

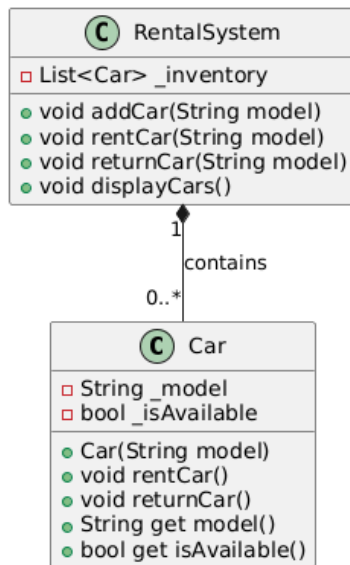
Mobile development and Cybersecurity challenges Writeup

@0x.riyad

February 7, 2025

1 Dart OOP Challenge

1.1 UML DIAGRAM



1.2 Detailed explanation

1.2.1 CAR Class

1. We have two classes **Car** which defines the objects of type car , **RentalSystem** which handles the logic of renting the cars.
2. the constructor of this class takes the **String model** as input and sets the availability to **True**. (as asked for).

3. A car is defined by two private attributes (`model` & `isAvailable`) hence we need the getters `get model()` and `get isAvailable()` which return the state of each attribute.
4. `void rentCar` and `void returnCar` will act more like the setters for 2nd attribute.

1.2.2 RentalSystem Class

1. `List<Car> _inventory = []`; defines a private groable list of cars.
2. `addCar(String model)` adds a car to the list using the add method of the `_inventory` (addition is in FIFO mode obviously).
3. `void rentCar(String model)`, iterates through the cars in the inventory until the desired model is found and available, only then it's rented and the method is exited (`return;`) else the car is already rented or is an unavilable model.
4. `void rentCar(String model)`, a car is returned if it was rented in the list, else it would be redundant to return a car that wasn't even rented.

1.2.3 void Main (Optional)

- This is a test of the program, note that this part is AI generated.

2 DART List manipulation Challenge

2.1 Detailed explanation

- Can be explained simply following this expression :

$$f : \text{list} \rightarrow \text{even}$$

$$f(\text{list}) = \begin{cases} \text{list}[i]^2 & \text{if list}[i] \text{ is even,} \\ \text{null} & \text{if list}[i] \text{ is odd.} \end{cases}$$

before that `list[i]` gets mapped to `null`, its value is added to `sum`.

- In the end, what is returned is the list called "**even**" with even numbers squared and cleaned up from the nulls generated from the odd numbers.
- You may ask, why replace odd numbers with nulls in the even list in the first place? This is because i wrote it all in a single line using ternary operator, as you know, ternary operator needs to return something; i choose that something to be "**null**"

- Why choose null and not zero or any other number ? basically this would messup the algorithm . if you choose zero this will ruin the count of zeroes in the list , so is the case for other numbers. contrary to NULL, it is valueless.
- The result then is a tuple of a list and an integer.

3 OSINT Challenge

- MicroCTF{vincentVanGogh_ MuseumofModernArt}
- The challenge was objectively easy hence i didn't need for some sophisticated OSINT tools .
- Knowing the name of the painting was enough "Starry night" , the museum name is found on a wikipedia page https://en.wikipedia.org/wiki/The_Starry_Night
- was lastly edited in 2024/02/05 meaning that the information on the painting are fresh aswell.