

```

}
//Ham them dia vào giỏ hàng theo list voi so luong tuy y
public int addDigitalVideoDisc(DigitalVideoDisc... dvdlist) {
    int countAdd = 0;
    for (DigitalVideoDisc disc : dvdlist) {
        if (qtyOrdered == MAX_NUMBERS_ORDERED) {
            System.out.println("The cart is almost full");
            break;
        } else {
            itemsOrdered[qtyOrdered] = disc;
            qtyOrdered++;
            System.out.println("The DVD " + disc.getTitle() + " has been added");
            countAdd++;
        }
    }
    return countAdd;
}

//Ham them 2 dia DVD
public int addDigitalVideoDisc(DigitalVideoDisc dvd1, DigitalVideoDisc dvd2) {
    if (qtyOrdered + 1 >= MAX_NUMBERS_ORDERED) {
        System.out.println("The cart is almost full.");
        return 0;
    } else {
        itemsOrdered[qtyOrdered] = dvd1;
        qtyOrdered++;
        System.out.println("The DVD " + dvd1.getTitle() + " has been added");

        itemsOrdered[qtyOrdered] = dvd2;
        qtyOrdered++;
        System.out.println("The DVD " + dvd2.getTitle() + " has been added");

        return 2;
    }
}
}

```

```

package lab02;

public class TestPassingParameter {
    public static void main(String[] args) {
        // TODO Auto-generated method stub

        DigitalVideoDisc jungleDVD = new DigitalVideoDisc("Jungle");
        DigitalVideoDisc cinderellaDVD = new DigitalVideoDisc("Cinderella");
        swap(jungleDVD, cinderellaDVD);
        System.out.println("jungle dvd title: " + jungleDVD.getTitle());
        System.out.println("cinderella dvd title: " + cinderellaDVD.getTitle());
        swap2(jungleDVD, cinderellaDVD);
        System.out.println("jungle dvd title: " + jungleDVD.getTitle());
        System.out.println("cinderella dvd title: " + cinderellaDVD.getTitle());
        changeTitle(jungleDVD, cinderellaDVD.getTitle());
        System.out.println("jungle dvd title: " + jungleDVD.getTitle());

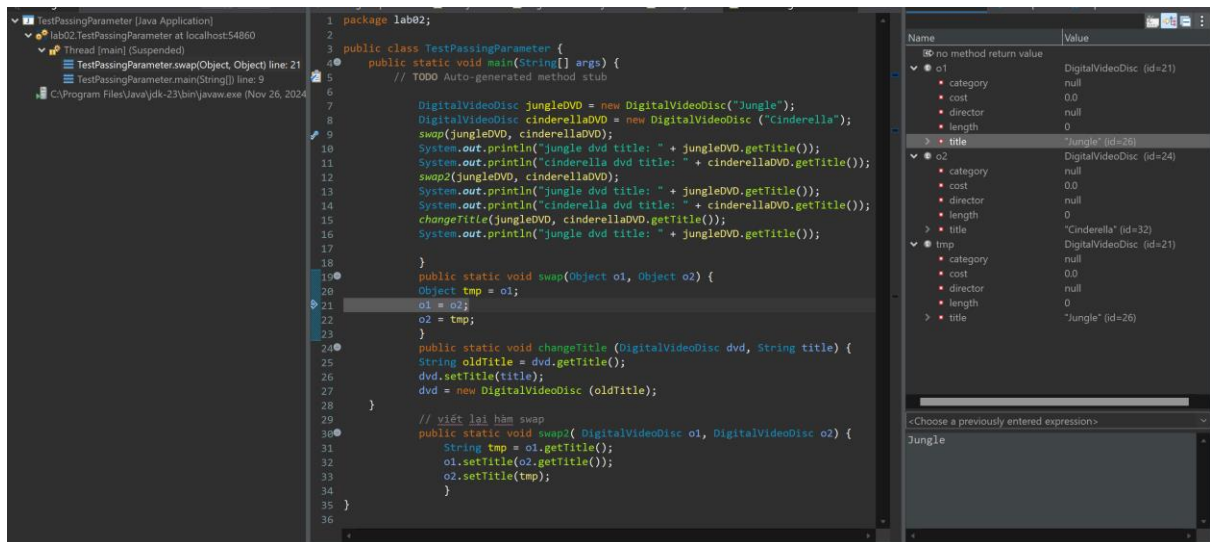
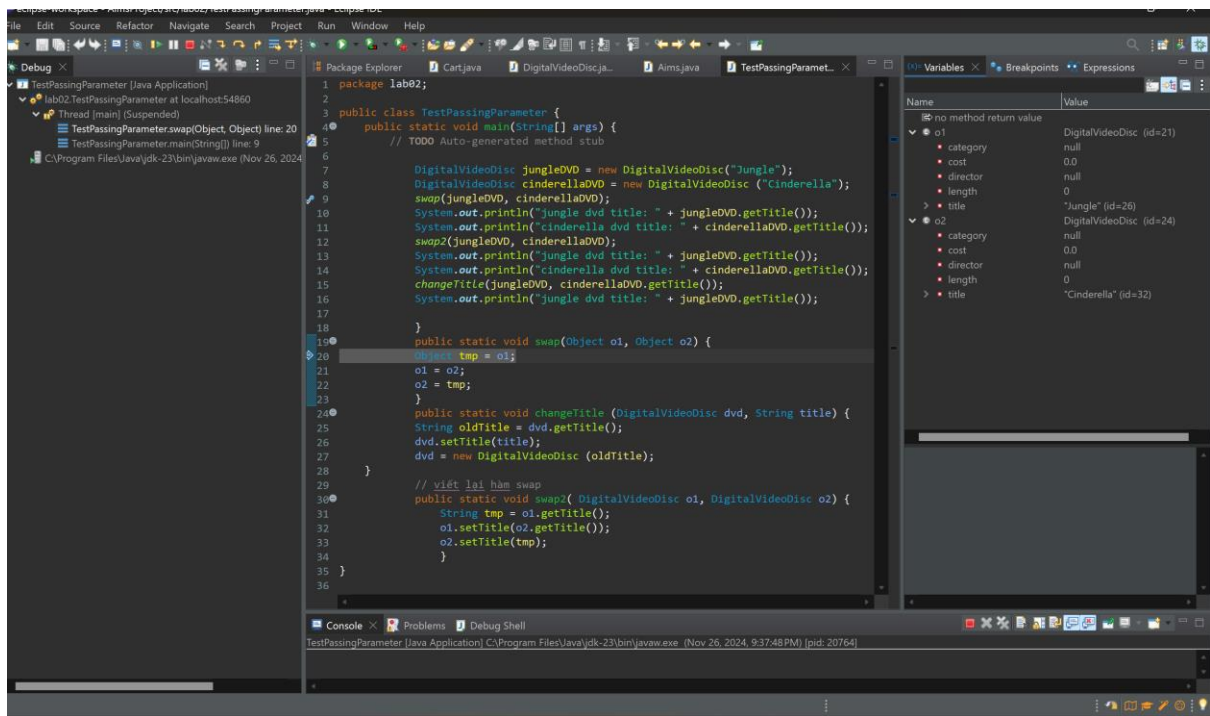
    }

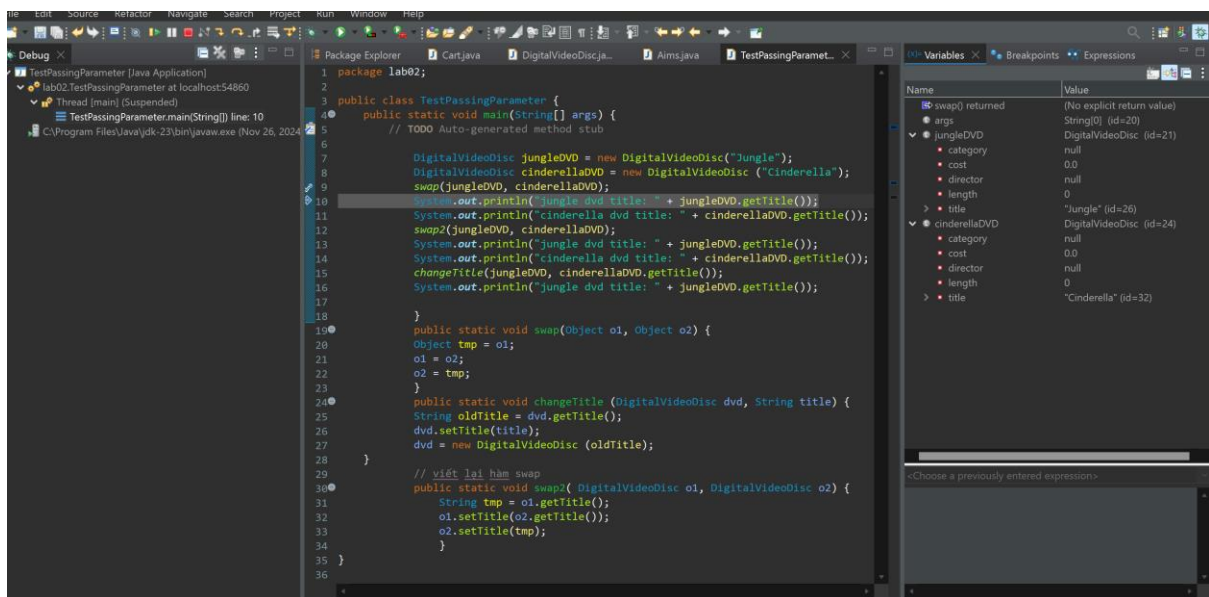
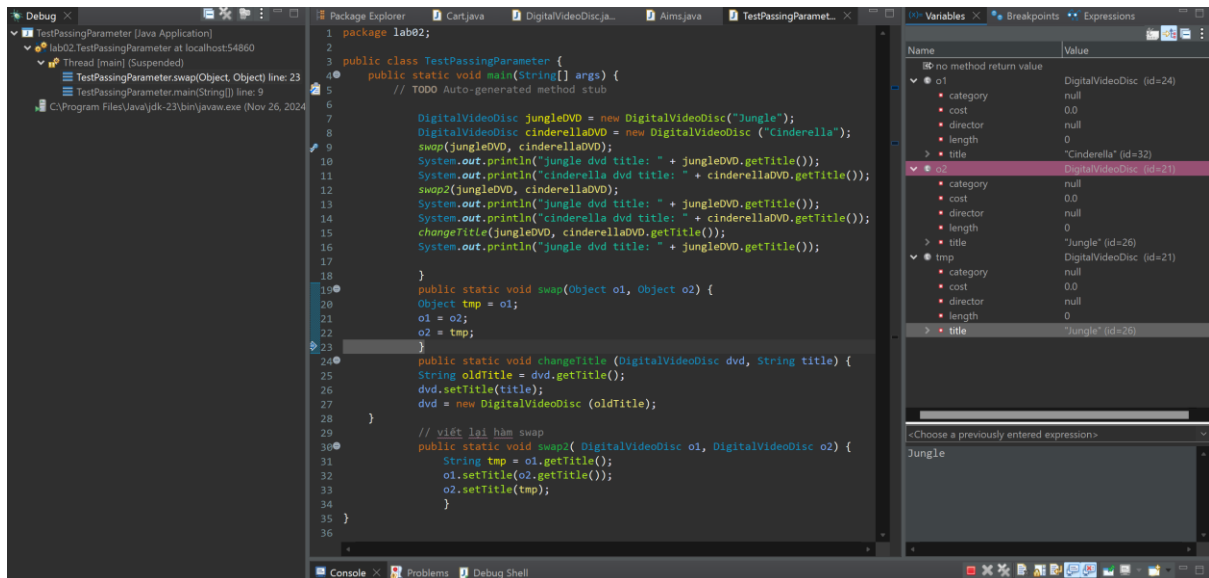
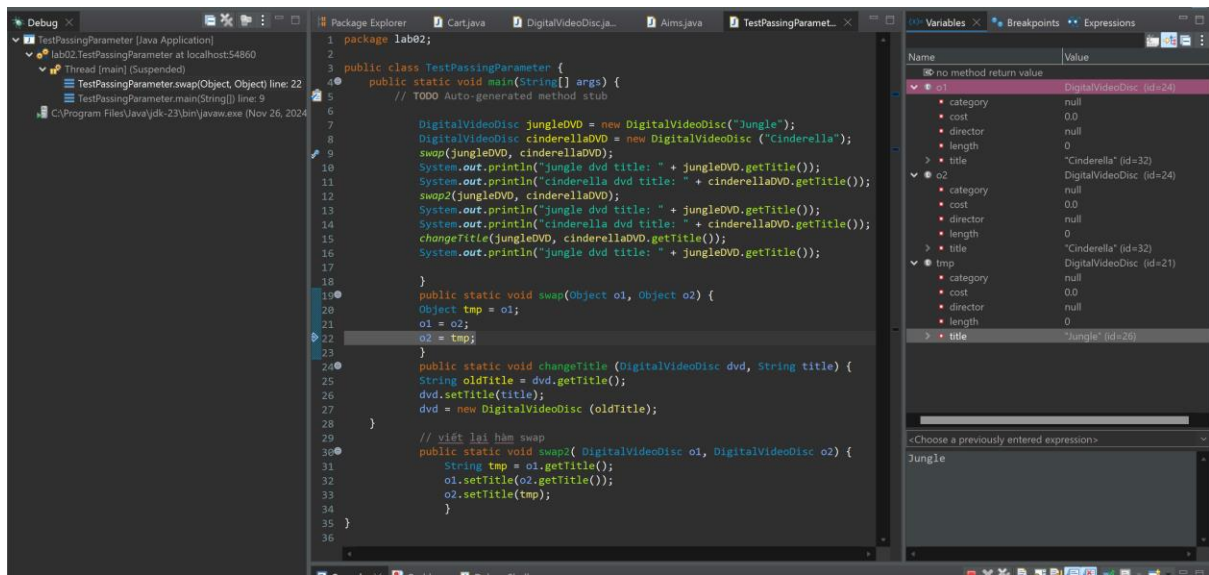
    public static void swap(Object o1, Object o2) {
        Object tmp = o1;
        o1 = o2;
        o2 = tmp;
    }

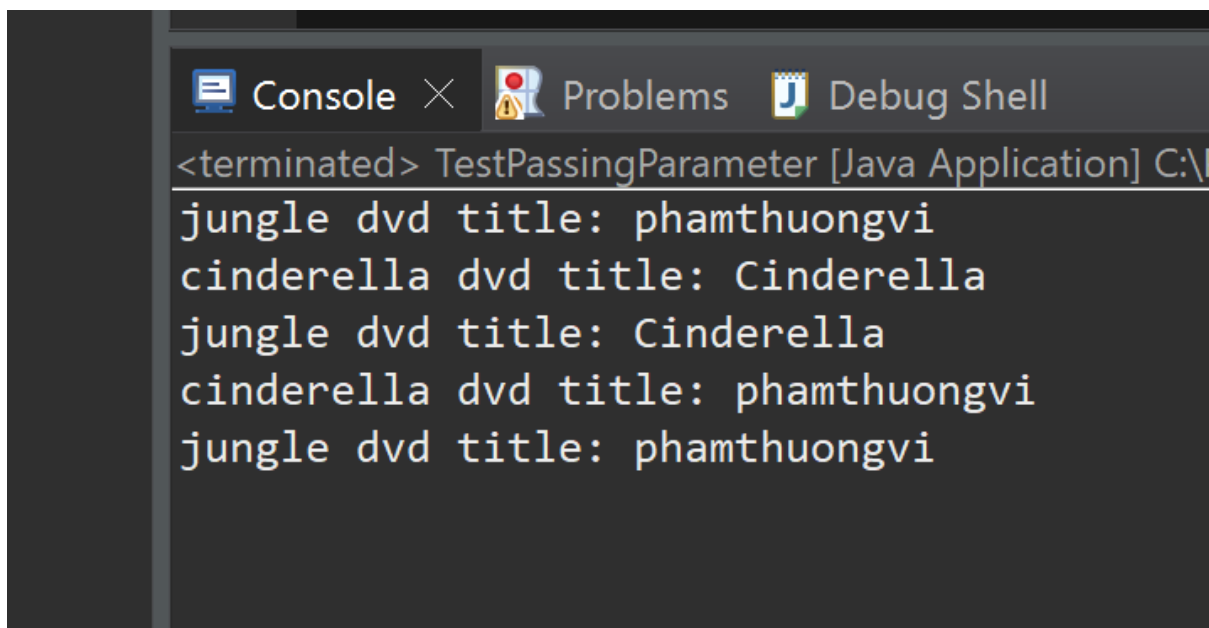
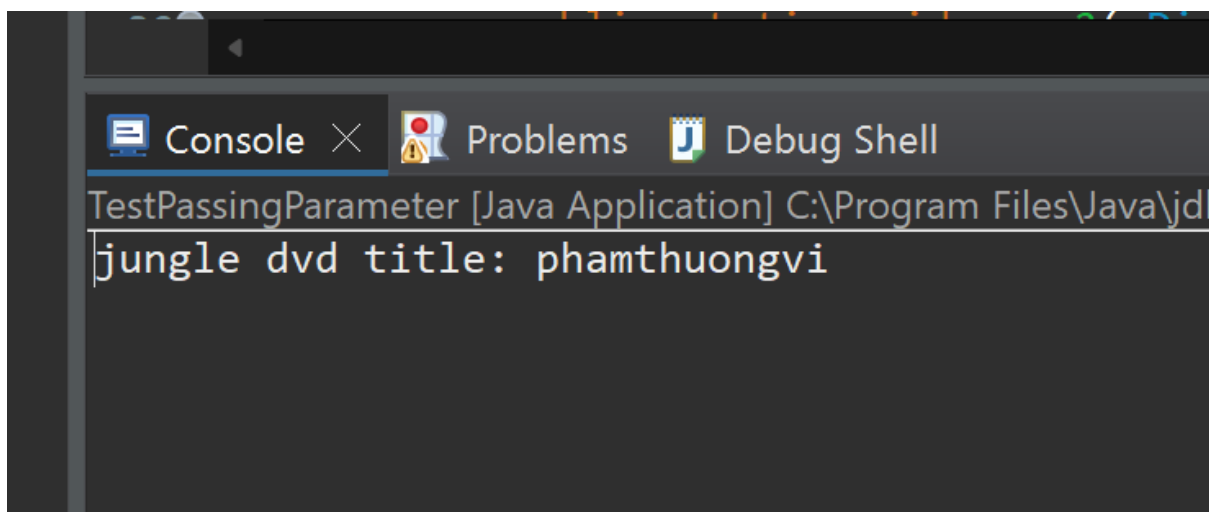
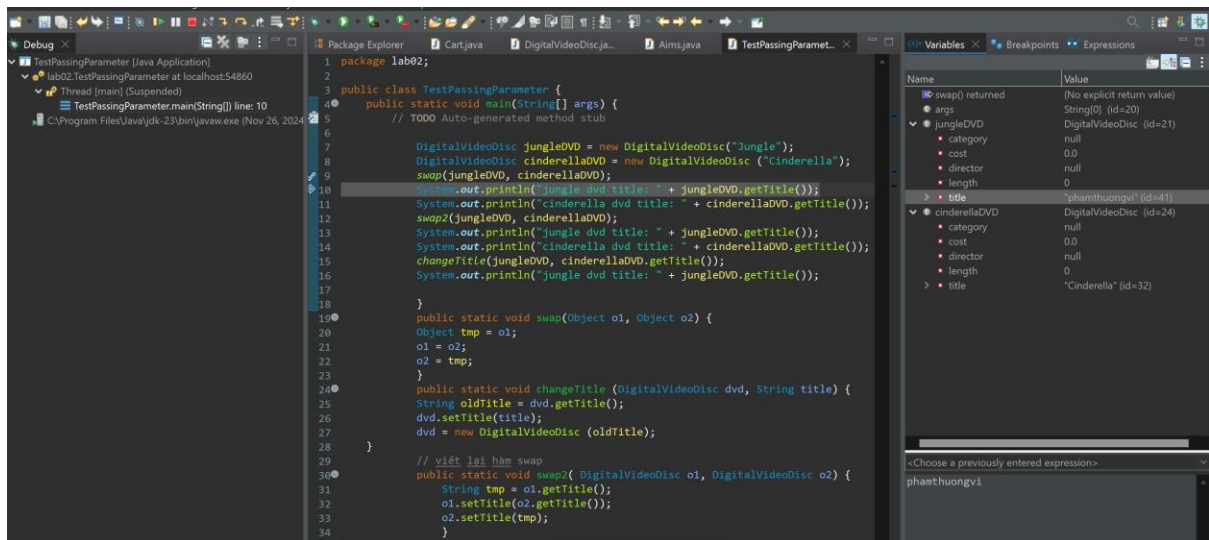
    public static void changeTitle (DigitalVideoDisc dvd, String title) {
        String oldTitle = dvd.getTitle();
        dvd.setTitle(title);
        dvd = new DigitalVideoDisc (oldTitle);
    }

    // viết lại hàm swap
    public static void swap2( DigitalVideoDisc o1, DigitalVideoDisc o2) {
        String tmp = o1.getTitle();
        o1.setTitle(o2.getTitle());
        o2.setTitle(tmp);
    }
}

```







```

9
0 public static int getNbDigitalVideoDiscs() {
1     return nbDigitalVideoDiscs;
2 }
3 public int getId() {
4     return id;
5 }
6 public void setTitle(String title) {
7     this.title = title;
8 }
9

```

```

public class DigitalVideoDisc {
private String title;
private String category;
private String director;
private int length;
private float cost;
private static int nbDigitalVideoDiscs = 0;
private int id;

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

```



```

// hàm print
public void print() {
    float totalCost = 0.00f;
    StringBuilder output = new StringBuilder("*****CART*****\nOrderItems\n");
    for (int i = 0; i < qtyOrdered; i++) {
        output.append((i + 1) + " - " + itemsOrdered[i].getTitle() + " - " + itemsOrdered[i].getCategory() + " - "
            + itemsOrdered[i].getDirector() + " - " + itemsOrdered[i].getLength() + " : "
            + itemsOrdered[i].getCost() + " $\n");
        totalCost = +itemsOrdered[i].getCost();
    }
    output.append("Total cost: " + totalCost + " $")
        .append("\n*****");
    System.out.println(output);
}

//hàm search ID
public void search(int id) {
    if (id > qtyOrdered) {
        System.out.println("No match found");
    } else {
        System.out.println("result: " + itemsOrdered[id - 1].getTitle() + " - " + itemsOrdered[id - 1].getCategory()
            + " - " + itemsOrdered[id - 1].getDirector() + " - " + itemsOrdered[id - 1].getLength() + " : "
            + itemsOrdered[id - 1].getCost() + " $\n");
    }
}

// hàm search by title
public void search(String title) {
    for (int i = 0; i < qtyOrdered; i++) {
        if (itemsOrdered[i].getTitle().equals(title)) {
            System.out.println("result: " + itemsOrdered[i].getTitle() + " - " + itemsOrdered[i].getCategory()
                + " - " + itemsOrdered[i].getDirector() + " - " + itemsOrdered[i].getLength() + " : "
                + itemsOrdered[i].getCost() + " $\n");
            return;
        }
    }
    System.out.println("No match found");
}
}

```

The screenshot shows the Eclipse IDE with the following components:

- Package Explorer:** Shows the project structure with packages `hust.soict.dsai.aims.cart` and `hust.soict.dsai.aims.disc`.
- Editor:** Displays the `CartTest.java` file. The code includes imports for `Cart` and `DigitalVideoDisc`, and a `main` method that creates a `Cart` object, adds three `DigitalVideoDisc` objects (dvd1, dvd2, dvd3), and calls the `print`, `search(2)`, and `search("Aladin")` methods.
- Console:** Shows the output of the program:
 

```

<terminated> CartTest [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 27, 2024, 1:24:13 PM - 1:24:13 PM) [pid: 17792]
Total cost: 18.99 $
*****
result: Star Wars - Science Fiction - George Lucas - 87 : 24.95 $

result: Aladin - Animation - null - 0 : 18.99 $
            
```

```

1 package hust.soict.dsai.aims.store;
2 import java.util.ArrayList;
3 import hust.soict.dsai.aims.disc.DigitalVideoDisc;
4
5 public class Store {
6     final int MAX = 1000;
7     private ArrayList<DigitalVideoDisc> itemsInStore = new ArrayList<>();
8     private boolean checkDVD(DigitalVideoDisc disc) {
9         for (DigitalVideoDisc i : itemsInStore) {
10             if (i == null)
11                 return false;
12             if (i.equals(disc))
13                 return true;
14         }
15         return false;
16     }
17
18     public void addDVD(DigitalVideoDisc disc) {
19         if (!checkDVD(disc)) {
20             itemsInStore.add(disc);
21             System.out.println("the DVD " + disc.getTitle() + " has just been added");
22             return;
23         }
24         System.out.println("DVD already exist");
25     }
26
27     public void removeDVD(DigitalVideoDisc disc) {
28         if (checkDVD(disc)) {
29             itemsInStore.remove(disc);
30             System.out.println("the DVD " + disc.getTitle() + " has just been removed");
31             return;
32         }
33         System.out.println("DVD not exist");
34     }
35 }
36

```

```

























Package Explorer | Cart.java | DigitalVideoDisc.java | Aims.java | TestPassingParameter.java | CartTest.java | Store.java | testS
1 package hust.soict.dsai.test.store;
2
3 import hust.soict.dsai.aims.store.Store;
4 import hust.soict.dsai.aims.disc.DigitalVideoDisc;
5
6 public class testStore {
7     public static void main(String[] args) {
8         //Create a new store
9         Store store = new Store();
10        //Create new dvd objects and add them to the store
11        DigitalVideoDisc dvd1 = new DigitalVideoDisc ("The Lion King", "Animation", "Roger Allers", 87, 19.95f);
12        DigitalVideoDisc dvd2 = new DigitalVideoDisc ("Star Wars", "Science Fiction", "George Lucas", 87, 24.95f);
13        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation", 18.99f);
14        //test addDVD
15        store.addDVD(dvd1);
16        store.addDVD(dvd2);
17        store.addDVD(dvd3);
18        store.addDVD(dvd3);
19        //test removeDVD
20        store.removeDVD(dvd2);
21        store.removeDVD(dvd3);
22        store.removeDVD(dvd3);
23
24    }
25
26 }
27

```

```

Problems | Javadoc | Declaration | Console | Coverage
terminated> testStore [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 27, 2024, 5:03:16 PM - 5:03:16 PM) [pid: 22684]
the DVD The Lion King has just been added
the DVD Star Wars has just been added
the DVD Aladin has just been added
DVD already exist
the DVD Star Wars has just been removed
the DVD Aladin has just been removed
DVD not exist

```

- ▼  AimsProject
  -  JRE System Library [JavaSE-22]
  - ▼  lab02\_03
    - ▼  hust.soict.dsai.aims
      -  Aims.java
    - ▼  hust.soict.dsai.aims.cart
      -  Cart.java
    - ▼  hust.soict.dsai.aims.disc
      -  DigitalVideoDisc.java
    - ▼  hust.soict.dsai.aims.store
      -  Store.java
    - ▼  hust.soict.dsai.test.cart
      -  CartTest.java
    - ▼  hust.soict.dsai.test.disc
      -  TestPassingParameter.java
    - ▼  hust.soict.dsai.test.store
      -  testStore.java
    -  module-info.java
  - ▼  Design
    -  class.png
    -  Class Diagram.asta
  - ▼  Requirement
    -  usecase.png
    -  UseCase Diagram.asta



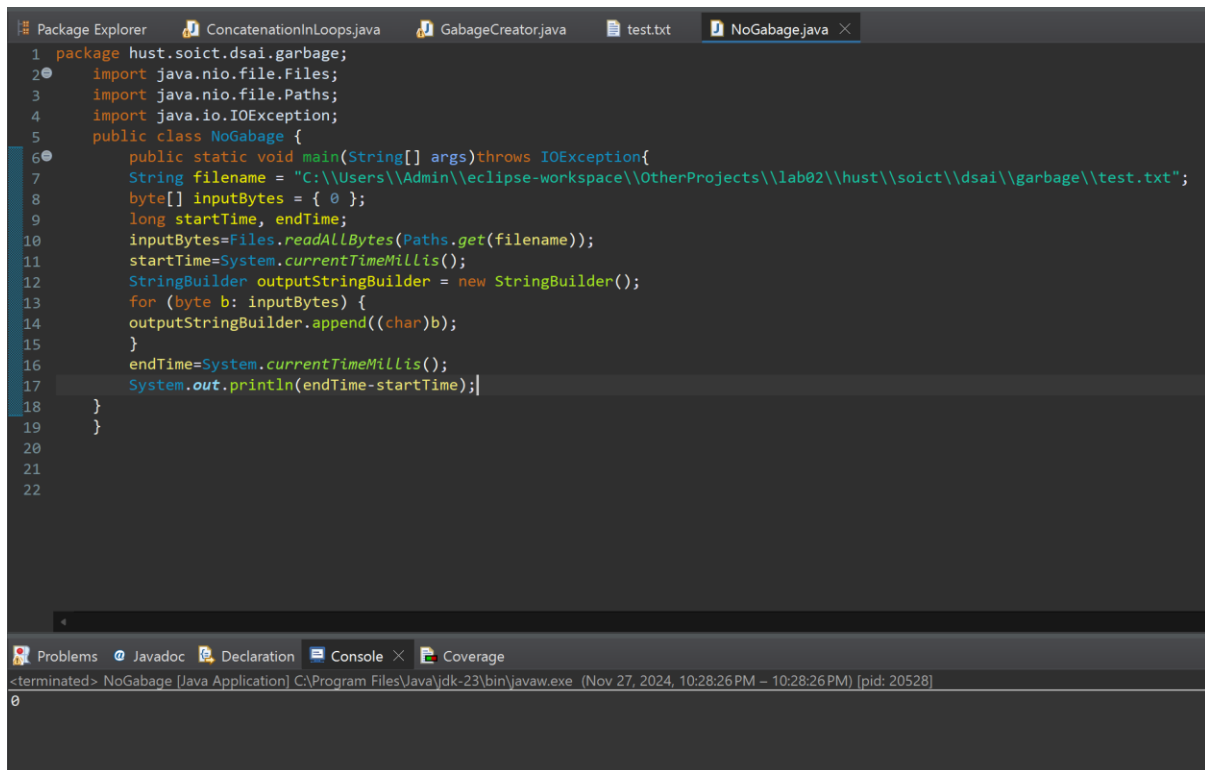
```
Package Explorer ConcatenationInLoops.java GabageCreator.java test.txt NoGabage.java

1 package hust.soict.dsai.garbage;
2 import java.util.Random;
3 public class ConcatenationInLoops {
4     public static void main(String[] args) {
5         Random r=new Random(123);
6         long start = System.currentTimeMillis();
7         String s = "";
8         for (int i=0; i< 65536; i++)
9             s += r.nextInt(2);
10        System.out.println(System.currentTimeMillis()- start); // This prints roughly 4500.
11        r = new Random(123);
12        start = System.currentTimeMillis();
13        StringBuilder sb = new StringBuilder();
14        for (int i=0; i < 65536; i++)
15            sb.append(r.nextInt(2));
16        s = sb.toString();
17        System.out.println(System.currentTimeMillis()-start); // This prints 5.
18    }
19 }
20
21

Problems Javadoc Declaration Console Coverage
terminated> ConcatenationInLoops [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 27, 2024, 10:25:59 PM – 10:26:01 PM) [pid: 1148]
4
```

```
1 package hust.soict.dsai.garbage;
2 import java.nio.file.Files;
3 import java.nio.file.Paths;
4 import java.io.IOException;
5 public class GabageCreator {
6     public static void main(String[] args)throws IOException{
7         String filename = "C:\\Users\\Admin\\eclipse-workspace\\OtherProjects\\lab02\\hust\\soict\\dsai\\garbage\\test.txt";
8         byte[] inputBytes = { 0 };
9         long startTime, endTime;
10        inputBytes=Files.readAllBytes(Paths.get(filename));
11        startTime=System.currentTimeMillis();
12        String outputString = "";
13        for(byte b: inputBytes)
14        {
15            outputString += (char) b;
16        }
17        endTime=System.currentTimeMillis();
18        System.out.println(endTime-startTime);
19    }
20 }
21

Problems Javadoc Declaration Console Coverage
terminated> GabageCreator [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 27, 2024, 10:27:39 PM – 10:27:39 PM) [pid: 22320]
41
```



```
1 package hust.soict.dsai.garbage;
2 import java.nio.file.Files;
3 import java.nio.file.Paths;
4 import java.io.IOException;
5 public class NoGabbage {
6     public static void main(String[] args) throws IOException {
7         String filename = "C:\\Users\\Admin\\eclipse-workspace\\OtherProjects\\lab02\\hust\\soict\\dsai\\garbage\\test.txt";
8         byte[] inputBytes = { 0 };
9         long startTime, endTime;
10        inputBytes=Files.readAllBytes(Paths.get(filename));
11        startTime=System.currentTimeMillis();
12        StringBuilder outputStringBuilder = new StringBuilder();
13        for (byte b: inputBytes) {
14            outputStringBuilder.append((char)b);
15        }
16        endTime=System.currentTimeMillis();
17        System.out.println(endTime-startTime);
18    }
19 }
20
21
22
```

Problems Javadoc Declaration Console Coverage

<terminated> NoGabbage [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 27, 2024, 10:28:26 PM – 10:28:26 PM) [pid: 20528]

0

-Is JAVA a Pass by Value or a Pass by Reference programming language?

Java là Pass by Value. Khi truyền tham số vào phương thức, Java truyền một bản sao giá trị của tham chiếu (đối với đối tượng) hoặc giá trị thực tế (đối với kiểu dữ liệu nguyên thủy).

-After the call of swap(jungleDVD, cinderellaDVD) why does the title of these two objects still remain?

Phương thức swap chỉ hoán đổi bản sao của tham chiếu, không ảnh hưởng đến các đối tượng thực trong bộ nhớ. Vì vậy, thứ tự và nội dung của jungleDVD và cinderellaDVD bên ngoài phương thức không thay đổi.

-After the call of changeTitle(jungleDVD, cinderellaDVD.getTitle()) why is the title of the JungleDVD changed?

Trong phương thức, sử dụng tham chiếu đến đối tượng jungleDVD thực trong bộ nhớ. Khi thay đổi thuộc tính (như tiêu đề) là đang thao tác trực tiếp trên đối tượng đó, nên tiêu đề của jungleDVD được cập nhật.