# Assignment 1: Zero-shot vs Few-shot Prompting

Topic Chosen: Web App Layout Design Prompting

## 1. Objective

The goal of this experiment is to understand the difference between zero-shot and few-shot prompting when instructing a Large Language Model (LLM) to create a web page layout specification for a specific use case. The use case chosen is:

A homepage where the user selects a state, sees a map and information on the state, with an image and text. Below, there are buttons for “Culture”, “Dressing Style”, “Food”, “Places to Explore”, etc. When the user clicks “Places to Explore”, the page should reload and show the heading “Places to Explore in [State Name]” along with details of the top 5 temples in that state, each with an image and content.

## Zero-shot Prompt

**Prompt:**  
Create HTML/CSS layout instructions for a webpage where the user can select a state. On selecting the state, display the state’s map and some information, with the image and content. Below, there should be buttons for “Culture”, “Dressing Style”, “Food”, and “Places to Explore”. When the user clicks “Places to Explore”, reload the page with a heading “Places to Explore in [State Name]” and show the top 5 temples of the state, each with an image on the left and description on the right.

**Hypothetical Output (Zero-shot):**  
- LLM provided a basic HTML structure with placeholders.  
- CSS styling was minimal and not aligned to the exact requirement.  
- No clear navigation flow between main page and 'Places to Explore' page.  
- Temple details were generic and not state-specific.

## Few-shot Prompt

**Prompt:**  
**Example 1: [HTML/CSS tourism site example with layout]**

Requirements:

- Homepage with dropdown to select a city.

- On selection, show a landmark image on the left and description on the right.

- Below, show buttons for “History”, “Cuisine”, and “Attractions”.

- On clicking “Attractions”, reload page showing heading “Attractions in [City]” and 3 key spots with image-left/text-right layout.

Example Output:

[HTML/CSS snippet showing dropdown, aligned layout, and navigation]

**Example 2: [HTML/CSS book showcase example with layout]**

Requirements:

- Homepage shows list of genres.

- On selecting a genre, display genre cover image on left, description on right.

- Below, show buttons for “Top Authors”, “Best Sellers”.

- On clicking “Top Authors”, reload with heading “Top Authors in [Genre]” and list 5 authors with image-left/text-right.

Example Output:

[HTML/CSS snippet showing consistent styling]

**Now complete this task:**

Create HTML/CSS layout instructions for a webpage where the user can select a state. On selecting the state, display the state’s map and some information, with the image on the left and content on the right. Below, there should be buttons for “Culture”, “Dressing Style”, “Food”, and “Places to Explore”. When the user clicks “Places to Explore”, reload the page with a heading “Places to Explore in [State Name]” and show the top 5 temples of the state, each with an image on the left and description on the right.

**Hypothetical Output (Few-shot):**  
- LLM produced more polished HTML/CSS closely matching the required layout.  
- Image-left/text-right formatting was consistent across both main and subpages.  
- Added proper navigation and styling for buttons.  
- Temple details appeared in a well-structured card layout.  
- Output was closer to a directly usable web template.

## 4. Observations

| **Criteria** | **Zero-shot Result** | **Few-shot Result** |
| --- | --- | --- |
| Layout Accuracy | Partially correct | Fully correct |
| Image/Text Alignment | Inconsistent | Consistent |
| Navigation Flow | Missing details | Well-implemented |
| Styling | Basic | Polished |
| Content Specificity | Generic | More state-specific |

Few-shot prompting gave clearer formatting patterns from the examples, leading to a more accurate and usable output.  
The zero-shot prompt relied solely on description, which left room for ambiguity in layout, navigation, and content structure.

## 5. Conclusion

Few-shot prompting significantly improves results for layout and design tasks. Providing 2–3 examples helps the LLM better understand structure, style, and content flow.

# Assignment 2: Role-based & Chain-of-Thought Prompting

Topic: Designing a Web Layout for State Selection and Information Display

## 1. Objective

The aim is to see how an LLM behaves when:  
- Given a specific role to act in (role-based prompting).  
- Asked to reason step-by-step before answering (chain-of-thought prompting).  
The chosen task is the same state-selection tourism website as in Assignment 1.

## 2. Prompts, Outputs, and Reflections

|  |  |  |  |
| --- | --- | --- | --- |
| Prompt Type | Prompt | Hypothetical Model Output | Reflection |
| Role-based Prompt | You are an experienced front-end web developer. Create a clean, responsive HTML/CSS layout for a tourism website. The homepage should let the user select a state, display the map and information (image-left/text-right), and have buttons for 'Culture', 'Dressing Style', 'Food', and 'Places to Explore'. When 'Places to Explore' is clicked, reload the page showing 'Places to Explore in [State Name]' and list top 5 temples with image-left/text-right format. | Output contained a polished HTML template with semantic tags, responsive flexbox layout, styled buttons, and hover effects. Looked visually professional. | Role-based prompting produced industry-standard design practices and professional-looking code. |
| Chain-of-Thought Prompt | Let’s design the website step-by-step. First, decide the homepage structure. Next, decide how the map and state info will be positioned. Then design the button section. After that, plan the navigation for 'Places to Explore'. Finally, write the HTML/CSS code following the plan. | Output began with a step-by-step breakdown: homepage with dropdown, map/info in flexbox, buttons in a grid, temple page with heading and cards, then HTML/CSS code implementing the plan. Functional but simpler styling. | Chain-of-thought prompting explained reasoning clearly, though final styling was simpler. |

## 3. Observations

- Role-based prompt → more polished and professional output.  
- Chain-of-thought prompt → clearer reasoning process but simpler output.  
- Best results likely from combining both techniques.

## 4. Conclusion

Role-based prompting is best for expert-quality output. Chain-of-thought prompting is best for teaching and understanding the reasoning. For this web app, combining both would give the most effective results.