**Bonus Task**

Bug Scope: Intelligent Root Cause Analyzer of Software Bugs

**Problem Statement**

Software engineering software debugging Processes are labour-intensive and usually involve manual logging, code history, and issue report tracing. It consumes up to 50 % of the developers' time trying to identify the source of the bugs. The existing tools can help you only on the syntactic level, and cannot provide any profound insights into the root cause of your codebases and systems.

**Tool Overview**

Bug Scope is a machine learning (ML) and natural language processing (NLP) encoded root cause analysis application designed to detect, trace, and explain the software bug (root cause). It integrates static code analysis, commit history, issue tracking, and run-time logs to recognize trends and produce explanations.

**Workflow**

1. Code Watchdog: It continuously tracks commits, logs, and crash reports.
2. Data Fusion: collects information in source code, stack traces, CI/CD logs, and descriptions of the issue.
3. Pattern Matching: ML is used to identify patterns of the root causes based on historical bugs.
4. NLP Module: Clarifies the probable cause in simple language.
5. Developer Suggestion: Suggests the possible solutions and the areas of the code.

**Impact**

* Accelerates debugging (by 60-80 percent)
* Decreases dependence on the higher-level developers
* Enhances code stability and handling of incidents
* Keeps learning based on organization-specific data