Thực hành lập trình hướng đối tượng

Báo cáo thực hành Lab02

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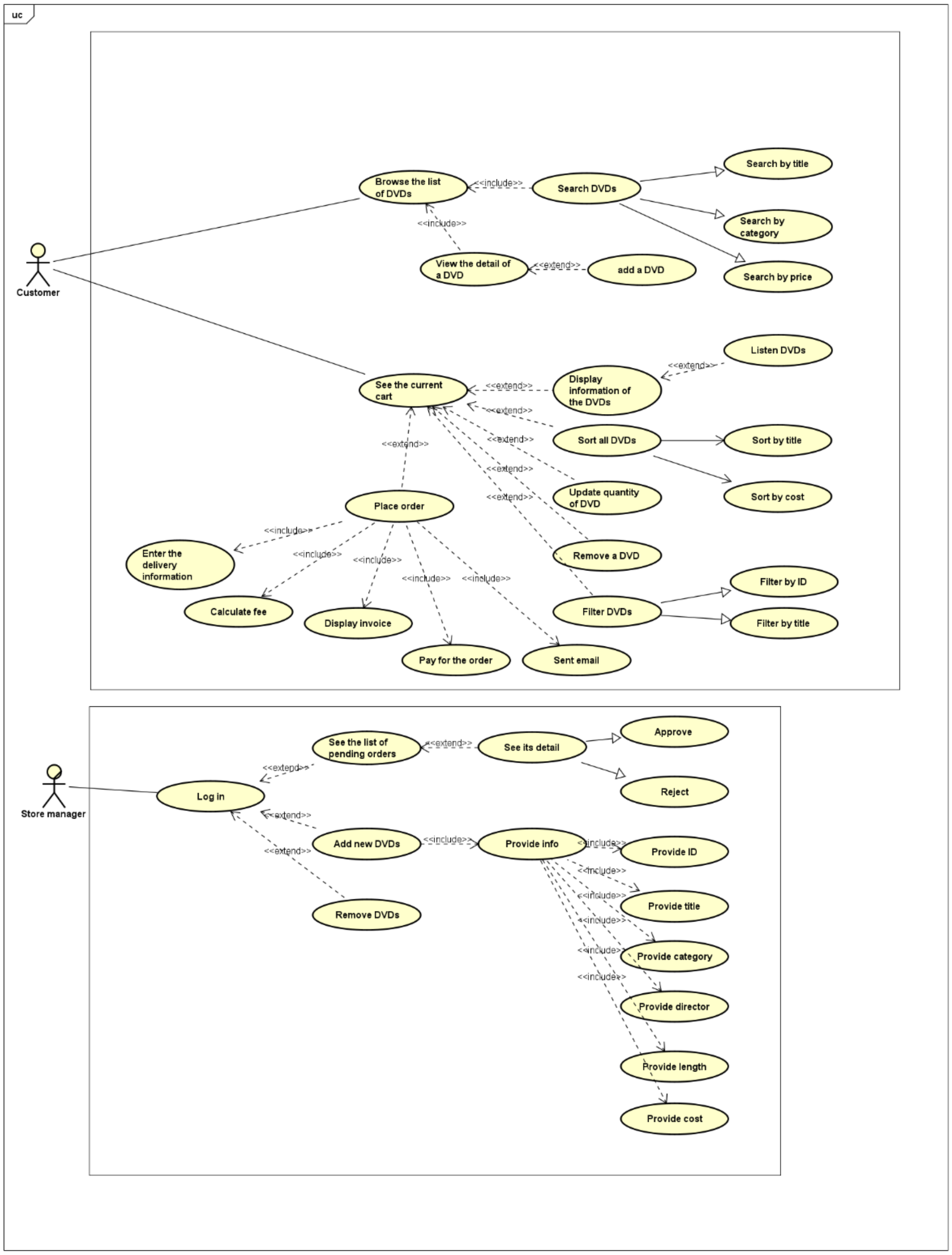
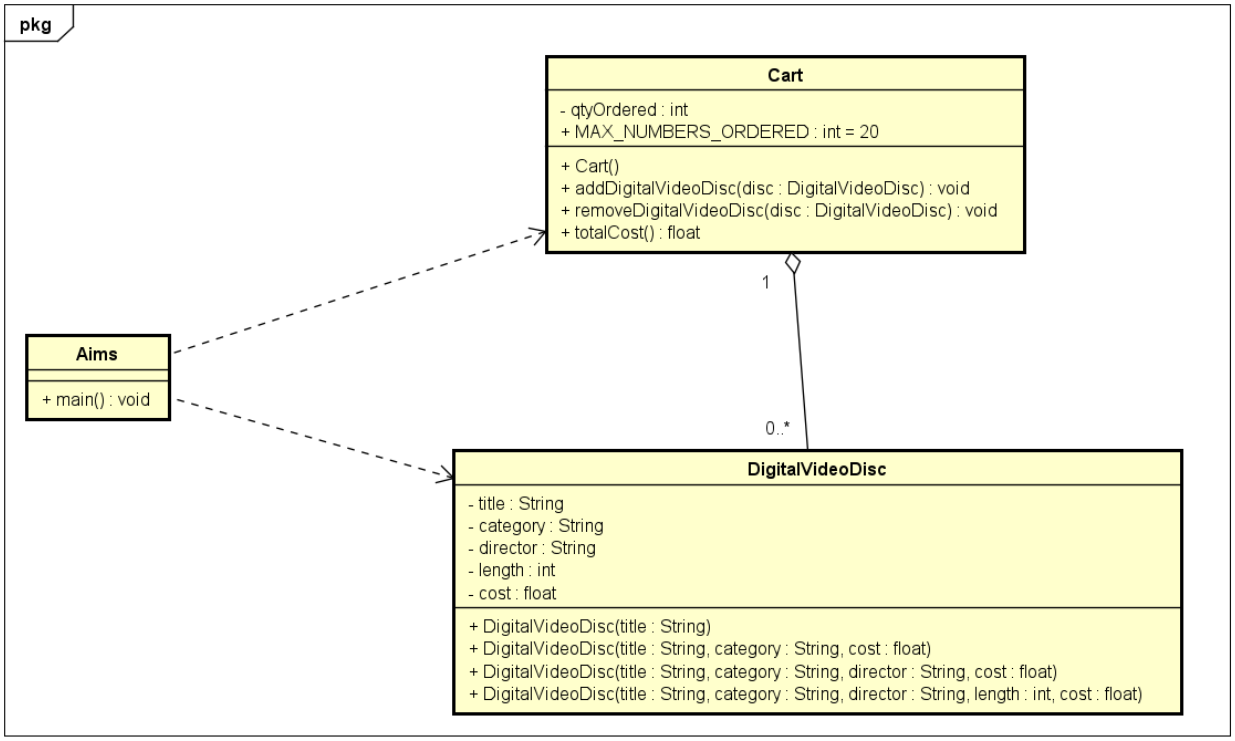
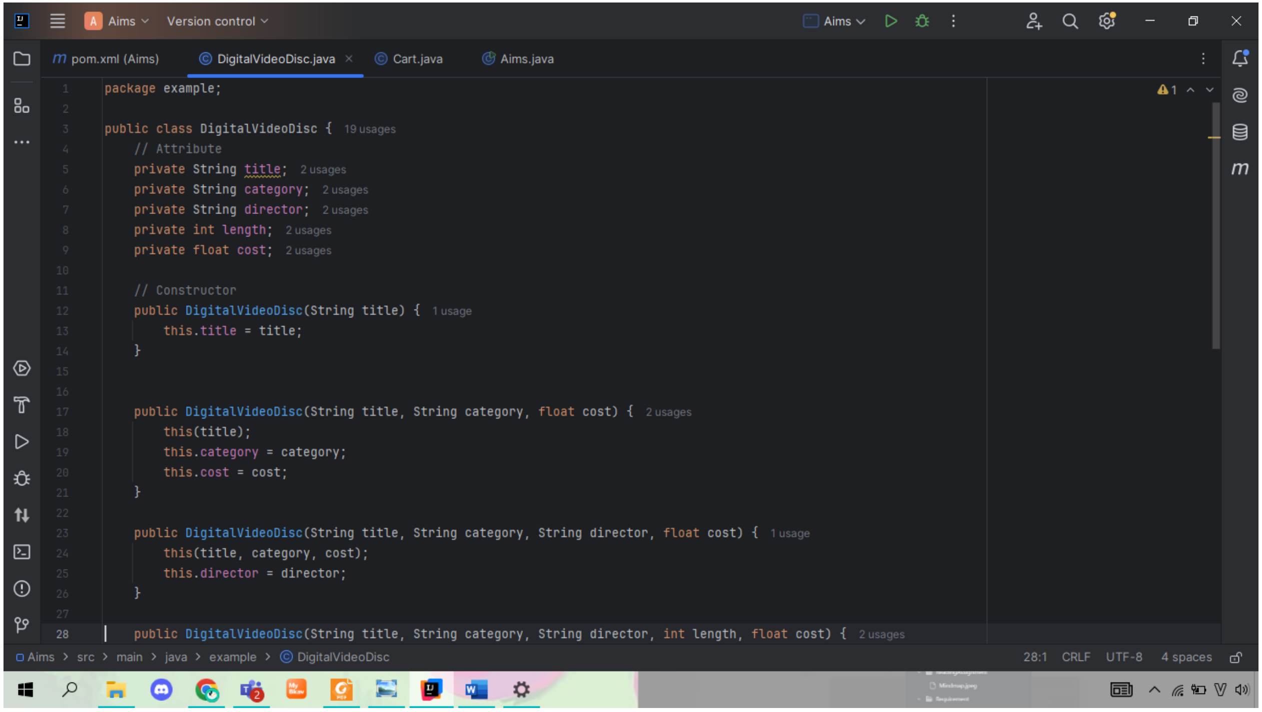
1. Use case diagram



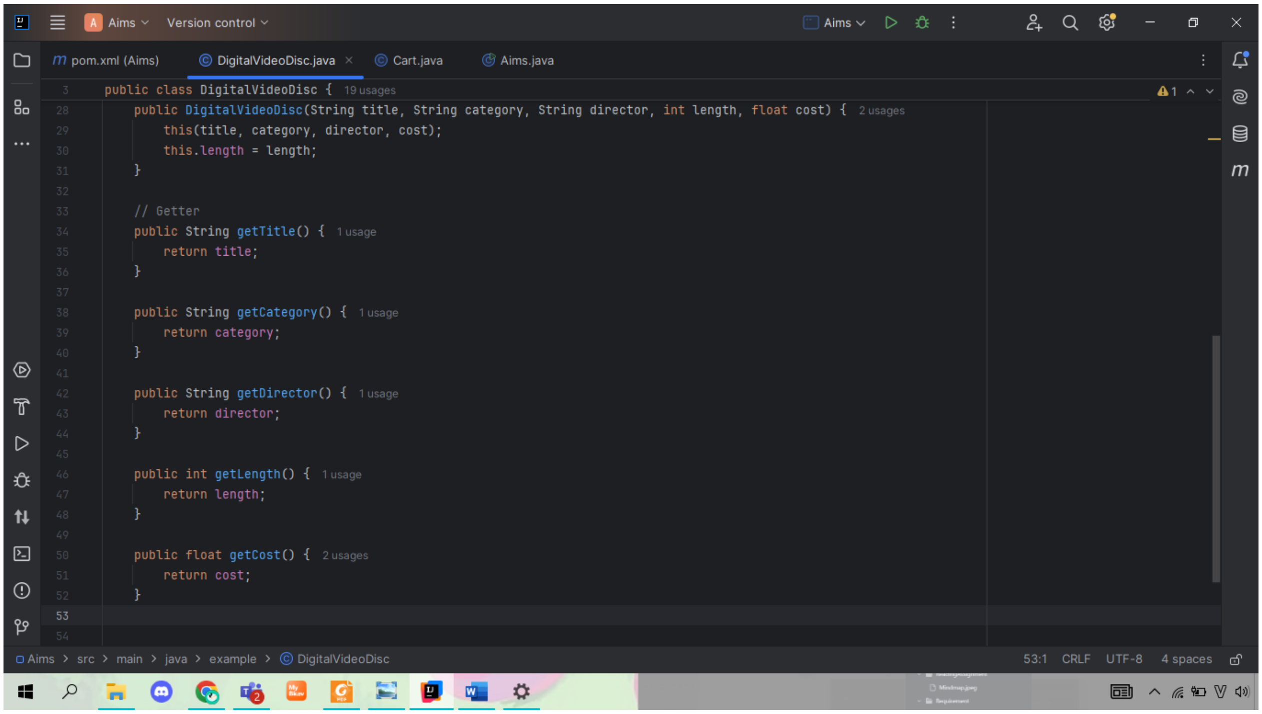
2. Class diagram


pkg
Cart
- qtyOrdered : int
+ MAX_NUMBERS_ORDERED : int = 20
+ Cart()
+ addDigitalVideoDisc(disc : DigitalVideoDisc) : void
+ removeDigitalVideoDisc(disc : DigitalVideoDisc) : void
+ totalCost() : float
1
0..*
Aims
+ main() : void
DigitalVideoDisc
- title : String
- category : String
- director : String
- length : int
- cost : float
+ DigitalVideoDisc(title : String)
+ DigitalVideoDisc(title : String, category : String, cost : float)
+ DigitalVideoDisc(title : String, category : String, director : String, cost : float)
+ DigitalVideoDisc(title : String, category : String, director : String, length : int, cost : float)

3. Lớp DigitalVideoDisc

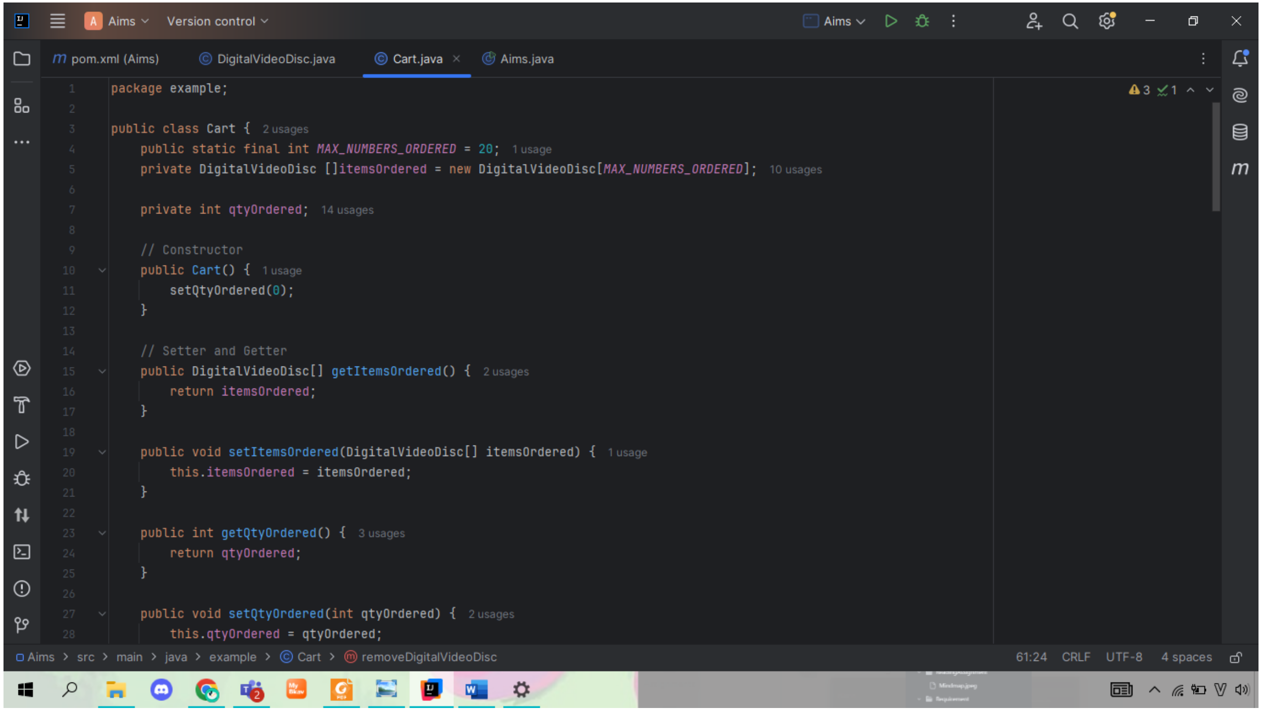


```java
package example;

public class DigitalVideoDisc {  19 usages
    // Attribute
    private String title;  2 usages
    private String category;  2 usages
    private String director;  2 usages
    private int length;  2 usages
    private float cost;  2 usages

    // Constructor
    public DigitalVideoDisc(String title) {  1 usage
        this.title = title;
    }


    public DigitalVideoDisc(String title, String category, float cost) {  2 usages
        this(title);
        this.category = category;
        this.cost = cost;
    }

    public DigitalVideoDisc(String title, String category, String director, float cost) {  1 usage
        this(title, category, cost);
        this.director = director;
    }

    public DigitalVideoDisc(String title, String category, String director, int length, float cost) {  2 usages
```

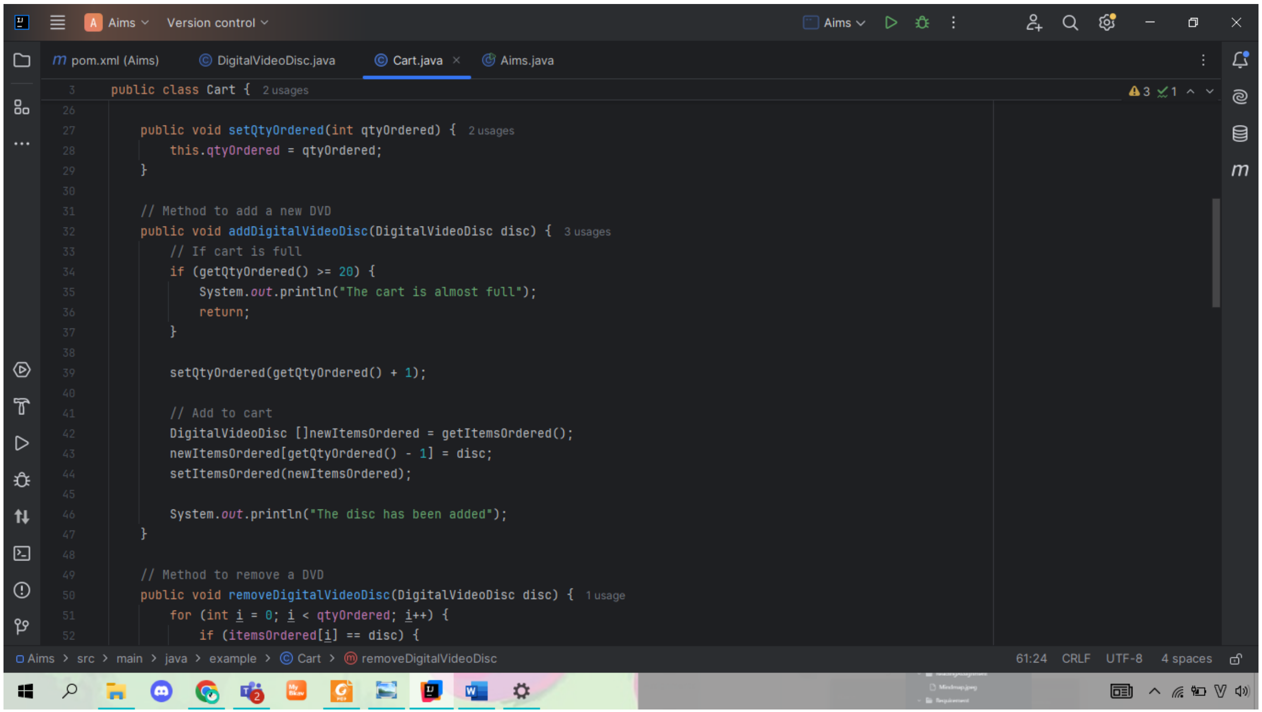


```java
public class DigitalVideoDisc {  19 usages
    public DigitalVideoDisc(String title, String category, String director, int length, float cost) {  2 usages
        this(title, category, director, cost);
        this.length = length;
    }

    // Getter
    public String getTitle() {  1 usage
        return title;
    }

    public String getCategory() {  1 usage
        return category;
    }

    public String getDirector() {  1 usage
        return director;
    }

    public int getLength() {  1 usage
        return length;
    }

    public float getCost() {  2 usages
        return cost;
    }

```

4. Lớp Cart

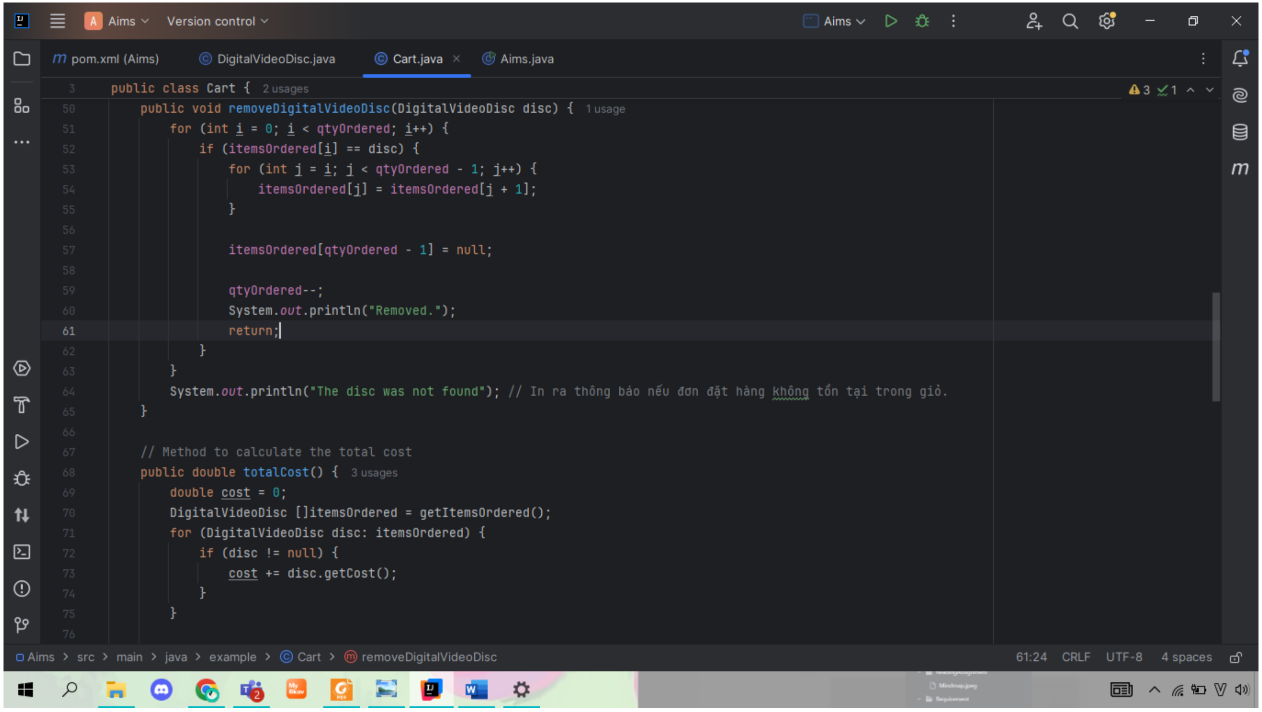


```java
package example;

public class Cart {  2 usages
    public static final int MAX_NUMBERS_ORDERED = 20;  1 usage
    private DigitalVideoDisc []itemsOrdered = new DigitalVideoDisc[MAX_NUMBERS_ORDERED];  10 usages

    private int qtyOrdered;  14 usages

    // Constructor
    public Cart() {  1 usage
        setQtyOrdered(0);
    }

    // Setter and Getter
    public DigitalVideoDisc[] getItemsOrdered() {  2 usages
        return itemsOrdered;
    }

    public void setItemsOrdered(DigitalVideoDisc[] itemsOrdered) {  1 usage
        this.itemsOrdered = itemsOrdered;
    }

    public int getQtyOrdered() {  3 usages
        return qtyOrdered;
    }

    public void setQtyOrdered(int qtyOrdered) {  2 usages
        this.qtyOrdered = qtyOrdered;
```



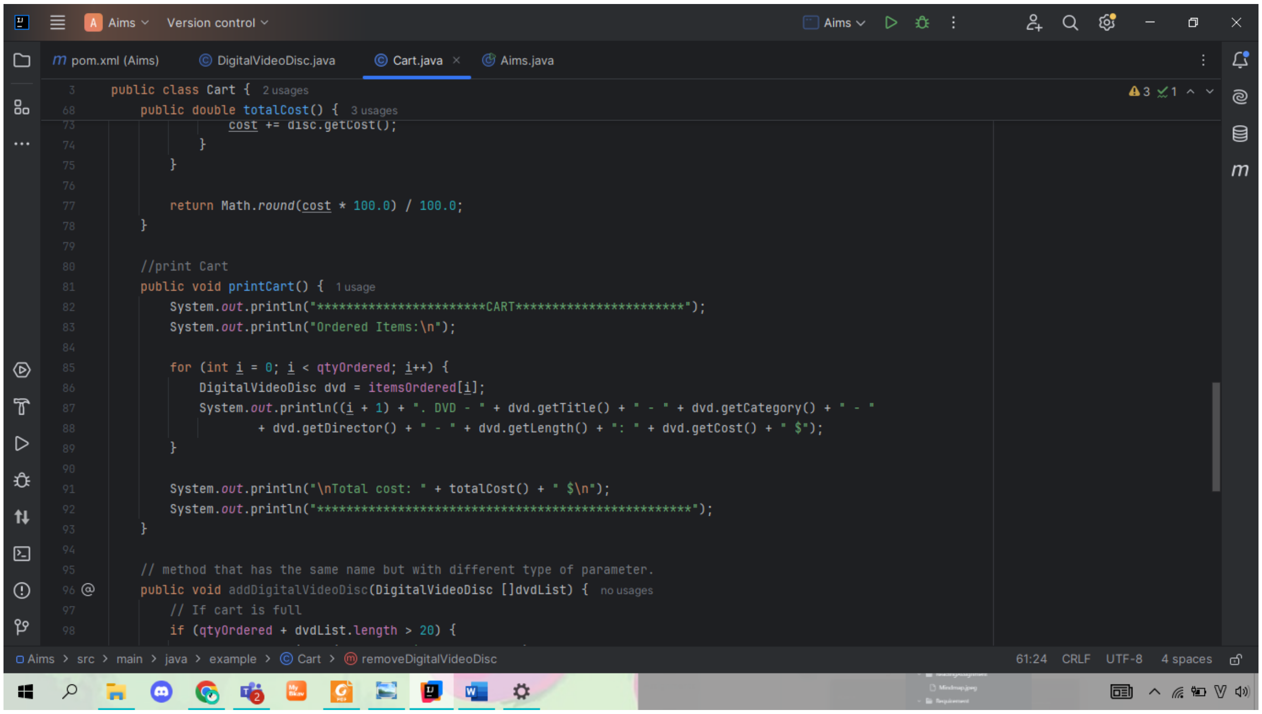
```java
public class Cart {  2 usages

    public void setQtyOrdered(int qtyOrdered) {  2 usages
        this.qtyOrdered = qtyOrdered;
    }

    // Method to add a new DVD
    public void addDigitalVideoDisc(DigitalVideoDisc disc) {  3 usages
        // If cart is full
        if (getQtyOrdered() >= 20) {
            System.out.println("The cart is almost full");
            return;
        }

        setQtyOrdered(getQtyOrdered() + 1);

        // Add to cart
        DigitalVideoDisc []newItemsOrdered = getItemsOrdered();
        newItemsOrdered[getQtyOrdered() - 1] = disc;
        setItemsOrdered(newItemsOrdered);

        System.out.println("The disc has been added");
    }

    // Method to remove a DVD
    public void removeDigitalVideoDisc(DigitalVideoDisc disc) {  1 usage
        for (int i = 0; i < qtyOrdered; i++) {
            if (itemsOrdered[i] == disc) {
```

Aims > src > main > java > example > Cart > removeDigitalVideoDisc
61:24
CRLF
UTF-8
4 spaces



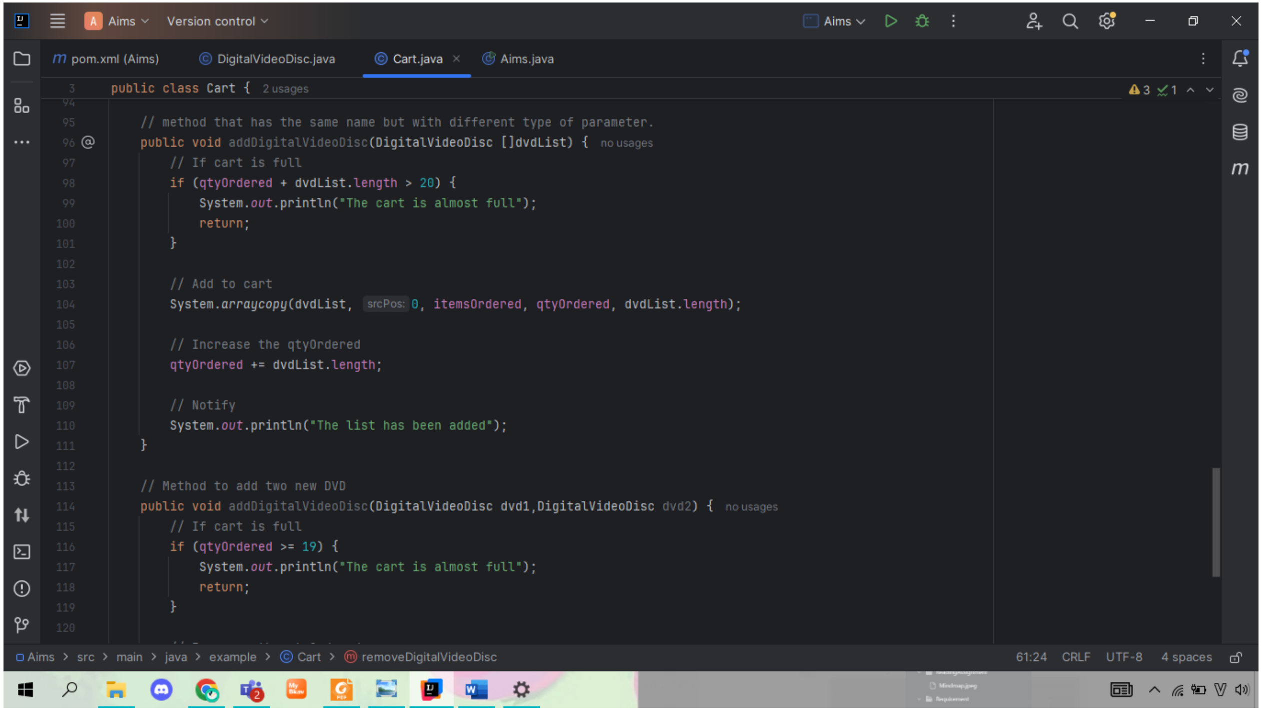
```java
public class Cart {  2 usages
    public void removeDigitalVideoDisc(DigitalVideoDisc disc) {  1 usage
        for (int i = 0; i < qtyOrdered; i++) {
            if (itemsOrdered[i] == disc) {
                for (int j = i; j < qtyOrdered - 1; j++) {
                    itemsOrdered[j] = itemsOrdered[j + 1];
                }

                itemsOrdered[qtyOrdered - 1] = null;

                qtyOrdered--;
                System.out.println("Removed.");
                return;
            }
        }
        System.out.println("The disc was not found"); // In ra thông báo nếu đơn đặt hàng không tồn tại trong giỏ.
    }

    // Method to calculate the total cost
    public double totalCost() {  3 usages
        double cost = 0;
        DigitalVideoDisc []itemsOrdered = getItemsOrdered();
        for (DigitalVideoDisc disc: itemsOrdered) {
            if (disc != null) {
                cost += disc.getCost();
            }
        }

```

Aims > src > main > java > example > Cart > removeDigitalVideoDisc
61:24
CRLF
UTF-8
4 spaces

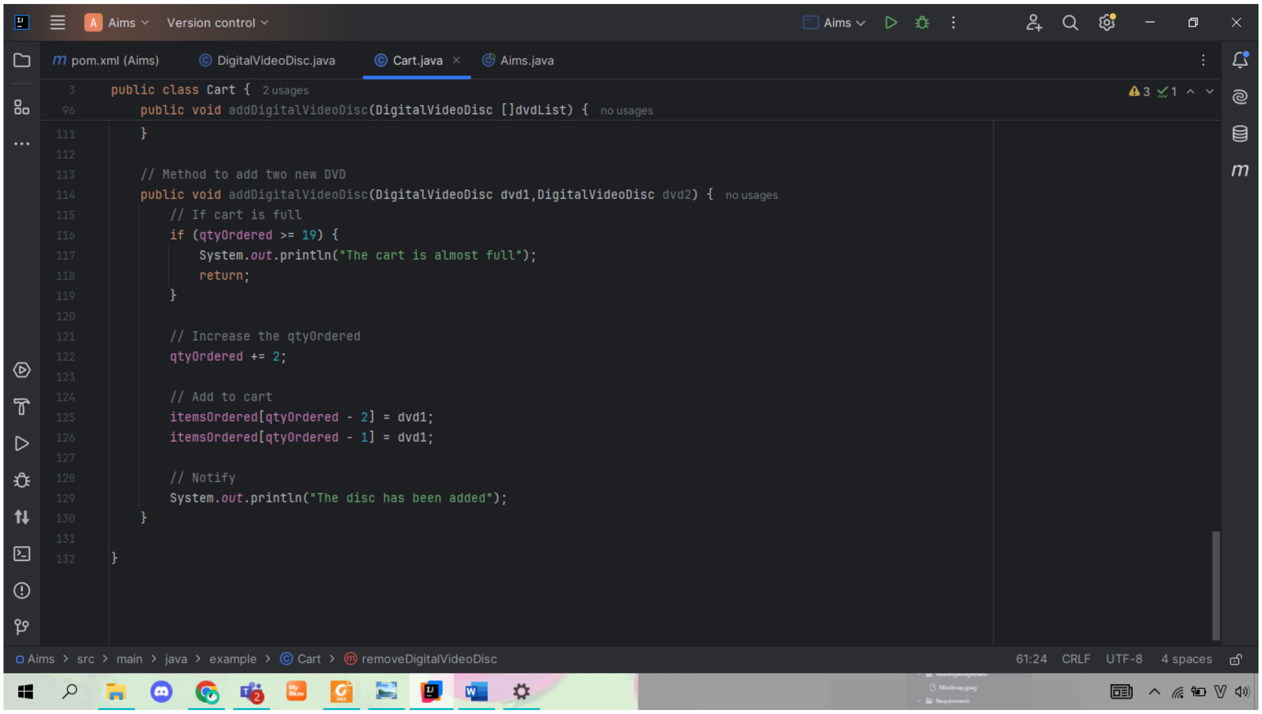

Aims
Version control
pom.xml (Aims)
DigitalVideoDisc.java
Cart.java
Aims.java
Aims › src › main › java › example › Cart › removeDigitalVideoDisc
61:24 CRLF UTF-8 4 spaces

```java
public class Cart {
    public double totalCost() {
                cost += disc.getCost();
            }
        }

        return Math.round(cost * 100.0) / 100.0;
    }

    //print Cart
    public void printCart() {
        System.out.println("**********************CART**********************");
        System.out.println("Ordered Items:\n");

        for (int i = 0; i < qtyOrdered; i++) {
            DigitalVideoDisc dvd = itemsOrdered[i];
            System.out.println((i + 1) + ". DVD - " + dvd.getTitle() + " - " + dvd.getCategory() + " - "
                    + dvd.getDirector() + " - " + dvd.getLength() + ": " + dvd.getCost() + " $");
        }

        System.out.println("\nTotal cost: " + totalCost() + " $\n");
        System.out.println("***************************************************");
    }

    // method that has the same name but with different type of parameter.
    public void addDigitalVideoDisc(DigitalVideoDisc []dvdList) {
        // If cart is full
        if (qtyOrdered + dvdList.length > 20) {
```

Các lớp overloading

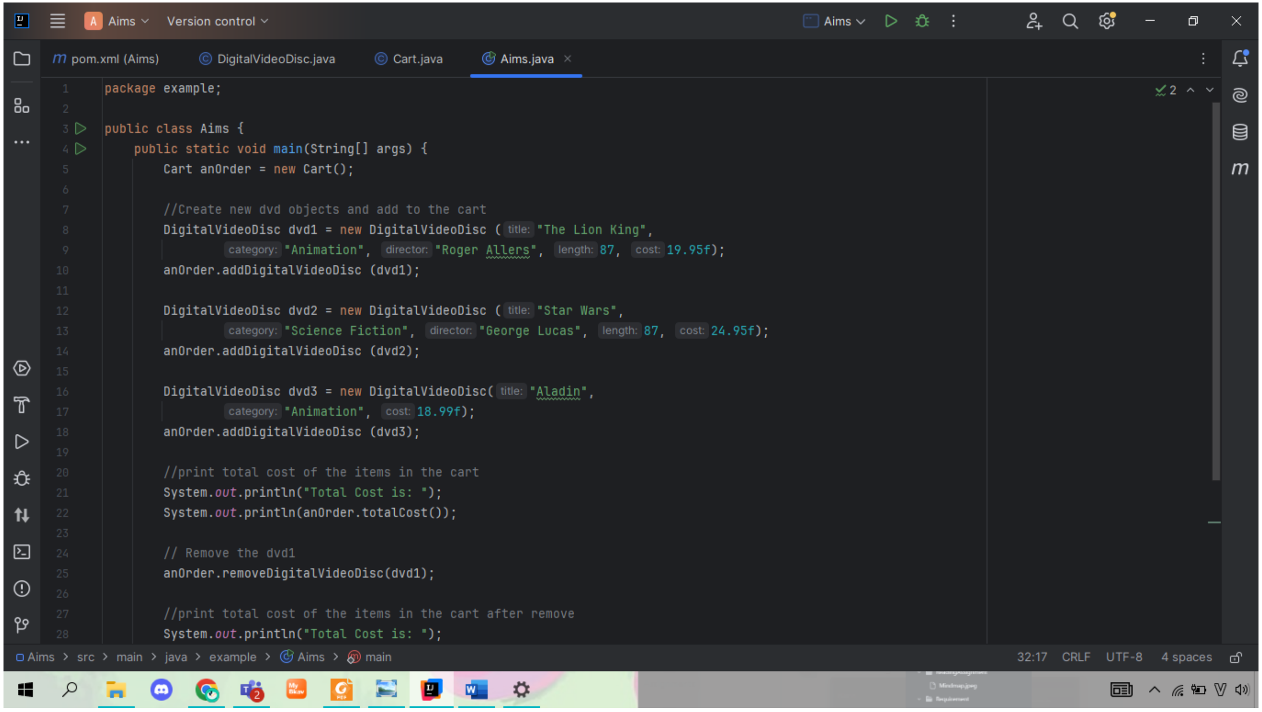

Aims
Version control
pom.xml (Aims)
DigitalVideoDisc.java
Cart.java
Aims.java
Aims › src › main › java › example › Cart › removeDigitalVideoDisc
61:24 CRLF UTF-8 4 spaces

```java
public class Cart {

    // method that has the same name but with different type of parameter.
    public void addDigitalVideoDisc(DigitalVideoDisc []dvdList) {
        // If cart is full
        if (qtyOrdered + dvdList.length > 20) {
            System.out.println("The cart is almost full");
            return;
        }

        // Add to cart
        System.arraycopy(dvdList, 0, itemsOrdered, qtyOrdered, dvdList.length);

        // Increase the qtyOrdered
        qtyOrdered += dvdList.length;

        // Notify
        System.out.println("The list has been added");
    }

    // Method to add two new DVD
    public void addDigitalVideoDisc(DigitalVideoDisc dvd1,DigitalVideoDisc dvd2) {
        // If cart is full
        if (qtyOrdered >= 19) {
            System.out.println("The cart is almost full");
            return;
        }
```

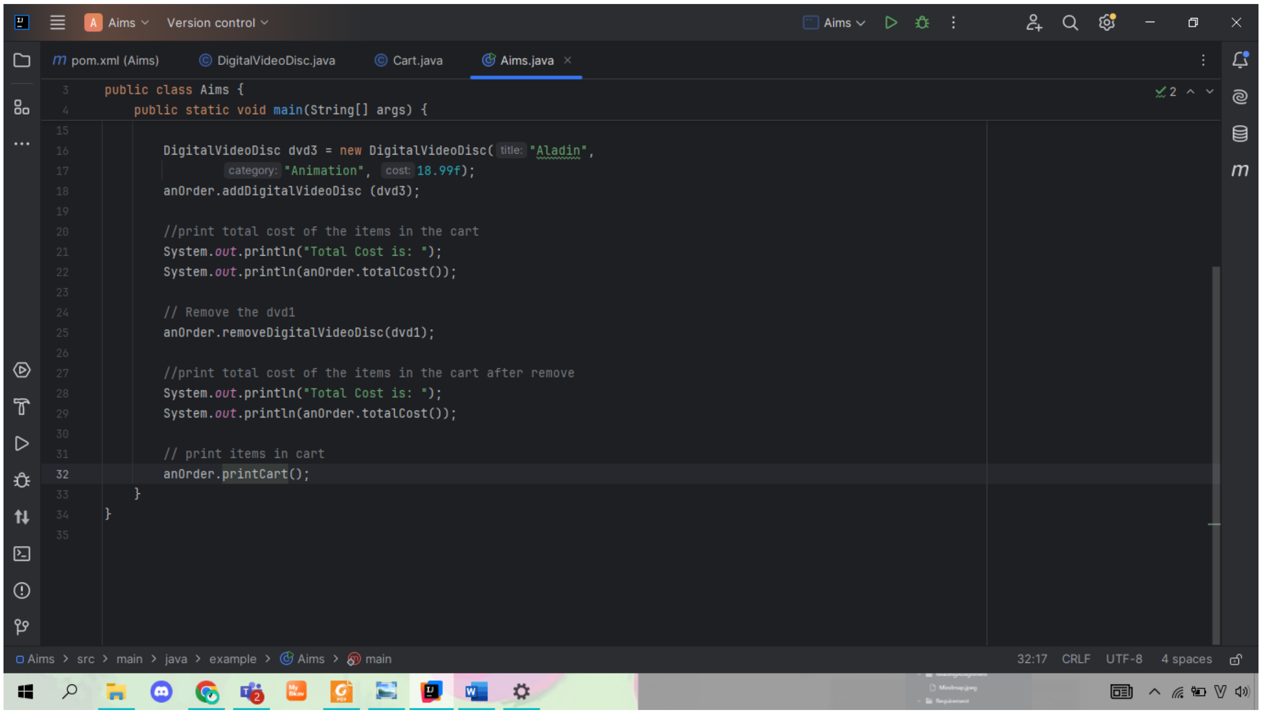


```java
public class Cart {  2 usages
    public void addDigitalVideoDisc(DigitalVideoDisc []dvdList) {  no usages
    }

    // Method to add two new DVD
    public void addDigitalVideoDisc(DigitalVideoDisc dvd1,DigitalVideoDisc dvd2) {  no usages
        // If cart is full
        if (qtyOrdered >= 19) {
            System.out.println("The cart is almost full");
            return;
        }

        // Increase the qtyOrdered
        qtyOrdered += 2;

        // Add to cart
        itemsOrdered[qtyOrdered - 2] = dvd1;
        itemsOrdered[qtyOrdered - 1] = dvd1;

        // Notify
        System.out.println("The disc has been added");
    }

}
```

5. Lớp Aims

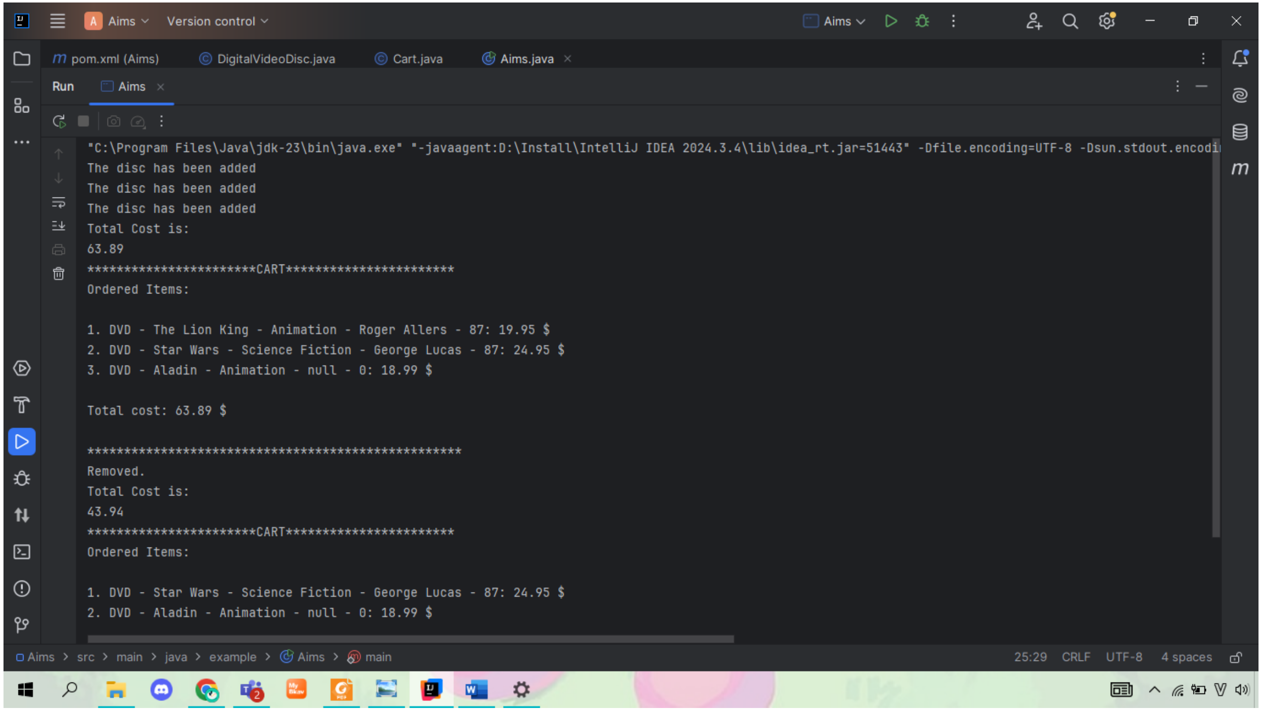


```java
package example;

public class Aims {
    public static void main(String[] args) {
        Cart anOrder = new Cart();

        //Create new dvd objects and add to the cart
        DigitalVideoDisc dvd1 = new DigitalVideoDisc ( title: "The Lion King",
                 category: "Animation",  director: "Roger Allers",  length: 87,  cost: 19.95f);
        anOrder.addDigitalVideoDisc (dvd1);

        DigitalVideoDisc dvd2 = new DigitalVideoDisc ( title: "Star Wars",
                 category: "Science Fiction",  director: "George Lucas",  length: 87,  cost: 24.95f);
        anOrder.addDigitalVideoDisc (dvd2);

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

        //print total cost of the items in the cart
        System.out.println("Total Cost is: ");
        System.out.println(anOrder.totalCost());

        // Remove the dvd1
        anOrder.removeDigitalVideoDisc(dvd1);

        //print total cost of the items in the cart after remove
        System.out.println("Total Cost is: ");
```



```
public class Aims {
    public static void main(String[] args) {

        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin",
                "Animation", 18.99f);
        anOrder.addDigitalVideoDisc (dvd3);

        //print total cost of the items in the cart
        System.out.println("Total Cost is: ");
        System.out.println(anOrder.totalCost());

        // Remove the dvd1
        anOrder.removeDigitalVideoDisc(dvd1);

        //print total cost of the items in the cart after remove
        System.out.println("Total Cost is: ");
        System.out.println(anOrder.totalCost());

        // print items in cart
        anOrder.printCart();
    }
}
```

Kết quả:



```
"C:\Program Files\Java\jdk-23\bin\java.exe" "-javaagent:D:\Install\IntelliJ IDEA 2024.3.4\lib\idea_rt.jar=51443" -Dfile.encoding=UTF-8 -Dsun.stdout.encodi
The disc has been added
The disc has been added
The disc has been added
Total Cost is:
63.89
***********************CART***********************
Ordered Items:

1. DVD - The Lion King - Animation - Roger Allers - 87: 19.95 $
2. DVD - Star Wars - Science Fiction - George Lucas - 87: 24.95 $
3. DVD - Aladin - Animation - null - 0: 18.99 $

Total cost: 63.89 $

***************************************************
Removed.
Total Cost is:
43.94
***********************CART***********************
Ordered Items:

1. DVD - Star Wars - Science Fiction - George Lucas - 87: 24.95 $
2. DVD - Aladin - Animation - null - 0: 18.99 $
```