# Refactoring Documentation for “Bulls and Cows”

Team “Caesium”

1. Redesigned the project structure:
   * Renamed the project to **Caesium.BullsAndCows**.
   * Renamed the main class **Program** to **BullsAndCowsMain**.
   * Deleted unnecessary classes **MyProvider** and **randomNumberProvider**
   * Renamed classes Record to **ScoreRecord** and Game to **GameEngine**
2. Reformatted the source code:
   * Removed all unneeded empty lines, e.g. in the Record class.
   * Removed all unnecessary comments, e.g. in the main file.
   * Inserted empty lines between the methods.
   * Inserted comments where needed, e.g.

/// <summary>

/// Fields for generating random bull position for the help command.

/// See also GenerateRandomPosition and ShowRand methods.

/// </summary>

* + Split the lines containing several statements into several simple lines, e.g.:

|  |  |  |
| --- | --- | --- |
| **if (found2) { c++; }** | **🡪** | **if (isCowFound)**  **{**  **cowsCount++;**  **}** |
| **if (found1) { b++; }** |  | **if (isBullFound)**  **{**  **bullsCount++;**  **}** |

* + 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://codecourse.telerik.com/)”.

1. Renamed variables:
   * In class **GameEngine**: **found2** 🡪 **isCowFound and c**🡪**cowsCount**.
   * Renamed Methods: Count1 and Count2 to **BullsCount** and **CowsCount.**
   * And simular changes for best readibility.
2. Fixed duplicating Methods **DoTopScores()** and **ScoreBoard()**.
3. Introduced Method **PrintOutput().**
4. Added better random position Method.
5. Added Test Initialize Method.
6. Moved **ShowScoreBoard()** Method to **ScoreBoard** class.
7. Made Unit Test to ensure bug-free code. Unit tests can be found in the two new classes **GameEngineTest** and **ScoreBoardTest.**