ["%1 is an Amazing company, I have heard about it. But they are in huge loss these days.",]
],
[
    r"(.)raining in (.)",
    ["No rain since last week here in %2","Damn its raining too much here in %2"]
],
[
    r"how (.) health(.)",
    ["I'm a computer program, so I'm always healthy ",]
],
[
    r"Which is your favourite sport ?",
    ["I'm a very big fan of cricket",]
],
```

```
[
    r"who (.*) sportsperson ?",
    ["kohli","rohit","dhoni"]
],
[
    r"who is your favourite actor?",
    ["I don't like movies"]
],
[
    r"(.*)engineering mathematics?",
    ["GV Kumbhojkar is a great book with each step explanation, you can explore and link-
https://drive.google.com/file/d/1GU0TBJokbuqVZn-7XNCH1Kv1uUrikGSP/view" ]
],
[
    r"(.*) dsat?",
    ["You can prepare from your class notes"]
],
[
    r"(.*) microprocessor?",
    ["Dougler's hall is the best option"]
],
[
    r"(.*) Semester 4?",
    [" Link- http://Bit.ly/cesem04"]
],
[
    r"(.*) python?",
    ["It is a programming language"]
],
[
```

```
        r"(.*) Electronic circuits?",
        ["Module 1 module 4,module 3 and for that you can refer class notes"]
    ],
    [
        r"(.*) CI? ",
        ["Sensor's and transducer are important module"]
    ],
    [
        r"(.*) Previous year paper?",
        ["https://drive.google.com/drive/mobile/folders/0Bz9C0ysJZ7PnMGZKeWcybUpXWGM"]
    ],
    [
        r"quit",
        ["Bye take care. See you soon :) ","It was nice talking to you. See you soon :)"]
    ],
]
def chat():
    print("Hi! I am a chatbot created by Harsh and Karthikey  for your service")
    chat = Chat(pairs, reflections)
    chat.converse()
#initiate the conversation
if _name_ == "_main_":
    chat()
```

Output:

```
Hi! I am a chatbot created by Harsh and Karthikey  for your service
>hi
Hello
>how are you
I'm doing good. How about You ?
>i am fine
Great to hear that, How can I help you?
>can you suggest book for engineering mathematics
GV Kumbhojkar is a great book with each step explanation, you can explore
>quite
It was nice talking to you. See you soon :)
>
```

ADVANTAGES:

1)Real-Time Interaction: Provides quick, real-time responses, ensuring seamless conversation flows.

2)24/7 Availability: Operates around the clock, providing constant support without downtime.

3)Improved User Experience: Combines rule-based and machine learning models for personalized, context-aware, and empathetic responses.

4)Data-Driven Insights: Analyzes conversation data to provide valuable insights for optimizing responses and business strategies.

5)Cost and Resource Efficiency: Automates repetitive tasks, reducing the need for human intervention and saving resources.

6) Scalability and Flexibility: Easily adaptable to various use cases with Python libraries like NLTK, TensorFlow, and PyTorch.

CONCLUSION

Chatbots or smart assistants with artificial intelligence, in our opinion, are revolutionizing the world. In comparison to larger chatbots developing a simple chatbot is not a difficult effort, and developers need to understand and address concerns such as reliability, scalability, and adaptability, as well as a high level of intent on human language. Chatbots are more effective than people in reaching out to a big audience via messaging apps.

The project successfully illustrates how chatbots can improve operational efficiency, reduce costs, and provide continuous support to users. With features like sentiment analysis and context retention, the chatbot enhances the user experience by simulating human-like conversations. Despite challenges in handling complex dialogues and ambiguous inputs, the system's performance in real-world use cases shows promise.

This project lays a solid foundation for further exploration and innovation in the field of chatbot development, offering insights for both researchers and developers interested in building conversational AI systems. They have the potential to become a useful information-gathering tool in the near future.

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