

Báo cáo OopLap03

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I. New Code

1. Working with method overloading

Tại class Cart.java

```
20      // Phương thức thêm list đĩa video vào giỏ hàng 2.1a (method overloading)
21      //      public void addDigitalVideoDisc(DigitalVideoDisc[] dvdList) {
22      //          for(DigitalVideoDisc dvd : dvdList) {
23      //              if (qtyOrdered < MAX_NUMBERS_ORDERED) {
24      //                  itemsOrdered[qtyOrdered] = dvd;
25      //                  qtyOrdered++;
26      //                  System.out.println("The disc \"" + dvd.getTitle() + "\" has been added.");
27      //                  if (qtyOrdered == MAX_NUMBERS_ORDERED) {
28      //                      System.out.println("The cart is almost full!");
29      //                      return;
30      //                  }
31      //              } else {
32      //                  System.out.println("The cart is full! Cannot add more items.");
33      //                  return;
34      //              }
35      //          }
36      //      }
37
38      // Phương thức thêm list đĩa video vào giỏ hàng 2.1b (method overloading)
39      ✓ public void addDigitalVideoDisc(DigitalVideoDisc... dvdList) {
40          for(DigitalVideoDisc dvd : dvdList) {
41              if (qtyOrdered < MAX_NUMBERS_ORDERED) {
42                  itemsOrdered[qtyOrdered] = dvd;
43                  qtyOrdered++;
44                  System.out.println("The disc \"" + dvd.getTitle() + "\" has been added.");
45                  if (qtyOrdered == MAX_NUMBERS_ORDERED) {
46                      System.out.println("The cart is almost full!");
47                      return;
48                  }
49                  } else {
50                      System.out.println("The cart is full! Cannot add more items.");
51                      return;
52                  }
53              }
54          }
55      }
```

```

// Phương thức thêm 2 đĩa video vào giỏ hàng 2.2 (method overloading)
✓ public void addDigitalVideoDisc(DigitalVideoDisc dvd1,DigitalVideoDisc dvd2) {
    if(qtyOrdered + 2 <= MAX_NUMBERS_ORDERED) {
        itemsOrdered[qtyOrdered] = dvd1;
        qtyOrdered++;
        System.out.println("The disc \"" + dvd1.getTitle() + "\" has been added.");
        itemsOrdered[qtyOrdered] = dvd2;
        qtyOrdered++;
        System.out.println("The disc \"" + dvd2.getTitle() + "\" has been added.");
        if (qtyOrdered == MAX_NUMBERS_ORDERED) {
            System.out.println("The cart is almost full!");
        }
    }else if (qtyOrdered + 1 == MAX_NUMBERS_ORDERED) {
        itemsOrdered[qtyOrdered] = dvd1;
        qtyOrdered++;
        System.out.println("The disc \"" + dvd1.getTitle() + "\" has been added.");
        System.out.println("The cart is almost full!");
    }else {
        System.out.println("The cart is full! Cannot add more items.");
    }
}

```

Tại class Aims.java

```

24 //lab3
25
26 // Phương thức thêm list đĩa video vào giỏ hàng 2.1a (method overloading)
27 Cart listOrderCart = new Cart();
28 DigitalVideoDisc[] listDVD = new DigitalVideoDisc [2];
29 listDVD[0] = new DigitalVideoDisc("The Lion King", "Animation", "Roger Allers", 87, 19.95f);
30 listDVD[1] = new DigitalVideoDisc("Star Wars",
31 "Science Fiction", "George", 87, 24.95f);
32 //listOrderCart.addDigitalVideoDisc (listDVD);
33
34 // Phương thức thêm list đĩa video vào giỏ hàng 2.1b (method overloading)
35 listOrderCart.addDigitalVideoDisc (listDVD[0], listDVD [1], listDVD[0], listDVD [1]);
36
37 // Phương thức thêm 2 đĩa video vào giỏ hàng 2.2 (method overloading)
38 anOrderCart.addDigitalVideoDisc (dvd1, dvd2);

```

2. Passing parameter

Tạo một class con để tạo đối tượng có thuộc tính là DigitalVideoDisc:

```

1  ✓ class SubDigitalVideoDisc {
2      public DigitalVideoDisc dvd;
3
4      public SubDigitalVideoDisc(DigitalVideoDisc dvd) {
5          this.dvd = dvd;
6      }
7  }

```

Tại class TestPassingParameter:

```
public static void swap(SubDigitalVideoDisc o1, SubDigitalVideoDisc o2) {  
    // Hoán đổi đối tượng DVD  
    DigitalVideoDisc temp = o1.dvd;  
    o1.dvd = o2.dvd;  
    o2.dvd = temp;  
}
```

Kết quả thu được

```
jungle dvd title: Jungle  
cinderella dvd title: Cinderella  
lab3
```

After swap:

```
Jungle DVD title: Cinderella  
Cinderella DVD title: Jungle
```

3. Classifier Member and Instance Member

Tại class DigitalVideoDisc:

```
8         private static int nbDigitalVideoDiscs = 0;  
9         private int id;  
10  
11  
12         public int getId() {  
13             return id;  
14         }
```

```

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

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

    public DigitalVideoDisc(String title, String category, float cost) {
        super();
        this.id = nbDigitalVideoDiscs++;
        this.title = title;
        this.category = category;
        this.cost = cost;
    }

    public DigitalVideoDisc(String title) {
        super();
        this.id = nbDigitalVideoDiscs++;
        this.title = title;
    }

```

4. Open the Cart class

Tại class Cart:

```

110  public void print()
111  {
112      System.out.println("*****CART*****");
113      System.out.println("Ordered Items:");
114      for (int i = 0; i < qtyOrdered; i++)
115      {
116          System.out.println(itemsOrdered[i]);
117      }
118      System.out.println("Total cost: " + totalCost());
119      System.out.println("*****");
120  }

```

Kết quả thu được tại class TestCart:

```

*****CART*****
Ordered Items:
hust.soict.hedspi.aims.disc.DigitalVideoDisc@5ecddf8f
hust.soict.hedspi.aims.disc.DigitalVideoDisc@3f102e87
hust.soict.hedspi.aims.disc.DigitalVideoDisc@27abe2cd
Total cost: 63.89
*****

```

Với chức năng tìm kiếm

- Id:

```

public void searchByID(int id)
{
    boolean found = false;
    for (int i = 0; i < qtyOrdered; i++)
    {
        if (itemsOrdered[i].getId() == id)
        {
            System.out.println("Found" + itemsOrdered[i]);
            found = true;
        }
    }
    if (found==false)
    {
        System.out.println("Sorry, no DVDs were found that match the ID provided!");
    }
}

```

- Title:

```

public void searchByTitle(String keyword)
{
    boolean matchFound = false;
    for (int i=0; i < qtyOrdered; i++)
    {
        if (itemsOrdered[i].isMatch(keyword))
        {
            System.out.println("Found" + itemsOrdered[i]);
            matchFound = true;
        }
    }
    if (matchFound == false)
    {
        System.out.println("Sorry, no DVDs were found with \"" + keyword + "\" in the title");
    }
}

```

Kết quả chạy được trên file TestCart:

```

Sorry, no DVDs were found that match the ID provided!
Foundhust.soict.hedspi.aims.disc.DigitalVideoDisc@27abe2cd

```

5. Implement the Store class

Tại class Store:

```
public void addDVD(DigitalVideoDisc dvd) {
    int index = itemsInStore.indexOf(dvd);
    if (index != -1) {
        System.out.println(dvd.getTitle() + " is already in the store.");
    } else {
        itemsInStore.add(dvd);
        System.out.println(dvd.getTitle() + " has been added to the store.");
    }
}

public void removeDVD(DigitalVideoDisc dvd) {
    boolean removed = itemsInStore.remove(dvd);
    if (removed) {
        System.out.println(dvd.getTitle() + " has been removed from the store.");
    } else {
        System.out.println(dvd.getTitle() + " is not found in the store.");
    }
}

public void print() {
    for (int i = 0; i < itemsInStore.size(); i++) {
        System.out.println((i + 1) + ". " + itemsInStore.get(i));
    }
}
```

Kết quả thu được khi chạy trên class StoreTest:

```
The Lion King has been added to the store.
Star Wars has been added to the store.
Aladin has been added to the store.
1. hust.soict.hedspi.aims.disc.DigitalVideoDisc@12f40c25
2. hust.soict.hedspi.aims.disc.DigitalVideoDisc@4fccd51b
3. hust.soict.hedspi.aims.disc.DigitalVideoDisc@44e81672
Aladin is already in the store.
Aladin has been removed from the store.
1. hust.soict.hedspi.aims.disc.DigitalVideoDisc@12f40c25
2. hust.soict.hedspi.aims.disc.DigitalVideoDisc@4fccd51b
Aladin has been added to the store.
1. hust.soict.hedspi.aims.disc.DigitalVideoDisc@12f40c25
2. hust.soict.hedspi.aims.disc.DigitalVideoDisc@4fccd51b
3. hust.soict.hedspi.aims.disc.DigitalVideoDisc@44e81672
```

II. Debug

Đặt breakpoint tại `swap(jungleDVD, cinderellaDVD);`

```

1 package hust.soict.hedspi.test.disc;
2
3 import hust.soict.hedspi.aims.disc.*;
4
5 public class TestPassingParameter {
6     public static void main(String[] args) {
7         DigitalVideoDisc jungleDVD = new DigitalVideoDisc("Jungle");
8         DigitalVideoDisc cinderellaDVD = new DigitalVideoDisc("Cinderella");
9
10        swap(jungleDVD, cinderellaDVD);
11        System.out.println("jungle dvd title: " + jungleDVD.getTitle());
12        System.out.println("cinderella dvd title: " + cinderellaDVD.getTitle());
13
14        //changeTitle(jungleDVD, cinderellaDVD.getTitle());
15        //System.out.println("jungle dvd title: " + jungleDVD.getTitle());
16
17        //lab3
18        SubDigitalVideoDisc subjungleDVD = new SubDigitalVideoDisc(jungleDVD);
19        SubDigitalVideoDisc subcinderellaDVD = new SubDigitalVideoDisc(cinderellaDVD);
20        swap(subjungleDVD, subcinderellaDVD);
21        System.out.println("lab3");
22        System.out.println("\nAfter swap:");
23        System.out.println("jungle DVD title: " + subjungleDVD.dvd.getTitle());
24        System.out.println("Cinderella DVD title: " + subcinderellaDVD.dvd.getTitle());
25    }
26
27    public static void swap(Object o1, Object o2) {
28        Object tmp = o1;
29        o1 = o2;
30        o2 = tmp;
31    }
32

```

Thay đổi giá trị của jungleDVD:

▼	🔍	jungleDVD	DigitalVideoDisc (id=22)
	▣	category	null
	▣	cost	0.0
	▣	director	null
	▣	id	0
	▣	lenght	0
	>	▣	title "abc" (id=35)
▼	🔍	cinderellaDVD	DigitalVideoDisc (id=25)
	▣	category	null
	▣	cost	0.0
	▣	director	null
	▣	id	1
	▣	lenght	0
	>	▣	title "Cinderella" (id=26)

Kết quả thu được:

```

TestPassingParameter (1) [Java Application] C:\Users\A
jungle dvd title: abc
cinderella dvd title: Cinderella

```

III. UML Diagram

➔ In the `changeTitle` method, you are passing `jungleDVD` as a parameter. Since `DigitalVideoDisc` is an object, the reference to the original object is passed by value (a copy of the reference). Inside the method, you change the title of the `dvd` object through `dvd.setTitle(title)`, which modifies the original `DigitalVideoDisc` object that `jungleDVD` points to. The line `dvd = new DigitalVideoDisc(oldTitle);` creates a new `DigitalVideoDisc` object and assigns it to the local variable `dvd`. However, this change does not affect the `jungleDVD` reference in the main method, because the reference itself is still pointing to the original object. Thus, the title of `jungleDVD` is changed to the new title passed into the method, while the local variable `dvd` now points to a new object that does not affect the original reference.

3. Write a `toString()` method for the `DigitalVideoDisc` class. What should be the return type of this method?

- The return type of the `toString()` method is `String`.
- It provides a convenient way to display object information, which can be particularly useful for debugging and logging.