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Leveraging prompt engineering to enhance financial market integrity and risk management

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Abstract This paper presents a comprehensive investigation into the role of prompt engineering in optimizing the effectiveness of large language models (LLMs) like ChatGPT-4 and Google Gemini for financial market integrity and risk management. As AI tools are increasingly integrated into financial services, including credit risk analysis, market risk evaluation, and financial modeling, prompt engineering has become crucial for improving the relevance, accuracy, and contextual alignment of AI-generated outputs. This study evaluates the impact of various prompt configurations in enhancing financial decision-making. Through a series of experiments, the paper compares the performance of ChatGPT-4 and Google Gemini (versions 1.5 and 2.0) in generating actionable insights for credit and market risk analysis. The results reveal that ChatGPT-4 outperforms Google Gemini by over 30% in generating accurate financial insights. Additionally, ChatGPT-4 Version 4 is found to be 20% more effective than Version 3 in risk analysis tasks, particularly in aligning with regulatory frameworks and financial data. These improvements highlight the significant role of prompt engineering in enhancing the precision of financial models. Furthermore, the study explores the reduction of error rates through optimized prompt strategies. In particular, prompt engineering reduces error rates by approximately 20% when assessing complex financial queries.

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