

Practical No. 3

Lab 1: Introduction to ChatGPT

Objective: Understand the basics of ChatGPT, its origin, capabilities, and real-world applications.

Key Components of ChatGPT:

1. **Transformer Architecture:**
Uses attention mechanisms to process and generate human-like text based on input.
2. **Pre-training and Fine-tuning:**
Trained on large datasets and then fine-tuned for specific tasks to improve accuracy and relevance.

Real-World Use Cases:

1. **Education:**
Provides personalized explanations, answers academic questions, and supports learning.
Example: A student gets step-by-step help with a math problem.
2. **Healthcare:**
Summarizes medical info, answers health-related questions, and clarifies terms.
Example: Explains medication side effects to patients.
3. **Business:**
Automates customer support, helps with data analysis, and assists in decision-making.
Example: Provides instant responses to customer inquiries on a website.
4. **Creativity:**
Helps writers and creators brainstorm ideas, generate content, and draft stories.
Example: Assists a writer with plot ideas or drafting articles.

Conclusion:

ChatGPT's transformer-based architecture powers its ability to assist in various fields like education, healthcare, business, and creativity, enhancing productivity and providing valuable support across industries.

Lab 2: Types of Prompts and Prompt Engineering Basics

Objective: Understand different types of prompts (instructional, interrogative, zero-shot, few-shot) and the basics of prompt engineering.

Prompt Types:

1. Instructional Prompts:

Clear commands or tasks.

Example: "Summarize the novel '1984'."

2. Interrogative Prompts:

Ask questions to gain information.

Example: "What is the capital of France?"

3. Zero-shot Prompts:

No examples or context given; the model generates an answer based on general knowledge.

Example: "Translate 'How are you?' into Spanish."

4. Few-shot Prompts:

Provide a few examples to guide the model's response.

Example:

"Translate:

1. 'I am happy' → 'Je suis heureux'
2. 'Where is the school?' → 'Où est l'école?'
Now, 'What is your name?'"

Zero-shot:

1. "Write a poem about autumn."
2. "Translate 'Good morning' into French."

Few-shot:

1. "Translate:

1. 'I like apples' → 'J'aime les pommes'
Now, 'How are you?'"

2. "Solve:

1. $3 + 5 = 8$
Now, $6 + 2 = ?$

Comparison:

- **Zero-shot:** Useful for general tasks, but may lack specificity.
- **Few-shot:** Provides more context, leading to more accurate and tailored responses.

Lab 3: Precision Prompting for Information Extraction

Objective: Extract structured data from ChatGPT responses using precision prompts.

Activities:

1. **Request JSON or Tabular Format:**
Ask ChatGPT to format its response in a structured way (e.g., JSON, table).
2. **Extract Specific Information:**
Extract contact details, resume sections, or keywords from a given text.

Examples:

Prompt 1:

"Extract contact info (name, phone, email) from: 'John Doe, 555-1234, johndoe@example.com"

Lab 4: Summarization and Text Transformation

Objective: Use ChatGPT for summarizing, rewriting, and transforming tone.

Activities:

1. **Summarize News/Research:**
Summarize long texts into concise versions.
2. **Rewrite Emails (Formal/Informal Tone):**
Change the tone of emails as needed.

Examples:

Summarize News:

Prompt: "Summarize: 'Global stock markets have been fluctuating due to US-China trade tensions. Experts warn of an economic slowdown as tariffs increase.'"

Output: *Stock markets are volatile due to US-China trade tensions, with experts predicting an economic slowdown.*

Rewrite Email (Formal):

Original: "Hey John, can you send me the report by tomorrow? Thanks!"

Formal: "Dear John, Could you kindly send me the report by tomorrow? It is crucial for the project. Best regards, [Your Name]."

Rewrite Email (Informal):

Original: "Dear Mr. Smith, could you send the data by Friday?"

Informal: "Hey Mr. Smith, hope you're doing well! Could you send the data by Friday? Cheers, [Your Name]."

Conclusion:

ChatGPT efficiently summarizes and adjusts tone in written content, making it useful for both professional and casual communication.

Lab 5: ChatGPT in Code Generation and Debugging

Objective: Explore how ChatGPT can assist in programming tasks like code generation and debugging.

Activities:

1. Generate Code from Prompts:

Request ChatGPT to generate code snippets in languages like Python, C++, or Java based on given tasks.

2. Debug a Code Snippet:

Provide a buggy code snippet and ask ChatGPT to identify and correct the issues.

Examples:

Activity 1: Generate Python Code

Prompt: *"Write a Python function that calculates the factorial of a number."*

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int num = 5;
```

```
cout << "Factorial of " << num << " is: " << fact(num);  
return 0;}
```

Output:

```
#include <iostream>  
  
using namespace std;  
  
int main() {  
    int num = 5;  
    cout << "Factorial of " << num << " is: " << fact(num);  
    return 0;  
}
```

Lab 6: Domain-Specific Applications

Objective: Use ChatGPT for domain-specific tasks.

Activities Chosen: Medical Chatbot Simulation

1. Prompt Design:

- *Task:* Simulate a medical chatbot that provides basic health advice.
- *Prompt:*
"You are a medical chatbot. A user asks, 'I have a headache and a fever. What should I do?' Respond with general advice, such as potential causes and when to seek professional help."

2. Output Evaluation:

- **Prompt Response:**
"Headaches and fever can be caused by various factors such as viral infections, dehydration, or even stress. It's important to rest, drink fluids, and monitor your symptoms. If symptoms worsen or persist for more than 48 hours, it's advisable to consult a healthcare professional."

Evaluation Criteria:

- **Relevance:** The response provides general advice suitable for the given symptoms.
- **Accuracy:** The advice aligns with general medical knowledge but emphasizes the importance of seeking professional help, which is essential.
- **Clarity:** The response is clear, concise, and actionable, offering basic care tips and when to seek medical attention.

Conclusion:

ChatGPT effectively simulates a medical chatbot by offering clear, general health advice. The prompt design allows for a realistic scenario, and the output is both relevant and accurate.