ABSTRACT

Test-Driven Development (TDD) is an approach to software development that focuses on improving quality from the outset by creating tests before writing code. However, challenges often arise, such as difficulty in writing effective tests, which hinders the TDD process. This study aims to utilize Large Language Models (LLMs) to assist in the TDD process, particularly in generating tests and code based on natural language descriptions. This study explores the ability of LLMs, specifically the LLaMA 3 model, to automatically generate test cases from requirements descriptions. To evaluate the model's effectiveness, two scenarios were used: a short and a long description, and an assessment was conducted based on automated metrics. The assessment used CodeBLEU, BLEU, and chrF metrics to measure the level of similarity between the resulting test cases and the manual reference. The results showed that the scenario with the more complete description scored 32.20% on CodeBLEU and 44.34% on chrF. Furthermore, the model produced consistent output across all trials. This study demonstrates that LLMs can be used to directly support the TDD process without additional training and still generate relevant test cases.

Keywords: *test generation, large language model, test driven development.*