

BÁO CÁO THỰC HÀNH LAB 2

LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

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1. Bài toán đặt ra

There might be a future that Tiki and Sendo be in talks over a potential merger to contend other e-commerce platforms and especially those who have foreign backers. The merger of these two firms would create a Ti-do company, where “Ti” is from Tiki, and “do” is from Sendo, which means a billion-dollar company in Vietnamese. That firm, Ti-do company, would like you to help them create a brand-new system for AIMS project (AIMS stands for An Internet Media Store). Currently, there is only one type of media: Digital Video Disc (DVD).

2. Yêu cầu hệ thống

2.1. Đối với Customer:

Customers can browse the list of DVDs available in the store, the display order is based on their added date, from latest to oldest. When a customer wants to search for DVDs to add to cart, he or she can choose one of three searching options. The software will display a list of all matches (latest DVDs first) with all their information. He or she can also choose to play a specific DVD. The software will play a DVD (a demo part). If a DVD has the length 0 or less, the system must notify the customer that the DVD cannot be played.

- When a customer searches for DVDs by title, he or she provides a string of keywords. If any DVD has the title containing any word in the string of keywords, it is counted as a match. Note that the comparison of words here is case-insensitive.
- When a customer searches for DVDs by category, he or she provides the category name. If any DVD has the matching category (case-insensitive), it is counted as a match.
- When a customer searches for DVDs by price, he or she provides either the minimum and maximum cost, or just the maximum cost.

Customers can view the detail information of a DVD from the list of DVDs. He/she can add a DVD to a cart from a list of DVDs or the detail screen.

When a customer wants to see the current cart, the system displays all the information of the DVDs, along with the total cost. Customers may listen to a DVD (a demo part) in the cart before confirming to place an order. Customers can sort all DVDs in the cart by title or by cost:

- Sort by title: the system displays all the DVDs in the alphabet sequence by title. In case they have the same title, the DVDs having the higher cost will be displayed first.
- Sort by cost: the system displays all the DVDs in decreasing cost order. In case they have the same cost, the DVDs will be ordered by increasing title.

Customers can update the quantity of a DVD in a cart or remove a DVD from a cart. To increase consumer demand for the product and grow sales, customers are allowed to have an item for free which is randomly picked out in the cart by the system. Customers can filter DVDs in the cart by providing either its ID or title. If the item is found, display information of the found item in the cart. Or else, notify the customer the item is not found in the current cart.

The customer can request to place order when they are seeing the current cart. For simplification, he/she does not need to log in to place an order. The application will prompt the customer to enter the delivery information and delivery instructions. The software will then calculate the delivery fee based on the total mass of the order & the delivery location. Then, it will display to the customer the invoice including the DVD list, total cost before VAT, total cost after VAT, and the delivery fee. The customer can then proceed to pay for the order. Currently, only one payment method – i.e. credit card – is allowed by connecting to a card association system for checking the validation of the card or performing the pay transaction. After the transaction, the AIMS software will display all the detailed information such as transaction ID, card owner, transaction amount, transaction message, balance, transaction date to the customer. The order will be in pending state and the information of the order & the transaction will be sent to the customer's email.

2.2. Đối với Store Manager:

The store manager needs to log in to the system to navigate to the management mode. He/she can see the list of pending orders, then can pick any order to see its detail to approve or reject the order. The store manager can add new DVDs to the store. He or she must provide all information of the new DVD, including its ID, title, category, director, length, and the cost. Additionally, the manager can also remove DVDs from the store.

3. Use Case Diagram

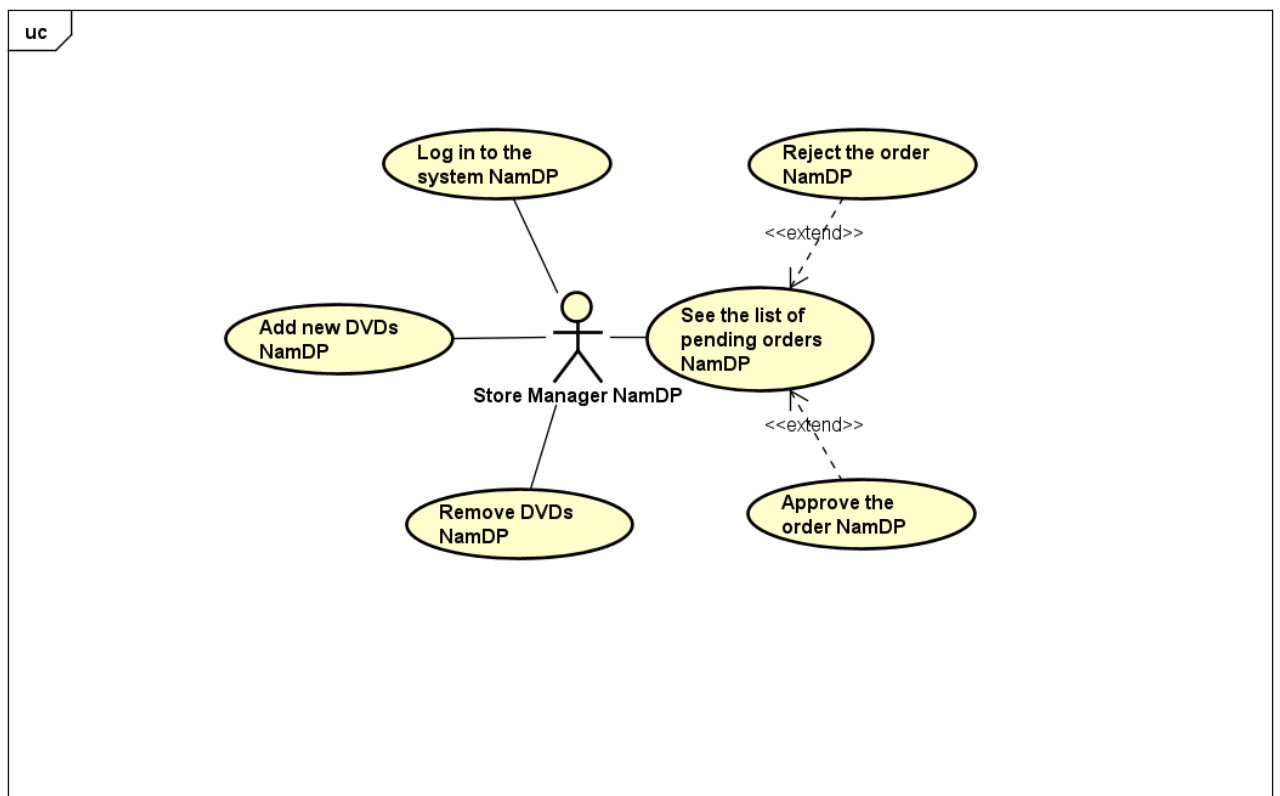
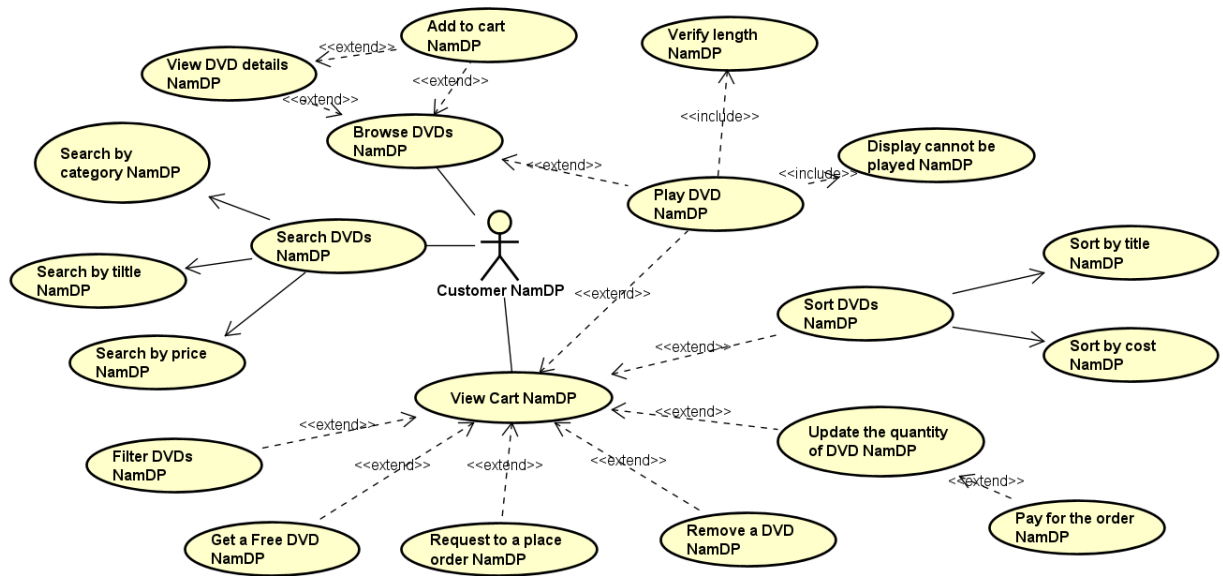


Figure 1: Use Case Diagram

4. Class Diagram

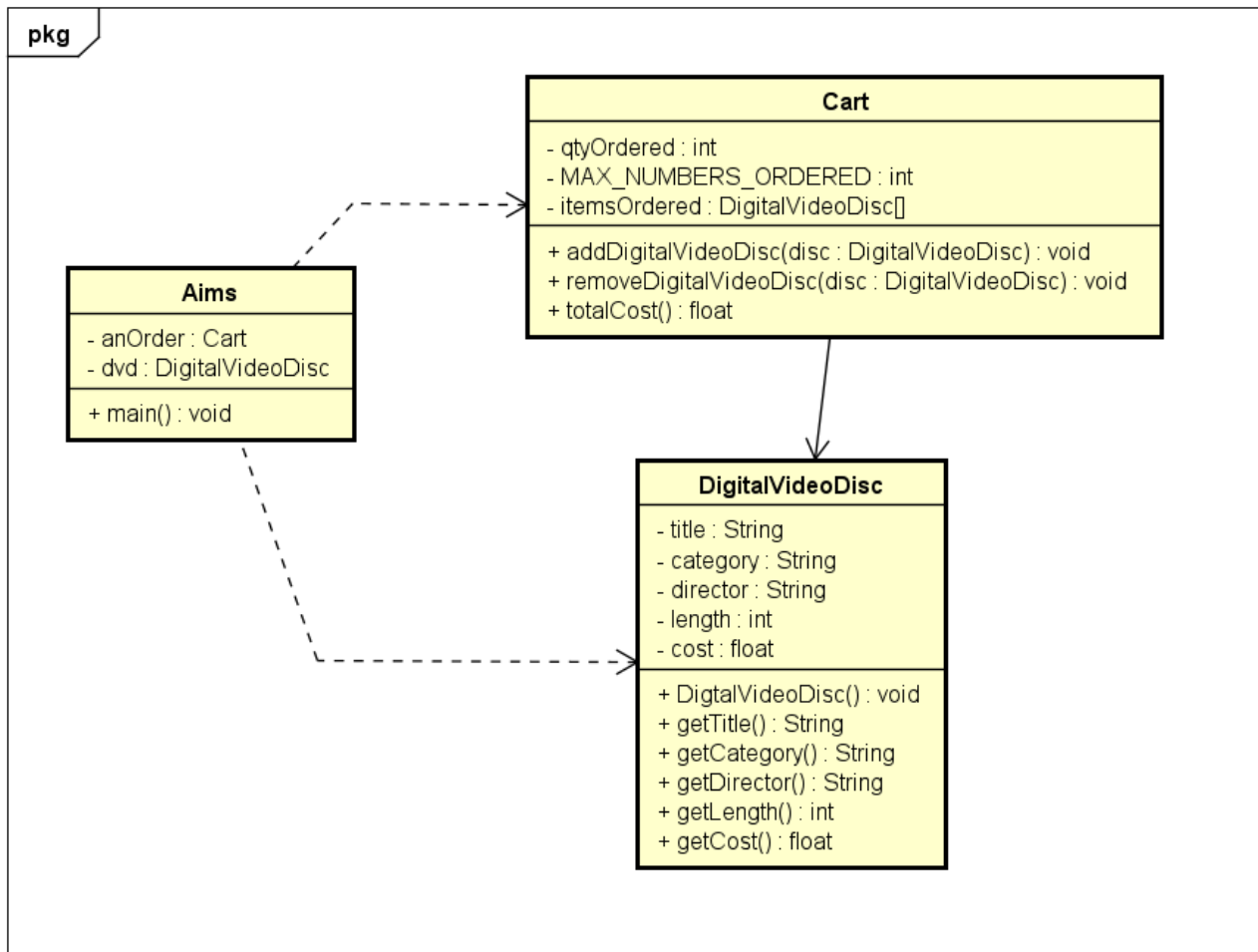
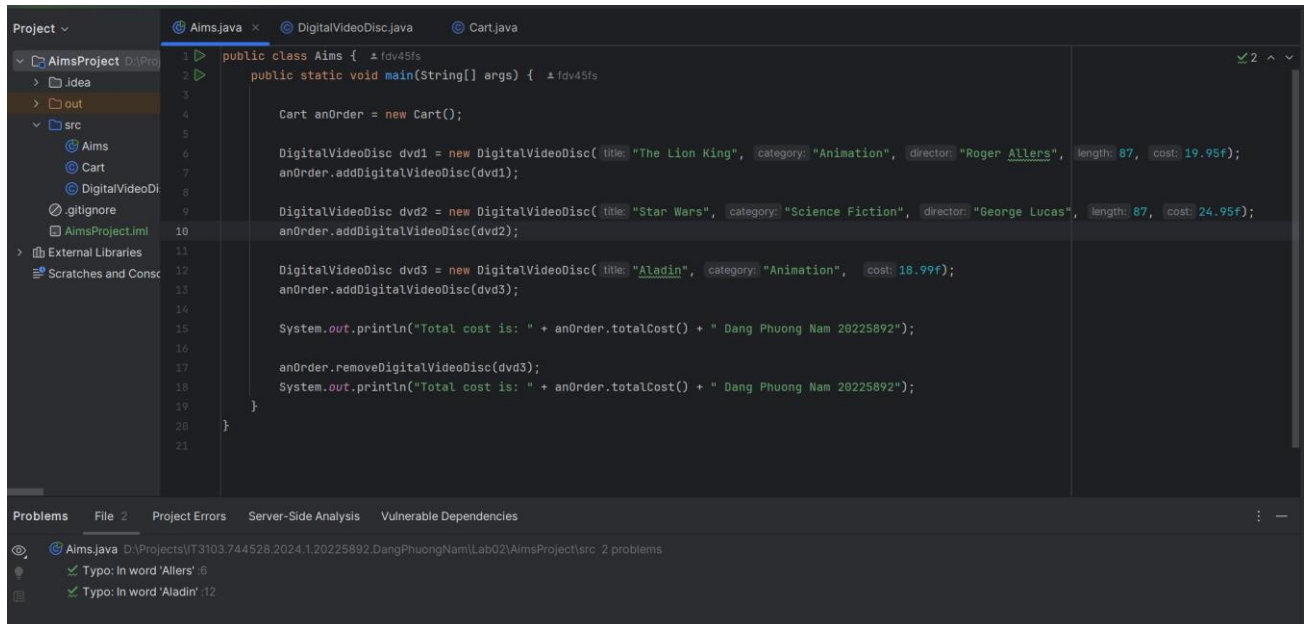


Figure 2: Class Diagram

5. Source Code

5.1. Aims Class



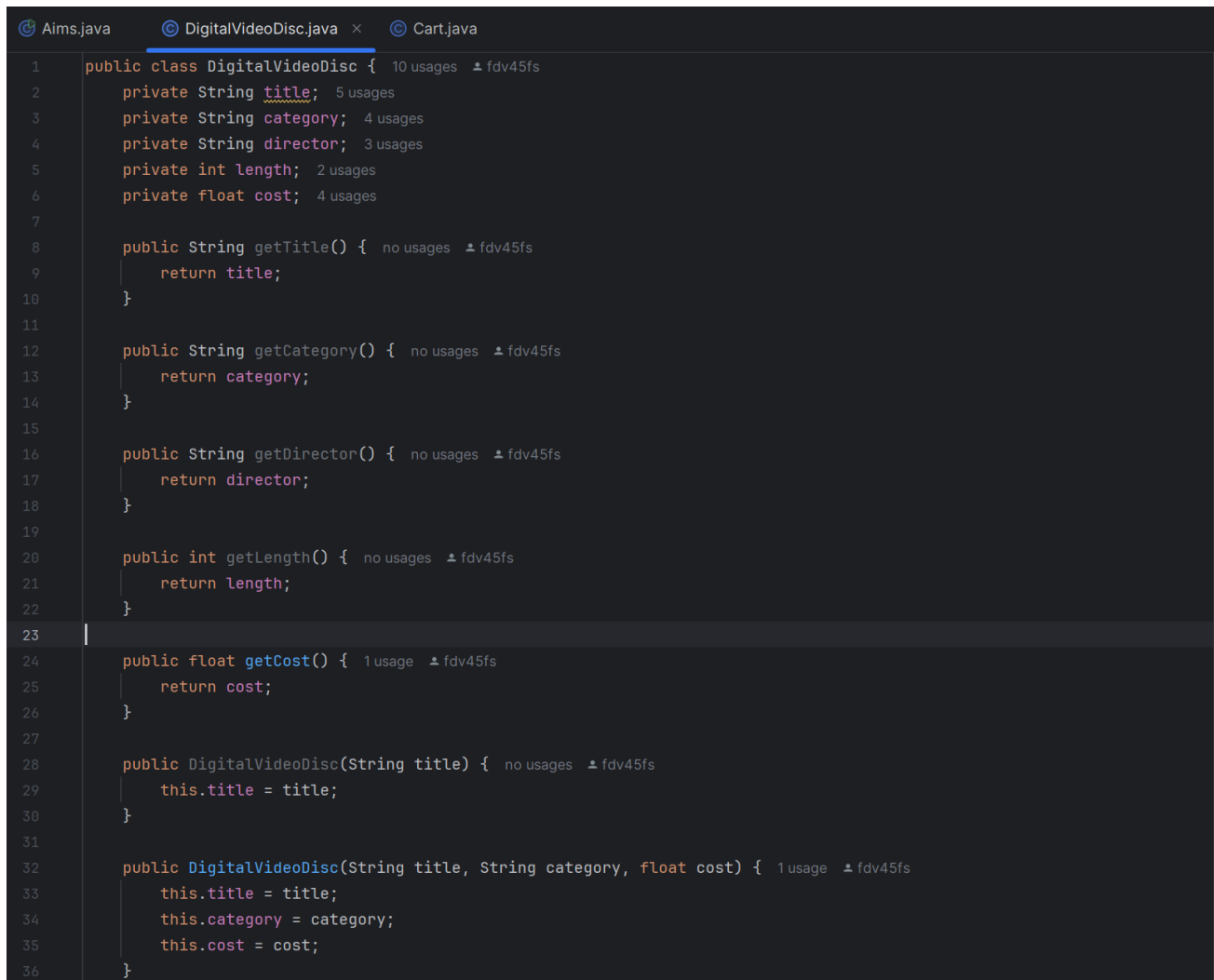
```
1 public class Aims {
2     public static void main(String[] args) {
3
4         Cart anOrder = new Cart();
5
6         DigitalVideoDisc dvd1 = new DigitalVideoDisc( title: "The Lion King", category: "Animation", director: "Roger Allers", length: 87, cost: 19.95f);
7         anOrder.addDigitalVideoDisc(dvd1);
8
9         DigitalVideoDisc dvd2 = new DigitalVideoDisc( title: "Star Wars", category: "Science Fiction", director: "George Lucas", length: 87, cost: 24.95f);
10        anOrder.addDigitalVideoDisc(dvd2);
11
12        DigitalVideoDisc dvd3 = new DigitalVideoDisc( title: "Aladin", category: "Animation", cost: 18.99f);
13        anOrder.addDigitalVideoDisc(dvd3);
14
15        System.out.println("Total cost is: " + anOrder.totalCost() + " Dang Phuong Nam 20225892");
16
17        anOrder.removeDigitalVideoDisc(dvd3);
18        System.out.println("Total cost is: " + anOrder.totalCost() + " Dang Phuong Nam 20225892");
19    }
20 }
21
```

Problems

- ✓ Typo: In word 'Allers' :6
- ✓ Typo: In word 'Aladin' :12

Figure 3: Aims Class

5.2. DigitalVideoDisc Class



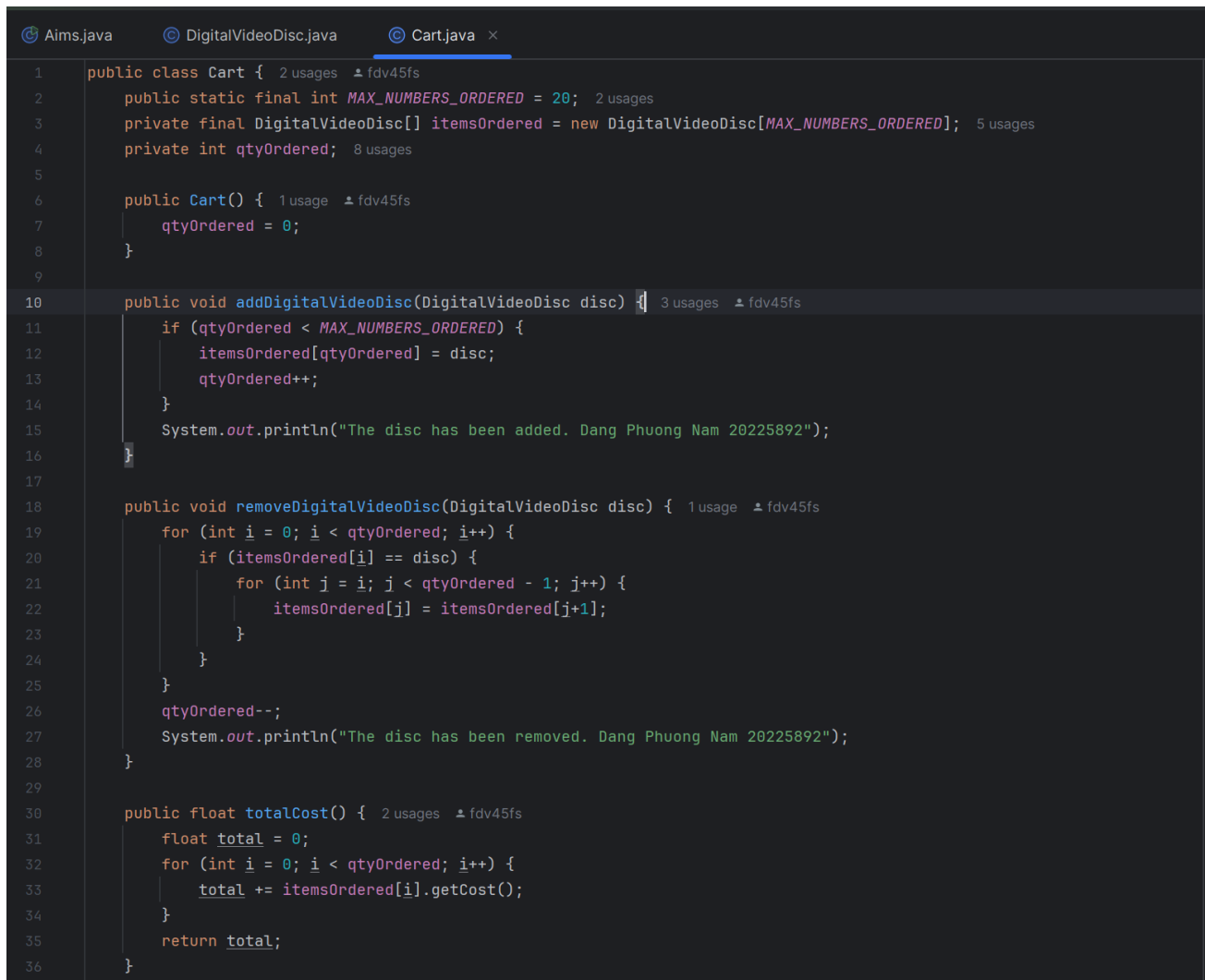
```
1 public class DigitalVideoDisc { 10 usages  ⚡ fdv45fs
2     private String title; 5 usages
3     private String category; 4 usages
4     private String director; 3 usages
5     private int length; 2 usages
6     private float cost; 4 usages
7
8     public String getTitle() { no usages  ⚡ fdv45fs
9         return title;
10    }
11
12    public String getCategory() { no usages  ⚡ fdv45fs
13        return category;
14    }
15
16    public String getDirector() { no usages  ⚡ fdv45fs
17        return director;
18    }
19
20    public int getLength() { no usages  ⚡ fdv45fs
21        return length;
22    }
23
24    public float getCost() { 1 usage  ⚡ fdv45fs
25        return cost;
26    }
27
28    public DigitalVideoDisc(String title) { no usages  ⚡ fdv45fs
29        this.title = title;
30    }
31
32    public DigitalVideoDisc(String title, String category, float cost) { 1 usage  ⚡ fdv45fs
33        this.title = title;
34        this.category = category;
35        this.cost = cost;
36    }
```

Figure 4: DigitalVideoDisc Class 1

```
32     public DigitalVideoDisc(String title, String category, float cost) { 1 usage  ⚡ fdv45fs
33         this.title = title;
34         this.category = category;
35         this.cost = cost;
36     }
37
38     public DigitalVideoDisc(String title, String category, String director, float cost) { no usages  ⚡ fdv45fs
39         this.title = title;
40         this.category = category;
41         this.director = director;
42         this.cost = cost;
43     }
44
45     public DigitalVideoDisc(String title, String category, String director, int length, float cost) { 2 usages  ⚡ fdv45fs
46         this.title = title;
47         this.category = category;
48         this.director = director;
49         this.length = length;
50         this.cost = cost;
51     }
52 }
53
```

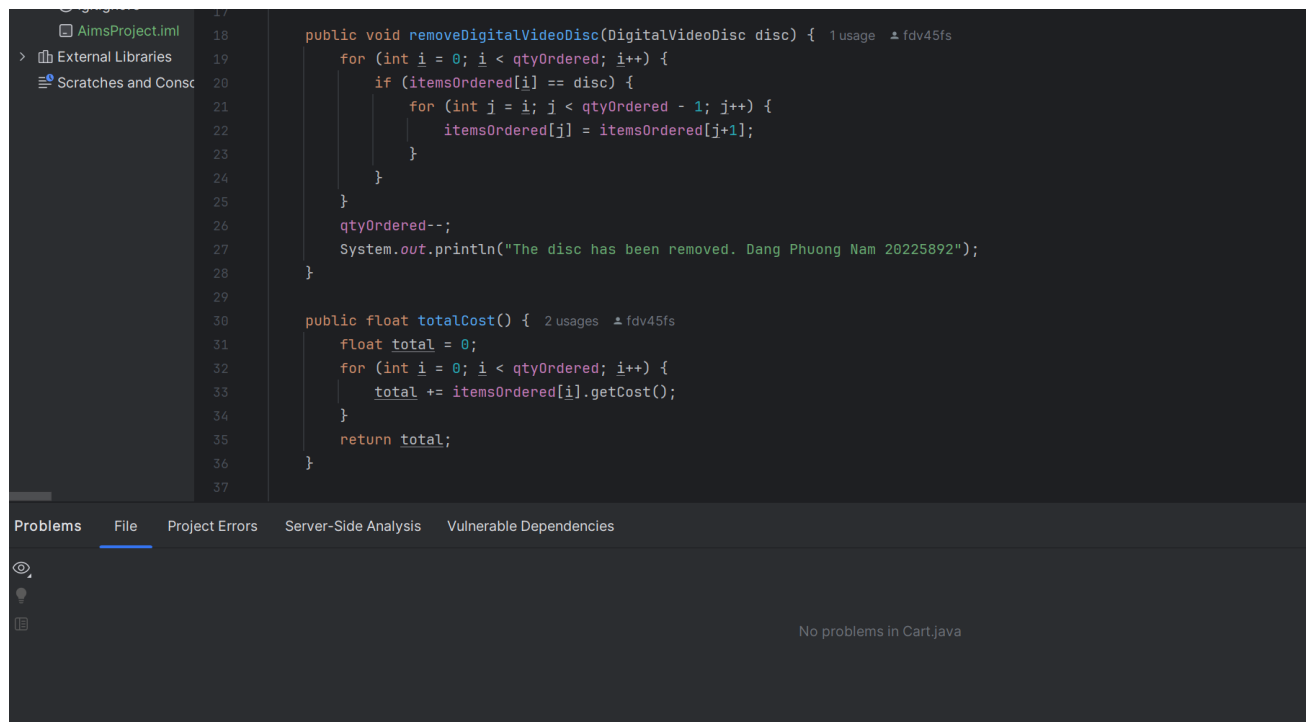
Figure 5: DigitalVideoDisc Class 2

5.3. Cart Class

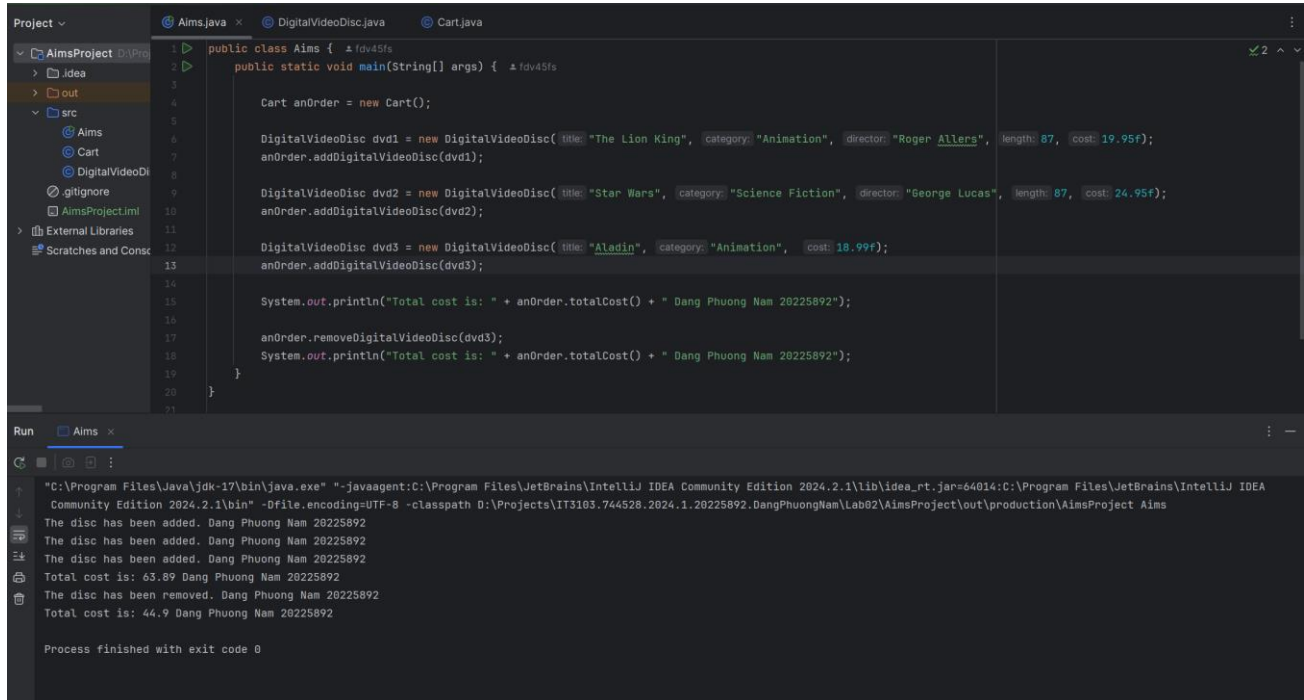


```
1 public class Cart { 2 usages fdv45fs
2     public static final int MAX_NUMBERS_ORDERED = 20; 2 usages
3     private final DigitalVideoDisc[] itemsOrdered = new DigitalVideoDisc[MAX_NUMBERS_ORDERED]; 5 usages
4     private int qtyOrdered; 8 usages
5
6     public Cart() { 1 usage fdv45fs
7         qtyOrdered = 0;
8     }
9
10    public void addDigitalVideoDisc(DigitalVideoDisc disc) { 3 usages fdv45fs
11        if (qtyOrdered < MAX_NUMBERS_ORDERED) {
12            itemsOrdered[qtyOrdered] = disc;
13            qtyOrdered++;
14        }
15        System.out.println("The disc has been added. Dang Phuong Nam 20225892");
16    }
17
18    public void removeDigitalVideoDisc(DigitalVideoDisc disc) { 1 usage fdv45fs
19        for (int i = 0; i < qtyOrdered; i++) {
20            if (itemsOrdered[i] == disc) {
21                for (int j = i; j < qtyOrdered - 1; j++) {
22                    itemsOrdered[j] = itemsOrdered[j+1];
23                }
24            }
25        }
26        qtyOrdered--;
27        System.out.println("The disc has been removed. Dang Phuong Nam 20225892");
28    }
29
30    public float totalCost() { 2 usages fdv45fs
31        float total = 0;
32        for (int i = 0; i < qtyOrdered; i++) {
33            total += itemsOrdered[i].getCost();
34        }
35        return total;
36    }
```

Figure 6: Cart Class 1

*Figure 7: Cart Class 2*

6. Kết quả demo



The screenshot displays the IntelliJ IDEA IDE with a Java project named 'AimsProject'. The main code file, 'Aims.java', contains the following code:

```
1 public class Aims {
2     public static void main(String[] args) {
3
4         Cart anOrder = new Cart();
5
6         DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion King", "Animation", "Roger Allens", length: 87, cost: 19.95f);
7         anOrder.addDigitalVideoDisc(dvd1);
8
9         DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star Wars", "Science Fiction", "George Lucas", length: 87, cost: 24.95f);
10        anOrder.addDigitalVideoDisc(dvd2);
11
12        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation", cost: 18.99f);
13        anOrder.addDigitalVideoDisc(dvd3);
14
15        System.out.println("Total cost is: " + anOrder.totalCost() + " Dang Phuong Nam 20225892");
16
17        anOrder.removeDigitalVideoDisc(dvd3);
18        System.out.println("Total cost is: " + anOrder.totalCost() + " Dang Phuong Nam 20225892");
19    }
20 }
21
```

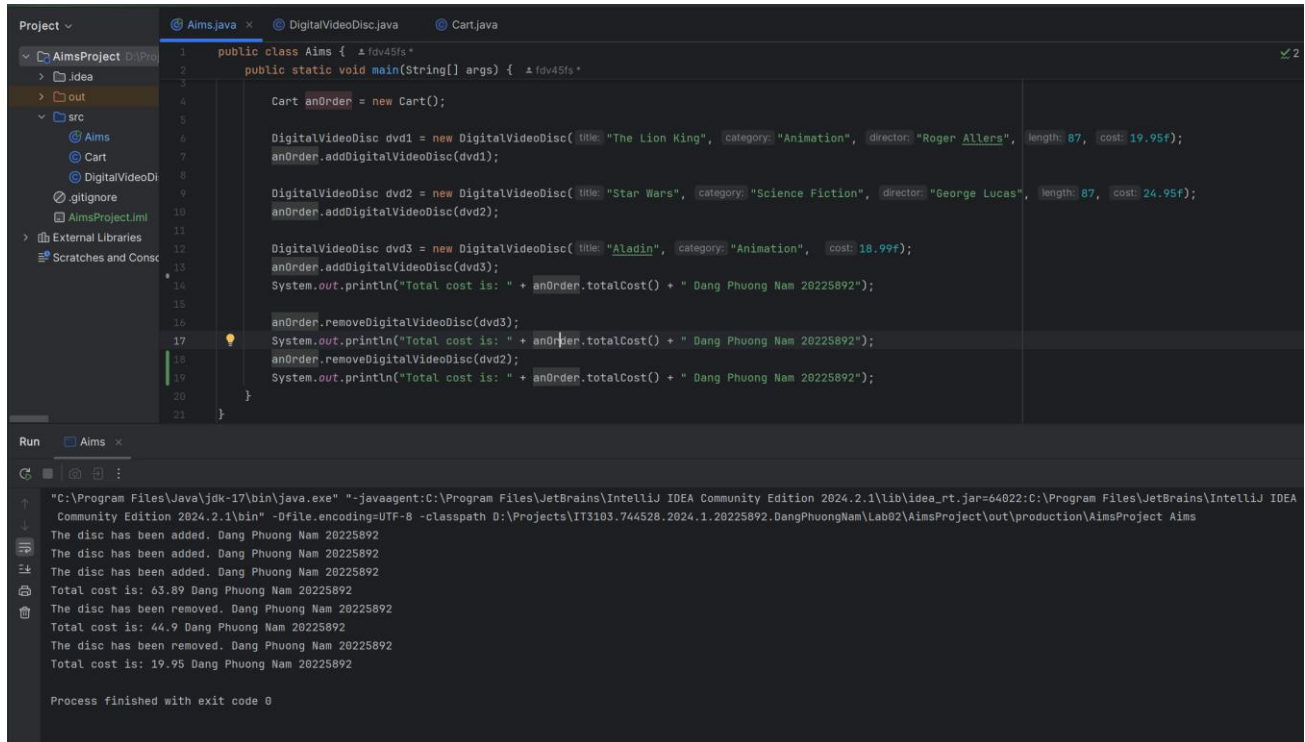
The Run window shows the output of the program:

```
"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=64014:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin" -Dfile.encoding=UTF-8 -classpath D:\Projects\IT3103.744528.2024.1.20225892.DangPhuongNam\Lab02\AimsProject\out\production\AimsProject Aims
The disc has been added. Dang Phuong Nam 20225892
The disc has been added. Dang Phuong Nam 20225892
The disc has been added. Dang Phuong Nam 20225892
Total cost is: 63.89 Dang Phuong Nam 20225892
The disc has been removed. Dang Phuong Nam 20225892
Total cost is: 44.9 Dang Phuong Nam 20225892

Process finished with exit code 0
```

Figure 8: Code Demo

Kết quả:



The screenshot displays the IntelliJ IDEA IDE with the `Aims.java` file open. The code defines a `Cart` class and a `main` method. The `main` method creates a `Cart` object, adds three `DigitalVideoDisc` objects (dvd1, dvd2, dvd3) to it, and prints the total cost. It then removes dvd3 and dvd2, and prints the total cost again. The output window shows the execution results, including the total cost before and after removing discs.

```
1 public class Aims {
2     public static void main(String[] args) {
3
4         Cart anOrder = new Cart();
5
6         DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion King", "Animation", "Roger Allers", length: 87, cost: 19.95f);
7         anOrder.addDigitalVideoDisc(dvd1);
8
9         DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star Wars", "Science Fiction", "George Lucas", length: 87, cost: 24.95f);
10        anOrder.addDigitalVideoDisc(dvd2);
11
12        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation", "cost: 18.99f");
13        anOrder.addDigitalVideoDisc(dvd3);
14        System.out.println("Total cost is: " + anOrder.totalCost() + " Dang Phuong Nam 20225892");
15
16        anOrder.removeDigitalVideoDisc(dvd3);
17        System.out.println("Total cost is: " + anOrder.totalCost() + " Dang Phuong Nam 20225892");
18        anOrder.removeDigitalVideoDisc(dvd2);
19        System.out.println("Total cost is: " + anOrder.totalCost() + " Dang Phuong Nam 20225892");
20    }
21 }
```

Run Aims

"C:\Program Files\Java\jdk-17\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=64022:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin" -Dfile.encoding=UTF-8 -classpath D:\Projects\IT3103.744528.2024.1.20225892.DangPhuongNam\Lab02\AimsProject\out\production\AimsProject Aims

The disc has been added. Dang Phuong Nam 20225892

The disc has been added. Dang Phuong Nam 20225892

The disc has been added. Dang Phuong Nam 20225892

Total cost is: 63.89 Dang Phuong Nam 20225892

The disc has been removed. Dang Phuong Nam 20225892

Total cost is: 44.9 Dang Phuong Nam 20225892

The disc has been removed. Dang Phuong Nam 20225892

Total cost is: 19.95 Dang Phuong Nam 20225892

Process finished with exit code 0

Figure 9: Result

7. Reading Assignment

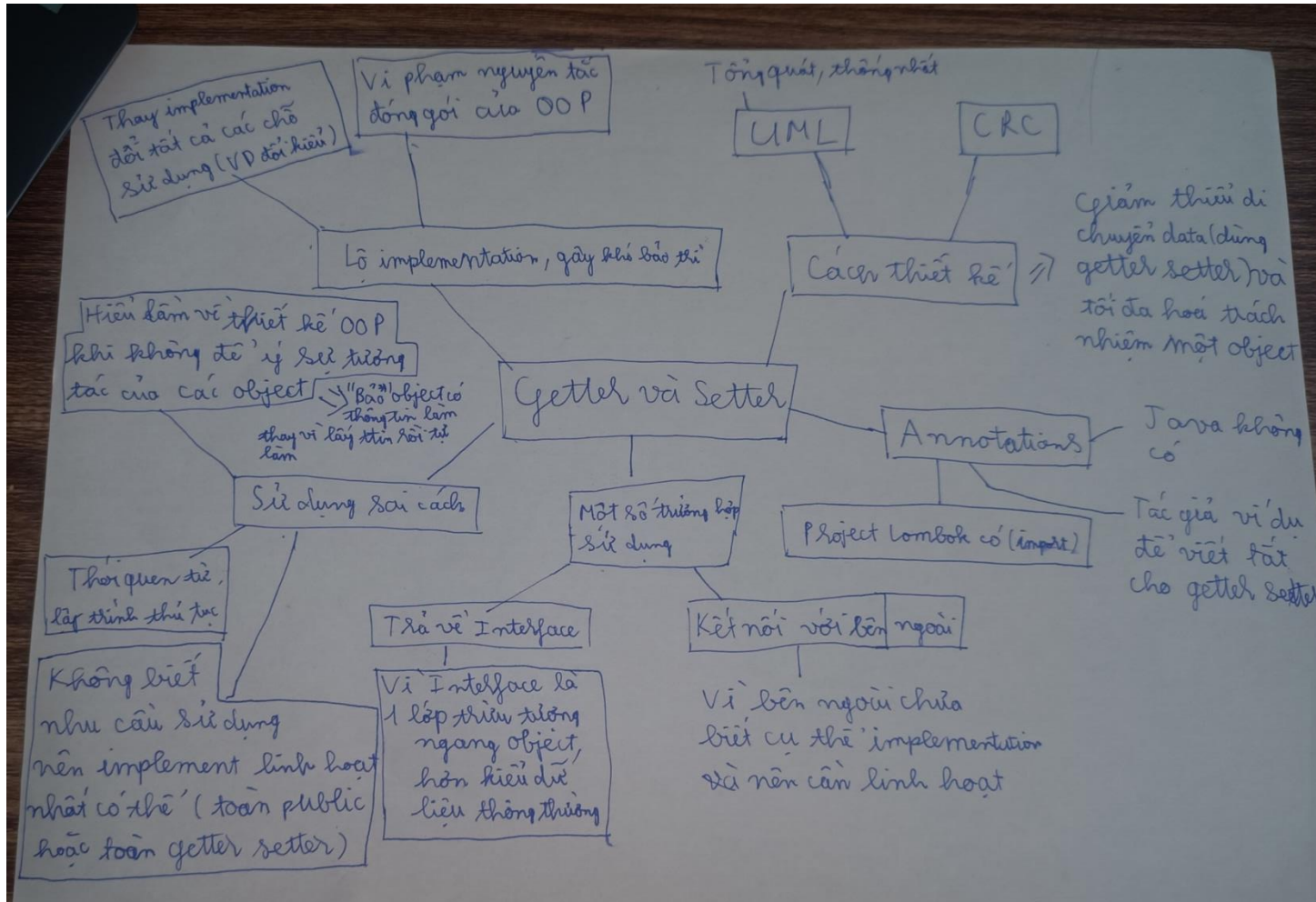


Figure 10: Getter and Setter Methods

8. Answer the question

- Có thể làm vậy vì Java cho phép tạo constructor cho object DVD bằng tiêu đề hoặc thể loại thông qua cơ chế Overloading (chúng ta sẽ overload constructor, arguments sẽ là tiêu đề hoặc thể loại).