**TITLE:** CodTech IT Solutions Internship - Task Documentation: Calculator for advanced features and chatbot

**INTERN INFORMATION:**

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**INTRODUCTION**

This Python program implements a simple calculator with advanced features, allowing users to perform basic arithmetic operations such as addition, subtraction, multiplication, division, and exponentiation. Additionally, users have the option to quit the calculator.

Chatbot with Natural Language Understanding:

The Python chatbot included here is capable of engaging in conversation with users, understanding natural language input, and responding appropriately. It utilizes natural language processing (NLP) techniques such as tokenization and part-of-speech tagging to interpret user queries accurately. The chatbot's responses are contextually relevant and contribute to a seamless user experience

.**Implementation**

The provided Python code comprises two components: a simple calculator with advanced features and a chatbot with natural language understanding. The calculator offers basic arithmetic operations such as addition, subtraction, multiplication, division, and exponentiation, along with an option to quit. Users are prompted to select an operation and input the required numbers, after which the calculator performs the chosen calculation and displays the result.

On the other hand, the chatbot utilizes natural language processing techniques to comprehend user queries accurately. It tokenizes and tags input text to identify numerical values and operation keywords. The chatbot interprets the input, determines the operation to perform, and extracts the relevant numbers. Subsequently, it executes the requested operation and provides the result. Users can interact with the chatbot by entering natural language queries specifying the desired calculation. The chatbot also supports the 'quit' command to exit the conversation gracefully..

**CODE EXPLAINATION**

Certainly! Here's an explanation of both the calculator and chatbot code:

\*Calculator Code Explanation:\*

1. The program starts by defining functions for basic arithmetic operations: add(), subtract(), multiply(), divide(), and exponentiate().

2. The calculator() function serves as the main entry point. It displays a menu of operations and prompts the user to choose one.

3. Inside a while loop, the user's choice is obtained through input.

4. Depending on the choice, the user is prompted to input two numbers.

5. The appropriate arithmetic function is called based on the user's choice, and the result is printed.

6. The loop continues until the user chooses to quit.

\*Chatbot Code Explanation:\*

1. The program begins by importing the necessary NLTK libraries for natural language processing.

2. The process\_input() function tokenizes and tags the user's input text using NLTK's word\_tokenize() and pos\_tag() functions, respectively.

3. The interpret\_input() function analyzes the tagged tokens to identify numerical values and operation keywords.

4. The identified operation and numbers are then used to perform the calculation using the perform\_operation() function.

5. The chatbot() function acts as the main entry point for the chatbot functionality.

6. It prompts the user for input and processes it using the aforementioned functions.

7. The chatbot responds with the calculated result or appropriate messages based on the user's input.

8. The conversation continues until the user chooses to quit.

These explanations provide a breakdown of how each component of the code works to facilitate both calculator and chatbot functionalities.

**CONCLUSION**

In this project, we've developed both a simple calculator with advanced features and a chatbot with natural language understanding using Python.

The calculator provides users with a straightforward interface to perform basic arithmetic operations like addition, subtraction, multiplication, division, and exponentiation. It offers a user-friendly menu system, allowing users to select their desired operation and input the required numbers. The calculator's functionality is enhanced by handling edge cases such as division by zero.

On the other hand, the chatbot leverages natural language processing techniques to interpret user queries accurately. By tokenizing and tagging input text, the chatbot identifies operation keywords and numerical values, enabling it to understand a wide range of user inputs. This allows for a more intuitive interaction with the chatbot, as users can input calculations in natural language without adhering to strict syntax.

Overall, both the calculator and chatbot aim to provide users with convenient tools for performing calculations. While the calculator offers a traditional interface for users comfortable with standard input methods, the chatbot introduces a more conversational and intuitive way to interact, catering to users who prefer natural language communication. Together, these components showcase the versatility and power of Python in developing practical and user-friendly applications.

**OUTPUT**

