

Lab 1

Introduction to chatgpt

Exploring the ChatGPT Interface

1. Input Area

- This is where you type your questions or prompts. It supports plain text input and sometimes markdown formatting for better structuring (like lists, code blocks).

2. Response Area

- Displays ChatGPT's replies. Responses are generated in real-time and can include explanations, lists, code, or even creative content depending on your prompt.

3. Conversation History

- Shows your previous interactions in the session. You can scroll up to revisit earlier messages, which helps maintain context during the conversation.

4. Settings/Options

- Allows customization such as choosing the model version (if available), toggling themes (dark/light mode), or adjusting response length and creativity (temperature settings).

5. System Prompts or Instructions

- Sometimes, you can provide initial instructions to guide ChatGPT's tone or style for the session (like formal, friendly, technical).

6. Export/Save Options

- Some interfaces let you export the chat transcript or save specific parts for future reference.

7. Special Features (if available)

- Image generation integration (DALL·E), code execution, or plugin access for enhanced tasks.
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Tips to Explore Effectively:

- **Try different prompts:** Test simple questions, creative writing, coding help, or complex explanations to see the range of responses.
- **Use follow-ups:** Build on previous answers to explore deeper or clarify topics.
- **Experiment with styles:** Ask for summaries, bullet points, or detailed analysis.
- **Check for corrections:** If something seems off, ask ChatGPT to revise or explain differently.

summary

Certainly! Here's a concise one-page summary covering ChatGPT's working, its transformer architecture, and real-world use cases across different sectors:

Summary: Understanding ChatGPT and Its Real-World Applications

ChatGPT Overview

ChatGPT is an AI language model developed by OpenAI that uses deep learning to understand and generate human-like text. It is powered by the transformer architecture, which enables it to process and generate language contextually and coherently.

Transformer Architecture

At the core of ChatGPT is the transformer model, introduced in 2017. Transformers use a mechanism called *self-attention* to weigh the importance of different words in a sentence relative to each other, enabling the model to understand context more effectively than previous RNN or CNN models. Visualization tools like attention heatmaps help illustrate how the model focuses on relevant words when predicting the next word in a sequence.

Key components of the transformer:

- **Encoder-Decoder layers** (though ChatGPT mainly uses decoder-only stacks)
- **Self-attention heads** that capture dependencies across words
- **Positional encoding** to retain the order of words

Real-World Use Cases

1. Education

ChatGPT acts as a personalized tutor, answering students' questions, explaining complex topics, and helping with language learning. For example, it can simplify Shakespearean language or assist with math problems interactively.

2. Healthcare

It supports healthcare professionals by summarizing medical literature, generating patient reports, or answering FAQs about symptoms and medications, helping to reduce administrative workload.

3. Business

Businesses leverage ChatGPT for customer support chatbots, drafting emails, creating marketing content, and automating repetitive tasks like report generation, thus improving efficiency and customer engagement.

4. Creativity

Writers, artists, and designers use ChatGPT as a brainstorming partner, generating ideas, writing drafts, or creating poetry and stories. It can also assist in coding and game design by suggesting scripts or plotlines.

Lab 2

Zero-Shot Prompt Examples & Responses

1. Prompt: Explain the benefits of drinking water.
Response: Drinking water helps maintain body temperature, supports digestion, keeps skin healthy, and aids in flushing out toxins.
2. Prompt: List three benefits of drinking water.
Response: 1) Hydrates the body, 2) Improves skin health, 3) Aids digestion.

3. Prompt: Why is drinking water important?
Response: Drinking water is important because it keeps the body hydrated, helps regulate body temperature, and supports organ function.
4. Prompt: Describe how drinking water affects your health.
Response: Drinking water is essential for good health; it improves circulation, detoxifies the body, and promotes overall wellness.
5. Prompt: What happens if you drink enough water daily?
Response: Drinking enough water daily can improve energy levels, enhance brain function, and reduce the risk of dehydration-related illnesses.

Few-Shot Prompt Examples & Responses

Prompt (with 2 examples):

Explain the benefits of drinking green tea.

Green tea is rich in antioxidants, boosts metabolism, and improves brain function.

Explain the benefits of exercising regularly.

Exercising regularly improves cardiovascular health, strengthens muscles, and boosts mood.

Now, explain the benefits of drinking water.

1. Response: Drinking water hydrates the body, supports digestion, helps regulate body temperature, and promotes healthy skin.

Prompt (with 3 examples):

List the benefits of eating apples.

Apples improve digestion, provide antioxidants, and support heart health.

List the benefits of sleeping well.

Sleeping well enhances memory, boosts immune function, and improves mood.

List the benefits of drinking water.

2. Response: Drinking water helps maintain hydration, flushes out toxins, supports kidney function, and improves energy levels.

Prompt (with examples in bullet points):

Benefits of running:

- Improves cardiovascular health
- Strengthens muscles
- Reduces stress

Benefits of reading books:

- Enhances knowledge
- Improves focus
- Stimulates imagination

Benefits of drinking water:

3. Response:

- Maintains hydration
- Supports digestion
- Helps regulate body temperature

Prompt (with detailed examples):

Explain the benefits of eating vegetables.

Eating vegetables provides essential vitamins, improves digestion, and supports immune health.

Explain the benefits of staying hydrated.

Staying hydrated helps regulate body temperature, maintains energy levels, and supports kidney function.

Explain the benefits of drinking water.

4. Response: Drinking water keeps the body hydrated, aids digestion, improves skin health, and helps eliminate waste.

Prompt (few-shot with instructions):

Explain the benefits of the following activities in two sentences each.

Jogging: Jogging improves cardiovascular health and strengthens leg muscles. It also boosts mental health by reducing stress.

Meditation: Meditation helps reduce anxiety and improves focus. It promotes emotional well-being and better sleep.

Drinking water:

5. Response: Drinking water hydrates the body and helps maintain vital bodily functions. It also supports digestion and keeps the skin healthy.

Comparison of Zero-Shot vs Few-Shot Results

Aspect	Zero-Shot	Few-Shot
Detail & Clarity	Often brief and general.	More structured and consistent.
Format Consistency	Varies widely by prompt style.	Tends to follow the examples' style.
Relevance	Good, but may miss nuances.	Better task understanding and relevant detail.

Creativity/Variation

Some variation in
answers.

More aligned with example format, less
random variation.

Summary:

Few-shot prompting usually leads to more precise, well-structured, and stylistically consistent answers by guiding the model with examples. Zero-shot is faster but can be less consistent or detailed.

Lab 3: Precision Prompting for Information Extraction

Objective

Learn to design clear, specific prompts to extract detailed information (like contact info, resume sections, keywords) in structured formats such as JSON or tables, enhancing output accuracy and usability.

Step 1: Understand the Information to Extract

Typical targets for extraction:

- Contact Information (name, email, phone)
 - Resume Sections (Education, Experience, Skills, Projects)
 - Keywords (skills, locations, roles, technologies)
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Step 2: Crafting Precision Prompts

Example 1: Extract Contact Info & Resume Details in JSON

Prompt:

From the following paragraph, extract the contact info (email, phone), list of resume sections mentioned, and keywords describing skills or roles. Output the results in JSON format with keys: "ContactInfo", "ResumeSections", and "Keywords".

Paragraph: "Jane Smith is a data scientist living in San Francisco. Reach her at jane.smith@domain.com or +1-415-555-9876. Her resume highlights Education, Experience, Skills, and Certifications. She is proficient in Python, R, and machine learning."

Step 3: Analyze Output & Accuracy

Expected JSON Output:

```
{
  "ContactInfo": {
    "Email": "jane.smith@domain.com",
    "Phone": "+1-415-555-9876"
  },
  "ResumeSections": [
    "Education",
    "Experience",
    "Skills",
    "Certifications"
  ],
  "Keywords": [
    "data scientist",
    "San Francisco",
    "Python",
    "R",
    "machine learning"
  ]
}
```

Evaluation:

- Accuracy: Correct extraction of email, phone, and sections.
- Format: Clear JSON structure ready for parsing.

Step 4: Experiment with Tabular Output

Prompt:

Extract the name, email, phone, and skills from the paragraph below and present them in a table format with columns: Name | Email | Phone | Skills.

Paragraph: "Michael Lee is a backend developer. Contact: michael.lee@mail.com, +1-212-555-1234. Skills include Java, SQL, and cloud computing."

Expected Table:

Name	Email	Phone	Skills
Michael Lee	michael.lee@mail.com	+1-212-555-1234	Java, SQL, cloud computing

Step 5: Increase Prompt Precision for Complex Texts

- Specify the format strictly (JSON keys, table columns).
 - Provide examples of expected outputs in the prompt (few-shot).
 - Use delimiters like quotes to mark input text.
 - Ask for error handling or note missing info if not present.
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Bonus: Compare Zero-Shot vs Few-Shot for Extraction

- **Zero-shot:** Prompt without examples. Output may be less consistent.
 - **Few-shot:** Provide example inputs/outputs to guide model, resulting in more reliable extraction.
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Lab 4: Summarization and Text Transformation

Objective:

Use ChatGPT for summarizing texts and transforming writing styles and tones, such as rewriting emails formally or informally.

Activities:

1. Summarize News Articles / Research Abstracts

Example:

Original:

“Scientists at the Global Climate Institute released a new report highlighting rapid ice melt in the Arctic. The study warns of significant sea-level rise if current trends continue.”

ChatGPT Prompt:

“Summarize the following news article in 2 sentences.”

Output:

“A recent report by the Global Climate Institute highlights rapid Arctic ice melt. It warns that ongoing trends could lead to major sea-level rise.”

2. Rewrite Emails in Formal or Informal Tone

Example:

Original Email (Informal):

“Hey team, just a quick reminder about the meeting tomorrow. Please be on time!”

ChatGPT Prompt (Formal Rewrite):

“Rewrite this email in a formal tone.”

Output (Formal):

“Dear Team,

This is a friendly reminder about tomorrow’s meeting. Kindly ensure you arrive on time.

Best regards,”

ChatGPT Prompt (Informal Rewrite):

“Rewrite this email in a casual, friendly tone.”

Output (Informal):

“Hi everyone, just a quick heads-up about tomorrow’s meeting. Hope to see you all there on time!”

Summary and Transformation Report:

Task	Original Text	ChatGPT Output
News Article Summary	Scientists report rapid ice melt in Arctic.	Arctic ice melting rapidly; sea levels may rise.
Research Abstract Summary	AI research improves diagnostic accuracy.	AI advances enhance medical diagnostic precision.
Formal Email Rewrite	Hey team, quick reminder about meeting.	Dear Team, this is a reminder about the meeting.
Informal Email Rewrite	Please submit the report ASAP.	Hey, can you send over the report soon?
Tone Transformation	I'm sorry for the inconvenience caused.	Apologies for any inconvenience this may have caused.

Tips for Effective Use:

- Specify summary length (e.g., "in 3 sentences").
 - Explicitly state desired tone ("formal," "casual," "empathetic").
 - Provide context or audience details when requesting rewrites.
 - Use examples in prompts for more consistent style.
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Lab 5: ChatGPT in Code Generation and Debugging

```
import random

def guessing_game():

    number_to_guess = random.randint(1, 100)

    attempts = 0

    print("Welcome to the Number Guessing Game!")

    print("I have selected a number between 1 and 100. Try to guess it!")

    while True:

        try:

            guess = int(input("Enter your guess: "))

            attempts += 1

            if guess < number_to_guess:

                print("Too low! Try again.")

            elif guess > number_to_guess:

                print("Too high! Try again.")

            else:

                print(f"Congratulations! You guessed it in {attempts} attempts.")

                break

        except ValueError:

            print("Please enter a valid integer.")

if __name__ == "__main__":

    guessing_game()
```

Debugged code

```
import random

def guessing_game():

    number_to_guess = random.randint(1, 100) # Pick a random number between 1 and 100

    attempts = 0

    print("Welcome to the Number Guessing Game!")

    print("I have selected a number between 1 and 100. Try to guess it!")

    while True:

        user_input = input("Enter your guess: ")

        # Check if the input is a valid integer

        if not user_input.isdigit():

            print("Invalid input. Please enter a valid integer.")

            continue # Ask again

        guess = int(user_input)

        attempts += 1

        # Compare the guess to the target number

        if guess < number_to_guess:

            print("Too low! Try again.")

        elif guess > number_to_guess:

            print("Too high! Try again.")

        else:

            print(f"Congratulations! You guessed it in {attempts} attempts.")

            break # Exit the loop when guessed correctly
```

```
if __name__ == "__main__":
```

```
    guessing_game()
```

Lab 6: Domain-Specific Applications

prompt1:-create a ai medical chatbot for me named health touch

Prompt 2 :assuem if u r a medical chat bot and talk to me



Health Touch:

Thanks for sharing. A fever of 100°F is considered **mild** and may be your body's natural response to an infection or inflammation.

Let me ask a few more quick questions to understand better:

1. Do you have any other symptoms (e.g., sore throat, cough, headache, fatigue)?
2. How long have you had this fever?
3. Have you taken any medicine yet?

(This will help me guide you better!)

User :-i am having a fever of 100 f



Health Touch:

Thanks for sharing. A fever of 100°F is considered **mild** and may be your body's natural response to an infection or inflammation.

Let me ask a few more quick questions to understand better:

1. Do you have any other symptoms (e.g., sore throat, cough, headache, fatigue)?
2. How long have you had this fever?
3. Have you taken any medicine yet?






(This will help me guide you better!)

user:-I have headache

Got it — you're experiencing a **mild fever (100°F)** along with a **headache**. These symptoms together could be due to:

- **Common viral infection or cold**
- **Mild flu**
- **Dehydration**
- **Fatigue or stress**

 **Here are a few things you can do right now:**

-  **Rest well** – your body needs energy to recover
-  **Drink plenty of fluids** – water, ORS, soups, etc.
-  **Take paracetamol (500mg)** if your fever or headache is uncomfortable (*avoid if allergic, and follow dose instructions*)
-  Try light food and avoid caffeine or junk
-  You can also use a **cold compress** on your forehead for relief

Would you like me to:

- Set a **medicine reminder** for you?
- Or help you find a **doctor nearby** if symptoms worsen?

Let me know how I can assist further. 