

GAME-FIFTEEN-1 TEAM

Project Name – High Quality Programming Code Project

Game Name – Fifteen, console based implementation

Team Members:

- Валентин Лозев username *valentin_lozev*
- Венцислав Кулин username *kulin_1987*
- Христофор Николов username *hristofor.nikolov*
- Николай Каракехайов username *Rocknmather*
- Цветан Манев username *mage3*
- **Христо Алексиев** username ***Aleksiev*** – did not express any willingness and did not contribute at all
- **Стефка Маринова** username ***jibonita*** – did not express any willingness and did not contribute at all
- **Андрей Славчев** username ***andrew.slavchev*** – did not express any willingness and did not contribute at all

Project Explanation

1. Game plot

The game represents an interactive console-based implementation of the “Fifteen” game in which the player tries to sequentially arrange the numbers from 1 to 15 in a square matrix of size 4 x 4. The game starts from randomly shuffled 15 numbers in a matrix (4 x 4) and a random cell left empty. At each turn the player enters a number from the matrix, a neighbor to the empty cell that should move onto its place. The game finishes when the numbers are arranged in a consequential manner. When the game is finished, a new game automatically starts.

The help menu is included into the starting screen, on top of it. By typing “start” a player starts a new game. By typing “top” we can have the scoreboard visualized and the game paused. Typing “exit” brings us to the end of the game, no matter if a game solution is reached or not.

2. Source Code

The game consists of several logical sections, each of which is responsible for a different part of the program:

GameFifteen.Common – This is the place where we create all the objects of the game (instances of the Field Matrix class, the Player class and the Scoreboard class). It also includes the Scoreboard Proxy class needed for the **Proxy Design Pattern** (Structural DP) and the Matrix Field class which implements the **Iterator Design Pattern** (Behavioral DP).

GameFifteen.Common.Contracts – This section contains all of the interfaces we use for the whole game. It has a sub-directory called Engine, which holds all the engine-relevant interfaces only. Through these interfaces we, in fact, apply the **Dependency Inversion Principle (5th SOLID principle)**.

GameFifteen.Common.Engine – This is the place where all commands needed for the implementation of the **Command Design Patterns** (Behavioral DP) are placed.

GameFifteen.Common.Engine.Factories – This is the place where we create the field and generate random numbers for the initialization of the starting matrix. The Field Factory class, in fact, implements the **Singleton Design Pattern** (Creational DP) and the **Simple Factory Design Pattern** (Creational DP).

GameFifteen.Common.Engine.Flyweight – This is the place where we store the numbers whose references we use for generating random numbers according to the **Flyweight Design Pattern** (Structural DP).

GameFifteen.Tests – We have placed all our unit tests into this section.

GameFifteen.UI – This is the section that contains all the game controlling tools the user uses for playing the game.

More detailed information can be found within the source code of the project itself.

3. Team Collaboration

For the processing of the game project our team used the GitHub CMS. Our project URL is:

<https://github.com/hristofornikolov/TeamSupremeProject>