

BASIC PROMPT ENGINEERING WITH CHATGPT: AN INTRODUCTION

MODULE 3: Prompt Templates

OVERVIEW

In this module, we will focus on developing reusable prompt templates, an essential component of prompt engineering. This module will equip you with the knowledge and skills necessary to create versatile and adaptable prompts that perform well across a variety of tasks and domains.

Prompt templates serve as a foundation for efficient and effective use of ChatGPT and other LLMs, providing a structured approach to formulating prompts. In this module, you will explore various prompt templates and their applications and how they can be customized to suit specific tasks and domains. By understanding the value of templates, you'll be able to streamline your prompt engineering process, saving time and effort while maintaining high-quality results.

By the end of Module 3, you will have a strong grasp of prompt templates, empowering you to create robust and flexible prompts that maximize the capabilities of language models across a wide range of tasks and situations.

The module should take between 4 – 7 hours to complete

LEARNING OBJECTIVES

By the end of this module you will be able to:

- 3.1. Explain the usefulness of prompt templates when using ChatGPT.
- 3.2. Develop simple prompt templates that can be applied to multiple questions or situations.
- 3.3. Develop multi-step prompt templates.
- 3.4. Train ChatGPT to respond to a prompt template in a generalizable way.

FLOW

OVERVIEW

Intro blurb (above)

Intro video:

- Now that you have the foundations of good prompt engineering, we'll be extending this to developing and using prompt templates

- Prompt templates allow you to create a prompt structure with placeholders that can be filled with context specific information. A good prompt template allows you to quickly and efficiently use ChatGPT to carry out different tasks without starting from scratch each time.
- Mastering prompt templates will allow you to develop approaches to using ChatGPT that turn it into a highly adaptable and professional tool.
- As with all modules, the exercises in this module will help develop your skills in getting the best out of ChatGPT more broadly.

ADDITIONAL INFORMATION:

Prompt templates are pre-defined structures or formats that can be filled with specific content, allowing for efficient generation of new prompts. By developing reusable templates, prompt engineers can quickly create a large number of related prompts with minimal effort. This is particularly useful when addressing a family of related tasks.

To create effective prompt templates, you will need to:

1. **Analyze the task:** Understand the core requirements of the task and identify the key components that need to be addressed in the prompt.
2. **Design the structure:** Develop a general structure for the prompt that can accommodate different inputs or situations. This may include creating placeholders for specific information or using conditional statements to adjust the prompt based on the context.
3. **Test and refine:** Continuously test the prompt template with various inputs and scenarios to ensure that it remains effective across a wide range of use cases. Make necessary adjustments and refinements based on the observed performance.

By mastering prompt templates, you will be able to create versatile and efficient prompts that can be adapted to a wide range of tasks and applications.

EXERCISE: Prompt template exploration (5 points)

This exercise is designed to allow you to explore the concept of prompt templates by playing and experimenting with ChatGPT.

- Open a chat session with ChatGPT, making sure that you are in GPT-4 mode.
- Have a conversation with ChatGPT about prompt templates. You may want to ask what they are, how they can be used, and good examples of their use. You may even want to work with ChatGPT on developing and testing your own skills here. Be creative in the conversation you have.
- Confirm you have completed the exercise below.

. You are not expected to spend more than 30 minutes on this exercise.

EXERCISE: Exploring an example prompt template (15 points)

This exercise uses a simple yet powerful example of a reusable prompt template to help you understand the structure and format of a successful template.

The template you will use was suggested by Siqi Chen (@blader on Twitter):

"Teach me how [anything] works by asking questions about my level of understanding of necessary concepts. With each response, fill in gaps in my understanding, then recursively ask me more questions to check my understanding."

The prompt template consists of:

A domain: This is the area that the template is designed to address. In this case the domain is things the user wants to learn about

A task: This is the think that the prompt template is designed to do. In this case it is getting ChatGPT to help the user to learn more about a specific topic

A process: This is how the template determines that ChatGPT will complete the task. A process that ChatGPT will use to execute the prompt.

An input: A new piece of information that is provided by the user each time the template is used. In this case it is the thing the user wants to learn about. A prompt template may have more than one inputs.

This isn't the only prompt template structure, but it is a useful one.

Exercise:

- Open a new session of ChatGPT using GPT-4
- Type in the prompt above with [anything] replaced by "prompt templates in ChatGPT" (you may want to also change the following "works" to "work").
- Have a conversation with ChatGPT over 3 – 4 responses, and think about what you can learn about the original prompt from this.
- Experiment with the same prompt template using another domain. How effective is this prompt at opening up the power of ChatGPT?
- Confirm you have completed the exercise below.

You are not expected to spend more than 30 minutes on this exercise, but feel free to spend longer on it!

EXERCISE: Developing your own prompt template (20 points)

In this exercise you will create a reusable prompt template. This will be designed for use with a specific domain. You can be creative here. For instance, science, history and literature are all great domains, but so are food, animals, climate change, AI, hobbies, and even Pokémon! You will test the template with ChatGPT and analyze the results, making any necessary adjustments to improve its effectiveness.

In this exercise you should be aware that there are different types of questions that you can ask ChatGPT to respond to in a prompt template. Three of these are factual questions, comparative questions, and hypothetical questions, although there are others.

For instance, you might select the domain of science fiction, and chose the question types of “factual” (e.g. what was x’s first book?), comparative (e.g. how does x compare to y?) and hypothetical (e.g. if the characters in x knew of y how would this affect the plot?).

You are free to use one of these, or develop your own unique type of question.

Tip: You can use delimiters and placeholders in your prompt template – something that’s covered in this document in Module 5. For instance, using the example from the previous exercise:

Teach me how [anything] works by asking questions about my level of understanding of necessary concepts. With each response, fill in gaps in my understanding, then recursively ask me more questions to check my understanding.

[anything]: (this is where you put what you want to learn about)

In this example you don’t have to substitute placeholder text in the prompt – you simply add the variable text after the “[anything]:” placeholder.

This exercise should take no longer than 1 – 2 hours.

1. Domain selection and exploration

- Choose a domain that interests you. Be creative!
- Think about and identify key topics, concepts, and types of questions that are commonly asked within this domain, or that you would like to ask.
- Think about specific challenges that might occur when asking ChatGPT questions about this domain, such as ambiguity and context-dependency.
- Note your domain, the key topics, and any challenges you have identified, below.

2. Designing a simple template

- Design a simple template for the domain and topics you identified in the previous step. Make sure that the prompt is sufficiently general that it gives different and useful responses when supplied with different inputs. Each question type, including placeholders for context and specific details. For example, if your domain is science fiction, a template may look like “If the characters in [book or movie] knew about [science or technology breakthrough] how would the story be different?”
- Test your template with ChatGPT (with GPT-4) using specific examples, and tweak the template so that the results are as useful as possible when using different inputs.
- When you are happy with the results, post your final template and an example of a ChatGPT response below.

EXERCISE: Training ChatGPT to use your template (20 points)

One of the powerful features of ChatGPT is that it can infer how to respond to questions from the information you provide it. This is called “systematic generalization” when developing LLMs and chatbots like ChatGPT.

In this exercise you will develop a prompt structure that allows ChatGPT to respond to different inputs to your prompt template without you typing the whole template in each time.

It is a powerful demonstration of ChatGPT’s ability to interpret general natural language instructions in sophisticated ways.

Exercise:

- Open a new session with ChatGPT using GPT-4
- Create a generalized prompt for ChatGPT based on your template that identifies key inputs to your template and allows you to simply provide these inputs in subsequent prompts. You will need to experiment with prompts until you find one that works well. But your aim is to be able to provide just the inputs in follow-on prompts and have ChatGPT respond as if you had typed in the full original prompt template.
- To get a better idea of how this works, try this example: “Hi ChatGPT. I am going to give you a general template and then provide you with input to this template and ask for answers. The general template is ‘If the characters in [supplied book or movie title] knew about [supplied science or technology breakthrough] how would the story be different?’” To play with the example, use this prompt out in a new ChatGPT session, and then simply give ChatGPT a book and a science or technology breakthrough in subsequent prompts and see what the responses are like.
- One approach here is to give ChatGPT an example of how you would like it to respond to the template.
- Experiment with your own prompt template until ChatGPT responds clearly and appropriately to relevant inputs.

- When you are happy with the results, post an example of a conversation with ChatGPT using your final generalized prompt below.

This exercise should take no longer than one hour.

EXERCISE: Multi-step task template (30 points)

In this exercise you will develop a template for tasks that consist of multiple steps. In the context of ChatGPT, a multi-step task template refers to a structured series of questions or instructions designed to guide the model through a conversational interaction. This approach breaks down a complex request into smaller, sequential steps, allowing the model to better understand and address the user's query.

A well-structured multi-step template helps to generate more accurate and relevant responses from ChatGPT.

For example, here's a multi-step task template for a conversation about a healthy meal recipe:

1. Prompt: "Please suggest a healthy meal recipe for dinner."
 - AI responds with a recipe suggestion.
2. Prompt: "What are the main ingredients for the recipe?"
 - AI lists the main ingredients.
3. Prompt: "Please provide step-by-step instructions on how to prepare the meal."
 - AI provides detailed cooking instructions.
4. Prompt: "What are the nutritional benefits of this meal?"
 - AI explains the nutritional benefits of the meal.

By using a multi-step task template, the conversation with ChatGPT becomes more structured and organized, which helps the AI to deliver more accurate and relevant information to the user.

Exercise:

- Select a task that can be broken into multiple steps. This may be something like developing a meal plan or a recipe (like the example above), or developing a travel itinerary, or outlining an essay, or even setting up a business.
- Develop a series of between 4 – 8 sequential prompts for this task. Remember to think about a sequence that can usefully be used multiple times, rather than just once. Also remember that you can have variables in your sequence. For instance, the example above may start with "Please suggest a healthy meal recipe for [insert meal]"
- Open a new session with ChatGPT using GPT-4

- Iteratively work with ChatGPT to test and refine your prompt sequence.
- Once you are happy with your multi-step task template, start a new ChatGPT session and run it.
- Repeat this with two additional new sessions.
- Submit documentation of each of the three ChatGPT sessions below.

This exercise should take no longer than 1 – 2 hours.

ASSIGNMENT: Testing understanding of prompt templates (10 points)

- Open a new session with ChatGPT using GPT-4
- Enter the following prompt: “Hi ChatGPT. My name is [enter full name] and I am completing a course assignment on prompt templates using ChatGPT. This is for a basic introduction to using ChatGPT as part of an undergraduate course. The assignment has the following learning objectives: ‘At the end of this module you will be able to: Explain the usefulness of prompt templates when using ChatGPT; Develop simple prompt templates that you can use across different situations and domains; Develop multi-step prompt templates; Train ChatGPT to respond to a prompt template in a generalizable way.’ Please ask me five simple questions on prompt templates with ChatGPT based on these objectives. After each question, please wait until I have answered before asking the next one. When I have answered all five questions, provide me with an assessment of my answers and a grade from A to C”
- Complete the quiz. You can repeat this as many times as you like, but do start each version of the quiz in a new ChatGPT session.
- When you have a response from ChatGPT that you are happy with, upload documentation of the quiz, your responses, and ChatGPT’s assessment, below.
- You will be graded as follows: ChatGPT “A” – 100%. ChatGPT “B” – 95%. ChatGPT “C” – 90%. A “+” or “-” grade counts the same as the letter grade.

This exercise should take no longer than an hour.