**GRG 356T Cartography and Maps**

Lab 7 Map Style Transfer using LLMs Tutorial

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## Prompt-1 for image appreciation

I want you to act as an image appreciator. I will provide you with an image. Your task is to describe it as detailed as possible, which means that the following topics should be covered:

* Content: What is in the image? What are the attributes and relationships of these things? What objects cannot possibly appear in this image? What temporal and spatial information does the image reflect?
* Color: What is the color of objects and background? Please provide hexadecimal color values as accurately as possible, e.g. #000000. What effect does the combination of these colors give to the brightness and contrast of the image?
* Theme & Design: If the provided image is a painting, then what is the theme of the painting? (e.g. Realistic, Surreal) What are the characteristics of the design? (e.g. Simple, Detailed, Complex)

If you understand the requirements of this task, you can reply 'OK' and provide your description after I provide the image.

## Prompt-2 for style sheet design

I want you to act as a style sheet designer. I will provide you with a reference image and its description, covering the content, color, theme & design. Your task is to design a suitable style sheet to render the following map elements so that the style of the rendered map is as consistent as possible with the reference image:

[Data name]: Neighborhood;

[Map elements]:

• background elements: Background.

• fill elements: Commercial\_area, Green\_space, Water, Commercial\_building, Residential\_building.

• line elements: Walkway, Street, Tertiary\_road, Secondary\_road, Primary\_road, Metro.

• symbol\_label elements: Water\_label, Settlement\_label, Street\_label, Tertiary\_road\_label, Secondary\_road\_label, Primary\_road\_label, Natural\_landscape\_label, Cultural\_landscape\_label.

• symbol\_icon elements: Metro\_station, Oriental\_pearl\_tower.

[Requirements]:

In the process of designing the style sheet, you can perform different actions for different types of elements:

• For each background element, you can set the background-color.

• For each fill element, you can set the fill-outline-color, fill-opacity, fill-color.

• For each line element, you can set the line-color, line-width, line-opacity.

• For each symbol\_label element, you can set the text-halo-width, text-halo-color, text-color, text-halo-blur.

• For each symbol\_icon element, you can describe the expected style as detailed as possible, e.g. its content, color, theme & design. The icon designer will design this icon according to your expectations.

Meanwhile, please pay attention to the following requirements:

1. Completeness: please set the styles for all elements;

2. Unity: the styles of relevant elements should be as close as possible, such as roads of different levels, and when choosing a style, please consider the contrast and visual hierarchy of the map as much as possible;

3. Rationality: when choosing a style, it is necessary to take into account the semantic information of the elements, that is, the real-world connotations of the elements;

4. Explainability: please explain the specific reason for your rendering;

5. Normativeness: all colors should be given in hexadecimal format, e.g. #000000, and opacity should be a decimal between 0 and 1, where 0 represents transparent and 1 represents opaque. Please strictly follow the following JSON format to return results and just return this JSON file:

{

"background": {

"Background": {"background-color": ..., },

},

"fill": {

"Commercial\_area": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Green\_space": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Water": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Commercial\_building": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Residential\_building": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

},

"line": {

"Walkway": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Street": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Tertiary\_road": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Secondary\_road": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Primary\_road": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Metro": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

},

"symbol\_label": {

"Water\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Settlement\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Street\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Tertiary\_road\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Secondary\_road\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Primary\_road\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Natural\_landscape\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Cultural\_landscape\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

},

"symbol\_icon": {

"Metro\_station": {"expectation": ..., "explanation": ...},

"Oriental\_pearl\_tower": {"expectation": ..., "explanation": ...},

},

}

If you understand the requirements of this task, you can reply 'OK' and provide your answer after I provide the reference image and its description.

## Prompt-3 for file configuration

I want you to act as a senior computer expert. I will provide you with a style specification file and a new style sheet. Your task is to modify the style specification file based on the new style sheet while strictly following the original style specification file format. Please note that the returned result should be the entire modified style specification file, including the unmodified parts. Also, when encountering a filtering expression, please refrain from modifying the filtering condition and only modify the variable value. For example, when you come across the expression: "opacity": ["match",["get","class"],["commercial\_area"],1,0] and you want to change its opacity to 0.8, you should understand that the aforementioned expression selects features in the layer with a class of "commercial\_area" and sets their opacity to 1, while setting the opacity of others to 0. Therefore, you should modify the expression to "opacity": ["match",["get","class"],["commercial\_area"],0.8,0].

If you understand the requirements of this task, you can reply 'OK' and provide the modified style specification file after I provide the original style specification file and the new style sheet.

## Prompt-4 for map evaluation

I want you to act as a map evaluation expert. I will provide you with two images. One is a reference image and the other is a map designed according to the style of the reference image. Your task is to evaluate whether the style of the map is consistent with the style of the reference image, based on a comprehensive consideration of the color, theme & design. Once you have completed the evaluation, you can make one of the following two choices: Accept/Revision. If you choose 'Accept', then you do not need to do anything else; If you choose 'Revision', then you need to provide the modified style sheet and corresponding explanations.

Specifically, our map elements include:

• background elements: Background.

• fill elements: Commercial\_area, Green\_space, Water, Commercial\_building, Residential\_building.

• line elements: Walkway, Street, Tertiary\_road, Secondary\_road, Primary\_road, Metro.

• symbol\_label elements: Water\_label, Settlement\_label, Street\_label, Tertiary\_road\_label, Secondary\_road\_label, Primary\_road\_label, Natural\_landscape\_label, Cultural\_landscape\_label.

In the process of modifying the style sheet, you can perform different actions for different types of elements:

• For each background element, you can change the background-color.

• For each fill element, you can change the fill-outline-color, fill-opacity, fill-color.

• For each line element, you can change the line-color, line-width, line-opacity.

• For each symbol\_label element, you can change the text-halo-width, text-halo-color, text-color, text-halo-blur.

Please pay attention to the following requirements:

1. You do not need to modify all map elements.

2. Normativeness: all colors should be given in hexadecimal format, e.g. #000000, and opacity should be a decimal between 0 and 1, where 0 represents transparent and 1 represents opaque. Please strictly follow the following JSON format to return results and do not output any other text:

If you choose 'Accept', then return this JSON:

{

"Action": "Accept"

}

If you choose 'Revision', then return this JSON:

{

"Action": "Revision",

"Modified style sheet": {

"background": {

"Background": {"background-color": ..., },

},

"fill": {

"Commercial\_area": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Green\_space": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Water": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Commercial\_building": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

"Residential\_building": {"fill-opacity": ..., "fill-color": ..., "fill-outline-color": ..., },

},

"line": {

"Walkway": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Street": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Tertiary\_road": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Secondary\_road": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Primary\_road": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

"Metro": {"line-opacity": ..., "line-color": ..., "line-width": ..., },

},

"symbol\_label": {

"Water\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Settlement\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Street\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Tertiary\_road\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Secondary\_road\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Primary\_road\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Natural\_landscape\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

"Cultural\_landscape\_label": {"text-color": ..., "text-halo-color": ..., "text-halo-width": ..., "text-halo-blur": ..., },

},

}

}

If you understand the requirements of this task, you can reply 'OK' and provide your answer after I provide the reference image and the map. Next, I will upload the reference image and the map in order.