Implementation of chatbot using NLP

Coding:

Here is the Python code for the chatbot:

```python
import nltk
from nltk.chat.util import Chat, reflections
from datetime import datetime
import re  # For parsing mathematical expressions

# Function to evaluate mathematical expressions
def evaluate_expression(expression):
    try:
        # Evaluate the mathematical expression safely
        result = eval(expression)
        return f"The result of {expression} is {result}."
    except Exception as e:
        return "I'm sorry, I couldn't evaluate that expression. Please ensure it's a valid mathematical operation."

# Function to get the current time
def get_current_time():
    now = datetime.now()
    current_time = now.strftime("%H:%M:%S")
    return current_time

# Define chatbot patterns and responses
patterns = [
    (r"hello|hi|hey", ["Hello! How can I assist you?", "Hi there! How can I help?"]),
    (r"what is your name?", ["I am an NLP chatbot created by Rishikesh Dwivedi."]),
    (r"how are you?", ["I'm functioning optimally, thank you!", "I'm doing great!"]),
    (r"what is the time|current time", [f"The current time is {get_current_time()}"]),
    (r"who are you|tell me about yourself", ["I am a chatbot created by Rishikesh Dwivedi to assist you with basic queries."]),
    (r"(.*)", ["I'm sorry, I didn't understand that. Could you rephrase?"])
```

```python
]

# Initialize the chatbot
chatbot = Chat(patterns, reflections)


# Main program
def main():
    print("Welcome to the NLP Chatbot!")
    print("Type 'bye' to exit the chat.")

    while True:
        user_input = input("You: ")
        if user_input.lower() == "bye":
            print("Chatbot: Goodbye! Have a nice day!")
            break

        # Check for mathematical expressions first
        math_match = re.fullmatch(r"\d+[-+*/%]\d+", user_input)
        if math_match:
            print(f"Chatbot: {evaluate_expression(user_input)}")
        else:
            response = chatbot.respond(user_input)
            print(f"Chatbot: {response}")

if __name__ == "__main__":
    main()
```

Output:

```
D:\python>python chatbotnlp.py
Welcome to the NLP Chatbot!
Type 'bye' to exit the chat.
You: hi
Chatbot: Hello! How can I assist you?
You: what is your name?
Chatbot: I am an NLP chatbot created by Rishikesh Dwivedi.
You: how are you?
Chatbot: I'm functioning optimally, thank you!
You: what is time?
Chatbot: I'm sorry, I didn't understand that. Could you rephrase?
You: what is the time?
Chatbot: The current time is 21:41:01
You: 4/3
Chatbot: The result of 4/3 is 1.3333333333333333.
You: 4+5
Chatbot: The result of 4+5 is 9.
You: tell me about your self
Chatbot: I'm sorry, I didn't understand that. Could you rephrase?
You: tell me about yourself
Chatbot: I am a chatbot created by Rishikesh Dwivedi to assist you with basic queries.
You: bye
Chatbot: Goodbye! Have a nice day!

D:\python>_
```