

LAB 1

ChatGPT: Summary and Applications

1. What is ChatGPT?

ChatGPT is an AI chatbot developed by OpenAI, based on the GPT (Generative Pre-trained Transformer) model. It can understand and generate human-like text, making it useful for conversation, education, coding, and more.

2. How Does It Work?

ChatGPT uses the Transformer architecture, which relies on self-attention to process language. It is trained in two steps:

- **Pre-training:** Learn language from large text datasets.
- **Fine-tuning:** Improved using human feedback to respond accurately and helpfully.

3. Capabilities

- Understands and responds to text prompts
- Generates summaries, essays, and code
- Supports multiple languages
- Maintains context in conversation
- Can assist with images and data (in newer versions)

4. Real-World Applications

- Education: Tutoring, quiz creation, doubt solving
- Healthcare: Symptom checking, mental health chatbots
- Business: Customer support, content creation
- Creativity: Writing stories, poems, generating ideas

5. Limitations

ChatGPT may give incorrect or biased answers and should be used with human oversight, especially in sensitive fields.

LAB 2

Objective:

Learn different types of prompts: instructional, interrogative, zero-shot, and few-shot. Try examples and compare how ChatGPT responds.

1. Instructional Prompts (Commands or tasks)

Example 1:

Input: Write a short paragraph on pollution.

Output: Pollution is the introduction of harmful substances into the environment. It affects air, water, and land, and can harm living beings.

Example 2:

Input: Translate this sentence to Hindi: "I love my country."

Output: मैं अपने देश से प्यार करता हूँ।

Example 3:

Input: Summarize the story of "The Hare and the Tortoise."

Output: A fast hare mocks a slow tortoise. They race, but the hare naps. The tortoise keeps going and wins. Slow and steady wins the race.

2. Interrogative Prompts (Questions)

Example 1:

Input: What is artificial intelligence?

Output: Artificial Intelligence is the simulation of human intelligence by machines that can learn, reason, and solve problems.

Example 2:

Input: Who was the first president of India?

Output: Dr. Rajendra Prasad was the first president of India.

Example 3:

Input: Why do we need trees?

Output: Trees give us oxygen, improve air quality, conserve water, and support wildlife.

3. Zero-shot Prompts (No examples given)

Example 1:

Input: Write a slogan for a mobile company.

Output: "Connect Smarter, Live Better."

Example 2:

Input: Explain the water cycle in 3 lines.

Output: Water evaporates, forms clouds, and falls as rain. It flows back into rivers and oceans. The cycle repeats.

Example 3:

Input: Describe a lion in one sentence.

Output: A lion is a large, powerful wild cat known as the king of the jungle.

4. Few-shot Prompts (Give examples before asking)

Example 1:

Input:

Q: Apple = Fruit

Q: Carrot = Vegetable

Q: Milk = ?

Output: Dairy

Example 2:

Input:

Q: $2 + 2 = 4$

Q: $3 + 3 = 6$

Q: $5 + 5 = ?$

Output: 10

Conclusion:

- Instructional: Clear tasks, reliable results.
- Interrogative: Good for questions and learning.
- **Zero-shot: Works well for simple tasks.**
- **Few-shot: Best for pattern-based tasks with examples.**

LAB 3

Objective:

Extract structured data from ChatGPT responses like contact info, resume details, and keywords.

Activities:

1. Format response in JSON

Prompt:

Extract name, email, phone number from this text and format in JSON:

"Hi, I'm Priya Shah. You can contact me at priya.shah@email.com or call me at +91-9876543210."

Output (JSON):

```
{  
  "name": "Priya Shah",  
  "email": "priya.shah@email.com",  
  "phone": "+91-9876543210"  
}
```

2. Extract resume sections

Prompt:

Extract the following sections from the paragraph: Education, Skills, Experience.

"John has a B.Tech in Computer Science. He worked at Infosys for 2 years. His skills include Python and Machine Learning."

Output (Table):

Section	Details
Education	B.Tech in Computer Science
Experience	Worked at Infosys for 2 years
Skills	Python, Machine Learning

3. Extract keywords

Prompt:

Extract keywords from the following text and present them in a table:

"Artificial Intelligence is used in education, healthcare, and business automation."

Output:

Keyword	Domain
Artificial Intelligence	Application
Education	Application
Healthcare	Application
Business automation	Application

Observation:

While performing this lab, we observed that:

- The quality of the output heavily depends on how clearly the prompt is written.
- JSON format is useful for machine-readable structured data.
- Tabular format helps in presenting human-readable summaries (like resume data).
- Even with short paragraphs, ChatGPT can extract detailed information if guided properly.
- Minor changes in wording can affect how complete or accurate the results are.

This shows how important precision and clarity are in prompt design when doing information extraction tasks.

LAB 4

Objective:

Use ChatGPT to perform summarization, rewriting, and tone transformation on various types of texts such as articles, abstracts, and emails.

- **Activity 1: Summarize a News Article**

Prompt:

Summarize the following news article in 3–4 lines:

"India successfully launched its next-generation weather satellite INSAT-3DS from Sriharikota to improve disaster warnings and weather forecasting systems. This mission marks another milestone for ISRO's efforts in enhancing climate and environmental monitoring."

Output:

India launched INSAT-3DS to improve weather forecasting and disaster alerts. The satellite supports better climate and environmental monitoring, marking another success for ISRO.

Accuracy: Key points preserved

Format: Concise and clear summary

- **Activity 2: Summarize a Research Abstract**

Prompt:

Summarize this abstract in simple terms:

"This study investigates the impact of deep learning models in medical image analysis. Results show improved accuracy in diagnosing diseases from X-ray and MRI scans using CNN-based architectures."

Output:

The research shows that deep learning models like CNNs help doctors analyze X-rays and MRIs more accurately to detect diseases.

Accuracy: Simplified but informative

Format: Easy to understand

- **Activity 3: Rewrite Email – Formal Tone**

Prompt:

Rewrite this email in a formal tone:

"Hey, I can't make it to the meeting today. Let's reschedule?"

Output:

Dear [Name],

I regret to inform you that I will be unable to attend today's meeting. Kindly let me know a suitable time for rescheduling.

Best regards,

[Your Name]

Accuracy: Message preserved

Format: Formal and professional tone

- **Activity 4: Rewrite Email – Informal Tone**

Prompt:

Rewrite this email in an informal tone:

"Dear Sir, I am writing to inform you that I will not be able to attend class due to illness."

Output:

Hey! Just wanted to let you know I'm not feeling well and won't be able to make it to class today.

Accuracy: Message preserved

Format: Casual and friendly tone

Observation:

- Summarization works best when prompts specify length or goal (for example, "in simple terms" or "in 3 lines").
- ChatGPT maintains the original meaning in both formal and informal versions.
- Adding clear context like "news article" or "email" improves relevance and quality.
- -Tone transformation is accurate even with short or casual input.

LAB 5

Objective:

Explore how ChatGPT can assist in generating code and debugging programs in Python, C++, or Java.

- **Activity 1: Generate Python Code**

Prompt:

Write a Python program to check if a number is prime.

Output:

```
def is_prime(n):
    if n <= 1:
        return False
    for i in range(2, int(n ** 0.5) + 1):
        if n % i == 0:
            return False
    return True

num = int(input("Enter a number: "))
if is_prime(num):
    print("Prime number")
else:
    print("Not a prime number")
```

Expected Output:

Correctly identifies prime and non-prime numbers.

Accuracy: Matches expected logic

Format: Clean, correct Python syntax

- **Activity 2: Generate C++ Code**

Prompt:

Write a C++ program to calculate the factorial of a number.

Output:

```
#include <iostream>
using namespace std;

int main() {
    int n;
    long long factorial = 1;
    cout << "Enter a number: ";
    cin >> n;

    for (int i = 1; i <= n; ++i) {
        factorial *= i;
    }

    cout << "Factorial = " << factorial;
    return 0;
}
```

Expected Output:

Correct factorial result for any valid input.

Accuracy: Logical and syntactically correct

Format: Proper use of C++ structure

● Activity 3: Debug a Python Code Snippet

Prompt:

Debug the following code to calculate the sum of a list:

```
numbers = [1, 2, 3, 4, 5]
total = 0
for i in range(1, len(numbers)):
    total = total + i
print("Sum:", total)
```

Output:

Issue: Loop is adding index values instead of list elements.

Corrected Code:

```
numbers = [1, 2, 3, 4, 5]
total = 0
for num in numbers:
```

```
total += num  
print("Sum:", total)
```

Expected Output:

Sum: 15

Accuracy: Correctly identifies and fixes the logic error

Format: Output is as expected

Observation:

- ChatGPT accurately generates code in different languages when the prompt is clear.
- Debugging works well when the input code is short and the error is logical or syntactic.
- Responses include complete and executable code with clear structure and comments when prompted.
- Minor errors in prompt wording can affect code quality or completeness.

LAB 6

Objective:

Use ChatGPT to perform a task within a specific domain like medical, legal, or education.

- **Activity Chosen: Educational Quiz Generation**

Prompt Design:

Prompt:

Generate a 5-question multiple choice quiz on the topic "Basics of Photosynthesis" for grade 7 students. Each question should have four options and the correct answer indicated separately.

Output:

Question 1:

What is the main function of photosynthesis?

- A. Absorb oxygen
- B. Produce food
- C. Release nitrogen
- D. Digest water

Answer: B. Produce food

Question 2:

Which gas is used by plants during photosynthesis?

- A. Oxygen
- B. Carbon dioxide
- C. Nitrogen
- D. Hydrogen

Answer: B. Carbon dioxide

Question 3:

What is the green pigment in plants called?

- A. Hemoglobin
- B. Chlorophyll
- C. Melanin
- D. Plasma

Answer: B. Chlorophyll

Question 4:

Where does photosynthesis mainly take place in a plant?

A. Roots
B. Stem
C. Leaves
D. Flowers
Answer: C. Leaves

Question 5:
Which of the following is a product of photosynthesis?
A. Oxygen
B. Carbon monoxide
C. Methane
D. Sulfur
Answer: A. Oxygen

Output Evaluation:

Relevance:
All questions are age-appropriate and correctly focused on the topic.

Accuracy:
All answers are scientifically correct.

Clarity:
Language is simple and easy for grade 7 students to understand.

Structure:
Proper multiple-choice format with clear options and correct answers labeled.

Observation:

- ChatGPT can easily adapt to the educational domain by generating structured quizzes.
- Prompts that include details like difficulty level, topic, and number of questions result in better outputs.
- The questions were factually correct and followed a good pattern, making them usable in real classrooms.
- This demonstrates ChatGPT's usefulness for teachers, tutors, and educational app developers.

