Software Requirements Specification for AI-Code Review Assistant

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Table of Contents

1. Introduction

1.1 Purpose

This document outlines the requirements for the development of an AI-Code Review Assistant. The assistant is designed to analyze C code entered by users, compile it, identify errors, and suggest fixes using machine learning algorithms.

1.2 Project Scope

The AI-Code Review Assistant aims to enhance the efficiency of code review processes by automating error detection and correction in C code. It will assist developers in identifying and rectifying common coding mistakes.

1.3 Overview of Document

This document provides a comprehensive overview of the requirements, features, and constraints of the AI-Code Review Assistant. It serves as a reference for developers and stakeholders throughout the development lifecycle.

2. Overall Description

2.1 Product Perspective

The AI-Code Review Assistant functions as a standalone application that integrates machine learning models for code analysis and correction. It will analyze C code entered by users, compile it, detect errors, and propose fixes.

2.2 Product Functions

The key functionalities of the AI-Code Review Assistant include:

- **C Code Analysis**: The assistant will parse and analyze the C code provided by the user.

- **Error Detection**: It will identify syntax errors, logical flaws, and other issues in the code.

- **Machine Learning Model**: The assistant will leverage machine learning algorithms to suggest potential fixes for detected errors.

- **Compilation**: Users will have the option to compile the code within the assistant's interface.

2.3 User Classes and Characteristics

The primary users of the AI-Code Review Assistant include:

- **Developers**: Software developers who write and review C code.

- **Students**: Individuals learning C programming who require assistance in error correction.

2.4 Constraints

- The assistant will focus on analyzing and correcting C code exclusively.

- It will require internet access to access machine learning models and update error databases.

3. Specific Requirements

3.1 External Interface

The AI-Code Review Assistant will feature a user-friendly interface allowing users to:

- Input C code for analysis and correction.
- Receive error notifications and suggested fixes.
- Compile the corrected code.
- Access documentation and help resources.

3.2 Performance Requirements

- The assistant should be capable of handling C code of varying complexities.
- Response time for error detection and correction should be reasonable, ensuring a smooth user experience.
- The assistant should be compatible with major operating systems including Windows, macOS, and Linux.

4. Appendices

- **C Code Review Assistant**: An application designed to analyze and correct errors in C code.

- Machine Learning Model: A model trained to identify patterns and suggest fixes for code errors.

- **Compilation**: The process of translating C code into executable machine code.

- **GUI**: Graphical User Interface facilitating user interaction with the software.