



Experiment 1.2

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Subject: Java

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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.



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Code:

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

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.");
      }
    }

    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");
    }
}
```



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```
class VideoStore {

    private ArrayList<Video> inventory;

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

    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);
    }

    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));
                  }
        }
    }

    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;
    }
}
```



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```
        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.");
}
}

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: ");

          int choice = -1;
          if (scanner.hasNextInt())
          { choice = scanner.nextInt();
            } else {
                System.out.println("Invalid choice. Please enter a number.");
                scanner.next();
                continue;
            }
          scanner.nextLine();

          switch (choice)
          { case 1:
              System.out.print("Enter video title to add: ");
              String titleToAdd = scanner.nextLine().trim();
```



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```
        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:

```
PS D:\Waheguru\java-ds\final\2D - Arrays> cd "d:\Waheguru\java-ds\final\2D - Arrays\" ; if ($?) { javac VideoRentalSystem.java
($?) { java VideoRentalSystem }

--- 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: Joban
Video added successfully: Joban

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

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



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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.