Week 8 Exercise 8

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CE480 - Java and Internet Application

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# Author Note

# The Question

Restaurant (Vector + toString() + equals()) [.](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/inheritance/hw/q3/)  
A big restaurant serves several kinds of food. For example, Japanese Food, Korean Food, Mexican food, Vietnamese Food, Indian food, Chinese food, American food, etc. Details of each kind of food is described by its corresponding menu. The front cover describes the name of the restaurant and the total number of dishes. The back cover describes the phone number to order to-go. The pages between the front cover and back cover list the page numbers. A menu is usually colorless. However, a fancy menu is printed with color.

-----------------------------------------------------------------

| Menu |

| |

| String title; // The title of the Menu |

| // For example, "Mexican Food", |

| // "Ammerican Food", "Indian Food", etc. |

| |

| --------------------- --------------------- |

| | FrontCover | | BackCover | |

| | | | | |

| | String name | | | |

| | int numOfDishes; | | String phoneNum | |

| --------------------- --------------------- |

| --------------------- --------------------- |

| | Page | | Page | |

| | |...... | | |

| | int pageNum | | int pageNum | |

| --------------------- --------------------- |

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|

|

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| FancyMenu |

| |

| String color |

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Note:

* + pageNum shows the number of each menu page For example, the first page's page number is 1, the second page's page number is 2, etc.
  + The default value for numOfDishes is 10.
  + The minimum features for FrontCover, BackCover, Menu and Page are:
    1. implements Cloneable.
    2. Constructor
    3. get and set.
    4. toString

Title: Chinese Food

Front Cover:

name: Forbidden City

numOfDishes: 123

Back Cover:

phoneNum: 408-123-4356

Totoal number of pages: 3

pageNum: 1

pageNum: 2

pageNum: 3

* + 1. equals
  + The minimum features for FanceyMenu are:
    1. Constructor
    2. get and set
    3. toString  
       Note: you can just print name-value pair of all the attributes of the FancyMenu. For example,

Title: Mexicon Food

Front Cover:

name: Taco Bell

numOfDishes: 46

Back Cover:

phoneNum: 510-123-4567

Totoal number of pages: 4

pageNum: 1

pageNum: 2

pageNum: 3

pageNum: 4

Color: red

* + 1. equals
  + You should create a main function to test all your member functions of all the classes in your code.
  + You should use Javadoc to document your program and post the document on Internet.
  + References
    1. [Class containing two layers of simple object attribute + toString() + clone() + equals()](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/classStruct.htm#Class%20containing%20two%20layers%20of%20simple%20object%20attribute%20+%20toString()%20+%20clone()%20+%20equals())
    2. [get/set](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/get_set.html)
    3. [Inheritance Class Structure](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/inheritance/slide/inhStruct.html)
    4. [4 Types of Member Functions](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/javaMemFunc.html)
    5. [Summary of toString(), clone(), equals()](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/summary_table.html)
  + Sample code [.](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/week1/mid/mid0799.html) [.](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/week1/mid/mid1098_ans.html)
    1. Vector can be used to implement array of pages?
       - Week 3, link ["class structure"](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/classStruct.htm)
       - Week 3, link ["Vector"](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/vector.html)
    2. How to implement inheritance?
       - Week4, link ["Inheritance Class Structure"](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/inheritance/slide/inhStruct.html)
    3. String
       - Week3, link ["Strings"](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/string.html)
    4. toString
       - Week3, link ["toString() methods (operator<<)"](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/toString.html)
    5. equals
       - Week3, link ["The equals() method (operator==)"](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/equalMethod.html)
    6. clone
       - Week3, link ["Clone"](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/java_class/slide/clone.html)
    7. Base Class vs. Subclass
       - [Case 7](https://hc.labnet.sfbu.edu/~henry/sfbu/course/introjava/inheritance/slide/inhStruct.html#c7)

A computer screen shot of a black screen

Description automatically generated

A screen shot of a computer

Description automatically generated

A screen shot of a computer screen

Description automatically generated

============================Source Code================================

**Main.java**

public class Main {

    public static void main(String[] args) {

        // Create a Chinese menu and add pages

        Menu chineseMenu = new Menu(

                "Chinese Food",

                "Forbidden City",

                "408-123-4356");

        chineseMenu.pages.add(chineseMenu.new Page(1));

        chineseMenu.pages.add(chineseMenu.new Page(2));

        chineseMenu.pages.add(chineseMenu.new Page(3));

        System.out.println("---------- Chinese Menu ----------");

        System.out.println(chineseMenu);

        System.out.println("-------------------------------\n");

        // Create a fancy Mexican menu and add pages

        FancyMenu mexicanMenu = new FancyMenu(

                "Mexican Food",

                "Taco Bell",

                "510-123-4567",

                "red");

        mexicanMenu.pages.add(mexicanMenu.new Page(1));

        mexicanMenu.pages.add(mexicanMenu.new Page(2));

        mexicanMenu.pages.add(mexicanMenu.new Page(3));

        mexicanMenu.pages.add(mexicanMenu.new Page(4));

        // Print Fancy Mexican menu details

        System.out.println("---------- Fancy Mexican Menu ----------");

        System.out.println(mexicanMenu);

        System.out.println("--------------------------------------");

        // Japanese menu

        Menu japaneseMenu = new Menu(

                "Japanese Food",

                "Sushi Joe",

                "408-123-4356");

        japaneseMenu.pages.add(japaneseMenu.new Page(1));

        japaneseMenu.pages.add(japaneseMenu.new Page(2));

        japaneseMenu.pages.add(japaneseMenu.new Page(3));

        System.out.println("---------- Japanese Menu ----------");

        System.out.println(japaneseMenu);

        System.out.println("-------------------------------\n");

        // Korean menu

        Menu koreanMenu = new Menu(

                "Korean Food",

                "Korean BBQ",

                "408-123-4356");

        koreanMenu.pages.add(koreanMenu.new Page(1));

        koreanMenu.pages.add(koreanMenu.new Page(2));

        koreanMenu.pages.add(koreanMenu.new Page(3));

        System.out.println("---------- Korean Menu ----------");

        System.out.println(koreanMenu);

        System.out.println("-------------------------------\n");

        // Vietnamese menu

        Menu vietnameseMenu = new Menu(

                "Vietnamese Food",

                "Pho King",

                "408-123-4356");

        vietnameseMenu.pages.add(vietnameseMenu.new Page(1));

        vietnameseMenu.pages.add(vietnameseMenu.new Page(2));

        vietnameseMenu.pages.add(vietnameseMenu.new Page(3));

        System.out.println("---------- Vietnamese Menu ----------");

        System.out.println(vietnameseMenu);

        System.out.println("-------------------------------\n");

        // Indian menu

        Menu indianMenu = new Menu(

                "Indian Food",

                "Curry House",

                "408-123-4356");

        indianMenu.pages.add(indianMenu.new Page(1));

        indianMenu.pages.add(indianMenu.new Page(2));

        indianMenu.pages.add(indianMenu.new Page(3));

        System.out.println("---------- Indian Menu ----------");

        System.out.println(indianMenu);

        System.out.println("-------------------------------\n");

        // American menu

        Menu americanMenu = new Menu(

                "American Food",

                "McDonalds",

                "408-123-4356");

        americanMenu.pages.add(americanMenu.new Page(1));

        americanMenu.pages.add(americanMenu.new Page(2));

        americanMenu.pages.add(americanMenu.new Page(3));

        System.out.println("---------- American Menu ----------");

        System.out.println(americanMenu);

        System.out.println("-------------------------------\n");

        // Italian menu

        Menu italianMenu = new Menu(

                "Italian Food",

                "Olive Garden",

                "408-123-4356");

        italianMenu.pages.add(italianMenu.new Page(1));

        italianMenu.pages.add(italianMenu.new Page(2));

        italianMenu.pages.add(italianMenu.new Page(3));

        System.out.println("---------- Italian Menu ----------");

        System.out.println(italianMenu);

        System.out.println("-------------------------------\n");

        // French menu

        FancyMenu frenchMenu = new FancyMenu(

                "French Food",

                "Le Bistro",

                "408-123-4356",

                "blue");

        frenchMenu.pages.add(frenchMenu.new Page(1));

        frenchMenu.pages.add(frenchMenu.new Page(2));

        frenchMenu.pages.add(frenchMenu.new Page(3));

        frenchMenu.pages.add(frenchMenu.new Page(4));

        // Print Fancy Mexican menu details

        System.out.println("---------- Fancy French Menu ----------");

        System.out.println(frenchMenu);

        System.out.println("--------------------------------------");

        // Thai menu

        Menu thaiMenu = new Menu(

                "Thai Food",

                "Thai Express",

                "408-123-4356");

        thaiMenu.pages.add(thaiMenu.new Page(1));

        thaiMenu.pages.add(thaiMenu.new Page(2));

        thaiMenu.pages.add(thaiMenu.new Page(3));

        System.out.println("---------- Thai Menu ----------");

        System.out.println(thaiMenu);

        System.out.println("-------------------------------\n");

    }

}

**Menu.java**

import java.util.Vector;

public class Menu implements Cloneable {

    protected String title;

    protected FrontCover frontCover;

    protected BackCover backCover;

    protected Vector<Page> pages = new Vector<>();

    public Menu(String title, String name, String phoneNum) {

        this.title = title;

        this.frontCover = new FrontCover(name);

        this.backCover = new BackCover(phoneNum);

    }

    class FrontCover {

        String name;

        int numOfDishes = 10;

        FrontCover(String name) {

            this.name = name;

        }

    }

    class BackCover {

        String phoneNum;

        BackCover(String phoneNum) {

            this.phoneNum = phoneNum;

        }

    }

    class Page {

        int pageNum;

        Page(int pageNum) {

            this.pageNum = pageNum;

        }

    }

    @Override

    public String toString() {

        StringBuilder sb = new StringBuilder();

        sb.append("Title: ").append(title).append("\n");

        sb.append("Front Cover:\n");

        sb.append("    Name: ").append(frontCover.name).append("\n");

        sb

                .append("    Number of Dishes: ")

                .append(frontCover.numOfDishes)

                .append("\n");

        sb.append("Total number of pages: ").append(pages.size()).append("\n");

        for (Page page : pages) {

            sb.append("    PageNum: ").append(page.pageNum).append("\n");

        }

        sb.append("Back Cover:\n");

        sb.append("    Phone Number: ").append(backCover.phoneNum).append("\n");

        return sb.toString();

    }

}

**FancyMenu.java**

public class FancyMenu extends Menu {

    protected String MenuColor;

    public FancyMenu(

            String title,

            String name,

            String phoneNum,

            String MenuColor) {

        super(title, name, phoneNum);

        this.MenuColor = MenuColor;

    }

    @Override

    public String toString() {

        StringBuilder sb = new StringBuilder(super.toString()); // Leveraging the parent's toString()

        sb.append("Color: ").append(MenuColor).append("\n");

        return sb.toString();

    }

}

**Github - https://github.com/Georgycas/CE350-Java-and-Internet-Applications/tree/main/Code/Lab\_Code/Week8/Restaurant**