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ДОСЛІДЖЕННЯ LLM-АГЕНТІВ ДЛЯ АВТОМАТИЗАЦІЇ ДОКУМЕНТАЦІЇ REST API ДЛЯ МІКРОСЕРВІСІВ

EXPLORATION OF LLM AGENTS FOR AUTOMATING THE REST API DOCUMENTATION FOR MICROSERVICES

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Abstract. *This research paper explores LLM agents for automated documentation creation for microservices and a self-validated approach based on a set of LLM agents. A set of LLM agents is a microsystem whose primary purpose is to analyze the API endpoints, prepare documentation, write tests, and validate itself. A prototype for this approach was developed and tested. The results provide a foundation for optimizing microservices' development time and costs.*

Documenting microservices is very time-consuming, primarily manual work, even with the existence of digital tools and frameworks. Most of the existing tools depend on specific programming languages, approaches, or strict specifications. Modern microservices are created in a very agile manner, where changes and iterative approaches appear very often. It is time-consuming and sometimes costly for customers to manage the microservice documentation, especially when the infrastructure contains tens, hundreds, or more microservices. LLM agents provide a compelling opportunity to overcome these drawbacks. This research explores LLM agents, proposes an approach for automating the process of documentation creation, and describes the prepared prototype and its results. Using an agentic approach, AI can fill the gaps and drawbacks of manual REST API documentation creation. First, a selection and comparison of existing LLM models are researched. The outcome of this comparison is a selection of models for code analysis, documentation, testing, and validation. Then, a system of LLM agents is created. The system consists of several agents connected together. The system is tested and run on a local machine for testing purposes. Each LLM agent has its own zone of responsibility. The context, goal, expected outcomes, prompts, and additional data in configuration or in a human language have been set for each LLM agent. Then, a test Node.js microservice is created, for which the REST API will be generated. The tests contain different variants of the changes of the REST APIs. The outcome of the LLM agentic system is a file with the documentation created in an OpenAPI Specification format for the Swagger tool. Human input and validation in the loop are expected but not needed. The results show that generated documentation via LLM agents provides a documentation file with acceptable quality, describes the APIs, and adds additional information. The approach with LLM agents provides a foundation for improving development time and reducing developers' manual work.

References

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