

1) New code

- Thêm 1 mảng DVD

```
//Them 1 mang DVD
public int addDigitalVideoDisc(DigitalVideoDisc[] dvdArray) {
    int addCount = 0;
    for(DigitalVideoDisc disc : dvdArray){
        if(qtyOrdered == MAX_NUMBERS_ORDERED){
            System.out.println("The Cart is almost full. Can't add more discs");
            break;
        }else{
            itemsOrdered[qtyOrdered] = disc;
            qtyOrdered++;
            System.out.println("The DVD " + "\"" + disc.getTitle() + "\"" + "has been added");
            addCount++;
        }
    }
    return addCount;
}
```

- Thêm 1 số lượng DVD tùy ý

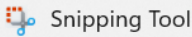
```
// Ham them dia vào gio hang theo List voi so luong tuy y
public int addDigitalVideoDisc(DigitalVideoDisc... dvdArray) {
    int addCount = 0;
    for (DigitalVideoDisc disc : dvdArray) {
        if (qtyOrdered == MAX_NUMBERS_ORDERED) {
            System.out.println("The cart is almost full. Can't add more discs");
            break;
        } else {
            itemsOrdered[qtyOrdered] = disc;
            qtyOrdered++;
            System.out.println("The DVD " + "\"" + disc.getTitle() + "\"" + " has been added");
            addCount++;
        }
    }
    return addCount;
}
```

- Thêm 2 DVD

```
//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. Can't add more discs");
        return 0;
    } else {
        itemsOrdered[qtyOrdered] = dvd1;
        qtyOrdered++;
        System.out.println("The DVD " + "\"" + dvd1.getTitle() + "\"" + " has been ad

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

        return 2; //Tra ve so dia DVD da them duoc
    }
}
```



- Thêm Id cho DVD được tạo mới

```
1 package hust.soict.dsai.aims.disc;
2
3 public class DigitalVideoDisc {
4     //Attributes
5     public static int nbDigitalVideoDiscs = 0;
6     private int id;
7     private String title;
8     private String category;
9     private String director;
10    private int length;
11    private float cost;
12    //Constructor
13    public DigitalVideoDisc(String title, String category, float cost) {
14        super();
15        this.title = title;
16        this.category = category;
17        this.cost = cost;
18        this.id = ++nbDigitalVideoDiscs;
19    }
20
21    public DigitalVideoDisc(String title) {
22        super();
23        this.title = title;
24        this.id = ++nbDigitalVideoDiscs;
25    }
26    public DigitalVideoDisc(String title, String category, String director, float cost) {
27        super();
28        this.title = title;
29        this.category = category;
30        this.director = director;
31        this.cost = cost;
32        this.id = ++nbDigitalVideoDiscs;
33    }
34 }
```

- printCart và run cartTest.java

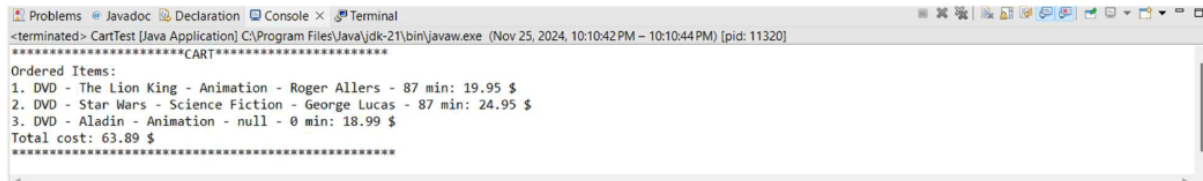
```
public void printCart() {
    System.out.println("*****CART*****");
    System.out.println("Ordered Items:");

    float totalCost = 0;
    for (int i = 0; i < qtyOrdered; i++) {
        DigitalVideoDisc dvd = itemsOrdered[i];
        System.out.println((i + 1) + ". " + dvd.toString());
        totalCost += dvd.getCost();
    }

    System.out.println("Total cost: " + totalCost + " $");
    System.out.println("*****");
}
```

```
1 package hust.soict.dsai.test.cart;
2
3 import hust.soict.dsai.aims.disc.DigitalVideoDisc;
4
5 public class CartTest {
6     public static void main(String[] args) {
7         Cart cart = new Cart();
8
9         DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion King", "Animation", "Roger Allers", 87, 19.95f);
10        cart.addDigitalVideoDisc(dvd1);
11        DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star Wars", "Science Fiction", "George Lucas", 87, 24.95f);
12        cart.addDigitalVideoDisc(dvd2);
13        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation", 18.99f);
14        cart.addDigitalVideoDisc(dvd3);
15        cart.printCart();
16    }
17 }
18
```

Run CartTest.java:



```
Problems Javadoc Declaration Console X Terminal
<terminated> CartTest [Java Application] C:\Program Files\Java\jdk-21\bin\javaw.exe (Nov 25, 2024, 10:10:42 PM - 10:10:44 PM) [pid: 11320]
*****CART*****
Ordered Items:
1. DVD - The Lion King - Animation - Roger Allers - 87 min: 19.95 $
2. DVD - Star Wars - Science Fiction - George Lucas - 87 min: 24.95 $
3. DVD - Aladin - Animation - null - 0 min: 18.99 $
Total cost: 63.89 $
*****
```

- SearchById và SearchByTitle

```
// Method to search DVDs by ID and print the result
public void searchById(int id) {
    boolean found = false;
    for (DigitalVideoDisc dvd : itemsOrdered) {
        if (dvd.getId() == id) {
            System.out.println("Found DVD: " + dvd.toString());
            found = true;
            break;
        }
    }
    if (!found) {
        System.out.println("No DVD found with ID: " + id);
    }
}

public void searchByTitle(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()
            );
            return;
        }
    }
    System.out.println("No match found !");
}
}
```

- Run cartTest.java để thử methods:

```
1 package hust.soict.dsai.test.cart;
2 import hust.soict.dsai.aims.cart.Cart;
3
4
5 public class CartTest {
6     public static void main(String[] args) {
7         // Tạo giỏ hàng trống
8         Cart anOrder = new Cart();
9         // Thêm đĩa vào giỏ hàng
10        DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion King", "Anim
11        "Roger Allers", 87, 19.95f);
12        anOrder.addDigitalVideoDisc(dvd1);
13        DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star wars", "Science
14        "Geogre Lucas", 87, 24.95f);
15        anOrder.addDigitalVideoDisc(dvd2);
16        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation",
17        anOrder.addDigitalVideoDisc(dvd3);
18
19        anOrder.printCart();
20        anOrder.searchById(1);
21    }
22 }
```

Problems Javadoc Declaration Console x

<terminated> CartTest [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 26, 2024, 11:19:55 AM -

The DVD "The Lion King" have been added!
The DVD "Star wars" have been added!
The DVD "Aladin" have been added!
*****CART*****
Ordered Items:
1. DVD - The Lion King - Animation - Roger Allers - 87 min: 19.95 \$
2. DVD - Star wars - Science Fiction - Geogre Lucas - 87 min: 24.95 \$
3. DVD - Aladin - Animation - null - 0 min: 18.99 \$
Total cost: 63.89 \$

Found DVD: DVD - The Lion King - Animation - Roger Allers - 87 min: 19.95 \$

```

1 package hust.soict.dsai.test.cart;
2 import hust.soict.dsai.aims.cart.Cart;
3
4
5 public class CartTest {
6     public static void main(String[] args) {
7         // Tao giỏ hàng trống
8         Cart anOrder = new Cart();
9         // Thêm đĩa vào giỏ hàng
10        DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion King", "Animation",
11            "Roger Allers", 87, 19.95f);
12        anOrder.addDigitalVideoDisc(dvd1);
13        DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star wars", "Science Fiction",
14            "Geogre Lucas", 87, 24.95f);
15        anOrder.addDigitalVideoDisc(dvd2);
16        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation", 18.99f);
17        anOrder.addDigitalVideoDisc(dvd3);
18
19        anOrder.printCart();
20        anOrder.searchByTitle("Aladin");
21    }
22 }

```

```

<terminated> CartTest [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 26, 2024,
[The DVD "The Lion King" have been added!
The DVD "Star wars" have been added!
The DVD "Aladin" have been added!
*****CART*****
Ordered Items:
1. DVD - The Lion King - Animation - Roger Allers - 87 min: 19.95 $
2. DVD - Star wars - Science Fiction - Geogre Lucas - 87 min: 24.95 $
3. DVD - Aladin - Animation - null - 0 min: 18.99 $
Total cost: 63.89 $
*****
Result: [Aladin] - [Animation] - [null] - [0]: 18.99 $

```

Store.java và run storeTest.java

```

1 package hust.soict.dsai.aims.store;
2 import hust.soict.dsai.aims.disc.DigitalVideoDisc;
3
4 public class Store {
5     private LinkedList<DigitalVideoDisc> itemsInStore = new LinkedList<DigitalVideoDisc>();
6     private boolean checkDVD(DigitalVideoDisc disc) {
7         for (DigitalVideoDisc digitalVideoDisc : itemsInStore) {
8             if (digitalVideoDisc.equals(disc)) {
9                 return true;
10            }
11        }
12        return false;
13    }
14
15    public void removeDVD(DigitalVideoDisc disc) {
16        if(checkDVD(disc)) {
17            itemsInStore.remove(disc);
18            System.out.println( disc.getTitle() + " 've been deleted from the store !");
19        } else {
20            System.out.println("There is no " + disc.getTitle() + " in the store !");
21        }
22    }
23
24    public void addDVD(DigitalVideoDisc disc) {
25        if(!checkDVD(disc)) {
26            itemsInStore.add(disc);
27            System.out.println( disc.getTitle() + " 've been added to the store !");
28        } else {
29            System.out.println( disc.getTitle() + " 'already exists in the store !");
30        }
31    }
32 }
33

```

```
5 public class StoreTest {
6     public static void main(String[] args) {
7         Store store = new Store();
8         DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion King", "Animation", "Roger Allers", 87, 19.95f);
9         DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star wars", "Science Fiction", "Geogre Lucas", 87, 24.95f);
10        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation", 18.99f);
11        store.addDVD(dvd1);
12        store.addDVD(dvd2);
13        store.addDVD(dvd3);
14        System.out.println(store.toString());
15        store.removeDVD(dvd1);
16        store.removeDVD(dvd2);
17        store.removeDVD(dvd3);
18        System.out.println(store.toString());
19    }
20 }
```

Problems Javadoc Declaration Console x

<terminated> StoreTest [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 26, 2024, 11:25:46 AM – 11:25:47 AM) [pid: 25840]

The Lion King 've been added to the store !
Star wars 've been added to the store !
Aladin 've been added to the store !
*****STORE*****
items in the store:
The Lion King - 19.95 \$
Star wars - 24.95 \$
Aladin - 18.99 \$

The Lion King 've been deleted from the store !
Star wars 've been deleted from the store !
Aladin 've been deleted from the store !
*****STORE*****
items in the store:
There is no dvd in the store !

- String, StringBuilder, StringBuffer:

```

1 package hust.soict.dsai.garbage;
2 import java.util.Random;
5 public class ConcatenationInLoops {
6
7     public static void main(String[] args) {
8         Random r = new Random(123);
9         long start = currentTimeMillis();
10        String s = "";
11        for (int i = 0; i < 65536; i++) s += r.nextInt(2);
12        System.out.println(currentTimeMillis() - start);
13
14        r = new Random(123);
15        start = System.currentTimeMillis();
16        StringBuilder sb = new StringBuilder();
17        for (int i = 0; i < 65536; i++) sb.append(r.nextInt(2));
18        s += sb.toString();
19        System.out.println(currentTimeMillis() - start);
20    }
21 }
22 }
23
7 public class GarbageCreator {
8     public static void main(String[] args) {
9         String filename = "C:\\Users\\longn\\OneDrive\\Máy tính\\JAVA_\\Lab3\\OtherProjects\\src\\hust\\soict\\dsai\\garbage\\
10        byte[] inputBytes = new byte[0];
11        long startTime, endTime;
12
13        try {
14
15            inputBytes = Files.readAllBytes(Paths.get(filename));
16            startTime = System.currentTimeMillis();
17
18            String outputString = "";
19            for (byte b : inputBytes) {
20                outputString += (char) b;
21            }
22
23            endTime = System.currentTimeMillis();
24            System.out.println("Thời gian xử lý với String concatenation (sử dụng +): " + (endTime - startTime) + " ms");
25
26            startTime = System.currentTimeMillis();
27
28            StringBuffer sb = new StringBuffer();
29            for (byte b : inputBytes) {
30                sb.append((char) b);
31            }
32            outputString = sb.toString(); // Chuyển StringBuffer thành chuỗi
33
34            endTime = System.currentTimeMillis();
35            System.out.println("Thời gian xử lý với StringBuffer: " + (endTime - startTime) + " ms");
36
37        } catch (IOException e) {
38            System.out.println("Lỗi khi đọc tệp: " + e.getMessage());
39        }
40    }
41 }

```

```

1 package hust.soict.dsai.garbage;
2
3 import java.io.*;
4
5 public class NoGarbage {
6     public static void main(String[] args) {
7         StringBuffer sb = new StringBuffer();
8         try {
9             // Đọc tệp "largefile.txt" sử dụng StringBuffer để nối chuỗi
10            FileInputStream fileInputStream = new FileInputStream("C:\\Users\\longn\\OneDrive\\Máy tính\\JAVA\\Lab3\\OtherProjects\\largefile.txt");
11            int content;
12            while ((content = fileInputStream.read()) != -1) {
13                sb.append((char) content);
14            }
15            fileInputStream.close();
16            // Chuyển StringBuffer thành String cuối cùng
17            String result = sb.toString();
18        } catch (IOException e) {
19            System.out.println("Lỗi khi đọc tệp: " + e.getMessage());
20        }
21    }
22 }

```

TRẢ LỜI CÂU HỎI:

JAVA là ngôn ngữ lập trình Pass By Value

So sánh cách dùng tham số mảng và tham số có số lượng tùy ý

Mảng: Phải tạo mảng trước khi truyền vào

Tùy ý: Truyền nhiều đối số, linh hoạt.

-> Tham số với số lượng tùy ý linh hoạt hơn.

Tiêu đề không thay đổi khi gọi swap

- Vì nó chỉ truyền bản sao của tham chiếu chứ không phải Pass by references

-> chỉ swap trong method, các tham chiếu gốc vẫn trỏ đến đối tượng ban đầu.

Tiêu đề thay đổi khi gọi changeTitle

- Tham chiếu của jungleDVD đã được truyền và phương thức. Cả bản sao và bản gốc của tham chiếu đều trỏ đến 1 đối tượng trong bộ nhớ. Nên khi changeTitle thì sẽ thay đổi chính xác đối tượng đó trên bộ nhớ