

Innovation Proposal: AutoDocAI – Intelligent Code Documentation Generator

Bonus Task – AI in Software Engineering Assignment (Week 4)

Team: 41

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Problem Statement

Software documentation is frequently outdated, inconsistent, or missing. Developers often skip writing documentation due to time constraints or a focus on feature delivery. This results in onboarding delays, poor maintainability, and team miscommunication.

Proposed Solution: AutoDocAI

AutoDocAI is an AI-powered tool that intelligently generates up-to-date and readable documentation directly from source code using **Natural Language Processing (NLP)** and **Machine Learning (ML)**.

Workflow





pgsql

CopyEdit





Source Code → NLP Parser → Function/Class Analysis → Documentation
Summary → Export

- **Parsing Engine:** Analyzes code written in Python, JavaScript, and other common languages.
 - **NLP Layer:** Understands the purpose of functions, parameters, and return values.
 - **ML Model:** Trained on open-source repositories to generate human-readable documentation.
 - **Export Module:** Outputs in Markdown, HTML, or PDF formats. Supports integration with GitHub Actions.
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Key Features


-  **Auto docstring generation** for undocumented functions.
 -  **Semantic understanding** of code to produce high-quality summaries.
 -  **VS Code extension** and **GitHub CI integration**.
 -  **Suggestion engine** for improving existing documentation.
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Expected Impact

-  Reduces documentation time by **60–80%**.
 -  Enhances developer onboarding experience.
 -  Improves codebase quality and readability.
 -  Encourages consistent documentation in collaborative environments.
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Future Scope

-  Support for **multilingual documentation** (e.g., English, French, Swahili).
-  Integration with **LLMs** (e.g., GPT-4) for advanced code summarization.
-  Auto-linking related functions and classes across large-scale projects.

-  Dashboard to monitor documentation coverage and quality.

Summary

AutoDocAI can revolutionize how software teams handle documentation. By combining the power of NLP and machine learning, it transforms code into accessible knowledge and enables faster, smarter development practices.