**Game-Fifteen-1**

**Refactoring Documentation**

**By Team “Game-Fifteen-1”**

# Redesigned project structure

* Renamed project to **GameFifteen**
* Renamed the main class Program to **GameFifteenEngine.cs**;
* Extracted all classes in separate files
* Classes arranged in separate folders
* All engine constants are separate in a class
* Interfaces arranged in separate folders
* Extracted main logic as separate assembly /class library/
* Extracted game demo into separate console application
* Unit test project added to the solution
* New “**Game-Fifteen**” functionality added

# Reformatted source code

* Removed all unneeded empty lines
* Separate methods with an empty line
* Empty line added after each closing } /curly bracket/ to separate logic
* Split lines containing long statements
* Long if conditions splitted into separate bool values in order to debug easily
* Formatted the curly braces { and } according to the best practices for the C# language.
* Put { and } after all conditionals and loops (when missing).
* Character casing: variables and fields made camelCase; types and methods made PascalCase.
* Formatted all other elements of the source code according to the best practices introduced in the course “[High-Quality Programming Code](http://telerikacademy.com/Courses/Courses/Details/174)”.

# Renamed variables and identifiers

* Variables renamed appropriate to their use
* Methods renamed appropriate to their use
* Classes renamed appropriate to their use

# Constants

* Every magic number or string is put at the class **GameFifteenConstants.cs**
* All fields that are not changed in properties are made read-only

# Class refactoring

* Each class is glued to the Single responsibility principle.
* Logic not typical for the current class extracted into new class
* Abstract class Command introduced as parent of all commands
* Access modifiers introduced to all classes

# Interfaces introduced

* Introduced interfaces for every class in order to stay Open/closed
* Interfaces used with the Iterator Pattern

# Methods refactoring

* Single responsibility principle
* Long methods shortened to e screen scroll
* Method logic not appropriate to the method name extracted into separate method
* Access modifiers introduced to all methods

# Design patterns introduced

* Singleton
* Simple Factory
* Command
* Iterator
* Flyweight
* Proxy

# Other features

* SOLID, DRY