

Code Quality 01 Assignment

1. Explain the concept of "Code Quality" and its significance in software development. Detail at least three key attributes of high-quality code and how they benefit a project.

Answer: Code quality means how good and reliable the code is for people to read, use, and maintain. In software development, high-quality code helps reduce bugs, makes teamwork easier, and saves time when adding new features.

Key attributes of high-quality code:

- **Readable:** Easy to understand with clear naming and comments → helps new developers learn the project faster.
- **Maintainable:** Organized and modular → makes fixing bugs or adding new features simpler.
- **Reliable:** Works correctly and passes tests → increases user trust and reduces errors in production.

Benefits: High-quality code makes the project more stable, easier to update, and cheaper to maintain in the long run.

2. Describe the purpose of "Refactoring" and when it should be performed. Provide examples of at least two types of refactoring techniques and two common code smells that indicate a need for refactoring.

Answer: Refactoring is the process of improving the internal structure of existing code without changing its behavior. It's usually done after code works correctly but becomes messy or hard to read. Developers refactor to make the code cleaner, faster, and easier to maintain.

Examples of refactoring techniques:

- **Extract Method:** Move repeated code into a new function to avoid duplication.
- **Rename Variable/Function:** Use clear, meaningful names to make the code more readable.

Common code smells (signs that refactoring is needed):

- **Duplicated Code:** The same logic appears in multiple places.
- **Long Function:** A function does too many things and becomes hard to understand.

