Experiment No.1
Study various applications of NLP and Formulate the Problem Statement for Mini Project based on chosen real world NLP applications
Date of Performance:
Date of Submission:

Aim: Study various applications of NLP and Formulate the Problem Statement for Mini Project based on chosen real world NLP applications.

Objective: Understand the different applications of NLP and their techniques by reading and critiquing IEEE/ACM/Springer papers.

Theory:

1. **Machine Translation**

Machine translation is a process of converting the text from one language to the other automatically without or minimal human intervention.

2. **Text Summarization**

Condensing a lengthy text into a manageable length while maintaining the essential informational components and the meaning of the content is known as summarization. Since manually summarising material requires a lot of time and is generally difficult, automating the process is becoming more and more popular, which is a major driving force behind academic research.

Text summarization has significant uses in a variety of NLP-related activities, including text classification, question answering, summarising legal texts, summarising news, and creating headlines. Additionally, these systems can incorporate the creation of summaries as a middle step, which aids in shortening the text.

The quantity of text data from many sources has multiplied in the big data era. This substantial body of writing is a priceless repository of data and expertise that must be skillfully condensed in order to be of any use. A thorough investigation of NLP for automatic text summarization has been necessitated by the increase in the availability of documents. Automatic text summarising is the process of creating a succinct, fluid summary without the assistance of a human while maintaining the original text's meaning.

3. Sentiment Analysis

Sentiment analysis, often known as opinion mining, is a technique used in natural language processing (NLP) to determine the emotional undertone of a document. This is a common method used by organisations to identify and group ideas regarding a certain good, service, or concept. Text is mined for sentiment and subjective information using data mining, machine learning, and artificial intelligence (AI).

Opinion mining can extract the subject, opinion holder, and polarity (or the degree of positivity and negative) from text in addition to identifying sentiment. Additionally, other scopes, including document, paragraph, sentence, and sub-sentence levels, can be used for sentiment analysis.

Businesses must comprehend people's emotions since consumers can now communicate their views and feelings more freely than ever before. Brands are able to listen carefully to their customers and customise their products and services to match their demands by automatically evaluating customer input, from survey replies to social media chats.

4. Information Retrieval

A software programme that deals with the organisation, storage, retrieval, and evaluation of information from document repositories, particularly textual information, is known as information retrieval (IR). The system helps users locate the data they need, but it does not clearly return the questions' answers. It provides information about the presence and placement of papers that may contain the necessary data. Relevant documents are those that meet the needs of the user. Only relevant documents will be pulled up by the ideal IR system.

5. Question Answering System (QAS)

Building systems that automatically respond to questions presented by humans in natural language is the focus of the computer science topic of question answering (QA), which falls under the umbrella of information retrieval and natural language processing (NLP).

Chatbot in Dialogflow

Abstract

Chatbots have become an essential part of modern business operations. They offer a costeffective way to provide instant support and information to customers. Dialogflow, a powerful natural language processing (NLP) platform by Google, enables developers to create conversational interfaces for websites, mobile applications, and other platforms. In this article, we'll walk you through the process of building a chatbot using Dialogflow and demonstrate how you can enhance its capabilities by integrating it with ChatGPT, a state-of-the-art language model. Chatbots have become an essential part of modern business operations. They offer a costeffective way to provide instant support and information to customers. Dialogflow, a powerful natural language processing (NLP) platform by Google, enables developers to create conversational interfaces for websites, mobile applications, and other platforms. In this article, we'll walk you through the process of building a chatbot using Dialogflow and demonstrate how you can enhance its capabilities by integrating it with ChatGPT, a state-of-the-art language model.

Methodology:

1. **Reason for Choosing DialogFlow:** Understanding why Dialogflow is an excellent choice for chatbot development.
2. **Dialogflow Setup:** A step-by-step guide on setting up a Dialogflow agent.
3. **Dialogflow Intents:** Creating intents to define how the chatbot should respond to user inputs.
4. **Dialogflow Entities:** Defining entities to extract specific information from user queries.
5. **Dialogflow Contexts:** Using contexts to maintain conversational context.
6. **Fulfillment:** Setting up fulfillment to handle backend interactions.
7. **Database Setup:** Creating a database to store and retrieve information.
8. **Backend Setup:** Preparing the backend for communication with Dialogflow.
9. **FastAPI Python Backend Coding:** Building the backend logic using FastAPI.

Reason for Choosing DialogFlow

1.Powerful NLP Capabilities: Dialogflow's NLP engine can understand user input in multiple languages and contexts, making it suitable for a wide range of applications.
2. Ease of Use: Its intuitive interface allows developers to design and train chatbots quickly, with minimal coding effort.
3.Integration with Other Services: Dialogflow seamlessly integrates with Google Cloud services, making it an attractive choice for businesses already using Google's ecosystem.
4.Versatility: Dialogflow can be used in various applications, including web and mobile apps, voice assistants, and more.

FastAPI

FastAPI is a modern, fast (high-performance) web framework for building APIs with Python 3.6+ based on standard Python type hints. We will use FastAPI to build the backend logic, enabling seamless communication between Dialogflow and external services.

Scope of Work

To address the problem statement, our goal is to build a chatbot that can provide instant responses to customer queries, handle routine tasks, and offer a seamless user experience. Additionally, we want to leverage ChatGPT, a language model developed by OpenAI, to enhance the chatbot's capabilities