CS455 : Introduction to Software Engineering

Assignment 2

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Abstract

This document presents the analysis of the StackNServe project as of `12th August, 2024`. It highlights the reliability, security, maintainability, and major code issues detected during the project analysis.

A total of `3,189` lines of code were analysed by `SonarCloud` and the following results were achieved :

Executive Summary

Overview

Reliability:	C
Security:	A
Maintainability:	A
Bugs:	29
Vulnerabilities:	0
Code Smells:	99
Security Hotspots:	5
Debt Ratio:	0.2%
Coverage:	0%
Duplications:	0%

New Code Analysis

New Code Findings

New Bugs:	29
New Vulnerabilities:	0
New Code Smells:	47
New Security Hotspots:	5
Debt Ratio on New Code:	0.3%

Issues Breakdown by Severity

Severity Overview

Severity	**Issue Type**	**Number of Issues**
Blocker	Bug	5
Critical	Vulnerability	0
Major	Code Smell	29
Minor	Info	99

Top Common Issues

Top Code Smells

Issue	Occurrences
external_roslyn:CA1050	29
Types should be defined in named namespaces	29
external_roslyn:CS8618	14
Fields that are only assigned in the constructor should be "readonly"	11
Types should be named in PascalCase	9
external_roslyn:CS8625	9
Non-derived "private" classes should be "sealed"	4

Security Hotspots

Security Hotspots

- **Using PRNGs**: 5 instances of pseudorandom number generators (PRNGs) detected in sensitive contexts.

Detailed Code Smells Breakdown

Top Code Smell Issues

Rule	Issue Type	Occurrences
Methods named "Dispose" should implement "IDisposable.Dispose"	Code Smell	1
Tests should include assertions	Code Smell	1
Unread "private" fields should be removed	Code Smell	1
Cognitive Complexity of methods too high	Code Smell	1

Additional Code Issues

Other Critical Issues

- **CS8618**: Non-nullable field errors in various components.
- **CS8625**: Cannot convert null literal to non-nullable reference types in multiple files.
- **Unused Assignments**: Useless assignment of variables in several components.