

BÁO CÁO THỰC HÀNH LAB 03

THỰC HÀNH LẬP TRÌNH HƯỚNG ĐỐI TƯỢNG

Contents

1. Working with method overloading.....	2
1.1. Overloading by differing types of parameter.....	2
Code	2
1.2. Overloading by differing the number of parameters.....	3
Code	3
Result.....	4
1. Passing paramete.....	4
2. Passing parameter	5
3. Class Member and Instance Member	7
Code	7
Result.....	9
4. Open the Cart class	9
Result.....	10
5. Implement the Store class.....	11
Result.....	12
6. String, StringBuilder and StringBuffer	13
7 Class Diagram	15

1. Working with method overloading

1.1. Overloading by differing types of parameter

Code

-Phương thức mới đầu tiên addDigitalVideoDisc(DigitalVideoDisc[] dvdList) cho phép thêm một danh sách các đĩa DVD vào giỏ hàng.

```
//add list
public int addDigitalVideoDisc(DigitalVideoDisc[] dvdList) {
    int addedCount = 0;
    for (DigitalVideoDisc disc : dvdList) {
        if (qtyOrdered == MAX_NUMBERS_ORDERED) {
            System.out.println("The cart is almost full. Can't add more disc");
            break;
        } else {
            itemsOrdered[qtyOrdered] = disc;
            qtyOrdered++;
            System.out.println("The DVD " + "\"" + disc.getTitle() + "\"" + " has been added!");
            addedCount++;
        }
    }
    return addedCount;
}
```

Figure 1 Method addDigitalVideoDisc(DigitalVideoDisc [] dvdList)

-Phương thức mới thứ hai addDigitalVideoDisc(DigitalVideoDisc... dvdArray) sử dụng varargs để cho phép thêm một số lượng tùy ý các đĩa DVD vào giỏ hàng.

```
//Thêm thêm đĩa vào giỏ hàng theo list với số lượng tùy ý
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;
}
```

Figure 2

-Cách sử dụng varargs linh hoạt hơn vì nó cho phép thêm bất kỳ số lượng đĩa DVD nào mà không cần chỉ định mảng một cách rõ ràng. Điều này làm cho mã nguồn sạch sẽ hơn và thuận tiện hơn khi gọi phương thức. Vì thế em thích phương thức dùng varargs.

```

The DVD "Frozen" has been added!
The DVD "Spider-Man" has been added!
The DVD "The Lion King 2" has been added!
Remove DVD "Spider-Man" successfully!
The DVD "The Lord of the Rings: The Fellowship of the Ring" has been added!
The cart is almost full. Can't add more discs
The cart is almost full. Can't add more discs
The cart is almost full. Can't add more discs
*****CART*****
Ordered items:
1. [Star Wars] - [Science Fiction] - [George Lucas] - [87]: 213.95vnd
2. [The Lion King] - [Animation] - [Roger Allers] - [88]: 193.95vnd
3. [Inception] - [Science Fiction] - [Christopher Nolan] - [148]: 24.99vnd
4. [Avatar] - [Science Fiction] - [James Cameron] - [162]: 292.99vnd
5. [The Dark Knight] - [Action] - [Christopher Nolan] - [152]: 119.99vnd
6. [Pulp Fiction] - [Drama] - [Quentin Tarantino] - [154]: 194.99vnd
7. [Forrest Gump] - [Drama] - [Robert Zemeckis] - [142]: 148.99vnd
8. [The Matrix] - [Science Fiction] - [The Wachowskis] - [136]: 262.99vnd
9. [Titanic] - [Romance] - [James Cameron] - [195]: 147.99vnd
10. [Jurassic Park] - [Adventure] - [Steven Spielberg] - [127]: 155.99vnd

```

Figure 3 Result

1.2. Overloading by differing the number of parameters

Code

```

//Thêm thêm 2 đĩa 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 added!");

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

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

```

Figure 4 Method addDigitalVideoDisc(DigitalVideoDisc [] dvdList)

```

DigitalVideoDisc dvd1 = new DigitalVideoDisc("Star Wars", "Science Fiction", "George Lucas", 87, 213.95f);
anOrder.addDigitalVideoDisc(dvd1);

DigitalVideoDisc dvd2 = new DigitalVideoDisc("The Lion King", "Animation", "Roger Allers", 88, 193.95f);
anOrder.addDigitalVideoDisc(dvd2);

```

Figure 5 Aims Class

Result

```
The DVD "Star Wars" has been added!
The DVD "The Lion King" has been added!
*****CART*****
Ordered items:
1. [Star Wars] - [Science Fiction] - [George Lucas] - [87]: 213.95vnd
2. [The Lion King] - [Animation] - [Roger Allers] - [88]: 193.95vnd
Total: 407.9vnd
```

Figure 6 Result

1. P
a
s
s
i
n
g
p
a
r
a
m
e
t
e

2. Passing parameter

-Trả lời câu hỏi: Java là ngôn ngữ lập trình "Pass by Value". Trong Java, khi bạn truyền một tham số cho một phương thức, giá trị của tham số được sao chép và truyền vào phương thức. Điều này có nghĩa là nếu bạn thay đổi giá trị của tham số bên trong phương thức, giá trị của biến gọi phương thức không bị ảnh hưởng.

-Tạo class test Passing Parameter:

```
package lab2_donhiu;

public class TestPassingParameter {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        DigitalVideoDisc jungleDVD = new DigitalVideoDisc("Jungle");
        DigitalVideoDisc cinderellaDVD = new DigitalVideoDisc("Cinderella");

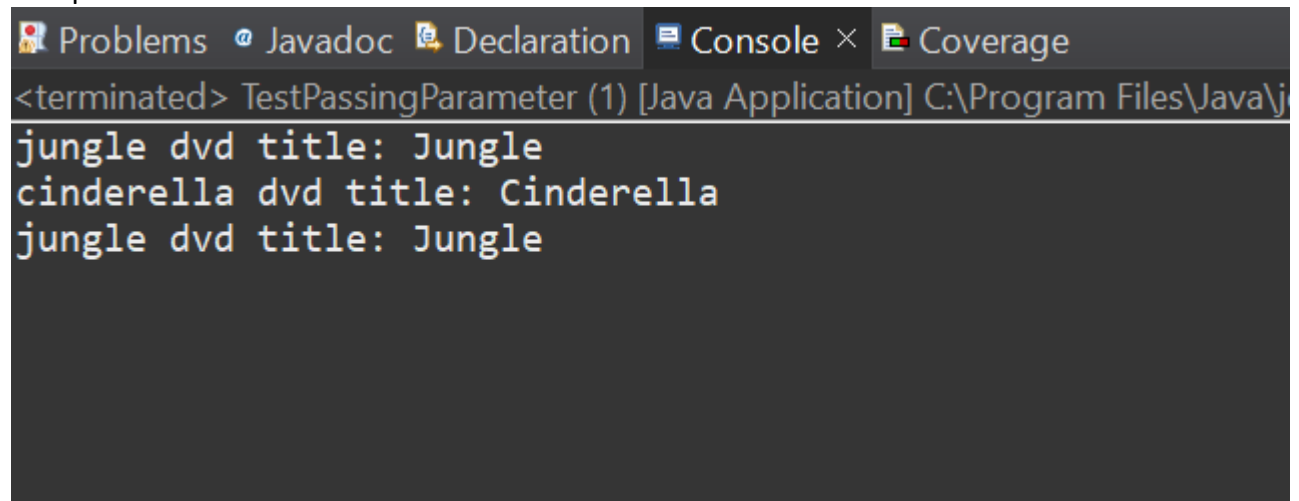
        swap(jungleDVD, cinderellaDVD);
        System.out.println("jungle dvd title: " + jungleDVD.getTitle());
        System.out.println("cinderella dvd title: " + cinderellaDVD.getTitle());

        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);
    }
}
```

Kết quả:



```
<terminated> TestPassingParameter (1) [Java Application] C:\Program Files\Java\j
jungle dvd title: Jungle
cinderella dvd title: Cinderella
jungle dvd title: Jungle
```

-Không có thay đổi tên => có vấn đề với hàm swap

Sửa lại:

```
package lab2_dohieu;

public class TestPassingParameter {

    public static void main(String[] args) {
        DigitalVideoDisc jungleDVD = new DigitalVideoDisc("Jungle");
        DigitalVideoDisc cinderellaDVD = new DigitalVideoDisc("Cinderella");

        // Tạo mảng chứa hai đối tượng
        DigitalVideoDisc[] dvds = {jungleDVD, cinderellaDVD};

        // Hoán đổi hai đối tượng
        swap(dvds);

        // Kiểm tra kết quả
        System.out.println("jungle dvd title: " + dvds[0].getTitle()); // Cinderella
        System.out.println("cinderella dvd title: " + dvds[1].getTitle()); // Jungle
    }

    // Phương thức hoán đổi hai đối tượng trong mảng
    public static void swap(DigitalVideoDisc[] dvds) {
        if (dvds.length >= 2) {
            DigitalVideoDisc temp = dvds[0];
            dvds[0] = dvds[1];
            dvds[1] = temp;
        }
    }
}
```

problems @ Javadoc Declaration Console × Coverage

minated> TestPassingParameter (1) [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 24, 2024, 11:11)

Jungle dvd title: Cinderella

Cinderella dvd title: Jungle

3. Class Member and Instance Member

Code

```
1 package lab2_dohieu;
2
3 public class DigitalVideoDisc {
4     private static int nbDigitalVideoDiscs = 0;
5     private String title;
6     private String category;
7     private String director;
8     private int length;
9     private float cost;
10    private int id;
11
12    public DigitalVideoDisc(String title) {
13        this.title = title;
14        this.length = 0;
15        this.cost = 0.0f;
16        // nbDigitalVideoDiscs++;
17        this.id = ++nbDigitalVideoDiscs;
18    }
19
20    public DigitalVideoDisc(String title, String category, float cost) {
21        this.title = title;
22        this.category = category;
23        this.cost = cost;
24        // nbDigitalVideoDiscs++;
25        this.id = ++nbDigitalVideoDiscs;
26    }
27
28    public DigitalVideoDisc(String title, String category, String director, float cost) {
29        this.title = title;
30        this.category = category;
31        this.director = director;
32        this.cost = cost;
33        // nbDigitalVideoDiscs++;
34        this.id = ++nbDigitalVideoDiscs;
35    }
36
37    public DigitalVideoDisc(String title, String category, String director, int length, float cost) {
38        this.title = title;
39        this.category = category;
40        this.director = director;
41        this.length = length;
42        this.cost = cost;
43        // nbDigitalVideoDiscs++;
44        this.id = ++nbDigitalVideoDiscs;
45    }
46
47    public String getTitle() { return title; }
48    public String getCategory() { return category; }
49    public String getDirector() { return director; }
50    public int getLength() { return length; }
51    public float getCost() { return cost; }
52    public int getId() { return id; }
53 }
```

Figure 9 Class member and Instance member

Result

Figure 10 Result

4. Open the Cart class

Code

```

101
102 public void print() {
103     System.out.println("*****CART*****");
104     System.out.println("Ordered items:");
105     for (int i = 0; i < qtyOrdered; i++) {
106         System.out.println((i + 1) + ". [" + itemsOrdered[i].getTitle() + "] - [" + itemsOrdered[i].getCategory() + "] - [" +
107             itemsOrdered[i].getDirector() + "] - [" + itemsOrdered[i].getLength() + "]: " + itemsOrdered[i].getCost() + "vnd");
108     }
109     System.out.println("Total: " + totalCost() + "vnd");
110     System.out.println("*****");
111 }
112 }
113

```

Problems Javadoc Declaration Console Coverage

terminated> AIMS [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 24, 2024, 11:33:15 PM - 11:33:15 PM) [pid: 30452]

he DVD "The Lion King" has been added!

he DVD "Star Wars" has been added!

```

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

DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star Wars",
    "Science Fiction", "George Lucas", 87, 24.95f);
anOrder.addDigitalVideoDisc(dvd2);

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

anOrder.print();

anOrder.removeDigitalVideoDisc(dvd2);
System.out.printf("Total cost is: %.2f", anOrder.totalCost());
}

```

Result

```
*****CART*****
Ordered items:
1. [The Lion King] - [Animation] - [Roger Allers] - [87]: 19.95vnd
2. [Star Wars] - [Science Fiction] - [George Lucas] - [87]: 24.95vnd
3. [Aladin] - [Animation] - [null] - [0]: 18.99vnd
Total: 63.89vnd
*****
```

5. Implement the Store class

Code

```

//Main class
public class Store {
    private LinkedList<DigitalVideoDisc> itemsInStore = new LinkedList<DigitalVideoDisc>();

    private boolean checkDVD(DigitalVideoDisc disc) {
        for (DigitalVideoDisc digitalVideoDisc : itemsInStore) {
            if (digitalVideoDisc.equals(disc)) {
                return true;
            }
        }
        return false;
    }

    public void removeDVD(DigitalVideoDisc disc) {
        if(checkDVD(disc)){
            itemsInStore.remove(disc);
            System.out.println(disc.getTitle() + ' ' + " 've been deleted from the store !");
        } else {
            System.out.println("There is no " + disc.getTitle() + " in the store !");
        }
    }

    public void addDVD(DigitalVideoDisc disc) {
        if(!checkDVD(disc)){
            itemsInStore.add(disc);
            System.out.println(disc.getTitle() + ' ' + " 've been added to the store !");
        } else {
            System.out.println(disc.getTitle() + " already exists in the store !");
        }
    }

    @Override
    public String toString() {
        StringBuilder string = new StringBuilder("=====STORE=====\\nItems in the store: \\n");
        if(itemsInStore.isEmpty()) string.append("There is no dvd in the store !\\n");
        else {
            for (DigitalVideoDisc dvd : itemsInStore) {
                string.append(dvd.getTitle() + " - " + dvd.getCost() + " $\\n");
            }
            string.append("=====");
        }
        return string.toString();
    }
}

```

Figure 17 Store Class

Result

Figure 18 StoreTest class

```

package test;

public class TestStore {
    public static void main(String[] args) {
        Store store = new Store();
        DigitalVideoDisc dvd1 = new DigitalVideoDisc("The Lion King", "Animation",
            "Roger Allers", 87, 19.95f);
        DigitalVideoDisc dvd2 = new DigitalVideoDisc("Star wars", "Science Fiction",
            "Geogre Lucas", 87, 24.95f);
        DigitalVideoDisc dvd3 = new DigitalVideoDisc("Aladin", "Animation", 18.99f);
        store.addDVD(dvd1);
        store.addDVD(dvd2);
        store.addDVD(dvd3);

        System.out.println(store.toString());

        store.removeDVD(dvd1);
        store.removeDVD(dvd2);
        store.removeDVD(dvd3);

        System.out.println(store.toString());
    }
}

```

Figure 19 Result

```

<terminated> AIMS [Java Application] C:\Program Files\Java\jdk-23\bin\javaw.exe (Nov 24, 2024)
The DVD "The Lion King" has been added!
The DVD "Star Wars" has been added!
The DVD "Aladin" has been added!
*****CART*****
Ordered items:
1. [The Lion King] - [Animation] - [Roger Allers] - [87]: 19.95vnd
2. [Star Wars] - [Science Fiction] - [George Lucas] - [87]: 24.95vnd
3. [Aladin] - [Animation] - [null] - [0]: 18.99vnd
Total: 63.89vnd
*****
Total cost is: 63.89

```

6. String, StringBuilder and StringBuffer

Code Tạo lớp ConcatenationInLoops

```
package hust.soict.hedspi.garbage;

public class ConcatenationInLoops {
    public static void main(String[] args) {
        Random r = new Random(123);
        long start = System.currentTimeMillis();
        String s = "";
        for (int i = 0; i < 65536; i++)
            s += r.nextInt(2);
        System.out.println(System.currentTimeMillis() - start); // This prints roughly 4500.

        r = new Random(123);
        start = System.currentTimeMillis();
        StringBuilder sb = new StringBuilder();
        for (int i = 0; i < 65536; i++)
            sb.append(r.nextInt(2));
        s = sb.toString();
        System.out.println(System.currentTimeMillis() - start); // This prints 5.
    }
}
```

PROBLEMS Declaration Console Coverage

<terminated> ConcatenationInLoops [Java Application] C:\Program Files\Java

376

2

Figure 20 So sánh String và StringBuilder

Tạo lớp GarbageCreator

```
package hust.soict.hedspi.garbage;

public class GarbageCreator {
    public static void main(String[] args) throws IOException {
        String filename = "D:\\code vao day\\projectJava\\lop thuc hanh\\OtherProjects\\src\\hust\\soict\\hedspi\\garbage\\test.text";
        byte[] inputBytes = { 0 };
        long startTime, endTime;
        inputBytes = Files.readAllBytes(Paths.get(filename));
        startTime = System.currentTimeMillis();
        String outputString = "";
        for (byte b : inputBytes) {
            outputString += (char) b;
        }
        endTime = System.currentTimeMillis();
        System.out.println(endTime - startTime);
    }
}
```

Figure 21 GarbageCreator class

Tạo lớp NoGarbage

```
package hust.soict.hedspi.garbage;

public class NoGarbage {
    public static void main(String[] args) throws IOException {
        String filename = "D:\\code vao day\\projectJava\\lop thuc hanh\\OtherProjects\\src\\hust\\soict\\hedspi\\garbage\\test.text";
        byte[] inputBytes = { 0 };
        long startTime, endTime;

        inputBytes = Files.readAllBytes(Paths.get(filename));
        startTime = System.currentTimeMillis();
        StringBuilder outputStringBuilder = new StringBuilder("");
        for (byte b : inputBytes) {
            outputStringBuilder.append((char) b);
        }
        endTime = System.currentTimeMillis();
        System.out.println(endTime - startTime);
    }
}
```

Figure 23 NoGarbage class

7 Class Diagram

Figure 25 Class Diagram

