# Refactoring Documentation for Project “Bulls-And-Cows 6”

Team “Lithium”

1. Redesigned the project structure:
   * Renamed the project to **domashno** to **BullsAndCowsGame**.
   * Renamed the main class **Program** to **PlayGame**.
   * Extracted each class in a separate file with a good name: **BullsAndCows.cs**, **PlayEngine.cs**, **ScoreBoard.cs, PlayGame.cs**.
2. Reformatted the source code:
   * Team used **StyleCop** & **JustCode** when reformatting.
   * Removed all unneeded empty lines, e.g. in the whole project.
   * Inserted empty lines between the methods.
   * Split the lines containing several statements into several simple lines, e.g.:

|  |  |  |
| --- | --- | --- |
| **if (input[i] != ' ') break;** | **🡪** | **if (input[i] != ' ')**  **{**  **break;**  **}** |

* + 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**, constants made **PascalCase**.
  + Formatted all other elements of the source code according to the best practices introduced in the course “[High-Quality Programming Code](http://codecourse.telerik.com/)”.

1. Renamed variables:
   * In class **BullsAndCows**: **digits** 🡪 **secretDigits**.
   * In class **BullsAndCows**: **helpExpression** 🡪 **helpDigits**.
   * In class **BullsAndCows**: **r** 🡪 **randomDigit**.
   * In **PlayEngine:** **flag1** 🡪 **isGameRunning**.
   * In **PlayEngine:** **count1** 🡪 **helpUsedCount**.
   * In **PlayEngine:** **count2** 🡪 **atemptsCount**.
   * In **PlayEngine:** **count3** 🡪 **bullsCount**.
   * In **PlayEngine:** **count4** 🡪 **cowsCount**.

1. Introduced private fields:
   * In class **PlayEngine**: **helpUsedCount.**
   * In class **PlayEngine**: **atemptsCount.**
   * In class **PlayEngine**: **scoreBoard.**
   * In class **PlayEngine**: **isGameRunning.**
2. Introduced constants:
   * **DigitsNumber = 4**
   * **BoardSize = 5**
3. Moved **Main()** method to separate class **PlayGame**.
4. Introduced class **ScoreBoard** and moved all related functionality in it.
5. Moved method **StartGame()** to separate class **GameEngine**, where is all the game functionallity.
6. Extracted the method **ManageUserGuess()** from the **StartGame()** method in the **GameEngine** class.
7. Renamed **Help()** method to **RevealRandomDigit()** in the **BullsAndCows** class.
8. Renamed **SetDigits()** method to **CreateRandomDigits()** in the **BullsAndCows** class.
9. Renamed **ProccessGues()** method to **IsGuessCorrect()** in the **BullsAndCows** class.