

Object Oriented System Design

Assignment #1



Board-game cafe

- Board-game cafe inventory + finances management system
- Create a program in the “Cafe” package
- Renting out Board-games
- Repairing Board-games
- Buying Board-games

Class Game

Variables:

- private String name
- private String quality // Bad/Okay/Good
- private double price

Methods:

- Game(String name, double price) // Quality always starts at "Good".
- public String toString(); // returns game's name, quality and price
- public double getRepairCost(); // bad = 0,5 * price , okay = 0,2 * price
- public void repair();
- public void lowerQuality(); // Lowers the quality of the game by 1 tier.

Class Cafe

Variables:

- private double money;
- private Game[] gamesInCafe;
- private Game[] rentedOutGames;

Methods:

- public Cafe(Game[] games, double startingMoney);
- public void rentOutGame(String name); // Cost of renting is the game's price * 0.5
- public void returnGame(String name);
- public void buyGame(Game game);
- public void printCafeDetails(); // Prints all games in the cafe and rented out, and the money in the register
- public void repairGame(String name);
- private int getIndexGamesInCafe(String name); // Helper function to get the index of the given game in the array, -1 if game doesn't exist.
- private int getIndexRentedOutGames(String name); // Helper function to get the index of the given game in the array, -1 if game doesn't exist.

Class Cafe

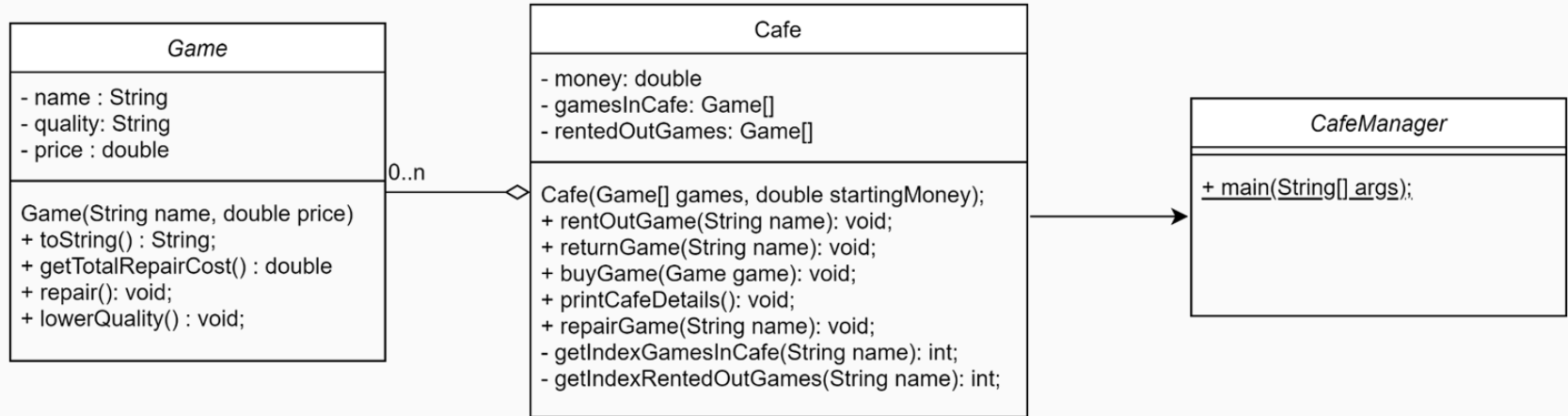
- The constructor initializes the cafe with **3 games** and **\$5** in the register
- When a game's quality reaches "**Bad**" it cannot be rented out again until it is repaired.
- Repairing is only possible if there is enough money in the cash-register.
- `rentOutGame()` moves the game to the `rentedOutGames[]` and increases the money in the register by the game's **price * 0.5**.
- `returnGame()` decreases the game's quality by **1 tier**, and moves the game to the `gamesInCafe[]` array. (**Good->Okay, Okay->Bad**)

Main class

method main:

- Initialize the Cafe
- Rent out a game until it's quality is 'bad' and repair it.
- Rent out more games until you have enough money to buy a new one (think of one yourself).
- Buy a new game.

UML



Visualization

Renting a game

```
Money: 25.0
Games in cafe:
Name: Battleship, Quality: Good, Price: 4.25.
Name: Uno, Quality: Good, Price: 7.0.
Games rented out:
What would you like to do:
1: Rent a game, 2: return a game, 3: repair a game, 4: Buy a new game
1
Which game whould you like to rent?
Uno
Game rented succefully
Money: 30.25
Games in cafe:
Name: Battleship, Quality: Good, Price: 4.25.
Games rented out:
Name: Uno, Quality: Good, Price: 7.0.
```


Visualization

Returning a game

```
What would you like to do:
1: Rent a game, 2: return a game, 3: repair a game, 4: Buy a new game
2
Which game would you like to return?
Uno
Game returned successfully
Money: 30.25
Games in cafe:
Name: Battleship, Quality: Good, Price: 4.25.
Name: Uno, Quality: Okay, Price: 7.0.
Games rented out:
```

```
What would you like to do:
1: Rent a game, 2: return a game, 3: repair a game, 4: Buy a new game
2
Which game would you like to return?
Uno
This is not one of our games that is rented out!
```

Visualization

Repairing a game

```
What would you like to do:
1: Rent a game, 2: return a game, 3: repair a game, 4: Buy a new game
3
Which game would you like to repair?
Uno
Repaired succesfully, remaining money: 28.85
Money: 28.85
Games in cafe:
Name: Battleship, Quality: Good, Price: 4.25.
Name: Uno, Quality: Good, Price: 7.0.
Games rented out:
```

Visualization

Buying a game

```
What would you like to do:  
1: Rent a game, 2: return a game, 3: repair a game, 4: Buy a new game  
4  
What is the name of the game?  
Monopoly  
What is the price of the game?  
12  
Game bought succesfully  
Money: 13.0  
Games in cafe:  
Name: Battleship, Quality: Good, Price: 4.25.  
Name: Uno, Quality: Good, Price: 7.0.  
Name: Monopoly, Quality: Good, Price: 12.0.  
Games rented out:
```

```
What would you like to do:  
1: Rent a game, 2: return a game, 3: repair a game, 4: Buy a new game  
4  
What is the name of the game?  
Chess  
What is the price of the game?  
25  
Not enough funds for the game
```

Rules

- Only regular arrays [], no Lists or Maps.
- The arrays should be the same length as the amount of games in the cafe, so if the cafe has 3 games, the array should also be of length 3.
- Use getters and setters when needed and only make them public if they are actually meant to be used from outside the class.
- Reading code is more difficult than writing code, place comments in complex methods.

Submission

Submit your program code package(Assignment1_code_이름_학번) and design document (Assigment1_이름_학번) in LMS. (Korean/English)

The design document describes the main methods, flow of the code and overall design of the program. It should also mention and explain every method that you added that was not described in this powerpoint.

Deadline: 21st of april (4월 21일) 23:59

Late penalties:

Up to 24 hours = -25%,

24-48 hours = -50%,

48-72 hours = -75%

after 72 Hours you get an automatic 0.