COMP503/ENSE502/ENSE602.
Individual Programming Assignment [The Streaming Service]

Outline

For this assignment, you will develop the *Streaming Service* application in Java which allows a user to query digital content (films or music) available on a streaming service.

Your Task

To complete the assignment, implement the following classes in Java as specified below

Methodology

Create the following java classes

DigitalContent: This is an abstract class with three instance variables for the digital content's title, publisher and release dates (as strings). Each instance variable has get and set methods. DigitalContent objects can only be instantiated by supplying input parameters for all three instance variables. Implement a toString method to return a string describing the digital content. Implement the method *boolean match(String query)* to return true if the input query is contained in the title or publisher or release date.

For example, if title = "title", publisher = "publisher" and release = "2022" then match("22") returns true, match("uBli") returns true, match("abc") return false

The query is not case sensitive. Implement the Comparable interface to compare titles.

Film: This class extends DigitalContent with a string instance variable to store the cast members on the film. Create get and set methods. Write a constructor that initializes all instance variables for Film objects. Write a toString method which uses super to invoke DigitalContent toString, but also adding the cast members to the output string. Override the match method to also include a check if the query match the cast. It must invoke the superclass match in DigitalContent.

Music: This class extends DigitalContent with a string instance variable to store the artist's name. Create get and set methods. Write a constructor that initializes all instance variables for Music objects. Write a toString method which uses super to invoke DigitalContent's toString, but also adding the artist's name to the output string. Override the match method to also include a check if the query matches the artist. It must invoke the superclass match in DigitalContent.

StreamingService: This class maintains a private ArrayList of DigitalContent. Do not include get or set methods for this instance variable. Write a default constructor to initialise the

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ArrayList. Write an add method which takes a DigitalContent object to add to the list, making sure the input object is not null. Write the

ArrayList<DigitalContent> match(String query)

method which invokes match on each DigitalContent object. If matching, it is added to an ArrayList to be returned

The toString method returns a string of all DigitalContent stored by the StreamingService, sorted by title

Client: This class streams digital content from the streaming service. It maintains a private instance variable for a StreamingService object and DigitalContent currentlyStreamed. Write a constructor which inputs a StreamingService object and initialises all instance variables. Write a get method for this instance variable.

The Client class implements the Play interface such that

- public DigitalContent getCurrentStream(); will return the currentlyStreamed instanceVariable, which is initially set to null.

- public void stream(String query); will set currentlyStreamed to the first DigitalContent object returned from the matching input query in StreamingService. If there are no matches, then currentlyStreamed is left unmodified

- public void stop(); will set currentlyStreamed to null.

The static void main(String[] args) method instantiates the Client with a StreamingService which is populated by at least 10 instances of Film and Music objects of your choosing. The main method implements a menu interface which repeatedly presents the following menu, asking the user to enter an option:

A. Display Digital Content library
B. Display currently streaming DigitalContent
C. Match Digital Content to Stream
D. Stop streaming
E. Quit Client Application

Option A: prints the contents of the streaming service to the screen, sorted by title

Option B: displays the currently streaming DigitalContent. If nothing is currently streaming, then a user-friendly message appears, rather than printing null

This assessment has been prepared by Dr. Kenneth Johnson at the Auckland University of Technology.

Option C: asks the user for an input query string and invokes streaming. Display the currently streaming DigitalContent. If nothing is currently streaming, then a user-friendly message appears, rather than printing null

Option D: invokes stop() and prints a user-friendly message

Option E: quits the client application

All other input is gracefully ignored by the Client menu interface

Commenting

All files must contain appropriate headers. Each method must include a brief high-level comment about the method's functionality

Authenticity

All work submitted must be unique and your own

Submission Instructions

Compress only the files DigitalContent.java, Film.java, Music.java, StreamingService.java, Client.java and Play.java in an archive file

Be sure to include header information in each file. We may not be able to identify your work otherwise.

Please ensure your submission filename matches the following:

- studentName_StudentID_AssignmentB.zip

Upload your file to the Canvas platform.

You will receive your marked assignment via Canvas. Please look over your entire assignment to make sure that it has been marked correctly. If you have any concerns, you must raise them with the lecturer. You have one week to raise any concerns regarding your mark. After that time, your mark cannot be changed.

Marking Scheme

Your total mark for this assignment is out of 100

See Canvas for the marksheet (May be subject to slight variations)

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