

Enhancing AI Code Generation and Logical Reasoning using JSON-Structured Prompting

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Abstract: Emerging innovations within large language models like GPT-4, Gemini, and Claude showcase remarkable prowess in generating codes and performing logical analyses. Nevertheless, their effectiveness hinges crucially upon clear and structured instructions provided in conventional natural language formats, frequently resulting in unclear meanings and divergent logic due to these methods of prompting. This study explores how encoding human prompts as structured data within JSON format improves the performance metrics such as precision, coherence among responses generated by artificial intelligence systems when processing coding-related inputs. By conducting extensive trials on fifty coding challenges and ten logical puzzles employing models like GPT-4, Claude III, and Gemini One. This research evaluates how JSON-formatted instructions compare to conventional human-readable input methods in their effectiveness for tasks. Evidence shows that systematic guidance yields a success rate of eighteen percent. A modest enhancement of only 0.5 percent in coding accuracy resulted in significant improvements. A notable enhancement of logical cohesion: an increase by 9%, along with a corresponding growth of 15%. Experience an enhanced service speed of 9%, coupled with improved performance metrics by achieving 18% higher token efficacy. Additionally, well-defined instructions greatly improve understanding of generated outputs and make it simpler for developers to identify issues during testing and verification processes. This research demonstrates how structured prompts encoded in JSON format can serve as an effective method for unified interaction between humans and AI tools during software creation projects, providing significant benefits for enhancing AI-driven coding platforms, accelerating automatic program crafting processes, and improving transparency within intelligent algorithms.

Keywords: Large Language Models, Prompt Engineering, JSON-Structured Prompting, Code Generation, Logical Reasoning, AI Efficiency

