BÁO CÁO THỰC HÀNH LAB 4
LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

Mục Lục

Báo Cáo

2. Additional requirements of AIMS

Starting from this lab, you extend the AIMS system that you created in the previous exercises to allow customer to order 2 new types of media: books and CD.

A book's information includes: id, title, category, cost and list of authors.
A CD's information includes: id, title, category, artist, director, track list and price.Additionally, each track is unique in a CD with its own title and length. The length of a CD is sum of the lengths of its tracks.

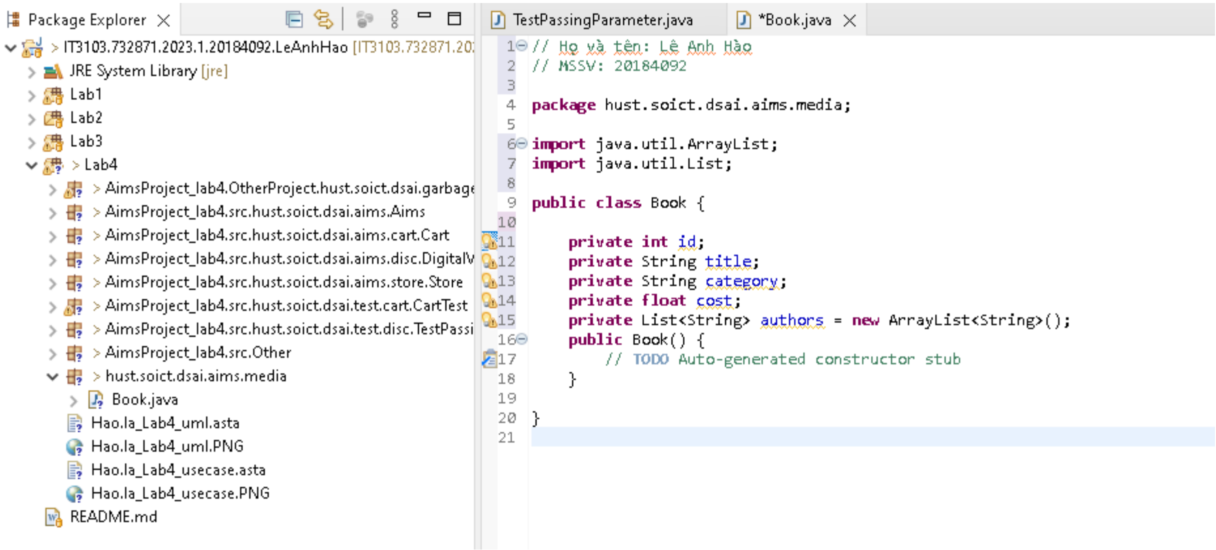
When a user sees the details of a media in the store, the information displayed depends on the type of media.

- **For books, the system shows their title, category, author list, the content length (i.e., the number of tokens).**
- **For CDs, the system displays the CD's information (i.e. CD title, category, artist, director, CD length, and the cost for the CD) and then displays the information of all the tracks in that CD.**
- **For DVDs, the system displays the DVD's information (i.e. DVD title, category, director, DVD length, and the cost for the DVD).**

Additionally, the user can choose to play some media when browsing the list of media in the store or seeing the current cart. For simplicity, we establish the way the system plays a media is as follows: When a CD is played, the system displays the CD information (i.e., CD title and CD length) and plays all the tracks of the CD. To play a track, the system displays the track's name and its length. Similarly, a DVD can also be played, i.e., the system displays the title and length of the DVD. If a DVD or track has the length 0 or less, the system must notify the user that the track, the DVD or the CD of that track cannot be played.

3. Creating the Book class

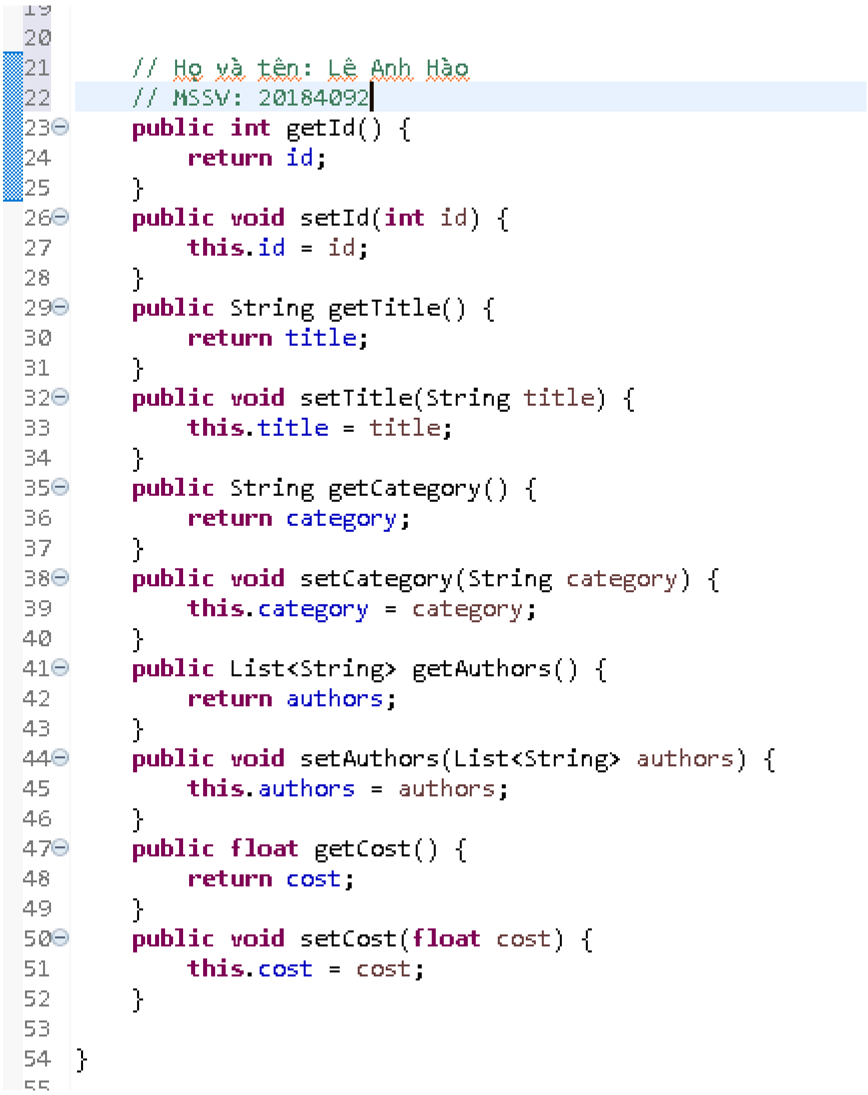
Add fields to the Book class



```
> IT3103.732871.2023.1.20184092.LeAnhHao [IT3103.732871.202
  > JRE System Library [jre]
  > Lab1
  > Lab2
  > Lab3
  > Lab4
    > AimsProject_lab4.OtherProject.hust.soict.dsai.garbage
    > AimsProject_lab4.src.hust.soict.dsai.aims.Aims
    > AimsProject_lab4.src.hust.soict.dsai.aims.cart.Cart
    > AimsProject_lab4.src.hust.soict.dsai.aims.disc.DigitalV
    > AimsProject_lab4.src.hust.soict.dsai.aims.store.Store
    > AimsProject_lab4.src.hust.soict.dsai.test.cart.CartTest
    > AimsProject_lab4.src.hust.soict.dsai.test.disc.TestPassi
    > AimsProject_lab4.src.Other
    > hust.soict.dsai.aims.media
      > Book.java
    Hao.la_Lab4_uml.asta
    Hao.la_Lab4_uml.PNG
    Hao.la_Lab4_usecase.asta
    Hao.la_Lab4_usecase.PNG
  README.md
```

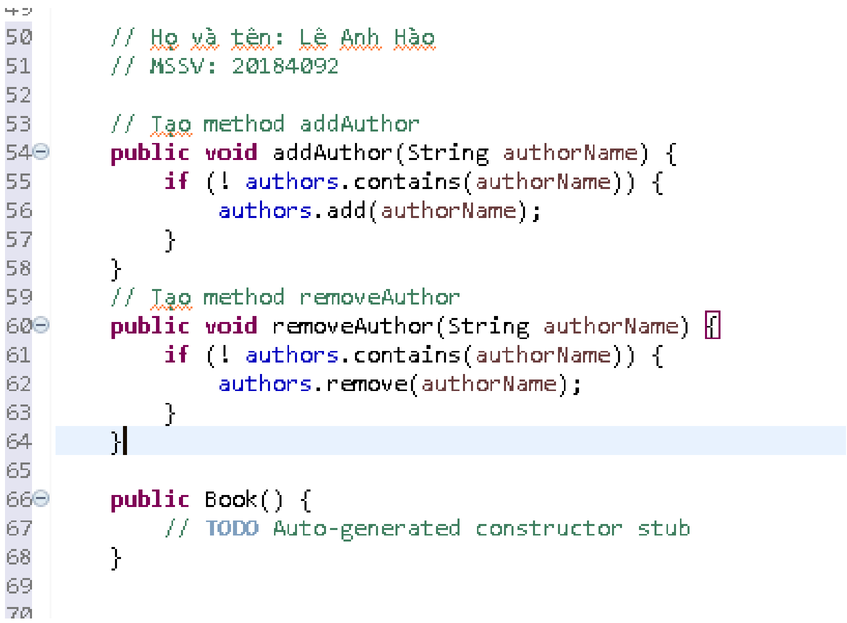
```java
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

package hust.soict.dsai.aims.media;

import java.util.ArrayList;
import java.util.List;

public class Book {

    private int id;
    private String title;
    private String category;
    private float cost;
    private List<String> authors = new ArrayList<String>();
    public Book() {
        // TODO Auto-generated constructor stub
    }

}
```

Generate Getter and Setter



```java

    // Họ và tên: Lê Anh Hào
    // MSSV: 20184092
    public int getId() {
        return id;
    }
    public void setId(int id) {
        this.id = id;
    }
    public String getTitle() {
        return title;
    }
    public void setTitle(String title) {
        this.title = title;
    }
    public String getCategory() {
        return category;
    }
    public void setCategory(String category) {
        this.category = category;
    }
    public List<String> getAuthors() {
        return authors;
    }
    public void setAuthors(List<String> authors) {
        this.authors = authors;
    }
    public float getCost() {
        return cost;
    }
    public void setCost(float cost) {
        this.cost = cost;
    }

}
```

Create *addAuthor(String authorName)* and *removeAuthor(String authorName)* for the Book class

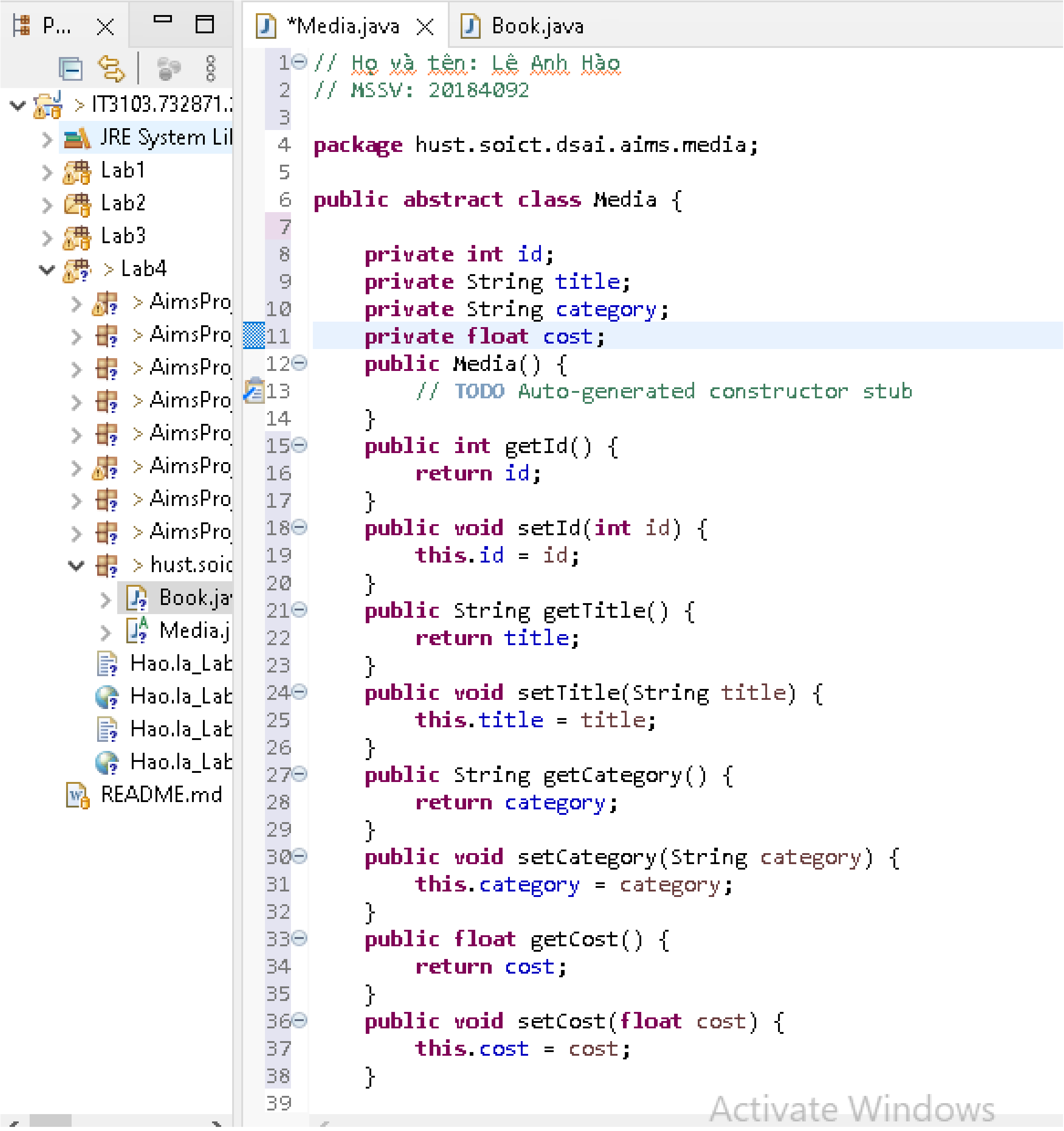


```
    // Họ và tên: Lê Anh Hào
    // MSSV: 20184092

    // Tạo method addAuthor
    public void addAuthor(String authorName) {
        if (! authors.contains(authorName)) {
            authors.add(authorName);
        }
    }
    // Tạo method removeAuthor
    public void removeAuthor(String authorName) {
        if (! authors.contains(authorName)) {
            authors.remove(authorName);
        }
    }

    public Book() {
        // TODO Auto-generated constructor stub
    }
```

4. Creating the abstract Media class

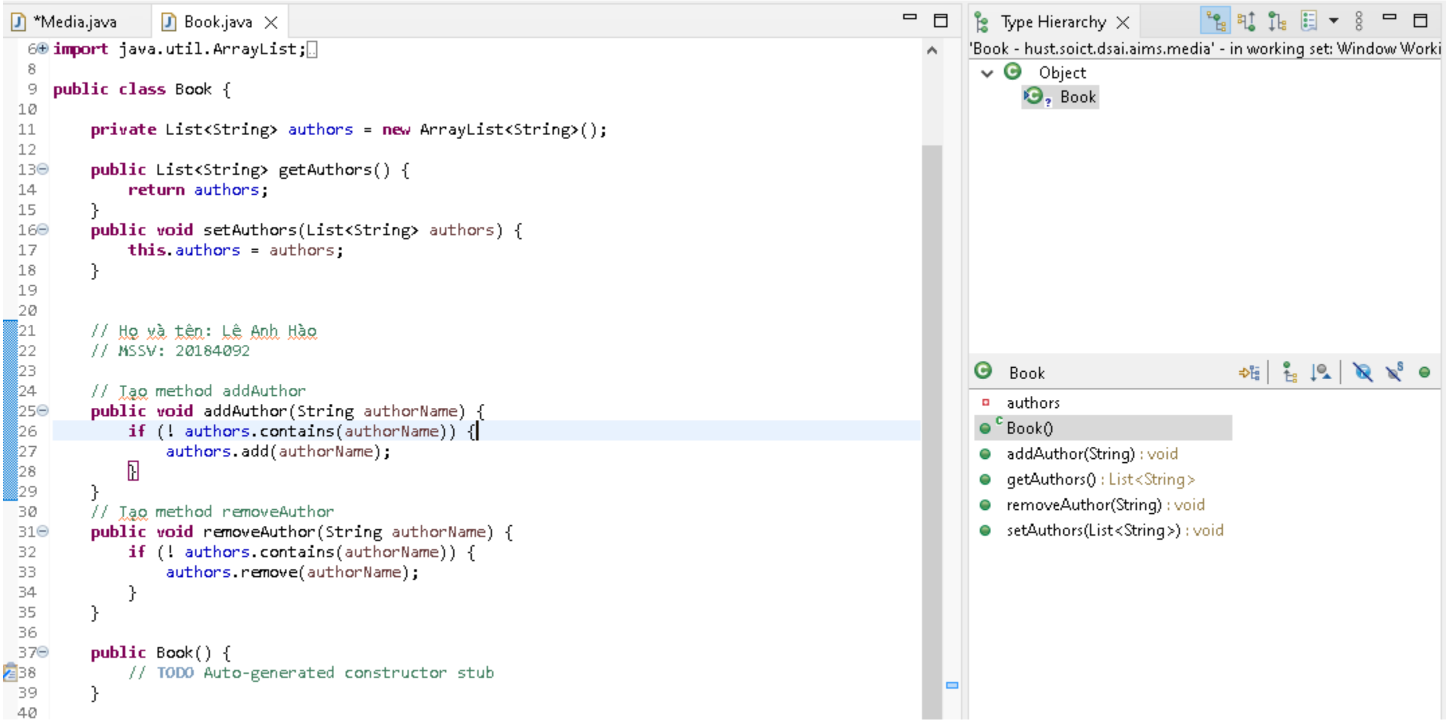
Create the Media class in the project

Add fields to the Media class



```java
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

package hust.soict.dsai.aims.media;

public abstract class Media {

    private int id;
    private String title;
    private String category;
    private float cost;
    public Media() {
        // TODO Auto-generated constructor stub
    }
    public int getId() {
        return id;
    }
    public void setId(int id) {
        this.id = id;
    }
    public String getTitle() {
        return title;
    }
    public void setTitle(String title) {
        this.title = title;
    }
    public String getCategory() {
        return category;
    }
    public void setCategory(String category) {
        this.category = category;
    }
    public float getCost() {
        return cost;
    }
    public void setCost(float cost) {
        this.cost = cost;
    }

```

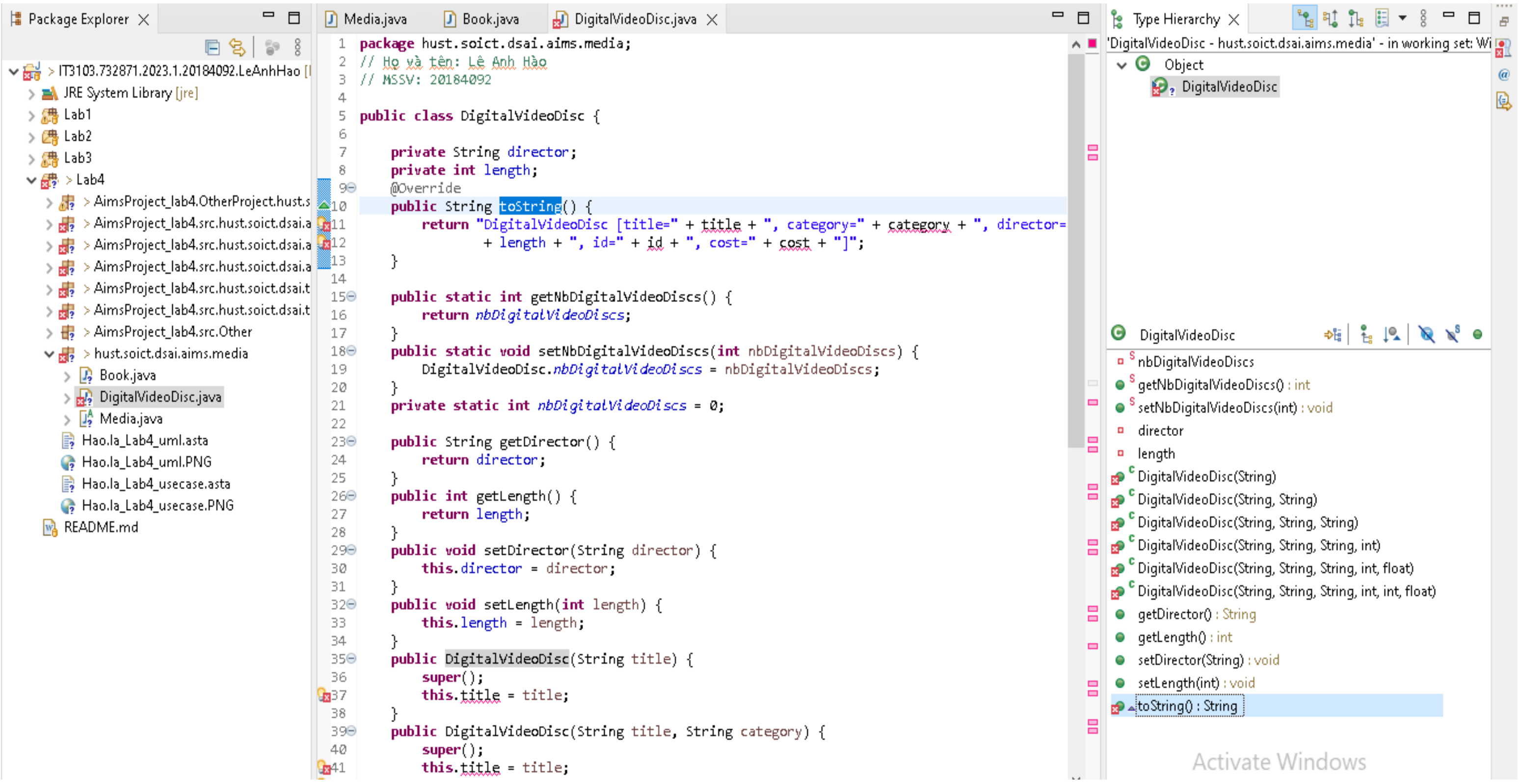
Remove fields and methods from Book class



*Media.java
Book.java
Type Hierarchy
'Book - hust.soict.dsai.aims.media' - in working set: Window Worki
Object
Book
Book
authors
Book()
addAuthor(String) : void
getAuthors() : List<String>
removeAuthor(String) : void
setAuthors(List<String>) : void

```java
import java.util.ArrayList;

public class Book {

    private List<String> authors = new ArrayList<String>();

    public List<String> getAuthors() {
        return authors;
    }
    public void setAuthors(List<String> authors) {
        this.authors = authors;
    }


    // Họ và tên: Lê Anh Hào
    // MSSV: 20184092

    // Tạo method addAuthor
    public void addAuthor(String authorName) {
        if (! authors.contains(authorName)) {
            authors.add(authorName);
        }
    }
    // Tạo method removeAuthor
    public void removeAuthor(String authorName) {
        if (! authors.contains(authorName)) {
            authors.remove(authorName);
        }
    }

    public Book() {
        // TODO Auto-generated constructor stub
    }

```

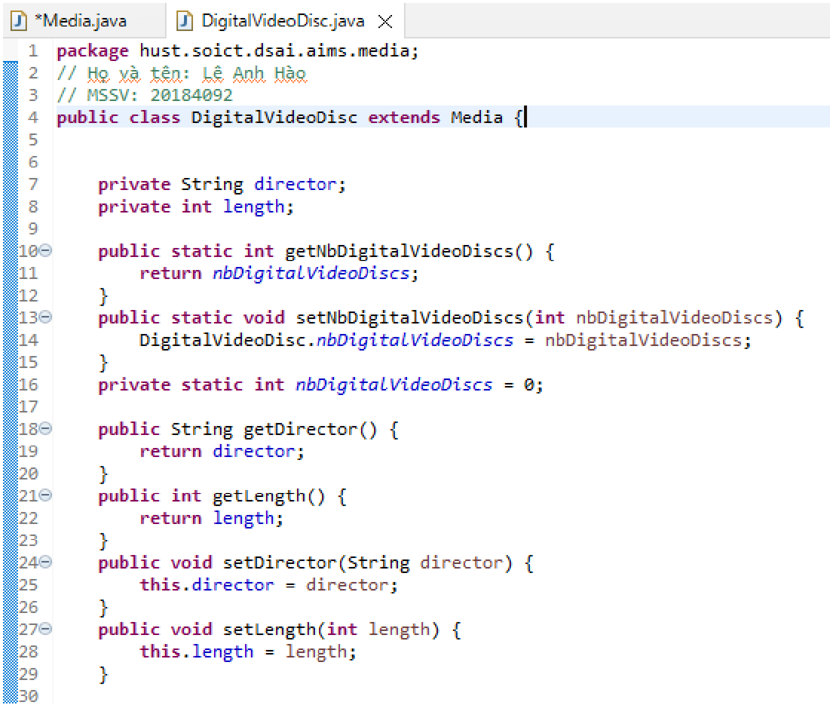
Do similarly for the DigitalVideoDisc class and move it to the package *hust.soict.dsai.aims.media*. Remove the package *hust.soict.dsai.aims.disc.*



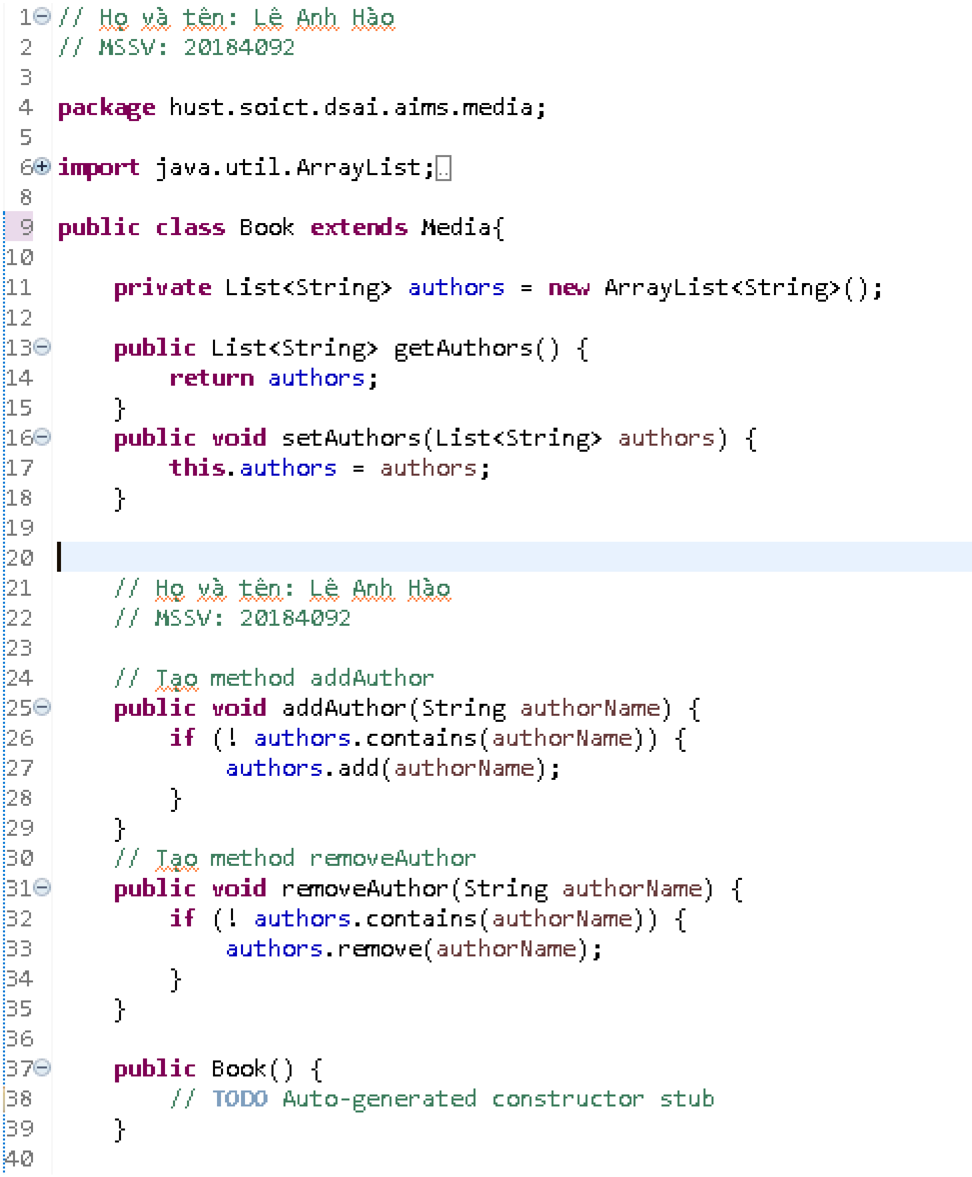
Package Explorer
> IT3103.732871.2023.1.20184092.LeAnhHao [I
JRE System Library [jre]
Lab1
Lab2
Lab3
> Lab4
> AimsProject_lab4.OtherProject.hust.s
> AimsProject_lab4.src.hust.soict.dsai.a
> AimsProject_lab4.src.hust.soict.dsai.a
> AimsProject_lab4.src.hust.soict.dsai.a
> AimsProject_lab4.src.hust.soict.dsai.t
> AimsProject_lab4.src.hust.soict.dsai.t
> AimsProject_lab4.src.Other
> hust.soict.dsai.aims.media
Book.java
DigitalVideoDisc.java
Media.java
Hao.la_Lab4_uml.asta
Hao.la_Lab4_uml.PNG
Hao.la_Lab4_usecase.asta
Hao.la_Lab4_usecase.PNG
README.md
Media.java
Book.java
DigitalVideoDisc.java
Type Hierarchy
'DigitalVideoDisc - hust.soict.dsai.aims.media' - in working set: Wi
Object
DigitalVideoDisc
DigitalVideoDisc
nbDigitalVideoDiscs
getNbDigitalVideoDiscs() : int
setNbDigitalVideoDiscs(int) : void
director
length
DigitalVideoDisc(String)
DigitalVideoDisc(String, String)
DigitalVideoDisc(String, String, String)
DigitalVideoDisc(String, String, String, int)
DigitalVideoDisc(String, String, String, int, float)
DigitalVideoDisc(String, String, String, int, int, float)
getDirector() : String
getLength() : int
setDirector(String) : void
setLength(int) : void
toString() : String
Activate Windows

```java
package hust.soict.dsai.aims.media;
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

public class DigitalVideoDisc {

    private String director;
    private int length;
    @Override
    public String toString() {
        return "DigitalVideoDisc [title=" + title + ", category=" + category + ", director=
            + length + ", id=" + id + ", cost=" + cost + "]";
    }

    public static int getNbDigitalVideoDiscs() {
        return nbDigitalVideoDiscs;
    }
    public static void setNbDigitalVideoDiscs(int nbDigitalVideoDiscs) {
        DigitalVideoDisc.nbDigitalVideoDiscs = nbDigitalVideoDiscs;
    }
    private static int nbDigitalVideoDiscs = 0;

    public String getDirector() {
        return director;
    }
    public int getLength() {
        return length;
    }
    public void setDirector(String director) {
        this.director = director;
    }
    public void setLength(int length) {
        this.length = length;
    }
    public DigitalVideoDisc(String title) {
        super();
        this.title = title;
    }
    public DigitalVideoDisc(String title, String category) {
        super();
        this.title = title;
```

Extend the Media class for both Book and DigitalVideoDisc



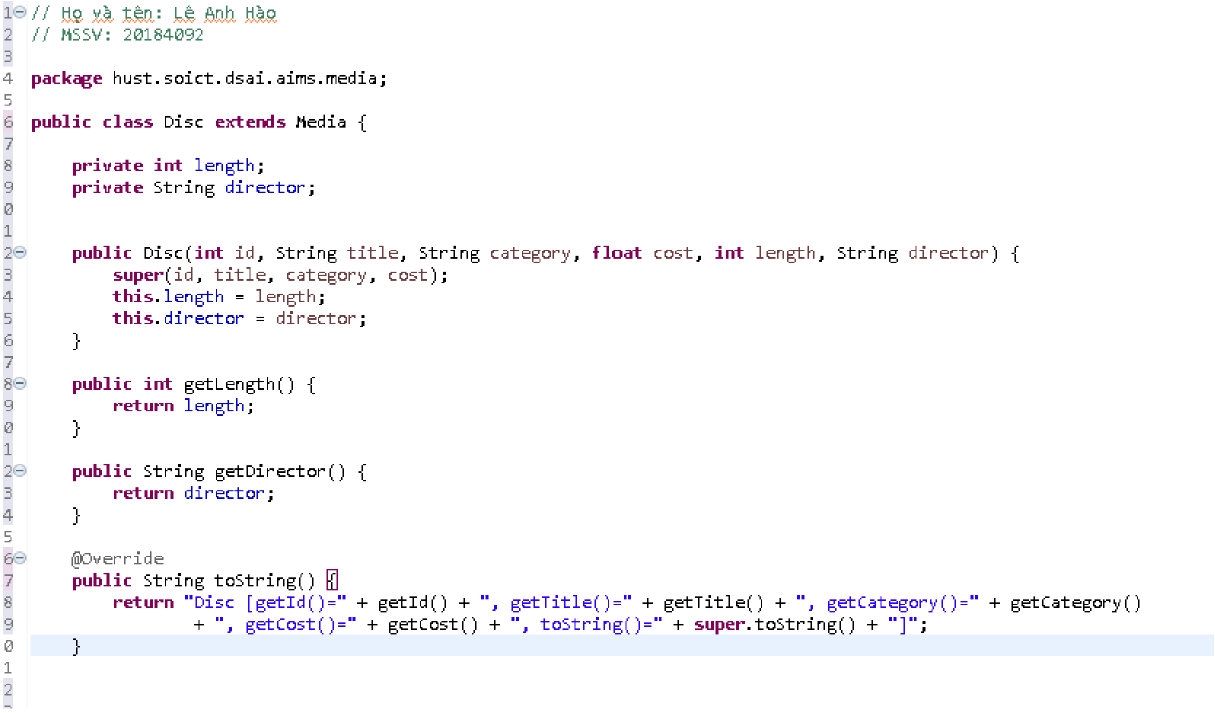
```java
package hust.soict.dsai.aims.media;
// Họ và tên: Lê Anh Hào
// MSSV: 20184092
public class DigitalVideoDisc extends Media {


    private String director;
    private int length;

    public static int getNbDigitalVideoDiscs() {
        return nbDigitalVideoDiscs;
    }
    public static void setNbDigitalVideoDiscs(int nbDigitalVideoDiscs) {
        DigitalVideoDisc.nbDigitalVideoDiscs = nbDigitalVideoDiscs;
    }
    private static int nbDigitalVideoDiscs = 0;

    public String getDirector() {
        return director;
    }
    public int getLength() {
        return length;
    }
    public void setDirector(String director) {
        this.director = director;
    }
    public void setLength(int length) {
        this.length = length;
    }

```



```java
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

package hust.soict.dsai.aims.media;

import java.util.ArrayList;

public class Book extends Media{

    private List<String> authors = new ArrayList<String>();

    public List<String> getAuthors() {
        return authors;
    }
    public void setAuthors(List<String> authors) {
        this.authors = authors;
    }


    // Họ và tên: Lê Anh Hào
    // MSSV: 20184092

    // Tạo method addAuthor
    public void addAuthor(String authorName) {
        if (! authors.contains(authorName)) {
            authors.add(authorName);
        }
    }
    // Tạo method removeAuthor
    public void removeAuthor(String authorName) {
        if (! authors.contains(authorName)) {
            authors.remove(authorName);
        }
    }

    public Book() {
        // TODO Auto-generated constructor stub
    }

```

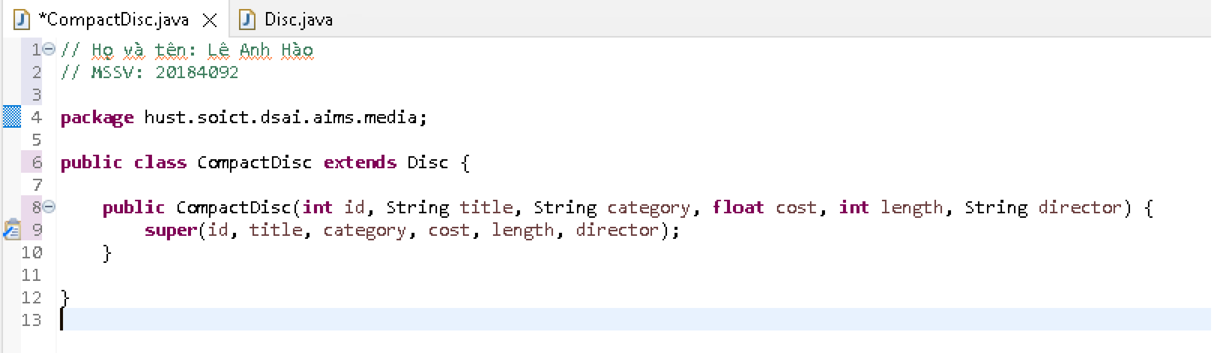
5. Creating the CompactDisc class

5.1. Create the Disc class extending the Media class



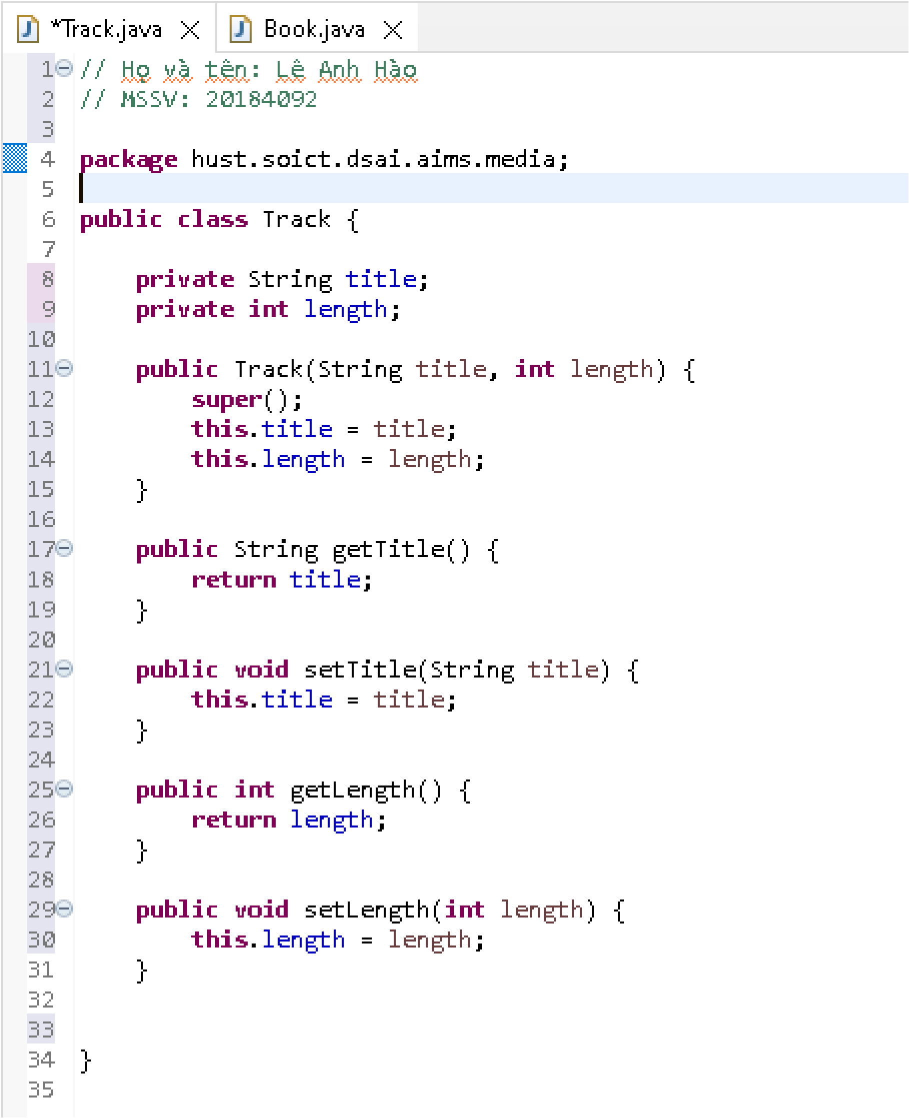
```java
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

package hust.soict.dsai.aims.media;

public class Disc extends Media {

    private int length;
    private String director;


    public Disc(int id, String title, String category, float cost, int length, String director) {
        super(id, title, category, cost);
        this.length = length;
        this.director = director;
    }

    public int getLength() {
        return length;
    }

    public String getDirector() {
        return director;
    }

    @Override
    public String toString() {
        return "Disc [getId()=" + getId() + ", getTitle()=" + getTitle() + ", getCategory()=" + getCategory()
                + ", getCost()=" + getCost() + ", toString()=" + super.toString() + "]";
    }


```

CompactDisc extending the Disc class



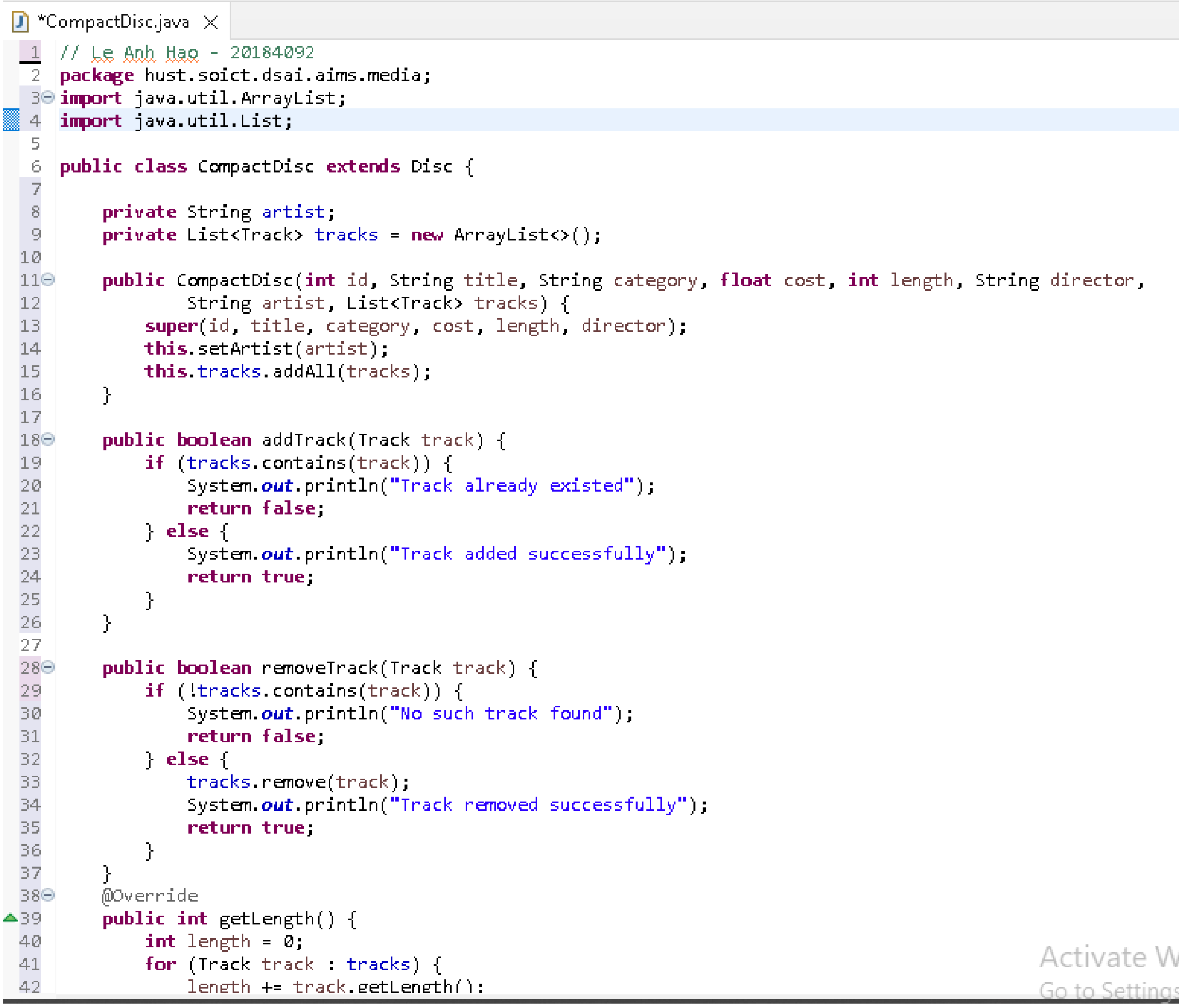
```java
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

package hust.soict.dsai.aims.media;

public class CompactDisc extends Disc {

    public CompactDisc(int id, String title, String category, float cost, int length, String director) {
        super(id, title, category, cost, length, director);
    }

}

```

5.2 Create the Track class



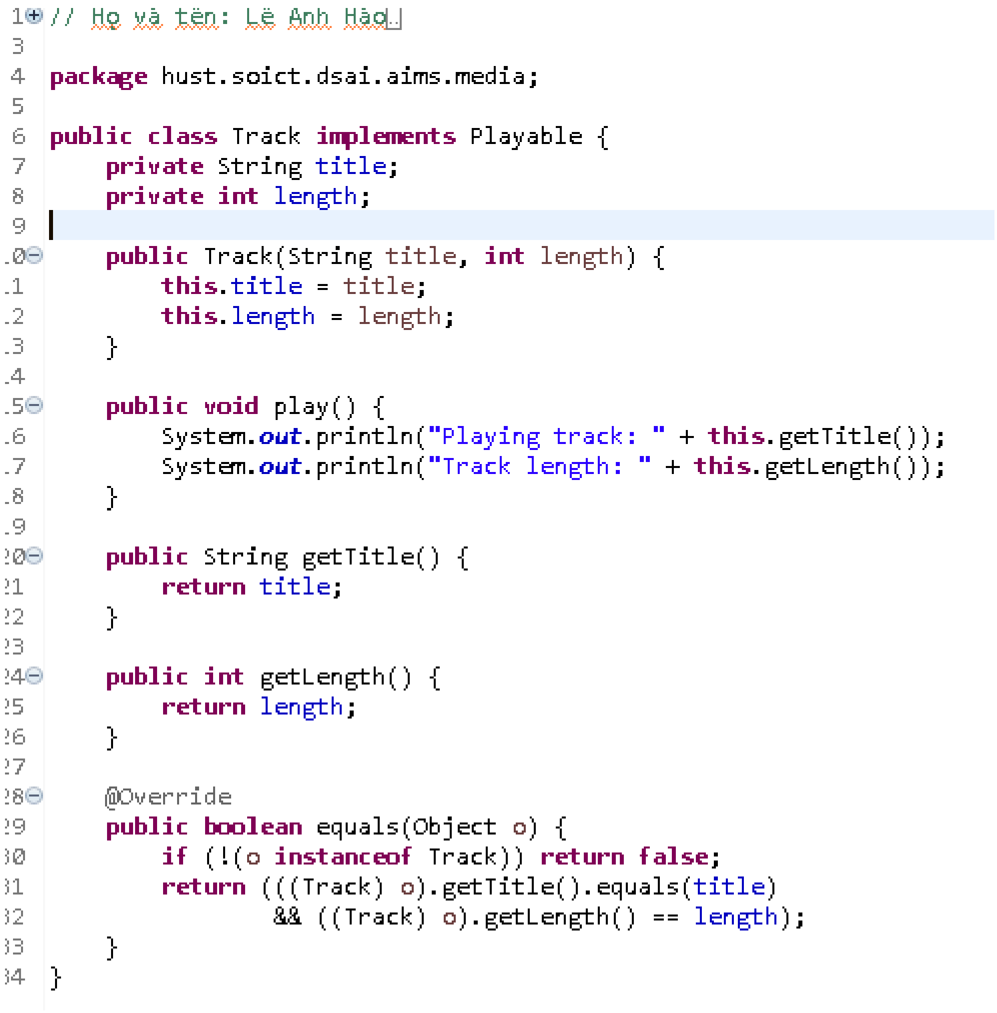
```java
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

package hust.soict.dsai.aims.media;

public class Track {

    private String title;
    private int length;

    public Track(String title, int length) {
        super();
        this.title = title;
        this.length = length;
    }

    public String getTitle() {
        return title;
    }

    public void setTitle(String title) {
        this.title = title;
    }

    public int getLength() {
        return length;
    }

    public void setLength(int length) {
        this.length = length;
    }


}

```

5.3 Open the CompactDisc class

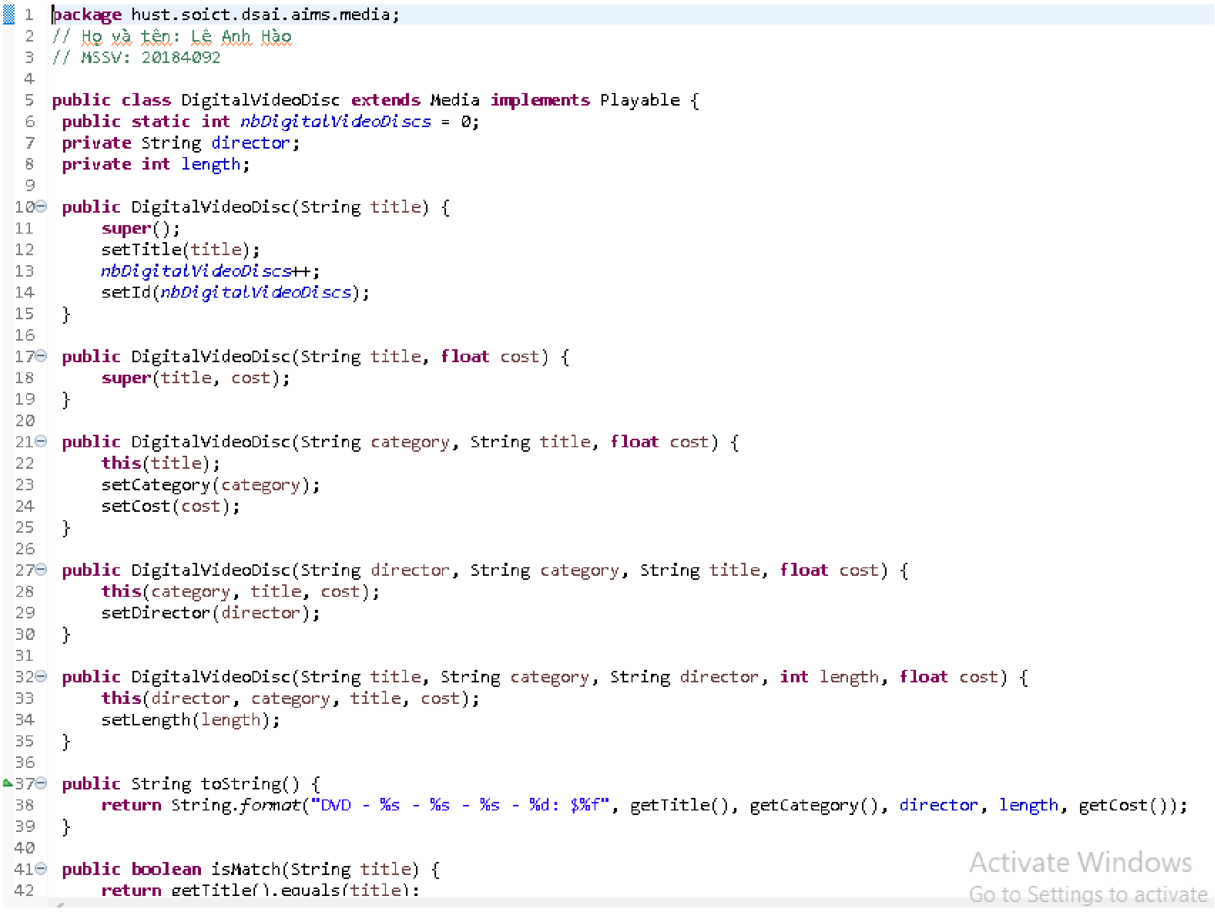


```java
// Le Anh Hao - 20184092
package hust.soict.dsai.aims.media;
import java.util.ArrayList;
import java.util.List;

public class CompactDisc extends Disc {

    private String artist;
    private List<Track> tracks = new ArrayList<>();

    public CompactDisc(int id, String title, String category, float cost, int length, String director,
            String artist, List<Track> tracks) {
        super(id, title, category, cost, length, director);
        this.setArtist(artist);
        this.tracks.addAll(tracks);
    }

    public boolean addTrack(Track track) {
        if (tracks.contains(track)) {
            System.out.println("Track already existed");
            return false;
        } else {
            System.out.println("Track added successfully");
            return true;
        }
    }

    public boolean removeTrack(Track track) {
        if (!tracks.contains(track)) {
            System.out.println("No such track found");
            return false;
        } else {
            tracks.remove(track);
            System.out.println("Track removed successfully");
            return true;
        }
    }
    @Override
    public int getLength() {
        int length = 0;
        for (Track track : tracks) {
            length += track.getLength();
```

6. Create the Playable interface

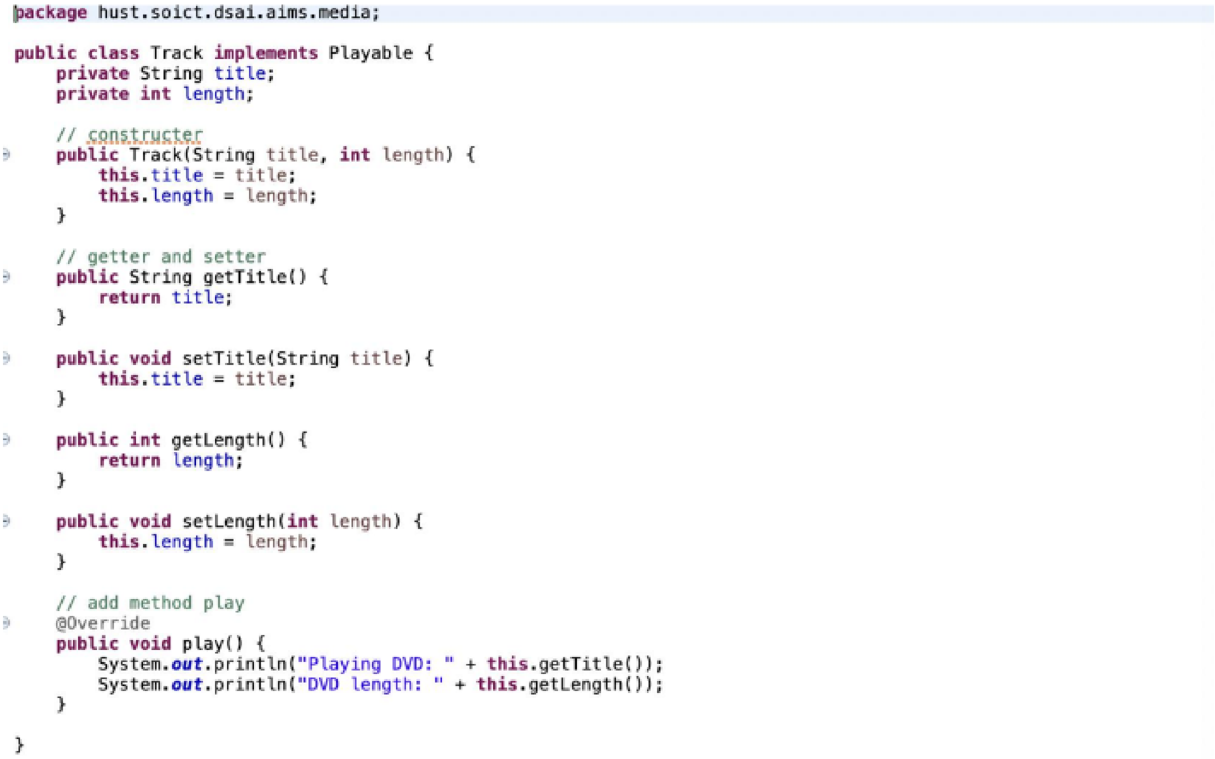


```java
// Họ và tên: Lê Anh Hào

package hust.soict.dsai.aims.media;

public class Track implements Playable {
    private String title;
    private int length;

    public Track(String title, int length) {
        this.title = title;
        this.length = length;
    }

    public void play() {
        System.out.println("Playing track: " + this.getTitle());
        System.out.println("Track length: " + this.getLength());
    }

    public String getTitle() {
        return title;
    }

    public int getLength() {
        return length;
    }

    @Override
    public boolean equals(Object o) {
        if (!(o instanceof Track)) return false;
        return (((Track) o).getTitle().equals(title)
                && ((Track) o).getLength() == length);
    }
}
```



```
package hust.soict.dsai.aims.media;
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

public class DigitalVideoDisc extends Media implements Playable {
 public static int nbDigitalVideoDiscs = 0;
 private String director;
 private int length;

 public DigitalVideoDisc(String title) {
     super();
     setTitle(title);
     nbDigitalVideoDiscs++;
     setId(nbDigitalVideoDiscs);
 }

 public DigitalVideoDisc(String title, float cost) {
     super(title, cost);
 }

 public DigitalVideoDisc(String category, String title, float cost) {
     this(title);
     setCategory(category);
     setCost(cost);
 }

 public DigitalVideoDisc(String director, String category, String title, float cost) {
     this(category, title, cost);
     setDirector(director);
 }

 public DigitalVideoDisc(String title, String category, String director, int length, float cost) {
     this(director, category, title, cost);
     setLength(length);
 }

 public String toString() {
     return String.format("DVD - %s - %s - %s - %d: $%f", getTitle(), getCategory(), director, length, getCost());
 }

 public boolean isMatch(String title) {
     return getTitle().equals(title);
```

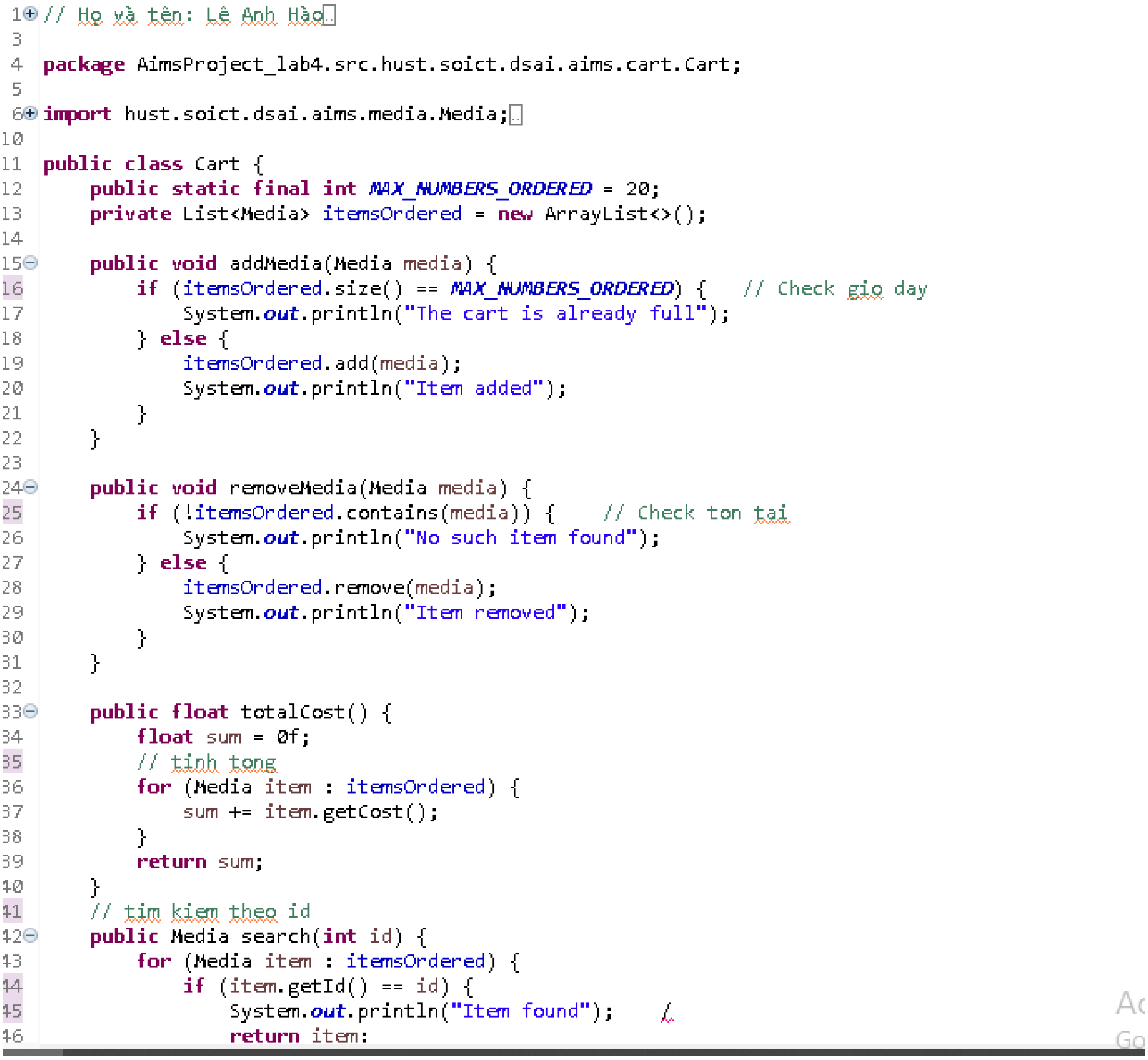
Method play



```
package hust.soict.dsai.aims.media;

public class Track implements Playable {
    private String title;
    private int length;

    // constructer
    public Track(String title, int length) {
        this.title = title;
        this.length = length;
    }

    // getter and setter
    public String getTitle() {
        return title;
    }

    public void setTitle(String title) {
        this.title = title;
    }

    public int getLength() {
        return length;
    }

    public void setLength(int length) {
        this.length = length;
    }

    // add method play
    @Override
    public void play() {
        System.out.println("Playing DVD: " + this.getTitle());
        System.out.println("DVD length: " + this.getLength());
    }
}
```

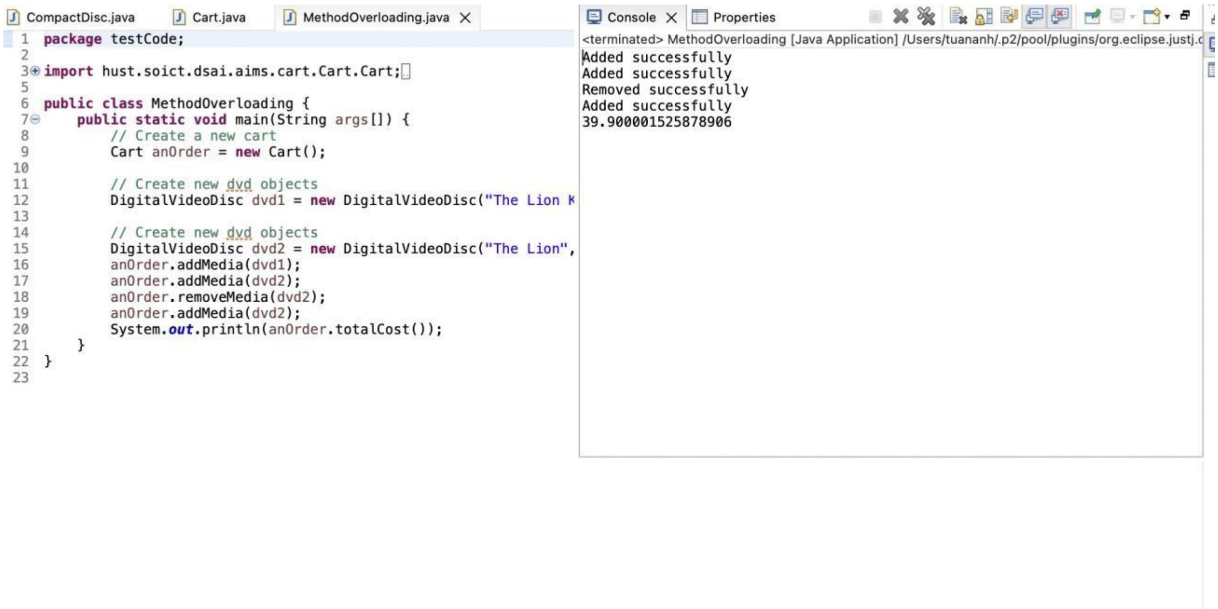
```
    public void removeTrack(Track track) {
        if (!tracks.contains(track)) {
            System.out.println("No found");
        } else {
            tracks.remove(track);
            System.out.println("Removed successfully");
        }
    }
// Le Anh Hao
    public void play() {
        for (Track track : tracks) {
            track.play();
        }
    }
```

7. Update the Cart class to work with Media



```
// Họ và tên: Lê Anh Hào

package AimsProject_lab4.src.hust.soict.dsai.aims.cart.Cart;

import hust.soict.dsai.aims.media.Media;

public class Cart {
    public static final int MAX_NUMBERS_ORDERED = 20;
    private List<Media> itemsOrdered = new ArrayList<>();

    public void addMedia(Media media) {
        if (itemsOrdered.size() == MAX_NUMBERS_ORDERED) {   // Check gio day
            System.out.println("The cart is already full");
        } else {
            itemsOrdered.add(media);
            System.out.println("Item added");
        }
    }

    public void removeMedia(Media media) {
        if (!itemsOrdered.contains(media)) {    // Check ton tai
            System.out.println("No such item found");
        } else {
            itemsOrdered.remove(media);
            System.out.println("Item removed");
        }
    }

    public float totalCost() {
        float sum = 0f;
        // tinh tong
        for (Media item : itemsOrdered) {
            sum += item.getCost();
        }
        return sum;
    }
    // tim kiem theo id
    public Media search(int id) {
        for (Media item : itemsOrdered) {
            if (item.getId() == id) {
                System.out.println("Item found");
                return item;
```

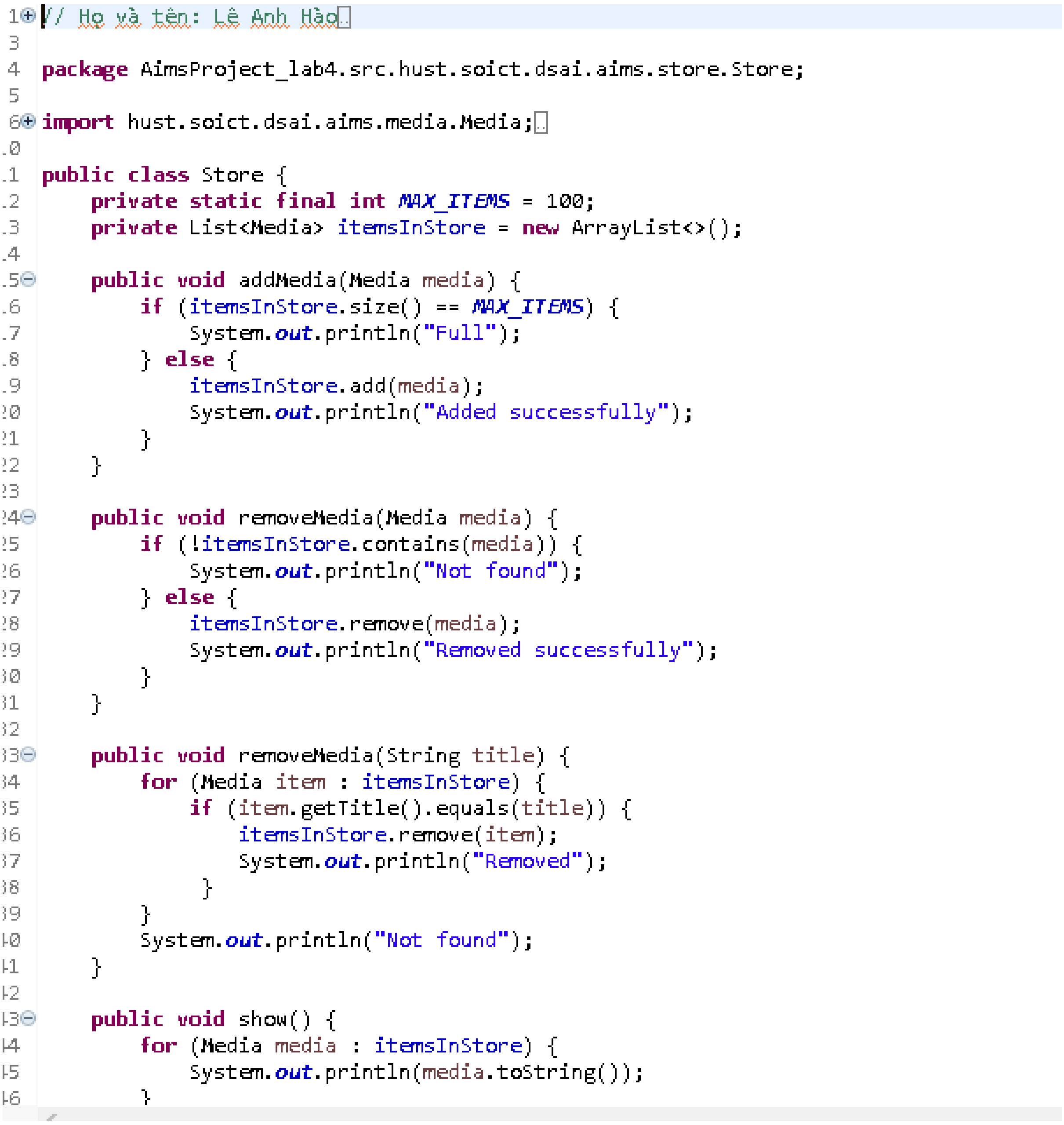
Kết quả:



```java
package testCode;

import hust.soict.dsai.aims.cart.Cart.Cart;

public class MethodOverloading {
    public static void main(String args[]) {
        // Create a new cart
        Cart anOrder = new Cart();

        // Create new dvd objects
        DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion K

        // Create new dvd objects
        DigitalVideoDisc dvd2 = new DigitalVideoDisc("The Lion",
        anOrder.addMedia(dvd1);
        anOrder.addMedia(dvd2);
        anOrder.removeMedia(dvd2);
        anOrder.addMedia(dvd2);
        System.out.println(anOrder.totalCost());
    }
}
```

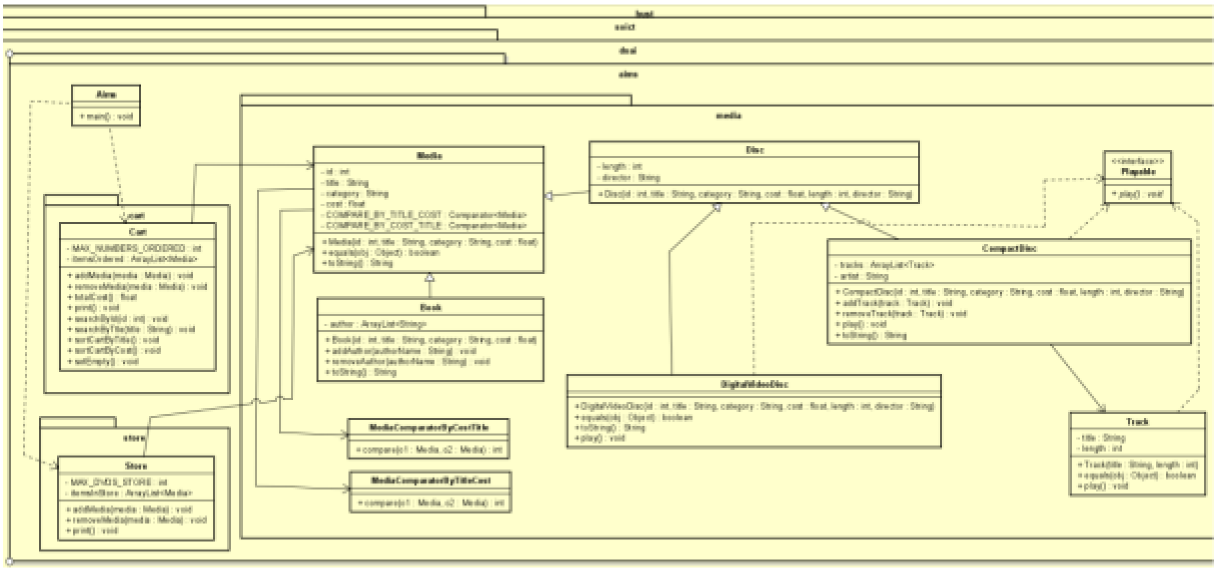
```
<terminated> MethodOverloading [Java Application] /Users/tuananh/.p2/pool/plugins/org.eclipse.justj.c
Added successfully
Added successfully
Removed successfully
Added successfully
39.900001525878906
```

8. Update the Store class to work with Media

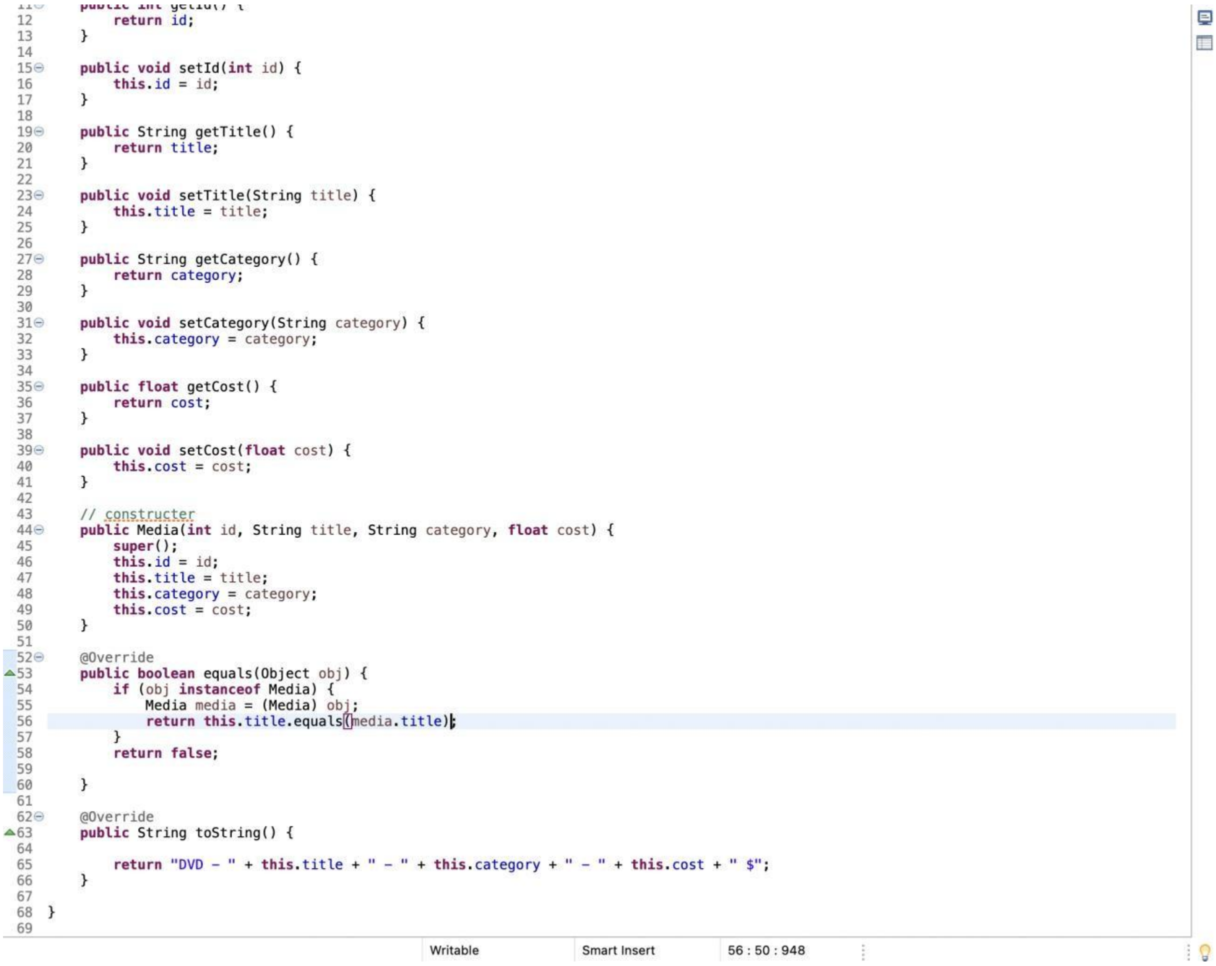


```
// Họ và tên: Lê Anh Hào

package AimsProject_lab4.src.hust.soict.dsai.aims.store.Store;

import hust.soict.dsai.aims.media.Media;

public class Store {
    private static final int MAX_ITEMS = 100;
    private List<Media> itemsInStore = new ArrayList<>();

    public void addMedia(Media media) {
        if (itemsInStore.size() == MAX_ITEMS) {
            System.out.println("Full");
        } else {
            itemsInStore.add(media);
            System.out.println("Added successfully");
        }
    }

    public void removeMedia(Media media) {
        if (!itemsInStore.contains(media)) {
            System.out.println("Not found");
        } else {
            itemsInStore.remove(media);
            System.out.println("Removed successfully");
        }
    }

    public void removeMedia(String title) {
        for (Media item : itemsInStore) {
            if (item.getTitle().equals(title)) {
                itemsInStore.remove(item);
                System.out.println("Removed");
             }
        }
        System.out.println("Not found");
    }

    public void show() {
        for (Media media : itemsInStore) {
            System.out.println(media.toString());
        }
```

9. Constructors of whole classes and parent classes

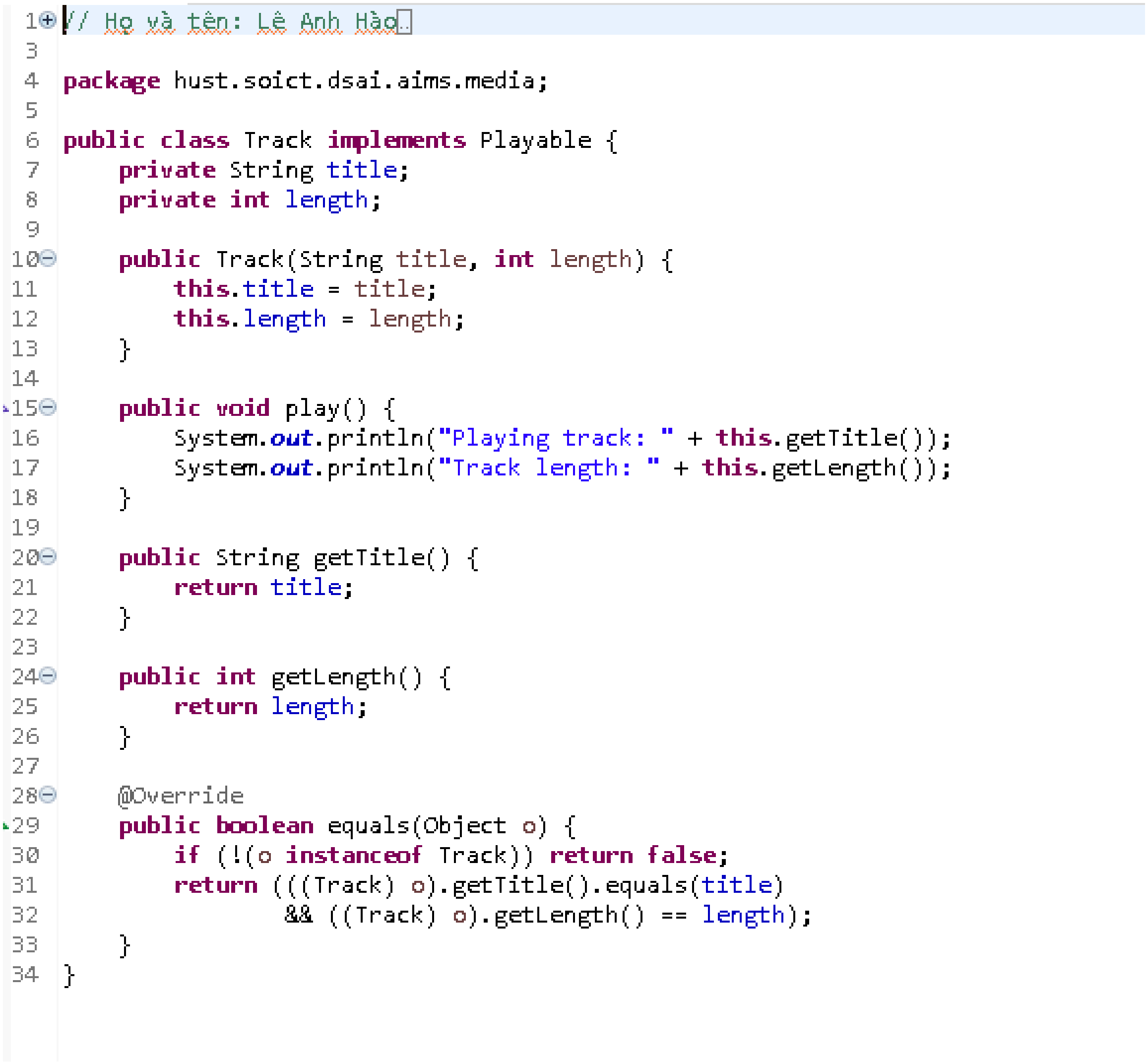

hust
soict
dsai
aims
Aims
+ main() : void
cart
Cart
- MAX_NUMBERS_ORDERED : int
- itemsOrdered : ArrayList<Media>
+ addMedia(media : Media) : void
+ removeMedia(media : Media) : void
+ totalCost() : float
+ print() : void
+ searchById(id : int) : void
+ searchByTitle(title : String) : void
+ sortCartByTitle() : void
+ sortCartByCost() : void
+ setEmpty() : void
store
Store
- MAX_DVDS_STORE : int
- itemsInStore : ArrayList<Media>
+ addMedia(media : Media) : void
+ removeMedia(media : Media) : void
+ print() : void
media
Media
- id : int
- title : String
- category : String
- cost : float
- COMPARE_BY_TITLE_COST : Comparator<Media>
- COMPARE_BY_COST_TITLE : Comparator<Media>
+ Media(id : int, title : String, category : String, cost : float)
+ equals(obj : Object) : boolean
+ toString() : String
Book
- author : ArrayList<String>
+ Book(id : int, title : String, category : String, cost : float)
+ addAuthor(authorName : String) : void
+ removeAuthor(authorName : String) : void
+ toString() : String
MediaComparatorByCostTitle
+ compare(o1 : Media, o2 : Media) : int
MediaComparatorByTitleCost
+ compare(o1 : Media, o2 : Media) : int
Disc
- length : int
- director : String
+ Disc(id : int, title : String, category : String, cost : float, length : int, director : String)
<<interface>>
Playable
+ play() : void
CompactDisc
- tracks : ArrayList<Track>
- artist : String
+ CompactDisc(id : int, title : String, category : String, cost : float, length : int, director : String)
+ addTrack(track : Track) : void
+ removeTrack(track : Track) : void
+ play() : void
+ toString() : String
DigitalVideoDisc
+ DigitalVideoDisc(id : int, title : String, category : String, cost : float, length : int, director : String)
+ equals(obj : Object) : boolean
+ toString() : String
+ play() : void
Track
- title : String
- length : int
+ Track(title : String, length : int)
+ equals(obj : Object) : boolean
+ play() : void

10. Unique item in a list



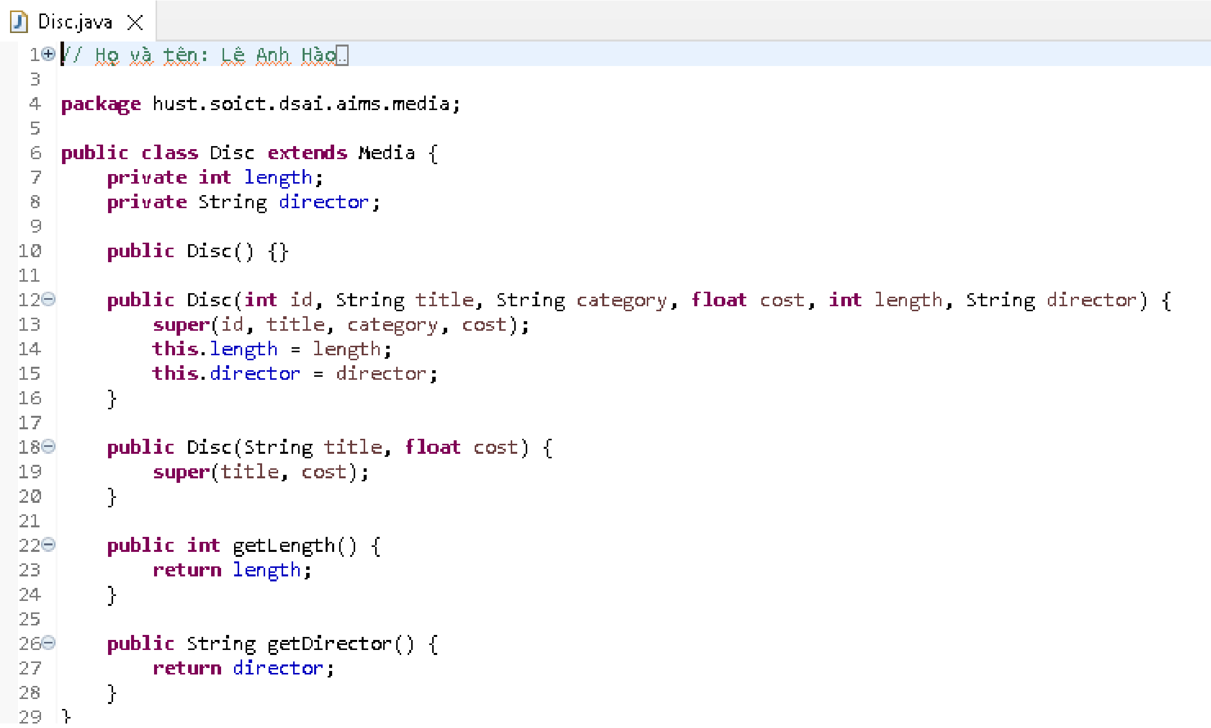
```
    public int getId() {
        return id;
    }

    public void setId(int id) {
        this.id = id;
    }

    public String getTitle() {
        return title;
    }

    public void setTitle(String title) {
        this.title = title;
    }

    public String getCategory() {
        return category;
    }

    public void setCategory(String category) {
        this.category = category;
    }

    public float getCost() {
        return cost;
    }

    public void setCost(float cost) {
        this.cost = cost;
    }

    // constructer
    public Media(int id, String title, String category, float cost) {
        super();
        this.id = id;
        this.title = title;
        this.category = category;
        this.cost = cost;
    }

    @Override
    public boolean equals(Object obj) {
        if (obj instanceof Media) {
            Media media = (Media) obj;
            return this.title.equals(media.title);
        }
        return false;

    }

    @Override
    public String toString() {

        return "DVD - " + this.title + " - " + this.category + " - " + this.cost + " $";
    }

}
```

Track class



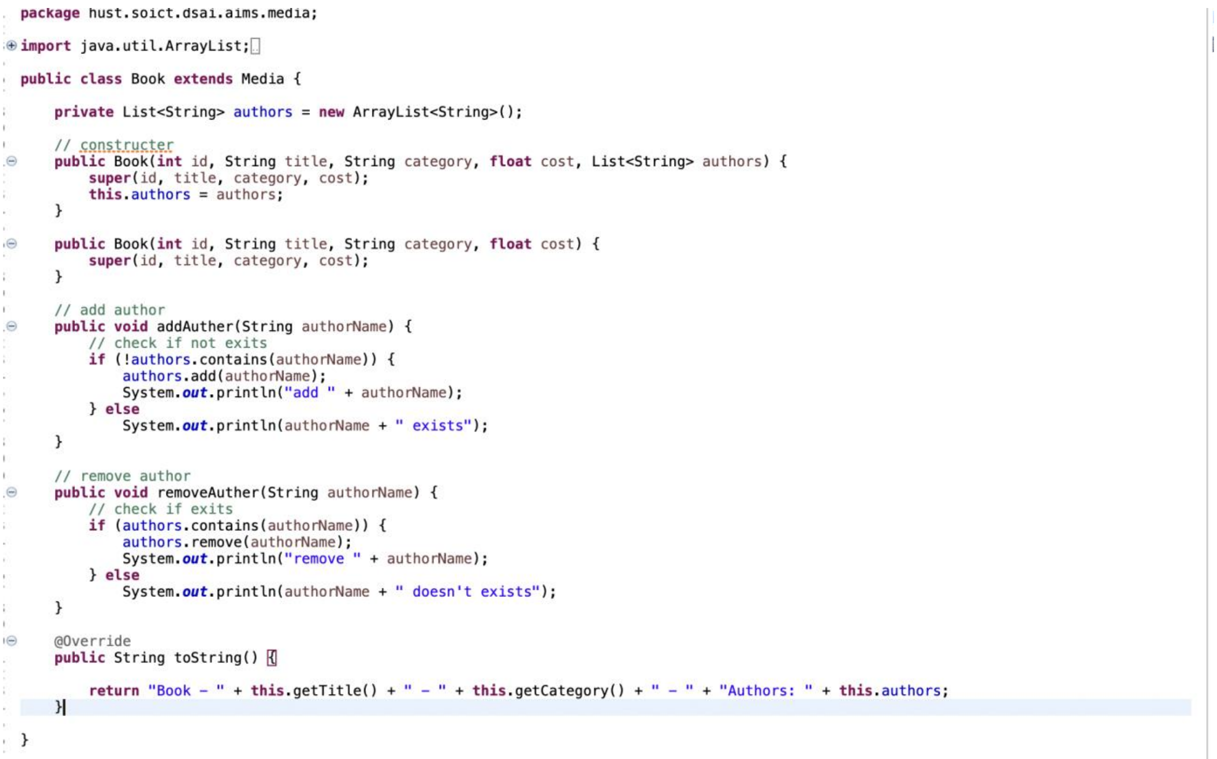
```
// Họ và tên: Lê Anh Hào

package hust.soict.dsai.aims.media;

public class Track implements Playable {
    private String title;
    private int length;

    public Track(String title, int length) {
        this.title = title;
        this.length = length;
    }

    public void play() {
        System.out.println("Playing track: " + this.getTitle());
        System.out.println("Track length: " + this.getLength());
    }

    public String getTitle() {
        return title;
    }

    public int getLength() {
        return length;
    }

    @Override
    public boolean equals(Object o) {
        if (!(o instanceof Track)) return false;
        return (((Track) o).getTitle().equals(title)
                && ((Track) o).getLength() == length);
    }
}
```

11.Polymorphism with toString() method

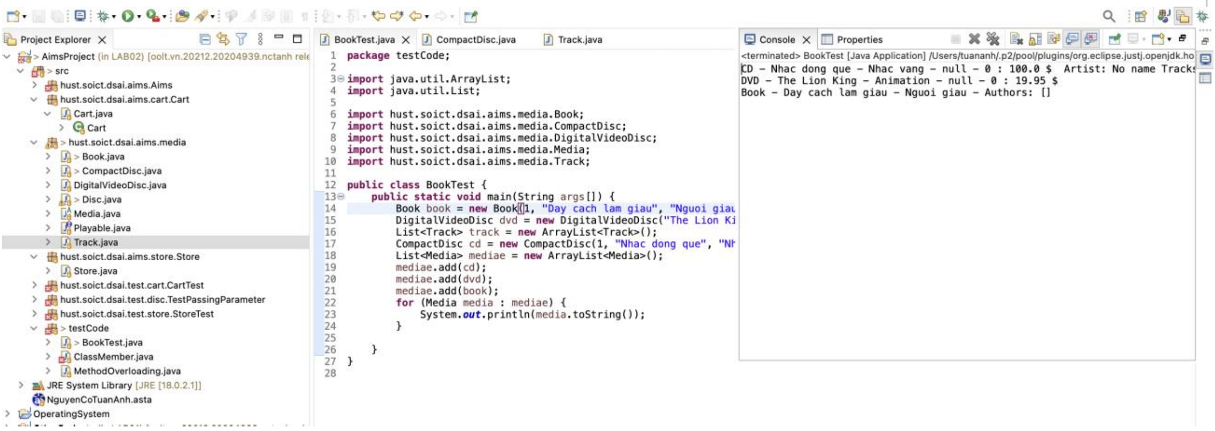


```java
// Họ và tên: Lê Anh Hào

package hust.soict.dsai.aims.media;

public class Disc extends Media {
    private int length;
    private String director;

    public Disc() {}

    public Disc(int id, String title, String category, float cost, int length, String director) {
        super(id, title, category, cost);
        this.length = length;
        this.director = director;
    }

    public Disc(String title, float cost) {
        super(title, cost);
    }

    public int getLength() {
        return length;
    }

    public String getDirector() {
        return director;
    }
}
```

Test Code



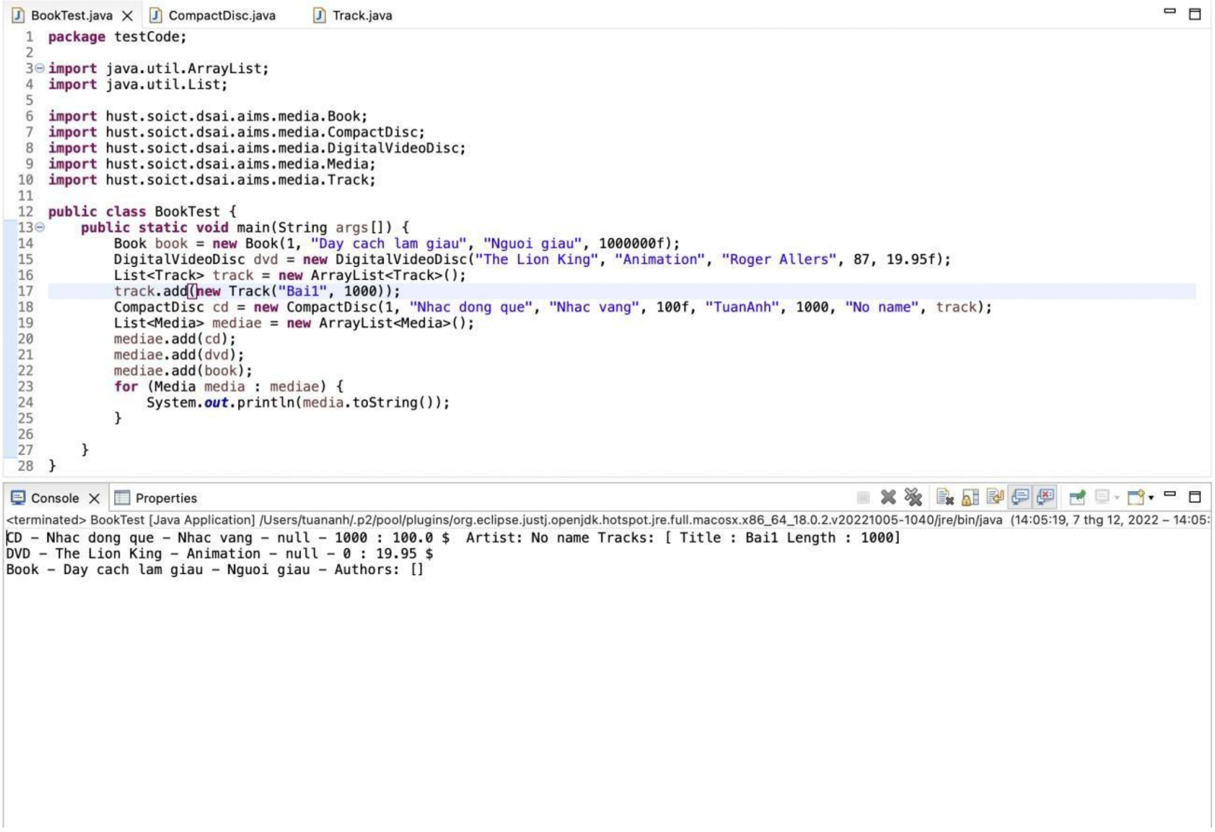
```java
package hust.soict.dsai.aims.media;

import java.util.ArrayList;

public class Book extends Media {

    private List<String> authors = new ArrayList<String>();

    // constructer
    public Book(int id, String title, String category, float cost, List<String> authors) {
        super(id, title, category, cost);
        this.authors = authors;
    }

    public Book(int id, String title, String category, float cost) {
        super(id, title, category, cost);
    }

    // add author
    public void addAuther(String authorName) {
        // check if not exits
        if (!authors.contains(authorName)) {
            authors.add(authorName);
            System.out.println("add " + authorName);
        } else
            System.out.println(authorName + " exists");
    }

    // remove author
    public void removeAuther(String authorName) {
        // check if exits
        if (authors.contains(authorName)) {
            authors.remove(authorName);
            System.out.println("remove " + authorName);
        } else
            System.out.println(authorName + " doesn't exists");
    }

    @Override
    public String toString() {

        return "Book - " + this.getTitle() + " - " + this.getCategory() + " - " + "Authors: " + this.authors;
    }

}
```



Project Explorer
AimsProject (in LAB02) [oolt.vn.20212.20204939.nctanh rele
src
hust.soict.dsai.aims.Aims
hust.soict.dsai.aims.cart.Cart
Cart.java
Cart
hust.soict.dsai.aims.media
Book.java
CompactDisc.java
DigitalVideoDisc.java
Disc.java
Media.java
Playable.java
Track.java
hust.soict.dsai.aims.store.Store
Store.java
hust.soict.dsai.test.cart.CartTest
hust.soict.dsai.test.disc.TestPassingParameter
hust.soict.dsai.test.store.StoreTest
testCode
BookTest.java
ClassMember.java
MethodOverloading.java
JRE System Library [JRE [18.0.2.1]]
NguyenCoTuanAnh.asta
OperatingSystem
BookTest.java
CompactDisc.java
Track.java
Console
Properties

```java
package testCode;

import java.util.ArrayList;
import java.util.List;

import hust.soict.dsai.aims.media.Book;
import hust.soict.dsai.aims.media.CompactDisc;
import hust.soict.dsai.aims.media.DigitalVideoDisc;
import hust.soict.dsai.aims.media.Media;
import hust.soict.dsai.aims.media.Track;

public class BookTest {
    public static void main(String args[]) {
        Book book = new Book(1, "Day cach lam giau", "Nguoi giau
        DigitalVideoDisc dvd = new DigitalVideoDisc("The Lion Ki
        List<Track> track = new ArrayList<Track>();
        CompactDisc cd = new CompactDisc(1, "Nhac dong que", "Nh
        List<Media> mediae = new ArrayList<Media>();
        mediae.add(cd);
        mediae.add(dvd);
        mediae.add(book);
        for (Media media : mediae) {
            System.out.println(media.toString());
        }

    }
}
```

```
<terminated> BookTest [Java Application] /Users/tuananh/.p2/pool/plugins/org.eclipse.justj.openjdk.ho
CD - Nhac dong que - Nhac vang - null - 0 : 100.0 $  Artist: No name Tracks
DVD - The Lion King - Animation - null - 0 : 19.95 $
Book - Day cach lam giau - Nguoi giau - Authors: []
```

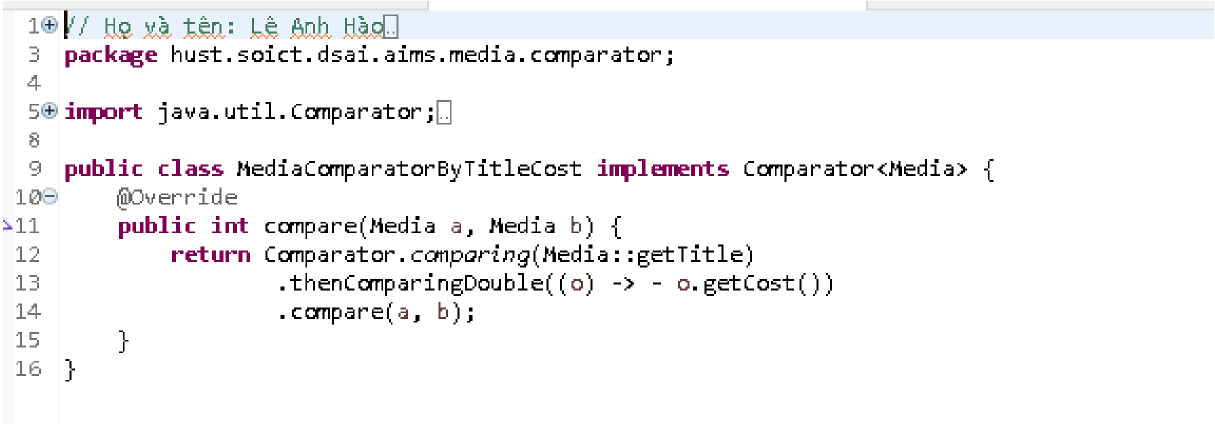


```java
package testCode;

import java.util.ArrayList;
import java.util.List;

import hust.soict.dsai.aims.media.Book;
import hust.soict.dsai.aims.media.CompactDisc;
import hust.soict.dsai.aims.media.DigitalVideoDisc;
import hust.soict.dsai.aims.media.Media;
import hust.soict.dsai.aims.media.Track;

public class BookTest {
    public static void main(String args[]) {
        Book book = new Book(1, "Day cach lam giau", "Nguoi giau", 1000000f);
        DigitalVideoDisc dvd = new DigitalVideoDisc("The Lion King", "Animation", "Roger Allers", 87, 19.95f);
        List<Track> track = new ArrayList<Track>();
        track.add(new Track("Bai1", 1000));
        CompactDisc cd = new CompactDisc(1, "Nhac dong que", "Nhac vang", 100f, "TuanAnh", 1000, "No name", track);
        List<Media> mediae = new ArrayList<Media>();
        mediae.add(cd);
        mediae.add(dvd);
        mediae.add(book);
        for (Media media : mediae) {
            System.out.println(media.toString());
        }

    }
}
```

```
<terminated> BookTest [Java Application] /Users/tuananh/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86_64_18.0.2.v20221005-1040/jre/bin/java  (14:05:19, 7 thg 12, 2022 – 14:05:
CD – Nhac dong que – Nhac vang – null – 1000 : 100.0 $  Artist: No name Tracks: [ Title : Bai1 Length : 1000]
DVD – The Lion King – Animation – null – 0 : 19.95 $
Book – Day cach lam giau – Nguoi giau – Authors: []
```

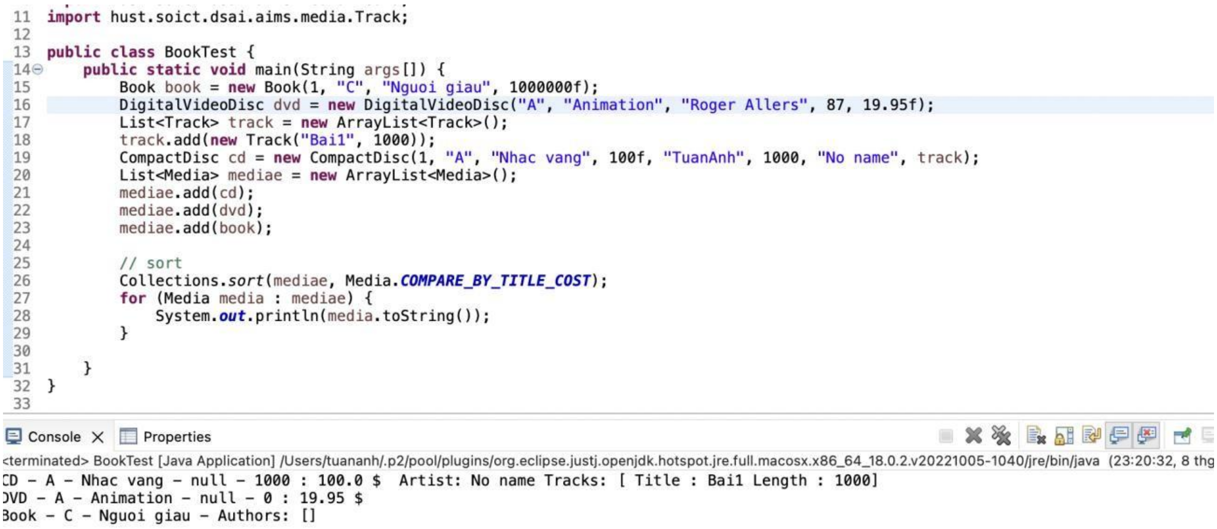
12. Sort media in the cart

Sort by title



```java
// Họ và tên: Lê Anh Hào
package hust.soict.dsai.aims.media.comparator;

import java.util.Comparator;

public class MediaComparatorByTitleCost implements Comparator<Media> {
    @Override
    public int compare(Media a, Media b) {
        return Comparator.comparing(Media::getTitle)
                .thenComparingDouble((o) -> - o.getCost())
                .compare(a, b);
    }
}
```

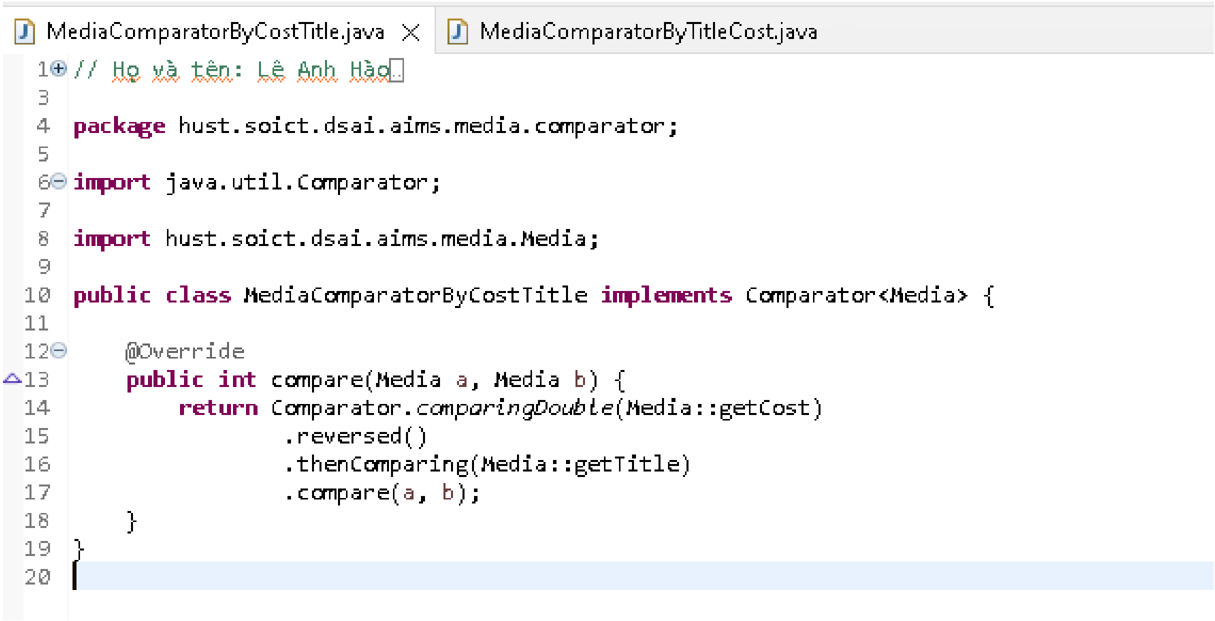
Kết quả:



```
import hust.soict.dsai.aims.media.Track;

public class BookTest {
    public static void main(String args[]) {
        Book book = new Book(1, "C", "Nguoi giau", 1000000f);
        DigitalVideoDisc dvd = new DigitalVideoDisc("A", "Animation", "Roger Allers", 87, 19.95f);
        List<Track> track = new ArrayList<Track>();
        track.add(new Track("Bai1", 1000));
        CompactDisc cd = new CompactDisc(1, "A", "Nhac vang", 100f, "TuanAnh", 1000, "No name", track);
        List<Media> mediae = new ArrayList<Media>();
        mediae.add(cd);
        mediae.add(dvd);
        mediae.add(book);

        // sort
        Collections.sort(mediae, Media.COMPARE_BY_TITLE_COST);
        for (Media media : mediae) {
            System.out.println(media.toString());
        }

    }
}
```

```
<terminated> BookTest [Java Application] /Users/tuananh/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86_64_18.0.2.v20221005-1040/jre/bin/java (23:20:32, 8 thg
CD – A – Nhac vang – null – 1000 : 100.0 $  Artist: No name Tracks: [ Title : Bai1 Length : 1000]
DVD – A – Animation – null – 0 : 19.95 $
Book – C – Nguoi giau – Authors: []
```

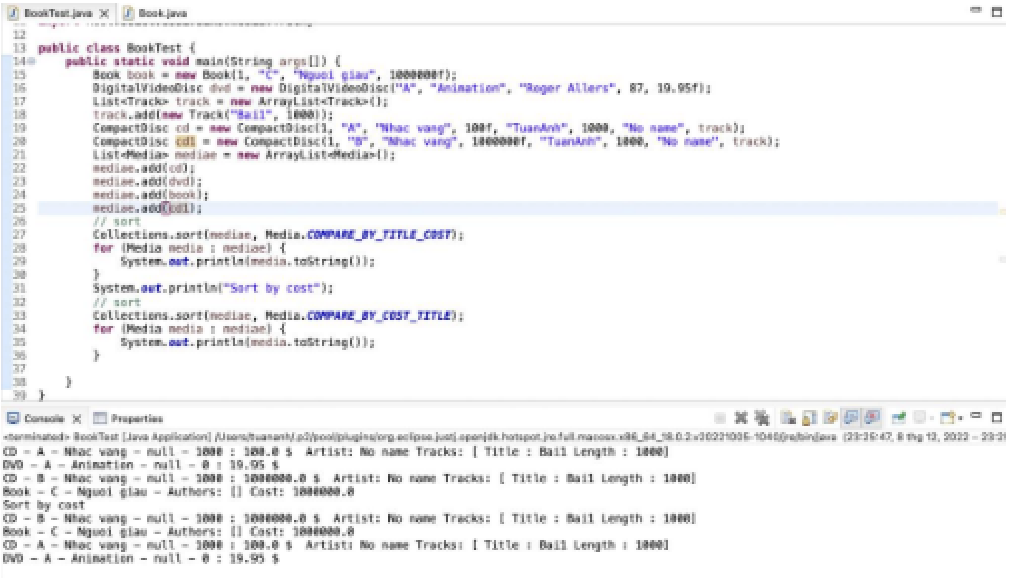
Sort by cost



MediaComparatorByCostTitle.java
MediaComparatorByTitleCost.java

```
// Họ và tên: Lê Anh Hào

package hust.soict.dsai.aims.media.comparator;

import java.util.Comparator;

import hust.soict.dsai.aims.media.Media;

public class MediaComparatorByCostTitle implements Comparator<Media> {

    @Override
    public int compare(Media a, Media b) {
        return Comparator.comparingDouble(Media::getCost)
                .reversed()
                .thenComparing(Media::getTitle)
                .compare(a, b);
    }
}
```

Kết quả:

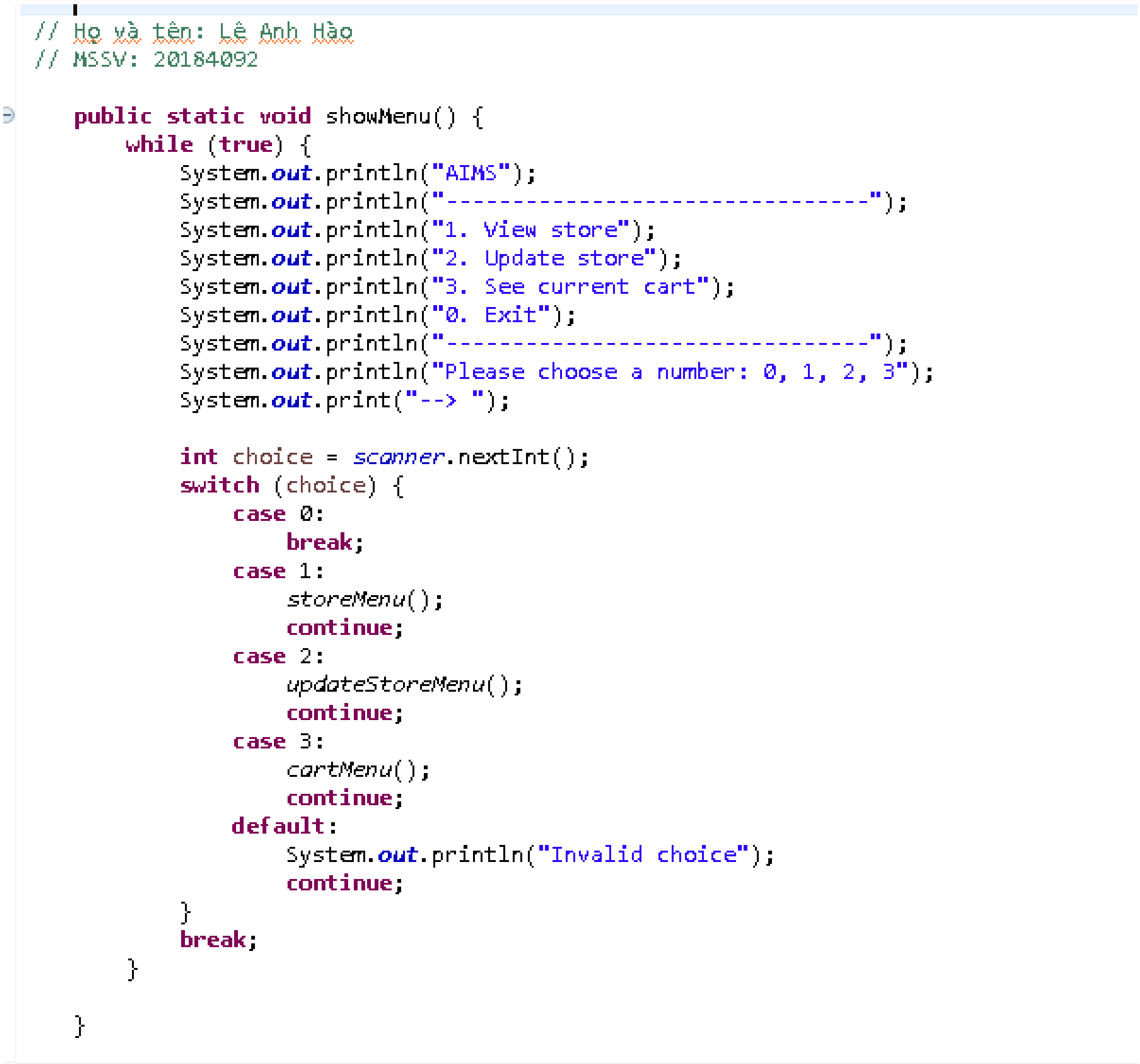


```
public class BookTest {
    public static void main(String args[]) {
        Book book = new Book(1, "C", "Nguoi giau", 1000000f);
        DigitalVideoDisc dvd = new DigitalVideoDisc("A", "Animation", "Roger Allers", 87, 19.95f);
        List<Track> track = new ArrayList<Track>();
        track.add(new Track("Bai1", 1000));
        CompactDisc cd = new CompactDisc(1, "A", "Nhac vang", 100f, "TuanAnh", 1000, "No name", track);
        CompactDisc cd1 = new CompactDisc(1, "B", "Nhac vang", 1000000f, "TuanAnh", 1000, "No name", track);
        List<Media> mediae = new ArrayList<Media>();
        mediae.add(cd);
        mediae.add(dvd);
        mediae.add(book);
        mediae.add(cd1);
        // sort
        Collections.sort(mediae, Media.COMPARE_BY_TITLE_COST);
        for (Media media : mediae) {
            System.out.println(media.toString());
        }
        System.out.println("Sort by cost");
        // sort
        Collections.sort(mediae, Media.COMPARE_BY_COST_TITLE);
        for (Media media : mediae) {
            System.out.println(media.toString());
        }

    }
}
```

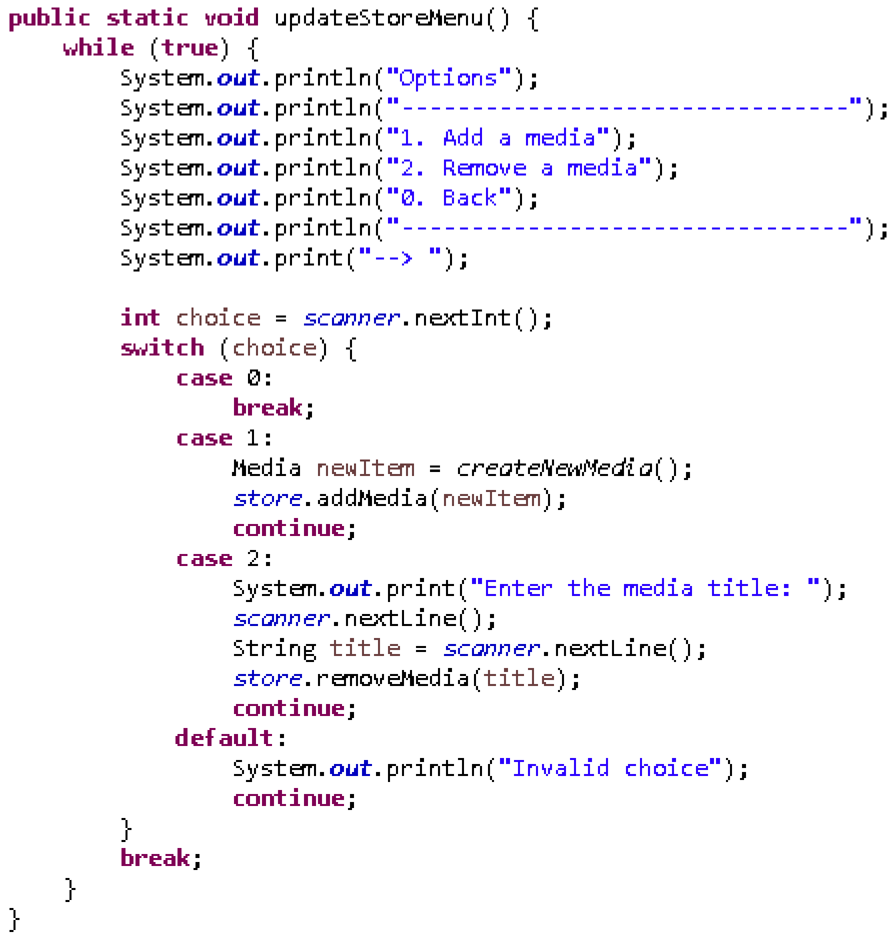
```
<terminated> BookTest [Java Application] /Users/tuananh/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86_64_18.0.2.v20221006-1040/jre/bin/java (23:35:47, 8 thg 12, 2022 – 23:3
CD - A - Nhac vang - null - 1000 : 100.0 $  Artist: No name Tracks: [ Title : Bai1 Length : 1000]
DVD - A - Animation - null - 0 : 19.95 $
CD - B - Nhac vang - null - 1000 : 1000000.0 $  Artist: No name Tracks: [ Title : Bai1 Length : 1000]
Book - C - Nguoi giau - Authors: [] Cost: 1000000.0
Sort by cost
CD - B - Nhac vang - null - 1000 : 1000000.0 $  Artist: No name Tracks: [ Title : Bai1 Length : 1000]
Book - C - Nguoi giau - Authors: [] Cost: 1000000.0
CD - A - Nhac vang - null - 1000 : 100.0 $  Artist: No name Tracks: [ Title : Bai1 Length : 1000]
DVD - A - Animation - null - 0 : 19.95 $
```

13. Create a complete console application in the Aims class

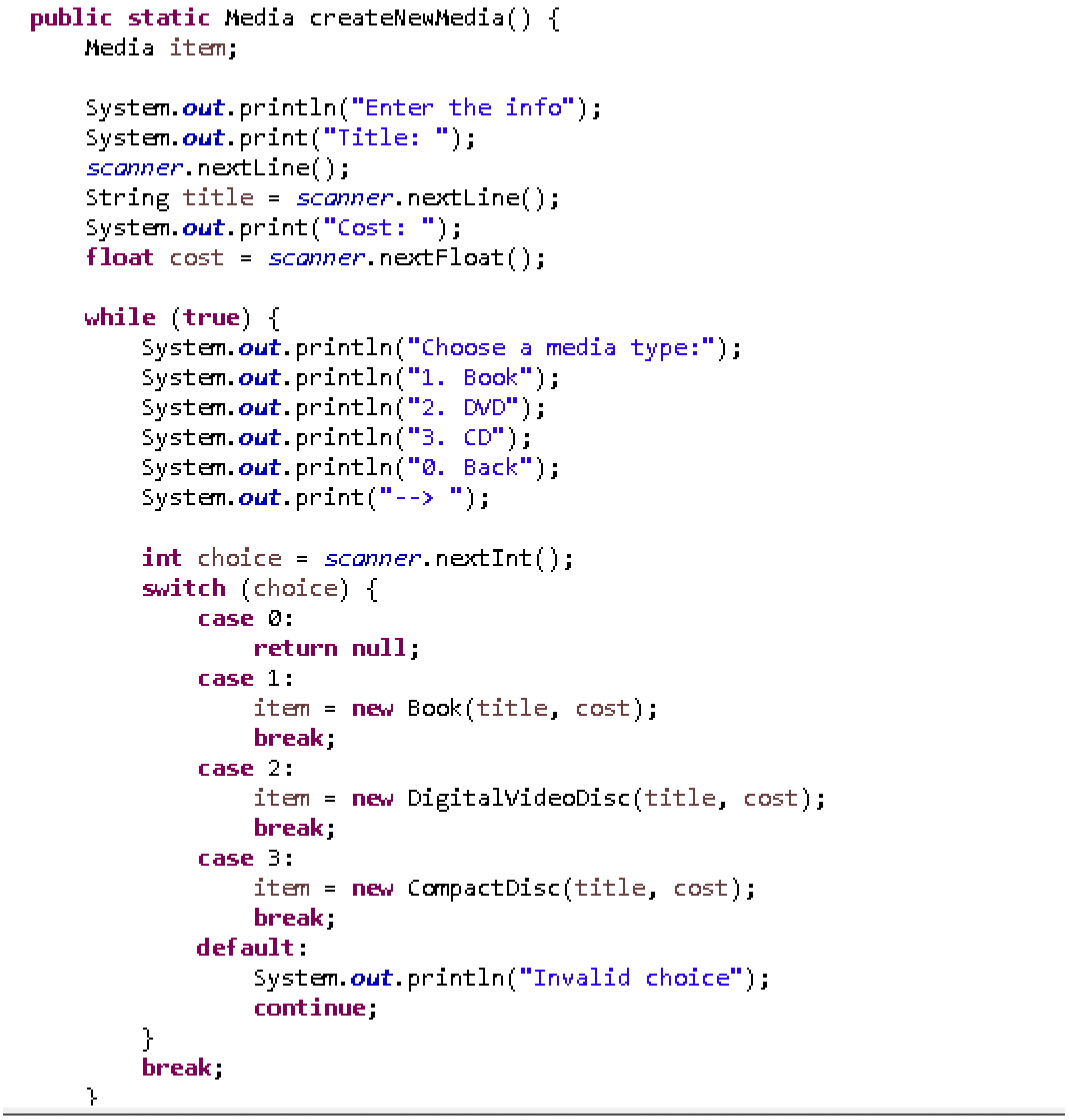
ShowMenuFunction Class



```
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

    public static void showMenu() {
        while (true) {
            System.out.println("AIMS");
            System.out.println("--------------------------------");
            System.out.println("1. View store");
            System.out.println("2. Update store");
            System.out.println("3. See current cart");
            System.out.println("0. Exit");
            System.out.println("--------------------------------");
            System.out.println("Please choose a number: 0, 1, 2, 3");
            System.out.print("--> ");

            int choice = scanner.nextInt();
            switch (choice) {
                case 0:
                    break;
                case 1:
                    storeMenu();
                    continue;
                case 2:
                    updateStoreMenu();
                    continue;
                case 3:
                    cartMenu();
                    continue;
                default:
                    System.out.println("Invalid choice");
                    continue;
            }
            break;
        }

    }
```

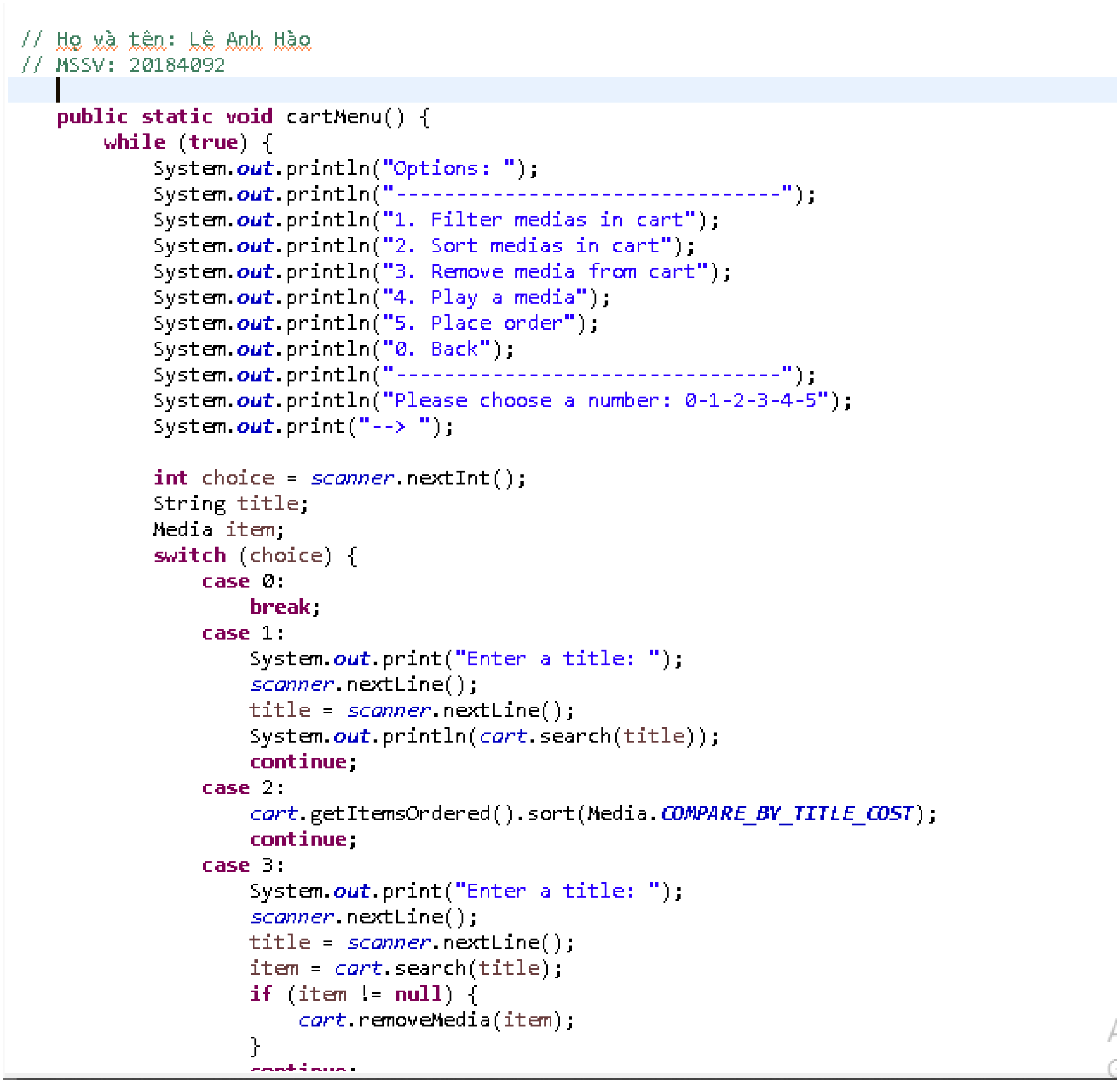


```
public static void updateStoreMenu() {
    while (true) {
        System.out.println("Options");
        System.out.println("--------------------------------");
        System.out.println("1. Add a media");
        System.out.println("2. Remove a media");
        System.out.println("0. Back");
        System.out.println("--------------------------------");
        System.out.print("--> ");

        int choice = scanner.nextInt();
        switch (choice) {
            case 0:
                break;
            case 1:
                Media newItem = createNewMedia();
                store.addMedia(newItem);
                continue;
            case 2:
                System.out.print("Enter the media title: ");
                scanner.nextLine();
                String title = scanner.nextLine();
                store.removeMedia(title);
                continue;
            default:
                System.out.println("Invalid choice");
                continue;
        }
        break;
    }
}
```

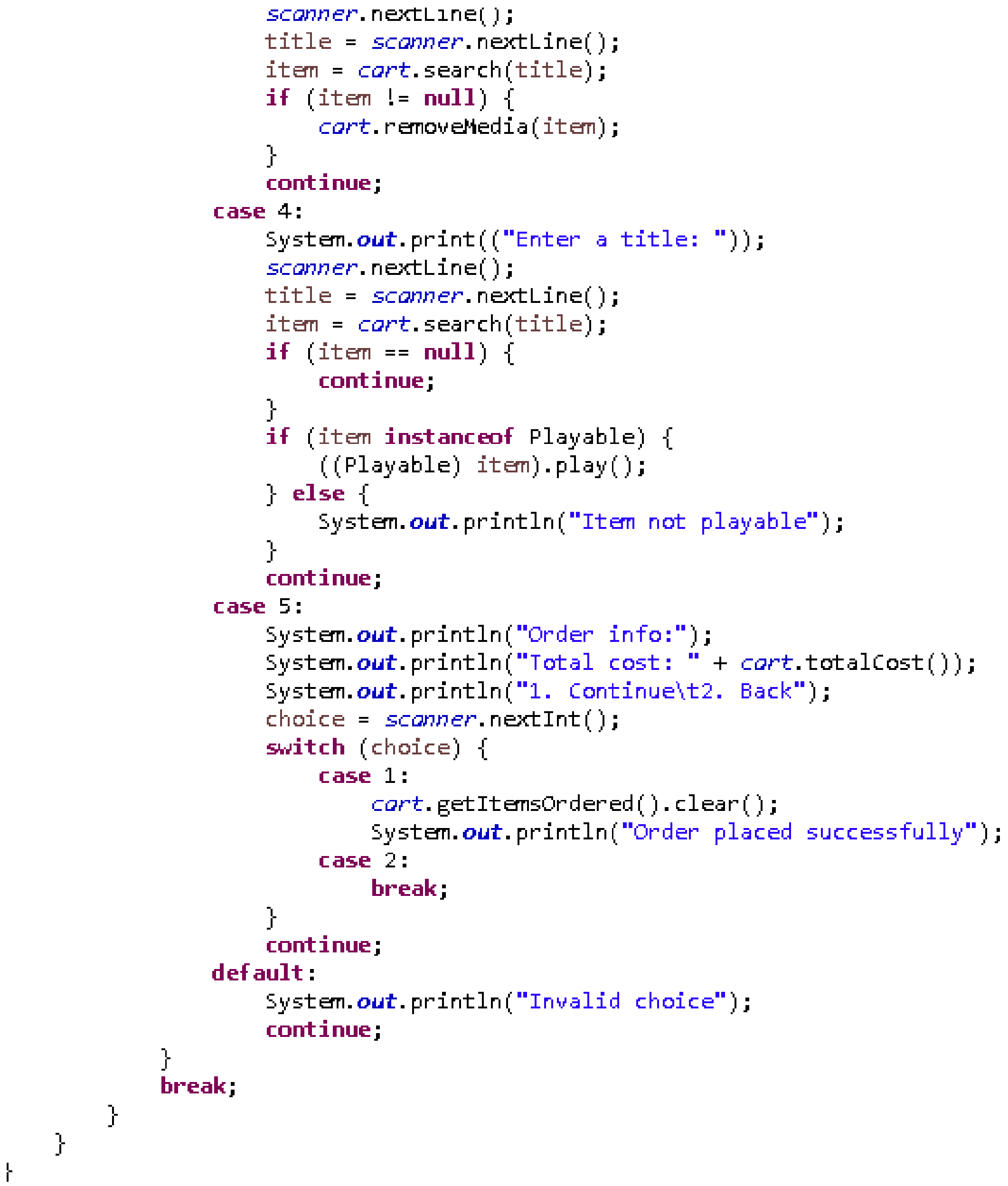


```
public static Media createNewMedia() {
    Media item;

    System.out.println("Enter the info");
    System.out.print("Title: ");
    scanner.nextLine();
    String title = scanner.nextLine();
    System.out.print("Cost: ");
    float cost = scanner.nextFloat();

    while (true) {
        System.out.println("Choose a media type:");
        System.out.println("1. Book");
        System.out.println("2. DVD");
        System.out.println("3. CD");
        System.out.println("0. Back");
        System.out.print("--> ");

        int choice = scanner.nextInt();
        switch (choice) {
            case 0:
                return null;
            case 1:
                item = new Book(title, cost);
                break;
            case 2:
                item = new DigitalVideoDisc(title, cost);
                break;
            case 3:
                item = new CompactDisc(title, cost);
                break;
            default:
                System.out.println("Invalid choice");
                continue;
        }
        break;
    }
```

Cart class

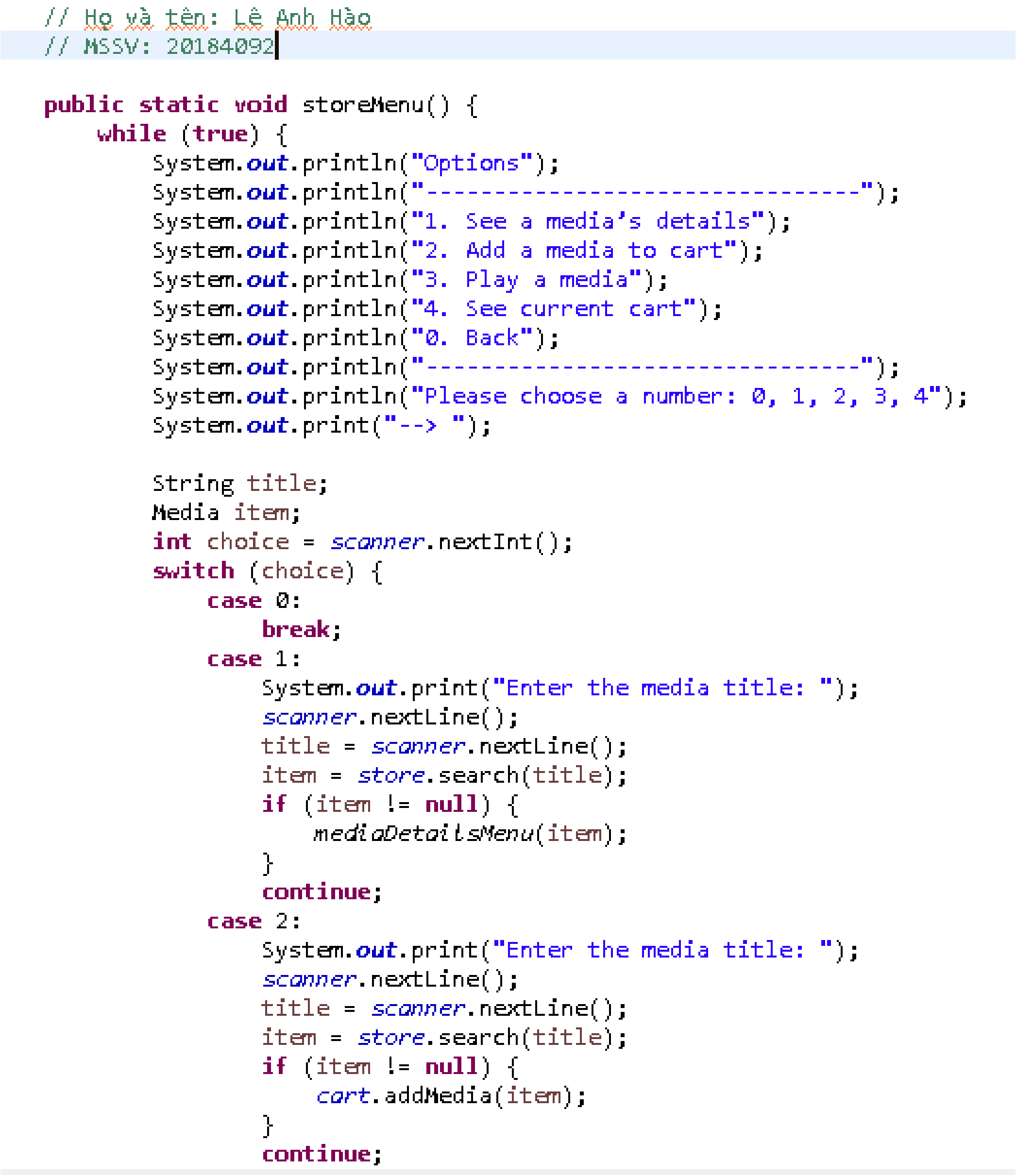


```
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

    public static void cartMenu() {
        while (true) {
            System.out.println("Options: ");
            System.out.println("--------------------------------");
            System.out.println("1. Filter medias in cart");
            System.out.println("2. Sort medias in cart");
            System.out.println("3. Remove media from cart");
            System.out.println("4. Play a media");
            System.out.println("5. Place order");
            System.out.println("0. Back");
            System.out.println("--------------------------------");
            System.out.println("Please choose a number: 0-1-2-3-4-5");
            System.out.print("--> ");

            int choice = scanner.nextInt();
            String title;
            Media item;
            switch (choice) {
                case 0:
                    break;
                case 1:
                    System.out.print("Enter a title: ");
                    scanner.nextLine();
                    title = scanner.nextLine();
                    System.out.println(cart.search(title));
                    continue;
                case 2:
                    cart.getItemsOrdered().sort(Media.COMPARE_BY_TITLE_COST);
                    continue;
                case 3:
                    System.out.print("Enter a title: ");
                    scanner.nextLine();
                    title = scanner.nextLine();
                    item = cart.search(title);
                    if (item != null) {
                        cart.removeMedia(item);
                    }
                    continue;
```

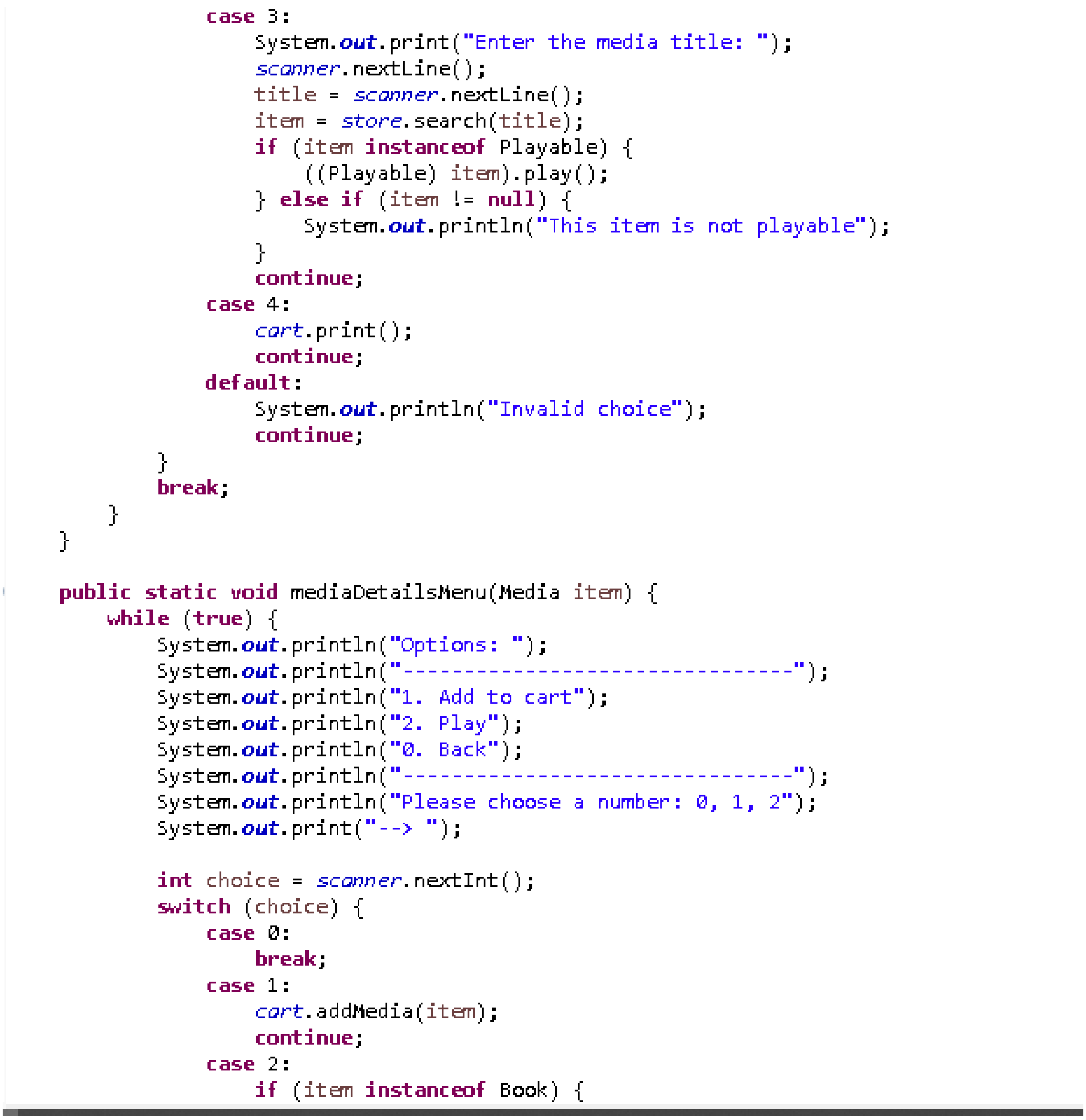


```
                    scanner.nextLine();
                    title = scanner.nextLine();
                    item = cart.search(title);
                    if (item != null) {
                        cart.removeMedia(item);
                    }
                    continue;
                case 4:
                    System.out.print(("Enter a title: "));
                    scanner.nextLine();
                    title = scanner.nextLine();
                    item = cart.search(title);
                    if (item == null) {
                        continue;
                    }
                    if (item instanceof Playable) {
                        ((Playable) item).play();
                    } else {
                        System.out.println("Item not playable");
                    }
                    continue;
                case 5:
                    System.out.println("Order info:");
                    System.out.println("Total cost: " + cart.totalCost());
                    System.out.println("1. Continue\t2. Back");
                    choice = scanner.nextInt();
                    switch (choice) {
                        case 1:
                            cart.getItemsOrdered().clear();
                            System.out.println("Order placed successfully");
                        case 2:
                            break;
                    }
                    continue;
                default:
                    System.out.println("Invalid choice");
                    continue;
            }
            break;
        }
    }
}
```

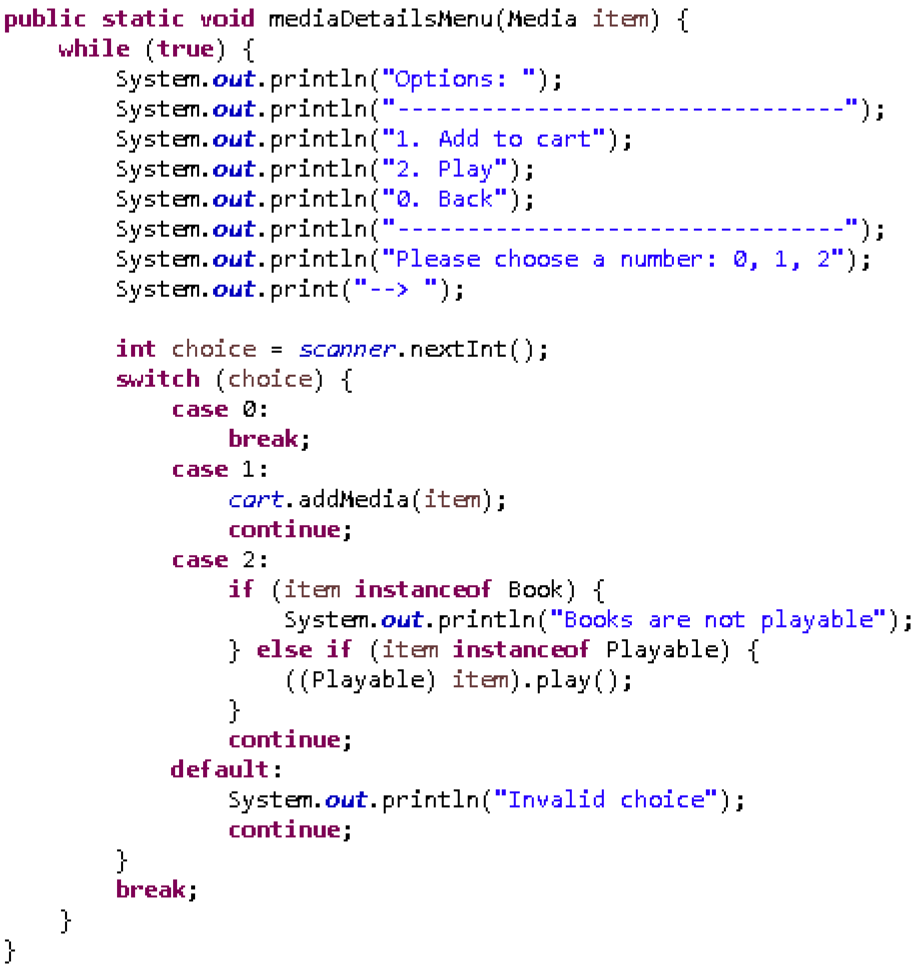
Store class



```
// Họ và tên: Lê Anh Hào
// MSSV: 20184092

public static void storeMenu() {
    while (true) {
        System.out.println("Options");
        System.out.println("--------------------------------");
        System.out.println("1. See a media’s details");
        System.out.println("2. Add a media to cart");
        System.out.println("3. Play a media");
        System.out.println("4. See current cart");
        System.out.println("0. Back");
        System.out.println("--------------------------------");
        System.out.println("Please choose a number: 0, 1, 2, 3, 4");
        System.out.print("--> ");

        String title;
        Media item;
        int choice = scanner.nextInt();
        switch (choice) {
            case 0:
                break;
            case 1:
                System.out.print("Enter the media title: ");
                scanner.nextLine();
                title = scanner.nextLine();
                item = store.search(title);
                if (item != null) {
                    mediaDetailsMenu(item);
                }
                continue;
            case 2:
                System.out.print("Enter the media title: ");
                scanner.nextLine();
                title = scanner.nextLine();
                item = store.search(title);
                if (item != null) {
                    cart.addMedia(item);
                }
                continue;
```



```
                case 3:
                    System.out.print("Enter the media title: ");
                    scanner.nextLine();
                    title = scanner.nextLine();
                    item = store.search(title);
                    if (item instanceof Playable) {
                        ((Playable) item).play();
                    } else if (item != null) {
                        System.out.println("This item is not playable");
                    }
                    continue;
                case 4:
                    cart.print();
                    continue;
                default:
                    System.out.println("Invalid choice");
                    continue;
            }
            break;
        }
    }

    public static void mediaDetailsMenu(Media item) {
        while (true) {
            System.out.println("Options: ");
            System.out.println("--------------------------------");
            System.out.println("1. Add to cart");
            System.out.println("2. Play");
            System.out.println("0. Back");
            System.out.println("--------------------------------");
            System.out.println("Please choose a number: 0, 1, 2");
            System.out.print("--> ");

            int choice = scanner.nextInt();
            switch (choice) {
                case 0:
                    break;
                case 1:
                    cart.addMedia(item);
                    continue;
                case 2:
                    if (item instanceof Book) {
```



```
public static void mediaDetailsMenu(Media item) {
    while (true) {
        System.out.println("Options: ");
        System.out.println("--------------------------------");
        System.out.println("1. Add to cart");
        System.out.println("2. Play");
        System.out.println("0. Back");
        System.out.println("--------------------------------");
        System.out.println("Please choose a number: 0, 1, 2");
        System.out.print("--> ");

        int choice = scanner.nextInt();
        switch (choice) {
            case 0:
                break;
            case 1:
                cart.addMedia(item);
                continue;
            case 2:
                if (item instanceof Book) {
                    System.out.println("Books are not playable");
                } else if (item instanceof Playable) {
                    ((Playable) item).play();
                }
                continue;
            default:
                System.out.println("Invalid choice");
                continue;
        }
        break;
    }
}
```