JAVA FUNDAMENTALS SECTION-07 PART-2

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Steps for Customizing the Inventory Software

1. Create the DVD and CD Subclasses

* a. Create the DVD subclass with additional fields for movie length, age rating, and film studio.
* b. Implement a constructor in DVD that initializes all fields, calling super to pass values to the Product constructor.
* c. Create getters and setters for the DVD fields.
* d. Similarly, create the CD subclass with fields for artist, number of songs, and record label.
* e. Implement a constructor in CD that initializes all fields, calling super to pass values to the Product constructor.
* f. Create getters and setters for the CD fields.

2. Override Methods in DVD and CD

* a. Override the getInventoryValue method in DVD to include a 5% restocking fee.
* b. Override the toString method in both DVD and CD to display subclass-specific information.

3. Modify the ProductTester Class

* a. Create a method addCDToInventory to handle adding CDs, including prompts for CD-specific fields and array indexing.
* b. Update the existing addToInventory method or create a new addDVDToInventory method for DVDs.
* c. Modify the addInventory method to include a menu for choosing between CD and DVD, and call the appropriate add method based on user input.
* d. Ensure the addToInventory method in Product stops adding stock for discontinued products.

FULL JAVA CODE

import java.util.Scanner;

// Base Product Class

class Product {

private String name;

private double price;

private int quantityInStock;

private int itemNumber;

private boolean isDiscontinued;

public Product(String name, double price, int quantityInStock, int itemNumber, boolean isDiscontinued) {

this.name = name;

this.price = price;

this.quantityInStock = quantityInStock;

this.itemNumber = itemNumber;

this.isDiscontinued = isDiscontinued;

}

public double calculateStockValue() {

return price \* quantityInStock;

}

public void setDiscontinued(boolean discontinued) {

this.isDiscontinued = discontinued;

}

public boolean isDiscontinued() {

return isDiscontinued;

}

@Override

public String toString() {

return "Item Number: " + itemNumber + "\n" +

"Name: " + name + "\n" +

"Quantity in stock: " + quantityInStock + "\n" +

"Price: " + price + "\n" +

"Stock Value: " + calculateStockValue() + "\n" +

"Product Status: " + (isDiscontinued ? "Discontinued" : "Active") + "\n";

}

// Getters and Setters

public String getName() { return name; }

public void setName(String name) { this.name = name; }

public double getPrice() { return price; }

public void setPrice(double price) { this.price = price; }

public int getQuantityInStock() { return quantityInStock; }

public void setQuantityInStock(int quantityInStock) { this.quantityInStock = quantityInStock; }

public int getItemNumber() { return itemNumber; }

public void setItemNumber(int itemNumber) { this.itemNumber = itemNumber; }

}

// DVD Subclass

class DVD extends Product {

private int length;

private int ageRating;

private String filmStudio;

public DVD(String name, double price, int quantityInStock, int itemNumber, boolean isDiscontinued,

int length, int ageRating, String filmStudio) {

super(name, price, quantityInStock, itemNumber, isDiscontinued);

this.length = length;

this.ageRating = ageRating;

this.filmStudio = filmStudio;

}

@Override

public double calculateStockValue() {

return super.calculateStockValue() \* 1.05; // 5% restocking fee

}

@Override

public String toString() {

return super.toString() +

"Movie Length: " + length + " minutes\n" +

"Age Rating: " + ageRating + "\n" +

"Film Studio: " + filmStudio + "\n";

}

// Getters and Setters

public int getLength() { return length; }

public void setLength(int length) { this.length = length; }

public int getAgeRating() { return ageRating; }

public void setAgeRating(int ageRating) { this.ageRating = ageRating; }

public String getFilmStudio() { return filmStudio; }

public void setFilmStudio(String filmStudio) { this.filmStudio = filmStudio; }

}

// CD Subclass

class CD extends Product {

private String artist;

private int numberOfSongs;

private String label;

public CD(String name, double price, int quantityInStock, int itemNumber, boolean isDiscontinued,

String artist, int numberOfSongs, String label) {

super(name, price, quantityInStock, itemNumber, isDiscontinued);

this.artist = artist;

this.numberOfSongs = numberOfSongs;

this.label = label;

}

@Override

public String toString() {

return super.toString() +

"Artist: " + artist + "\n" +

"Songs on Album: " + numberOfSongs + "\n" +

"Record Label: " + label + "\n";

}

// Getters and Setters

public String getArtist() { return artist; }

public void setArtist(String artist) { this.artist = artist; }

public int getNumberOfSongs() { return numberOfSongs; }

public void setNumberOfSongs(int numberOfSongs) { this.numberOfSongs = numberOfSongs; }

public String getLabel() { return label; }

public void setLabel(String label) { this.label = label; }

}

// ProductTester Class

public class ProductTester {

private static Product[] products = new Product[100];

private static int productIndex = 0;

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

while (true) {

System.out.println("1: Add CD");

System.out.println("2: Add DVD");

System.out.println("3: Exit");

System.out.print("Please enter the product type: ");

int stockChoice = scanner.nextInt();

scanner.nextLine(); // Clear the buffer

if (stockChoice == 1) {

if (productIndex >= products.length) {

System.out.println("Inventory full, cannot add more products.");

break;

}

addCDToInventory(productIndex, scanner);

} else if (stockChoice == 2) {

if (productIndex >= products.length) {

System.out.println("Inventory full, cannot add more products.");

break;

}

addDVDToInventory(productIndex, scanner);

} else if (stockChoice == 3) {

break;

} else {

System.out.println("Only numbers 1 or 2 allowed!");

continue;

}

productIndex++;

}

// Display all products

for (Product p : products) {

if (p != null) {

System.out.println(p);

}

}

scanner.close();

}

private static void addCDToInventory(int i, Scanner scanner) {

System.out.print("Please enter the CD name: ");

String name = scanner.nextLine();

System.out.print("Please enter the artist name: ");

String artist = scanner.nextLine();

System.out.print("Please enter the record label name: ");

String label = scanner.nextLine();

System.out.print("Please enter the number of songs: ");

int numberOfSongs = scanner.nextInt();

System.out.print("Please enter the quantity of stock for this product: ");

int quantity = scanner.nextInt();

System.out.print("Please enter the price for this product: ");

double price = scanner.nextDouble();

System.out.print("Please enter the item number: ");

int itemNumber = scanner.nextInt();

System.out.print("Is this product discontinued? (true/false): ");

boolean isDiscontinued = scanner.nextBoolean();

scanner.nextLine(); // Clear the buffer

products[i] = new CD(name, price, quantity, itemNumber, isDiscontinued, artist, numberOfSongs, label);

}

private static void addDVDToInventory(int i, Scanner scanner) {

System.out.print("Please enter the DVD name: ");

String name = scanner.nextLine();

System.out.print("Please enter the film studio name: ");

String filmStudio = scanner.nextLine();

System.out.print("Please enter the age rating: ");

int ageRating = scanner.nextInt();

System.out.print("Please enter the length in minutes: ");

int length = scanner.nextInt();

System.out.print("Please enter the quantity of stock for this product: ");

int quantity = scanner.nextInt();

System.out.print("Please enter the price for this product: ");

double price = scanner.nextDouble();

System.out.print("Please enter the item number: ");

int itemNumber = scanner.nextInt();

System.out.print("Is this product discontinued? (true/false): ");

boolean isDiscontinued = scanner.nextBoolean();

scanner.nextLine(); // Clear the buffer

products[i] = new DVD(name, price, quantity, itemNumber, isDiscontinued, length, ageRating, filmStudio);

}

}

OUTPUT:

