

## Section 1: Examples of Iteratively Optimized Prompts

This section presents examples of task prompts used in GPT-4 (UI). We utilize the following prompts to perform a series of tasks on the basis of GPT-4, including constructing a candidate pool, generating steganographic text, and extracting embedded information.

Prompt	Details
evaluation and optimize	I currently have three candidate pools: subjects, verbs, and objects, each containing words and their corresponding probabilities. I will provide you with combinations randomly drawn from these three pools. Your task is to assess the quality of these subject-verb-object (SVO) combinations across multiple dimensions, including logic and semantics. Based on the assessment, you will then fine-tune the provided word pools to improve the quality of the randomly drawn SVO combinations, thereby reducing the occurrence of low-quality combinations.
embedding prompt	As a journalist, you are given a subject "{subject}", a predicate "{predicate}", an object "{object}", and an emotional tendency "{emotional-tendency}". Your task is to generate an entertainment news sentence where the subject appears at the beginning, followed by the predicate, and then the specified object. Ensure that the sentence contains only one object entity, which should be "{object}". The sentence should align with the provided emotional tendency, crafting a coherent and engaging narrative for readers.
extraction prompt	hen provided with sentences from entertainment news, your task is to extract the main information, focusing specifically on identifying the key subjects, verbs, and objects within them. It's crucial that only one word or phrase is extracted for each category, and you should avoid extracting names, articles, adjectives, and adverbs. Additionally, you are to give an emotional evaluation of the sentence, categorizing the emotion as negative, neutral, or positive.
generate prompt	You will be provided with subjects, verbs, objects, and emotions to construct a sentence. The sentence must follow the format: "XXX (subject) did/do/does (verb) XXX (object) with XXX (emotion)." For example, "The model won the play positively". Ensure that the sentence accurately reflects the given components while adhering to the specified structure and effectively conveying the intended emotion.
feedback prompt	This sentence was generated using LLMs, with the combination:[...]. However, the combination extracted were:[...]. Analyze the reasons why the extraction was not accurate, and optimize the prompts used for generation and extraction.

## Section 2: Comparative Experimental Results Based on GPT-3.5 and GPT-4

The construction of the candidate pool, the generation of steganographic text, and the extraction of secret information were conducted independently on GPT-3.5 / GPT-4.

LLM	Length	PPL	Semantic similarity	Embedding rate	KLD(log)
GPT-3.5(UI)	8.913	318.61	0.6394	4.04	2.10
GPT-4(UI)	13.33	165.76	0.5881	5.93	1.76