AlexT – 17/08/2025

SOLID Principal Delivery Notes

The console application demonstrates the implementation of a Missing Number Finder using SOLID design principles and multiple algorithmic approaches.

A part from the original requirement, there are a few enhancements has been made to express my understanding of the SOLID principle.

- **SOLID Compliance**: Full implementation of all 5 SOLID principles.
- **Multiple Solutions**: 4 different algorithmic approaches to same problem.
- **Enhanced Requirements**: Finds all missing numbers, not just one.
- **Multiple Algorithm Support**: 4 different algorithmic approaches.
- **Flexible Architecture:** Runtime algorithm selection capability.
- **Testable Design**: Unit test coverage (5 Core Test Methods covering essential scenarios).

Project Structure

pps.solid.fmn (namespace)

- IMissingNumberFinder.cs # Core interface
- LinqMissingNumberFinder.cs # LINQ implementation
- HashSetMissingNumberFinder.cs # HashSet implementation
- XorMissingNumberFinder.cs # XOR implementation
- SumMissingNumberFinder.cs # Sum formula implementation
- Program.cs # Main application & factory
- Tests
  - MissingNumberFinderTests.cs # Unit tests
  - 20 Total Assertions (5 tests × 4 algorithms)
  - Edge Cases: Null input, empty arrays, single elements
  - Performance Verification: Large dataset handling

Technical Specifications

- **Framework**: .NET Framework 4.8.1
- **IDE**: Visual Studio 2019 compatible
- **Language**: C# 7.3
- **Testing**: MSTest Framework
- **Namespace**: pps.solid.fmn

GitHub location

https://github.com/indigovn/SolidPrincipleImplementation