CS-499 Computer Science Capstone

Module 2-1: Journal

Stephen Owusu-Agyekum

Southern New Hampshire University

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Part 1:

1. What is code review?

Code review in software development is a “systematic review of source code by one or more developers to improve code quality, identify errors, ensure adherence to coding standards, and promote knowledge sharing among a team of developers” (Felice, 2023).

2. Why is it an important practice for computer science professionals?

As a Computer Science Professional, code review is a crucial practice in software development. It helps identify and eliminate bugs in code at the early stages of the development process before the product is deployed. Code review also helps ensure the overall quality of the codebase by allowing multiple sets of eyes to examine the code, thereby reducing the likelihood of bugs, defects, and vulnerabilities making their way into the final product.

3. What are some code review best practices that you read about in the resources that are crucial to include in a code review? Include when a code review should occur in the development process with a rationale as to why.

Implementing best practices into the code review process can help ensure that the code is of high quality and aligned with the project's overall goals. Some of the code review best practices I am going to use are as follows:

- I will use a code review checklist to provide clear expectations for each type of review.
- I will take my time to inspect the code and find any hidden errors. I don't have to be in a rush when reviewing the code.
- Review fewer lines of code, like 400 or fewer lines, and do not exceed more than 60 minutes per review.
- To foster a positive code review culture

- I will also set clear objectives by defining the goals and expectations of the code review process. I have to make sure I understand which aspects of the review I should focus on, whether it's weaknesses, correctness, performance, security, limitation, or adherence to coding standards.

The rationale behind code reviews carried out at different stages during the application development is to identify and eliminate errors and safeguard the software from any vulnerabilities. “It facilitates teamwork and knowledge sharing, maintains code quality, and assures that coding standards are followed, eventually delivering a more dependable and maintainable software product” (Minhaz, 2022).

Part 2:

1. What software have you chosen to use to record your code review?

I will be using “ScreenPal” software to capture the video of my code review.

2. Describe your approach to creating an outline or writing a script for your code review for each of the three categories that you will be reviewing based on the rubric as well as the code review checklist.

Below is my approach to creating an outline of my code review for each of the three categories.

Category 1: Software Design and Engineering

(a) Existing Functionality

- I will provide a clear and complete description of the existing code functionality.
- I will review each component and its role within the system.

- I will evaluate it to ensure that it covers all aspects of the code's functionality, ensuring clarity and completeness.

(b) Code Analysis

- I will examine the code for flaws, restrictions, and vulnerabilities and for compliance with coding standards.
- I will assess the maintainability, consistency with the code, and the effectiveness and clarity of the comments.
- Variable name practices, consistency, type consistency, and the existence of unnecessary or redundant variables will all be evaluated.
- I will verify that the evaluation is accurate and comprehensive.

(c) Enhancements:

- Based on the analysis, I will identify areas for improvement, such as improving variable naming and optimizing algorithms.
- I will ensure the enhancements are clearly explained and aligned with the analysis findings.
- I will organize the enhancement of the area in a clear and structured manner and highlight their potential impact on improving code quality and maintainability.

Category 2: Algorithms and Data Structures

(a) Existing Functionality

- I will provide a thorough explanation of the current code's functioning, with an emphasis on the data structures and methods used.
- I'm going to evaluate whether the description adequately explains how the code uses data structures and algorithms.

(b) Code Analysis

- I will apply relevant code review criteria to analyze the existing code by assessing the weaknesses, limitations, and vulnerabilities.
- I will also evaluate the implementation of algorithms and data structures in terms of their effectiveness, accuracy, and clarity.
- I will follow the best practices for using data structures and designing algorithms.
- In addition, I will offer analysis-based conclusions that are substantiated and pertinent to the review standards.

(c) Enhancement

- I will make sure to provide workable enhancements that are in line with the results of the analysis.
- I will suggest improvements to algorithm efficiency, data structure selection, or algorithmic complexity.
- I will ensure the proposed enhancements are clearly explained, feasible, and aligned with the analysis findings.
- I will organize the proposed enhancements coherently, emphasizing their potential to improve the code's performance or scalability.

Category 3: Databases

(a) Existing Functionality

- I will provide a clear and complete description of the existing code functionality related to database operations.
- I will describe how data is stored, retrieved, and manipulated within the database.

(b) Code Analysis

- I will assess the database operations of existing code based on pertinent standards.

- I will evaluate the accuracy, effectiveness, and security of NoSQL queries.
- I will review the database schema design for normalization, indexing, and optimization.
- I will analyze error handling and transaction management.
- I will present findings based on the analysis, ensuring clarity and relevance to the review criteria.

(c) Enhancement

- I will propose optimizations to SQL queries, indexing strategies, or database schema changes.
- I will identify ways to enhance data consistency, transaction management, and error handling.
- I will thoroughly explain the proposed changes and highlight how they could boost database scalability, security, and performance.

References:

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Felice, S. (2023, September 28). *What is Code Review? | BrowserStack*. BrowserStack. https://www.browserstack.com/guide/what-is-code-review

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