Title : The effect of negation and distraction in large language models in coding tasks

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ABSTRACT

This research presents a comprehensive evaluation of Large Language Model (LLM) robustness on coding tasks when subjected to non-functional prompt interference, focusing specifically on the impact of distraction. As AI-assisted software development becomes increasingly prevalent, model sensitivity to instructional noise has emerged as a critical factor for reliability. This study utilizes a controlled experimental framework to compare five LLMs.

The methodology employs diverse prompt perturbation techniques, including the introduction of misleading variables, conflicting requirements, and erroneous input-output examples, to determine if models prioritize distractors over core problem logic. The research adopts a multi-dimensional assessment by analyzing models through two primary lenses: functional correctness via automated test cases and structural code quality using the Pylint analysis framework.

Preliminary findings from initial testing indicate that instructional distractors consistently degrade performance compared to baseline conditions. Specifically, conflicting requirements appear to be the most detrimental factor, causing the most significant reduction in logic accuracy. The introduction of misleading variables also leads to a substantial drop in reliability, often resulting in corrupted code logic. While models show higher resilience against unrelated contextual noise, performance remains notably lower than in optimized

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prompts. Furthermore, qualitative analysis via Pylint reveals that these distractions often compromise code integrity and increase convention violations even when the code remains functional.

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