Experiment 1.2

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Subject: Java   **Subject Code: 22CSH-359**

Aim: Design and implement a simple inventory control system for a small video rental store

Objective: To design and implement a user-friendly inventory control system for a small video rental store, enabling efficient management of video inventory, including functionalities for adding, renting, and returning videos.

Algorithm:

- **Define Classes:**

  - **Video**: To represent each video, with attributes such as video ID, title, genre, and availability status.
  - **Inventory**: To manage the list of videos, including adding and removing videos from the inventory.
  - **Customer**: To represent customers, with attributes such as customer ID, name, and rented videos.
  - **RentalSystem**: To control the process of renting and returning videos.

- **Video Class:**

  - Define the video with attributes such as `videoID`, `title`, `genre`, and `isAvailable`.
  - Define methods to mark the video as rented and returned.

- **Inventory Class:**

  - Maintain a list of videos (`ArrayList<Video>`).
  - Implement methods to add new videos, display available videos, and check if a video is available.

- **Customer Class:**

  - Define a list to store rented videos.
  - Implement methods to rent a video (if available) and return it.

- **RentalSystem Class:**

  - Handle the main functionality: list available videos, allow customers to rent and return videos, and display the inventory status.

Code:

```java
import java.util.ArrayList;
import java.util.Scanner;

// Class representing a Video
class Video {
    private String title;
    private boolean isAvailable;

    public Video(String title) {
        this.title = title;
        this.isAvailable = true;
    }

    public String getTitle() {
        return title;
    }

    public boolean isAvailable() {
        return isAvailable;
    }

    public void rent() {
        if (isAvailable) {
            isAvailable = false;
        } else {
            System.out.println("Error: Video is already rented out.");
        }

    }
```

```java
    }

    public void returnVideo() {
        if (!isAvailable) {
            isAvailable = true;
        } else {
            System.out.println("Error: Video was not rented.");
        }
    }

    @Override
    public String toString() {
        return "Title: " + title + " | Available: " + (isAvailable ? "Yes" : "No");
    }
}

// Class representing the Video Store
class VideoStore {
    private ArrayList<Video> inventory;

    public VideoStore() {
        inventory = new ArrayList<>();
    }

    // Add a new video to the inventory
    public void addVideo(String title) {
        for (Video video : inventory) {
            if (video.getTitle().equalsIgnoreCase(title)) {
                System.out.println("Error: Video already exists in the inventory.");
                return;
            }
        }
        inventory.add(new Video(title));
        System.out.println("Video added successfully: " + title);
    }

    // List all videos in the inventory
    public void listInventory() {
        if (inventory.isEmpty()) {
            System.out.println("No videos in inventory.");
        } else {
            System.out.println("Inventory:");
            for (int i = 0; i < inventory.size(); i++) {
                System.out.println((i + 1) + ". " + inventory.get(i));
            }
        }
    }

    // Rent a video
```
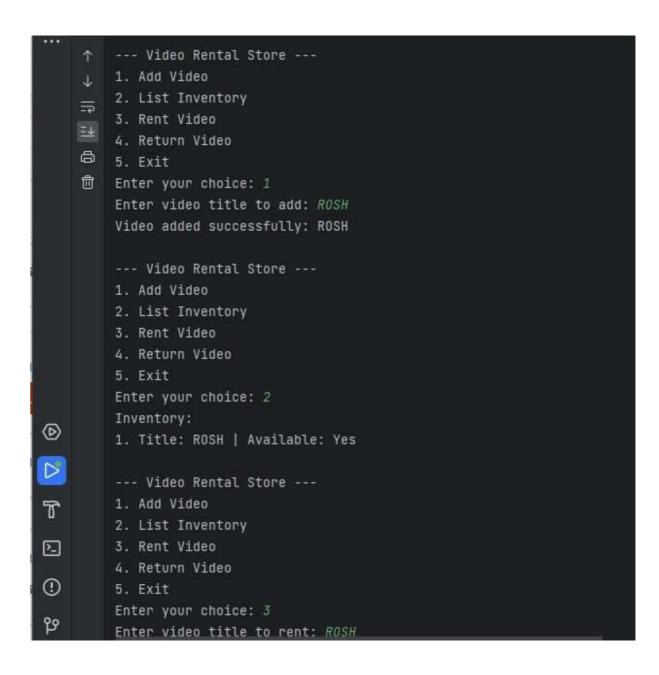
```java
    public void rentVideo(String title) {
        for (Video video : inventory) {
            if (video.getTitle().equalsIgnoreCase(title)) {
                if (video.isAvailable()) {
                    video.rent();
                    System.out.println("You rented: " + title);
                } else {
                    System.out.println("Video is currently unavailable.");
                }
                return;
            }
        }
        System.out.println("Error: Video not found in inventory.");
    }

    // Return a video
    public void returnVideo(String title) {
        for (Video video : inventory) {
            if (video.getTitle().equalsIgnoreCase(title)) {
                if (!video.isAvailable()) {
                    video.returnVideo();
                    System.out.println("You returned: " + title);
                } else {
                    System.out.println("Error: Video was not rented.");
                }
                return;
            }
        }
        System.out.println("Error: Video not found in inventory.");
    }
}

// Main class to run the Video Rental System
public class VideoRentalSystem {
    public static void main(String[] args) {
        VideoStore store = new VideoStore();
        Scanner scanner = new Scanner(System.in);

        while (true) {
            System.out.println("\n--- Video Rental Store ---");
            System.out.println("1. Add Video");
            System.out.println("2. List Inventory");
            System.out.println("3. Rent Video");
            System.out.println("4. Return Video");
            System.out.println("5. Exit");


System.out.print("Enter your choice: ");

            // Handle invalid input for menu choices


            int choice = -1;
```

```java
                if (scanner.hasNextInt()) {

                    choice = scanner.nextInt();
                } else {
                    System.out.println("Invalid choice. Please enter a number.");
                    scanner.next(); // Consume invalid input
                    continue;
                }

                scanner.nextLine();

                switch (choice) {
                    case 1:
                        System.out.print("Enter video title to add: ");
                        String titleToAdd = scanner.nextLine().trim();
                        store.addVideo(titleToAdd);
                        break;
                    case 2:
                        store.listInventory();
                        break;
                    case 3:
                        System.out.print("Enter video title to rent: ");
                        String titleToRent = scanner.nextLine().trim();
                        store.rentVideo(titleToRent);
                        break;
                    case 4:
                        System.out.print("Enter video title to return: ");
                        String titleToReturn = scanner.nextLine().trim();
                        store.returnVideo(titleToReturn);
                        break;
                    case 5:
                        System.out.println("Exiting the system. Goodbye!");
                        scanner.close();
                        return;
                    default:
                        System.out.println("Invalid choice. Please try again.");
                }
            }
        }
    }
```

Output:

```
--- Video Rental Store ---
1. Add Video
2. List Inventory
3. Rent Video
4. Return Video
5. Exit
Enter your choice: 1
Enter video title to add: ROSH
Video added successfully: ROSH

--- Video Rental Store ---
1. Add Video
2. List Inventory
3. Rent Video
4. Return Video
5. Exit
Enter your choice: 2
Inventory:
1. Title: ROSH | Available: Yes

--- Video Rental Store ---
1. Add Video
2. List Inventory
3. Rent Video
4. Return Video
5. Exit
Enter your choice: 3
Enter video title to rent: ROSH
```

Learning Outcomes:

- **Object-Oriented Design:** Learn to create and use classes for real-world entities.
- **Core Programming Skills:** Practice loops, conditionals, and methods for inventory operations.
- **Data Structure Usage:** Use `ArrayList` to manage dynamic data effectively.
- **User-Friendly Systems:** Design intuitive interfaces and handle errors smoothly.