# Refactoring Documentation for Project “ Balloons Pops”

1. Redesigned the project structure:

* Renamed the project and the solution to BalloonsPopsGame
* Renamed the namespace to BalloonsPopsGame
* Removed useless empty destructors
* Renamed GameState class to Game
* Renamed ballonsState class to BalloonsContainer
* Added new BalloonsPopsGame.Balloons namespace where is all the creational, storage and popping logic for the balloons is helded

1. Reformatted the source code:

* Removed all unneeded empty lines.
* Inserted empty lines between the methods.
* Formatted the curly braces { and } according to the best practices for the C# language.
* Put { and } after all conditionals and loops (when missing).
* Inserted the usings into the namespace
* Character casing: variables and fields made camelCase; types and methods made PascalCase.

1. Renamed variables:

* In class BalloonsContainer: poleto -> ballons.
* In class BalloonsContainer:cnt -> numberOfTurn.
* In class Game: \_st -> ballons

1. Renamed methods:

* In class BalloonsContainer: kraj -> IsContainerEmpty.
* In class BalloonsContainer: printArray -> Dispay.
* In class BalloonsContainer: pr -> ConvertBallonToChar.
* In class BalloonsContainer: PopBallon -> PopBallons.
* In class Game: sendCommand -> PopBallons.

1. Introduced constants:

* In class BalloonsContainer: NumberOfRows.
* In class BalloonsContainer: NumberOfColumns.
* In class BalloonsContainer: NumberOfBalloonColors.
* In class Ball

1. Introduced Properties:

* In class BalloonsContainer: NumberOfTurn.
* In class BalloonsContainer: Balloons

1. Moved the property NumberOfTurn into the Game class.
2. Removed unnecessary comments:
3. Added access modifiers to all methods:
4. Changed methods:

* In class BallonsContainer -> PopBallons: Changed the return type of the method to void. Removed the logic for checking if the container is empty from him. Added logic for checking if the balloon position is valid.
* In class Game -> PopBalloons: Removed the logic for validating the balloon position. Made the method to update the scoreboard only after the end of the game.
* In class Game -> ExecuteCommand: Fixed the parsing of the input when entering balloon position.

1. Extracted methods:

* In class BallonsContainer placed the logic for filling the container into method Fill.

1. Introduced new class ScoreBoard and moved all related functionality in it.
2. Introduced new interface IRandomNumberProvider and new class StandardRandomNumberProvider and moved the functionality for creating random numbers into them.
3. Implemented Singleton design pattern:

* Made the Game class a singleton one.
* Added Instance property for returning the static instance of Game class.

1. Implemented Factory Method design pattern:

* Made balloon creation with Factory Method.
* Created new Balloon, BalloonCreator, BlueBalloon, BlueBalloonCreator, RedBalloon, RedBalloonCreator, GreenBalloon, GreenBalloonCreator, YellowBalloon, YellowBalloonCreator, PoppedBalloon and PoppedBalloonCreator classes.
* Created new namespace BalloonsPopsGame.Balloons.Creator.

1. Implemented Flyweight design pattern:

* Made balloon storage with Flyweight pattern.
* Create new IBalloonFactory interface, BalloonFactory class and BalloonType enumeration.