Report Lab 03

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Method Overloading

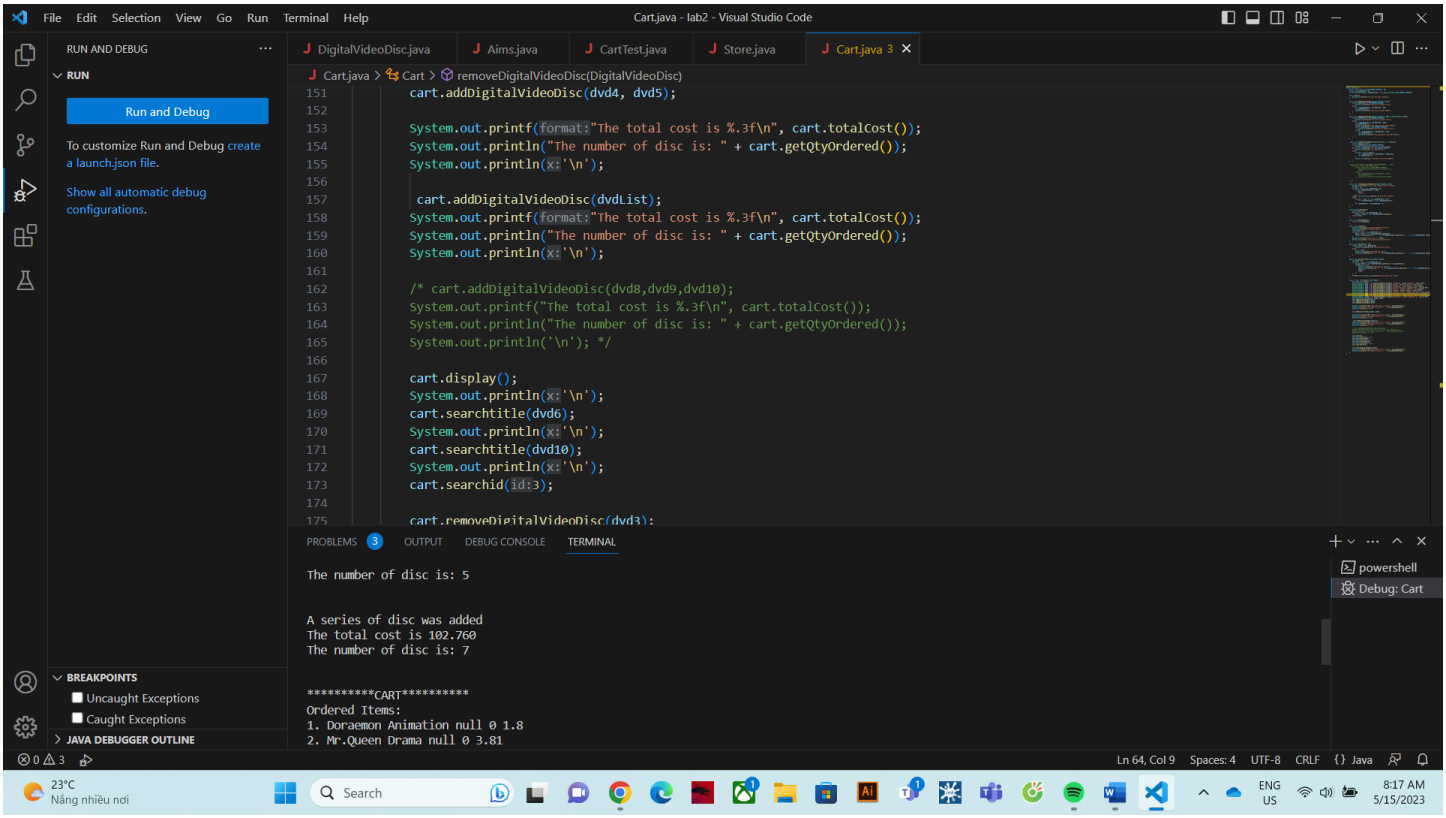
1. Overloading with different types of parameter

<u>Add a list of DVD into the cart:</u>

Source code:

```java
public void addDigitalVideoDisc(DigitalVideoDisc [] dvdList){
    int N = dvdList.length;
    if(this.qtyOrdered >= MAX_NUMBERS_ORDERED)
        System.out.println(x:"The cart is almost full");
    else if(this.qtyOrdered + N > MAX_NUMBERS_ORDERED)
        System.out.println(x:"Too many discs");
    else{
        for(int i = 0;i < N;i++){
            this.itemsOrdered[this.qtyOrdered] = dvdList[i];
            this.qtyOrdered ++;
        }
        System.out.println(x:"A series of disc was added");
    }
}
```

Running result:

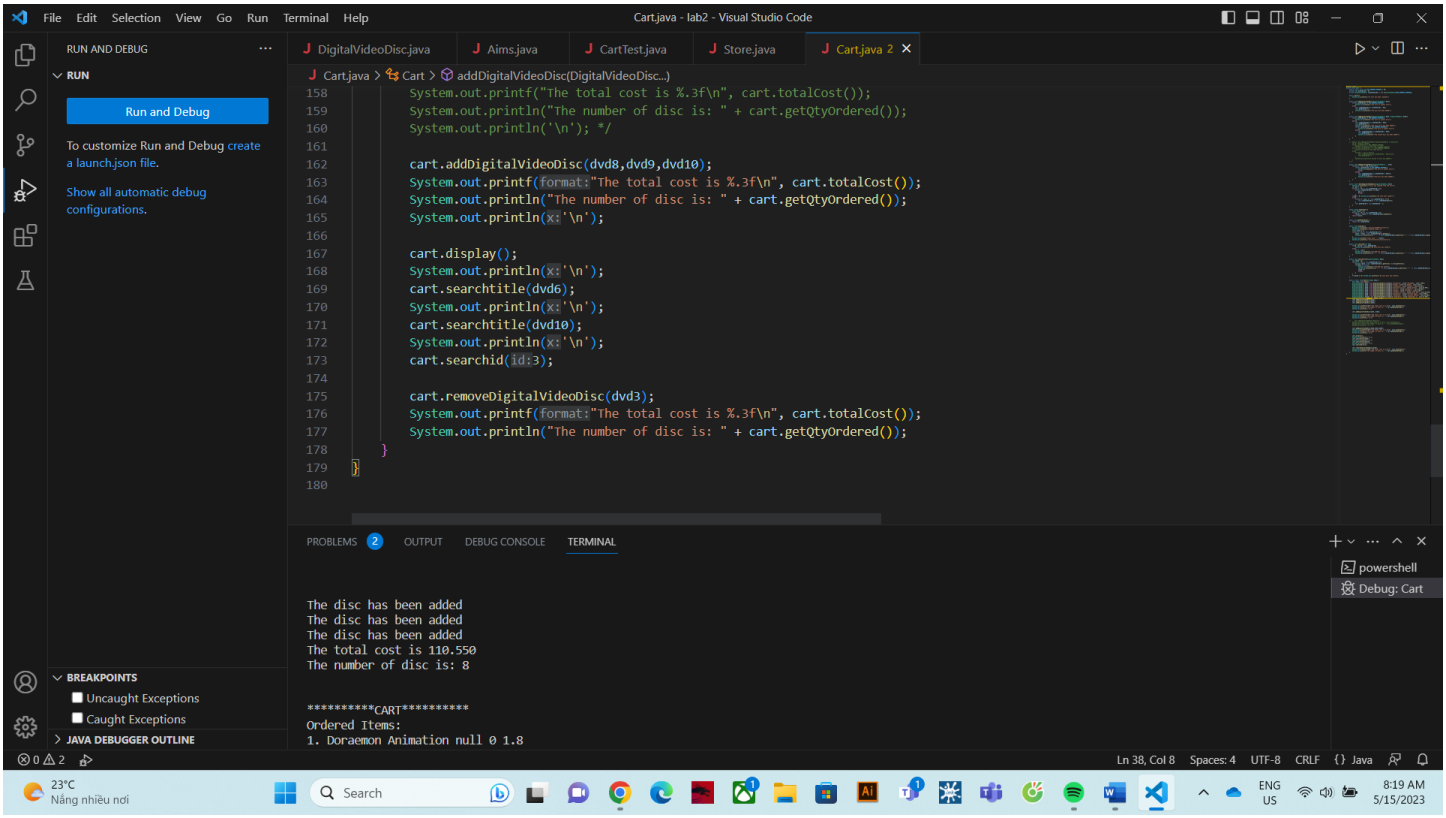


Add an arbitrary number of DVD into the cart

Source code:

```
public void addDigitalVideoDisc(DigitalVideoDisc... dvd){
    for(int i = 0;i < dvd.length;i++){
        if(this.qtyOrdered >= MAX_NUMBERS_ORDERED){
            System.out.println(x:"The cart is almost full");
            break;
        }else{
            this.itemsOrdered[this.qtyOrdered] = dvd[i];
            this.qtyOrdered ++;
            System.out.println(x:"The disc has been added");
        }
    }
}
```

Running result:

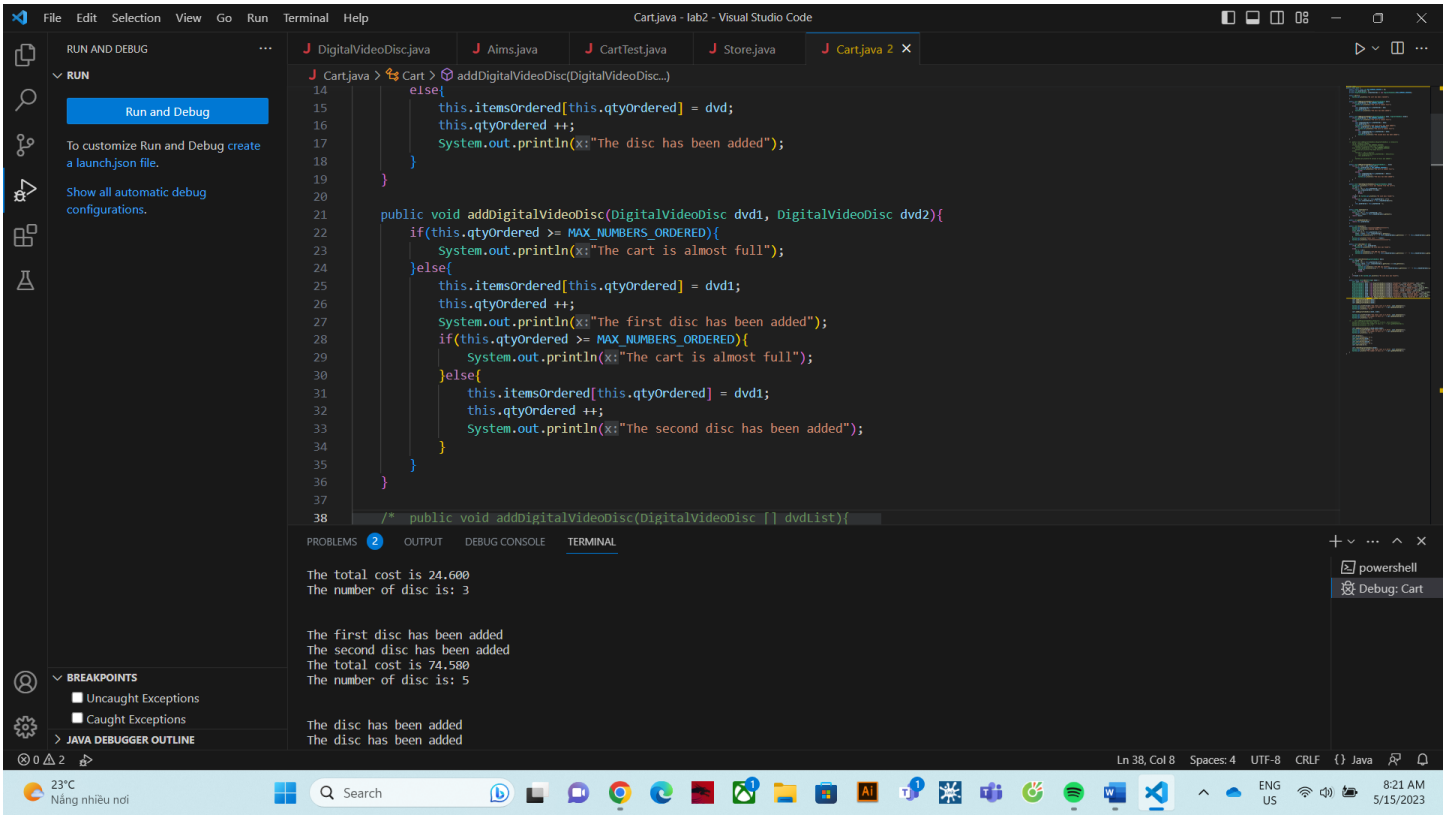


2. Overloading by differing the number of parameters

Source code:

```java
public void addDigitalVideoDisc(DigitalVideoDisc dvd1, DigitalVideoDisc dvd2){
    if(this.qtyOrdered >= MAX_NUMBERS_ORDERED){
        System.out.println(x:"The cart is almost full");
    }else{
        this.itemsOrdered[this.qtyOrdered] = dvd1;
        this.qtyOrdered ++;
        System.out.println(x:"The first disc has been added");
        if(this.qtyOrdered >= MAX_NUMBERS_ORDERED){
            System.out.println(x:"The cart is almost full");
        }else{
            this.itemsOrdered[this.qtyOrdered] = dvd1;
            this.qtyOrdered ++;
            System.out.println(x:"The second disc has been added");
        }
    }
}
```

Running result:

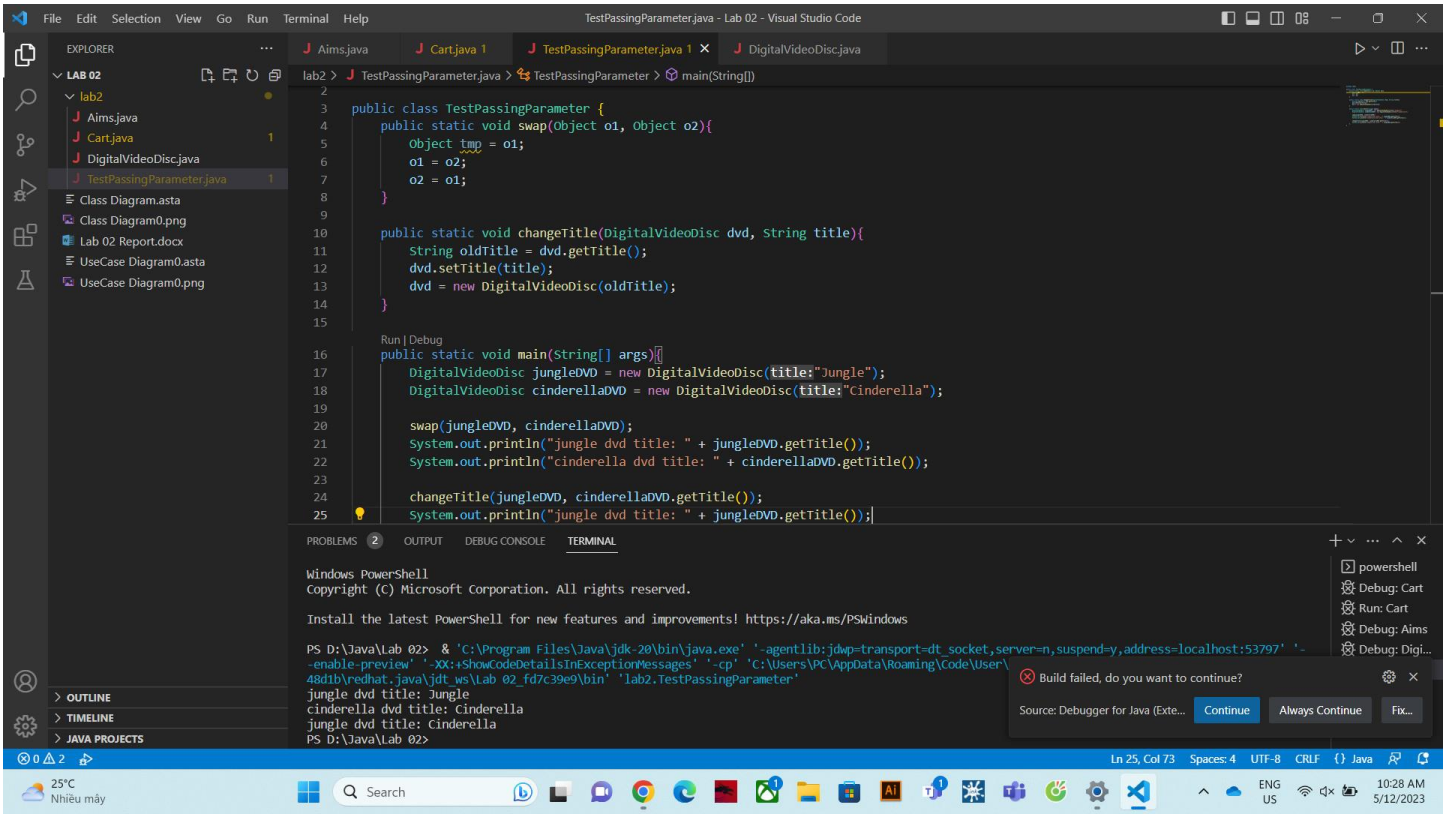


Passing by references or Passing by values:

Question: Is JAVA a Pass by Value or a Pass by Reference programming language?

Answer: JAVA is a Pass by Value only programming language.

Swapping functions: Source code and running result



True swapping:

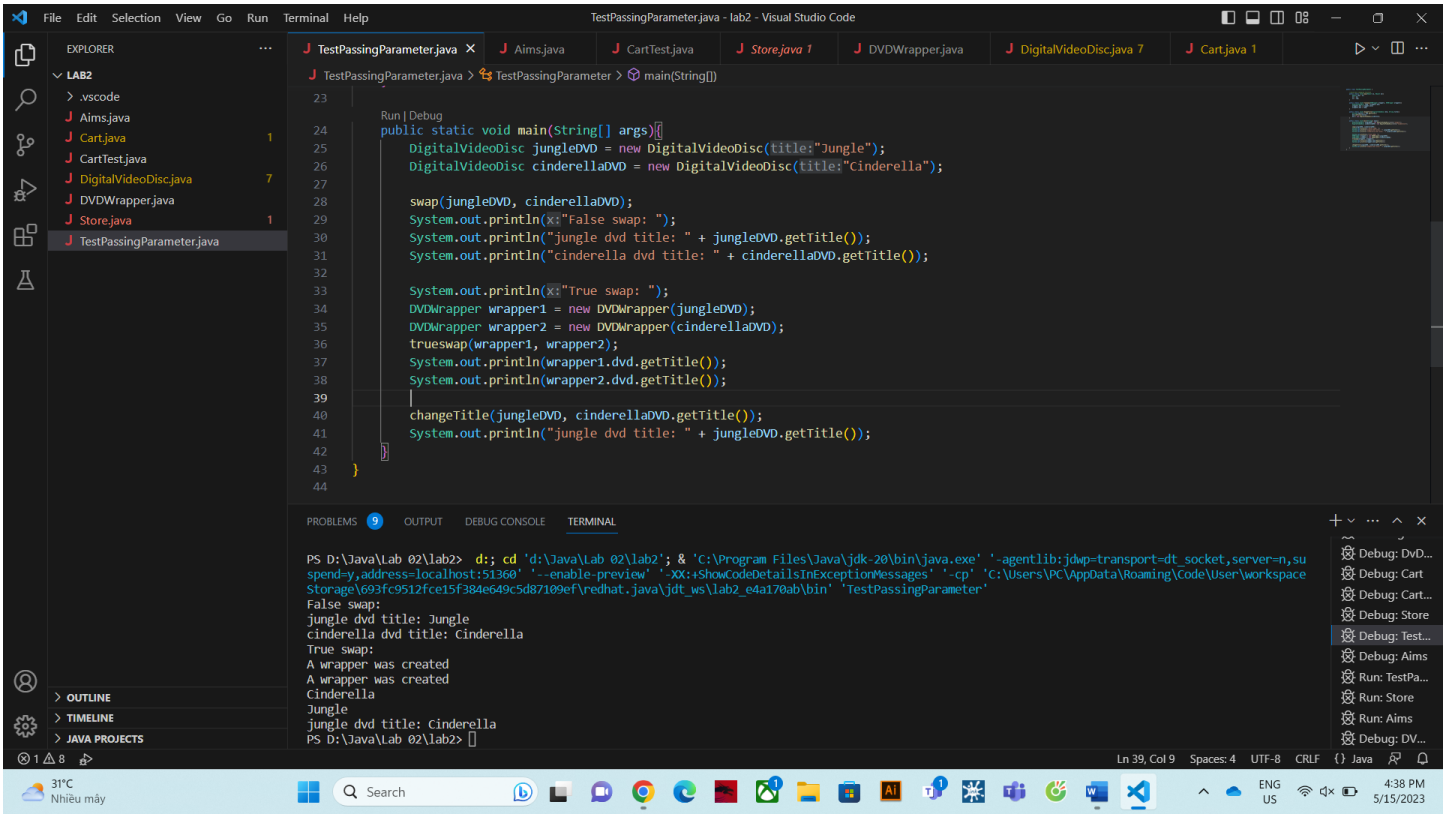
First, I create a wrapper class:

```
public class DVDWrapper {
    DigitalVideoDisc dvd;

    DVDWrapper(DigitalVideoDisc dvd){
        System.out.println(x:"A wrapper was created");
        this.dvd = dvd;
    }
    Run | Debug
    public static void main(String[] args) {
        DigitalVideoDisc dvd1 = new DigitalVideoDisc(category:"Animation", title:"Doraemon", cost:1.80f);
        DVDWrapper wrapper1 = new DVDWrapper(dvd1);
        System.out.println(wrapper1.dvd.getTitle());
    }
}
```

Swapping function:

```
public static void trueswap(DVDWrapper wrapper1, DVDWrapper wrapper2){
    DigitalVideoDisc temp = wrapper1.dvd;
    wrapper1.dvd = wrapper2.dvd;
    wrapper2.dvd = temp;
}
```

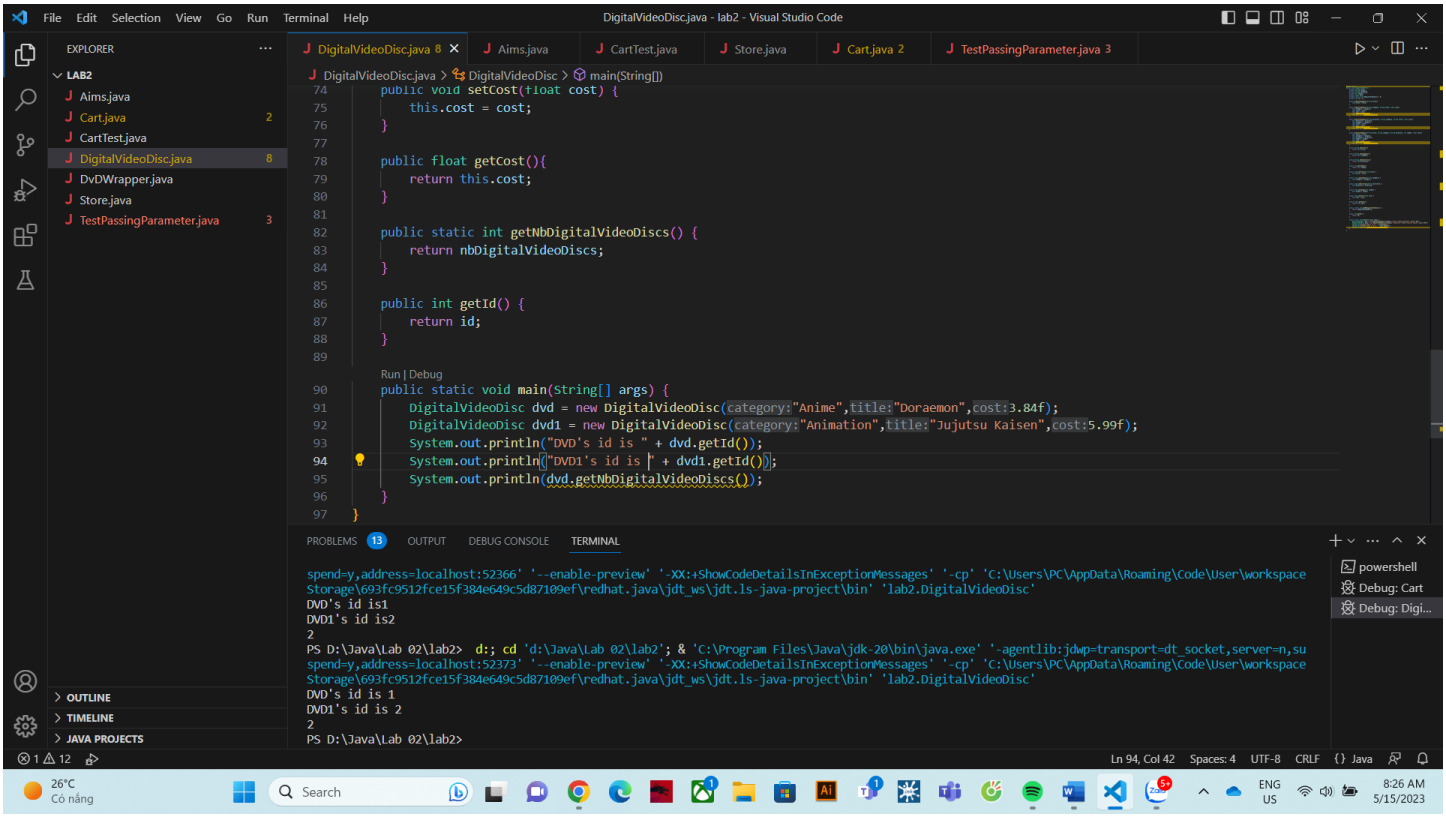
Running result:



Classifier members and Instance members:

Updated DigitalVideoDisc class:

```
package lab2;
public class DigitalVideoDisc {
    private String title;
    private String category;
    private String directory;
    private int length;
    private float cost;
    private static int nbDigitalVideoDiscs = 0;
    private int id = 0;
```



Display methods and Search methods:

Display methods:

```
public void display(){
    System.out.println("**********CART**********");
    System.out.println("Ordered Items:");
    float total = 0;
    for(int i = 0;i < this.qtyOrdered;i++){
        total = total + this.itemsOrdered[i].getCost();
        System.out.println((i+1) + ". " + this.itemsOrdered[i].getTitle() + " " + this.itemsOrdered[i].getCategory() + " "  + this.items
    }
    System.out.println("Total cost: " + total);
    System.out.println("**************************");
}
```

Search methods:

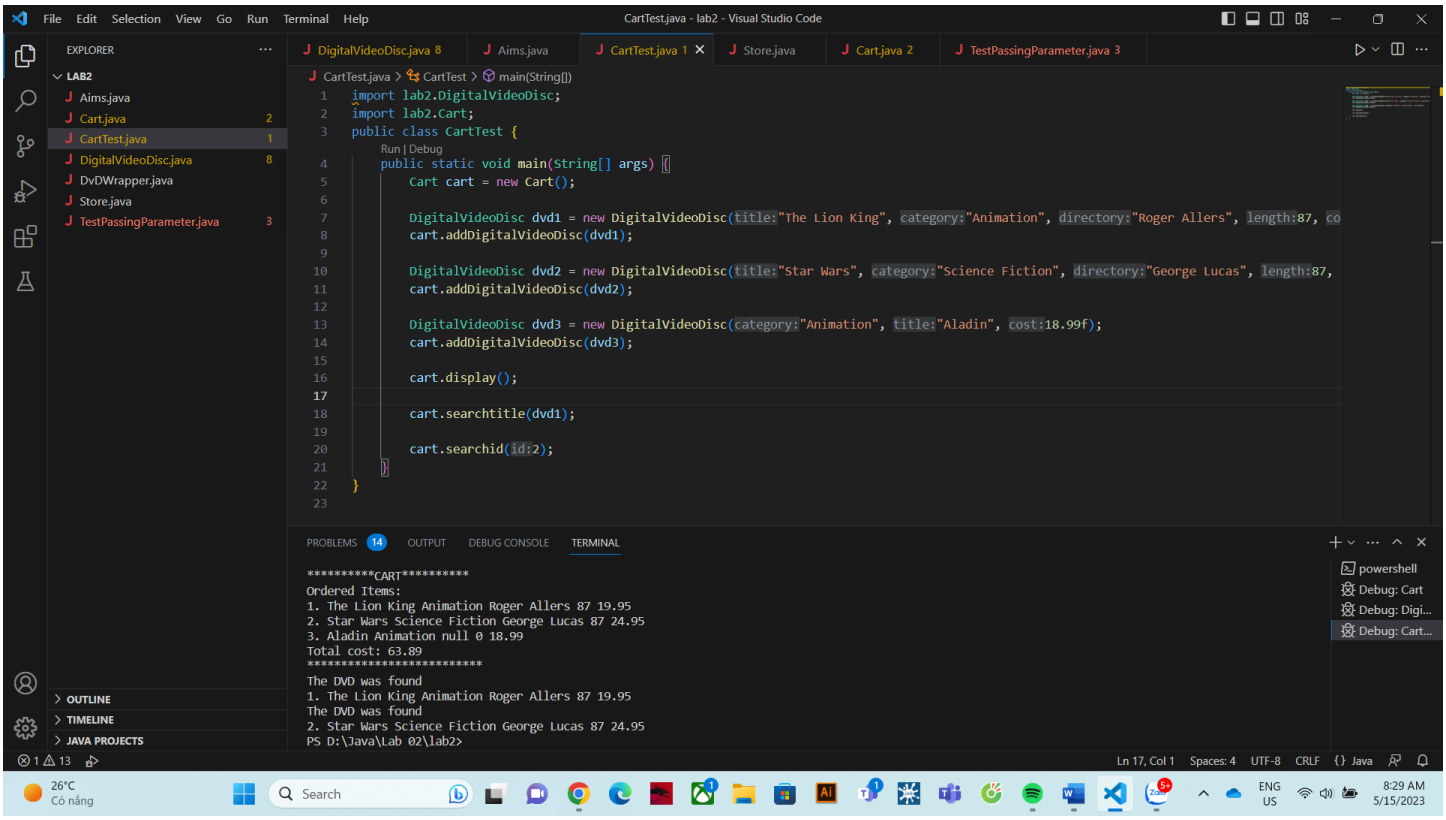
```
public void searchid(int id){
    if(id < 0||id > this.qtyOrdered)
        System.out.println("No such disc was found");
    else{
        int i = id-1;
        System.out.println("The DVD was found");
        System.out.println((i+1) + ". " + this.itemsOrdered[i].getTitle() + " " + this.itemsOrdered[i].getCategory() + " "  + this.items
    }
}

public void searchtitle(DigitalVideoDisc dvd){
    int found = 0;
    for(int i = 0;i < this.qtyOrdered;i++){
        boolean check = this.itemsOrdered[i].getTitle() == dvd.getTitle();
        if(check == true){
            System.out.println("The DVD was found");
            System.out.println((i+1) + ". " + this.itemsOrdered[i].getTitle() + " " + this.itemsOrdered[i].getCategory() + " "  + this.i
            found ++;
            break;
        }
```

Testing both methods:

Source codes:

```java
import lab2.DigitalVideoDisc;
import lab2.Cart;
public class CartTest {
    Run | Debug
    public static void main(String[] args) {
        Cart cart = new Cart();

        DigitalVideoDisc dvd1 = new DigitalVideoDisc(title:"The Lion King", category:"Animation", directory:"Roger Allers", length:87, co
        cart.addDigitalVideoDisc(dvd1);

        DigitalVideoDisc dvd2 = new DigitalVideoDisc(title:"Star Wars", category:"Science Fiction", directory:"George Lucas", length:87,
        cart.addDigitalVideoDisc(dvd2);

        DigitalVideoDisc dvd3 = new DigitalVideoDisc(category:"Animation", title:"Aladin", cost:18.99f);
        cart.addDigitalVideoDisc(dvd3);

        cart.display();

        cart.searchtitle(dvd1);

        cart.searchid(id:2);
    }
}
```

Running results:

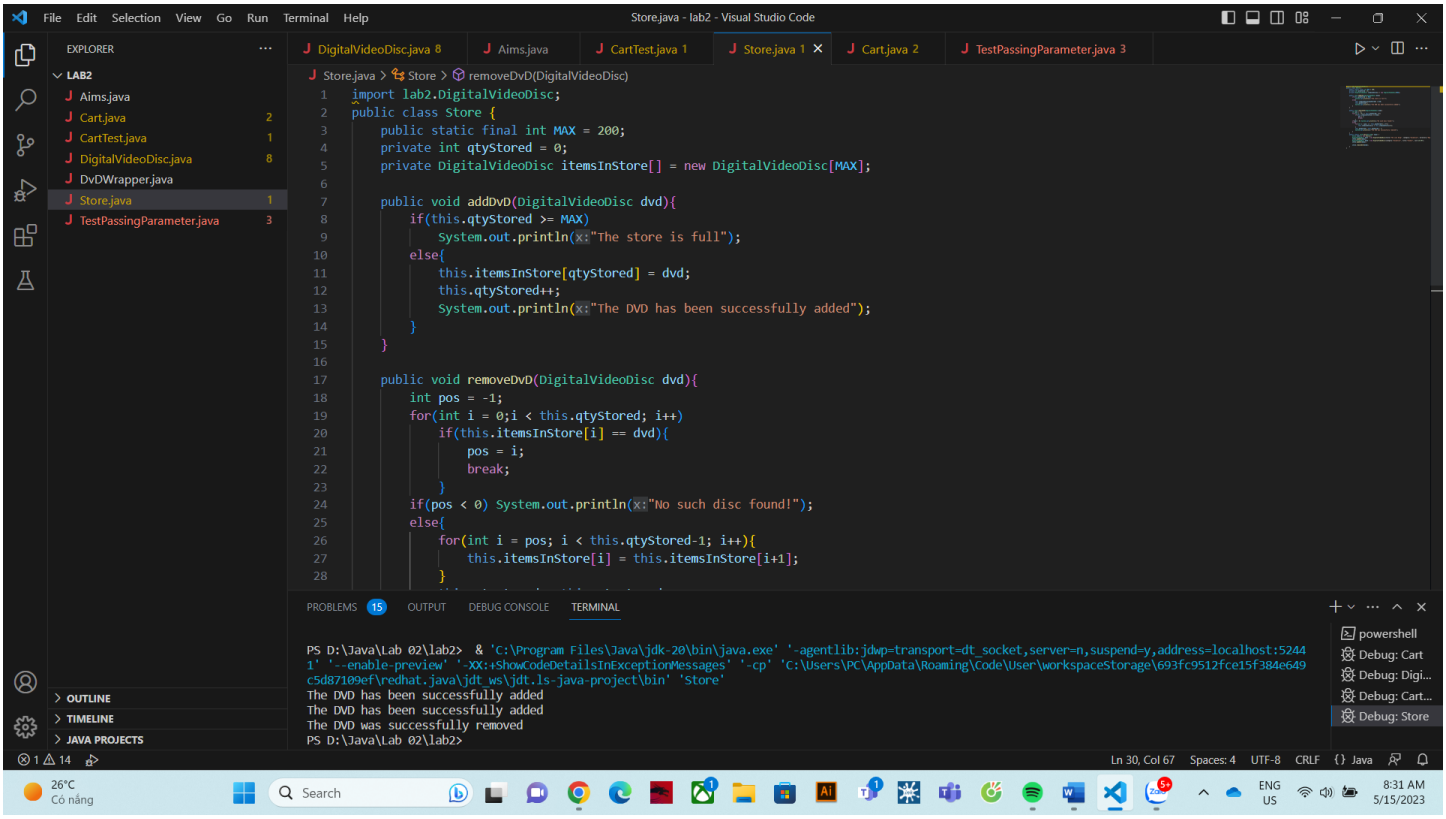


Implementing the Store class:

Source codes:

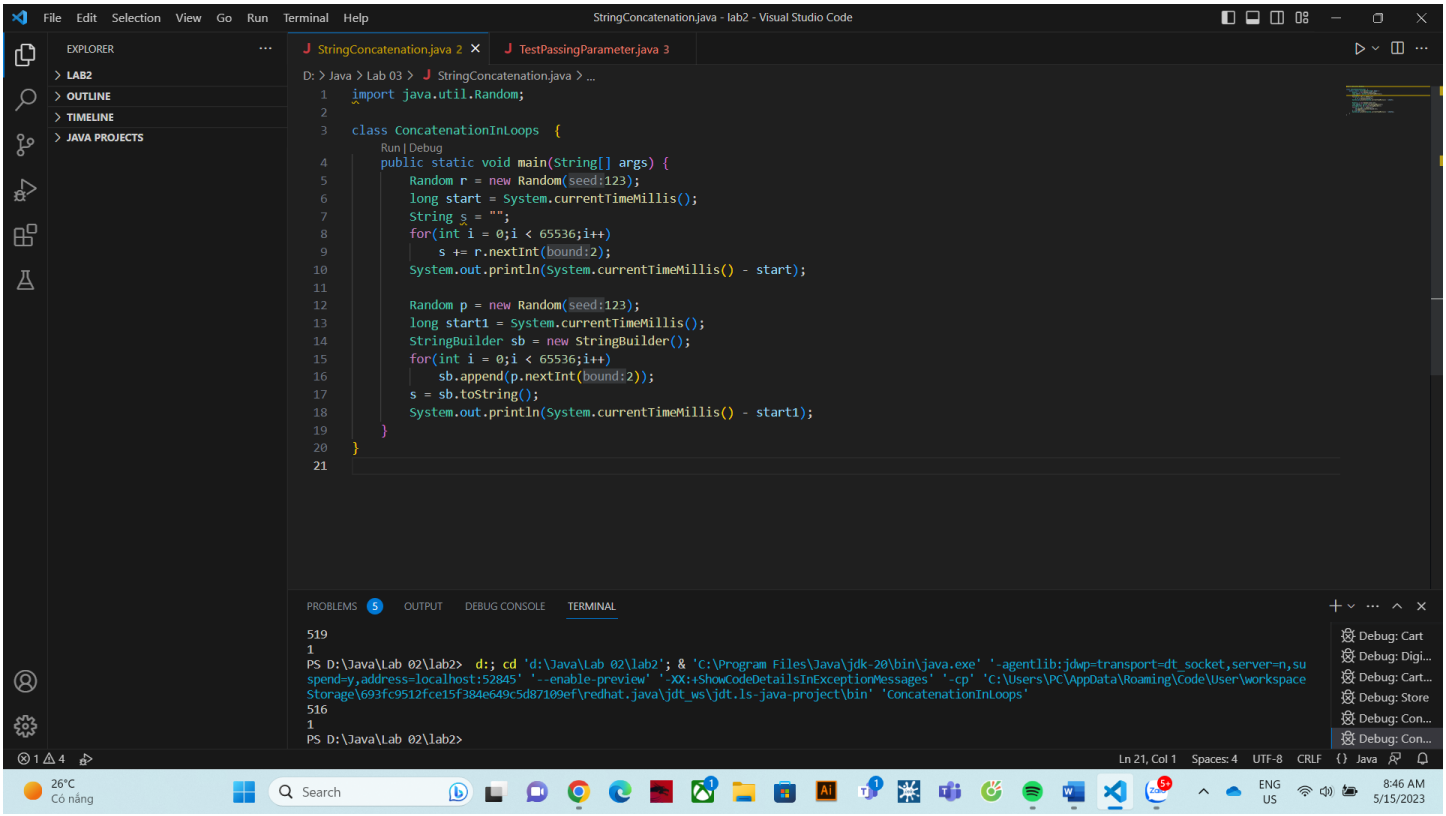
```java
import lab2.DigitalVideoDisc;
public class Store {
    public static final int MAX = 200;
    private int qtyStored = 0;
    private DigitalVideoDisc itemsInStore[] = new DigitalVideoDisc[MAX];

    public void addDvD(DigitalVideoDisc dvd){
        if(this.qtyStored >= MAX)
            System.out.println(x:"The store is full");
        else{
            this.itemsInStore[qtyStored] = dvd;
            this.qtyStored++;
            System.out.println(x:"The DVD has been successfully added");
        }
    }

    public void removeDvD(DigitalVideoDisc dvd){
        int pos = -1;
        for(int i = 0;i < this.qtyStored; i++)
            if(this.itemsInStore[i] == dvd){
                pos = i;
                break;
            }
        if(pos < 0) System.out.println(x:"No such disc found!");
        else{
            for(int i = pos; i < this.qtyStored-1; i++){
                this.itemsInStore[i] = this.itemsInStore[i+1];
            }
            this.qtyStored = this.qtyStored - 1;
            System.out.println(x:"The DVD was successfully removed");
        }
    }
```

Running results:



String concatenation experiments

Source codes and running results



Garbage collector