**Due before:** **11:59 PM on Thu Nov 17 2022**

# CSE-271: Object-Oriented Programming

## Homework #5: Media Mart

### Phase #2: Thu Nov 17 2022 before 11:59 PM

Delayed (by no more than 24-hours) submissions earn only 80% credit

Maximum Points: 25

*Key objectives of this project are:*

- Work with binary and text files
- Recap developing and working with a class hierarchy
- Review translating UML class diagrams to Java source code
- Review using JUnit testing
- Recap Java programming using an IDE like Eclipse
- Review and adhere to CSE department's Style guide
- Use Javadoc to document methods and their return values

**Submission Instructions**

This homework assignment must be turned-in electronically via Canvas CODE plug-in. Ensure your program compiles successfully, without any warnings or style errors. Ensure you have documented the methods. Ensure you have tested operations of your classes. Once you have tested your implementation, upload the following files:

- The 4 Java source files developed for this phase of the project.

**General Note**: Upload each file associated with homework (or lab exercises) individually.

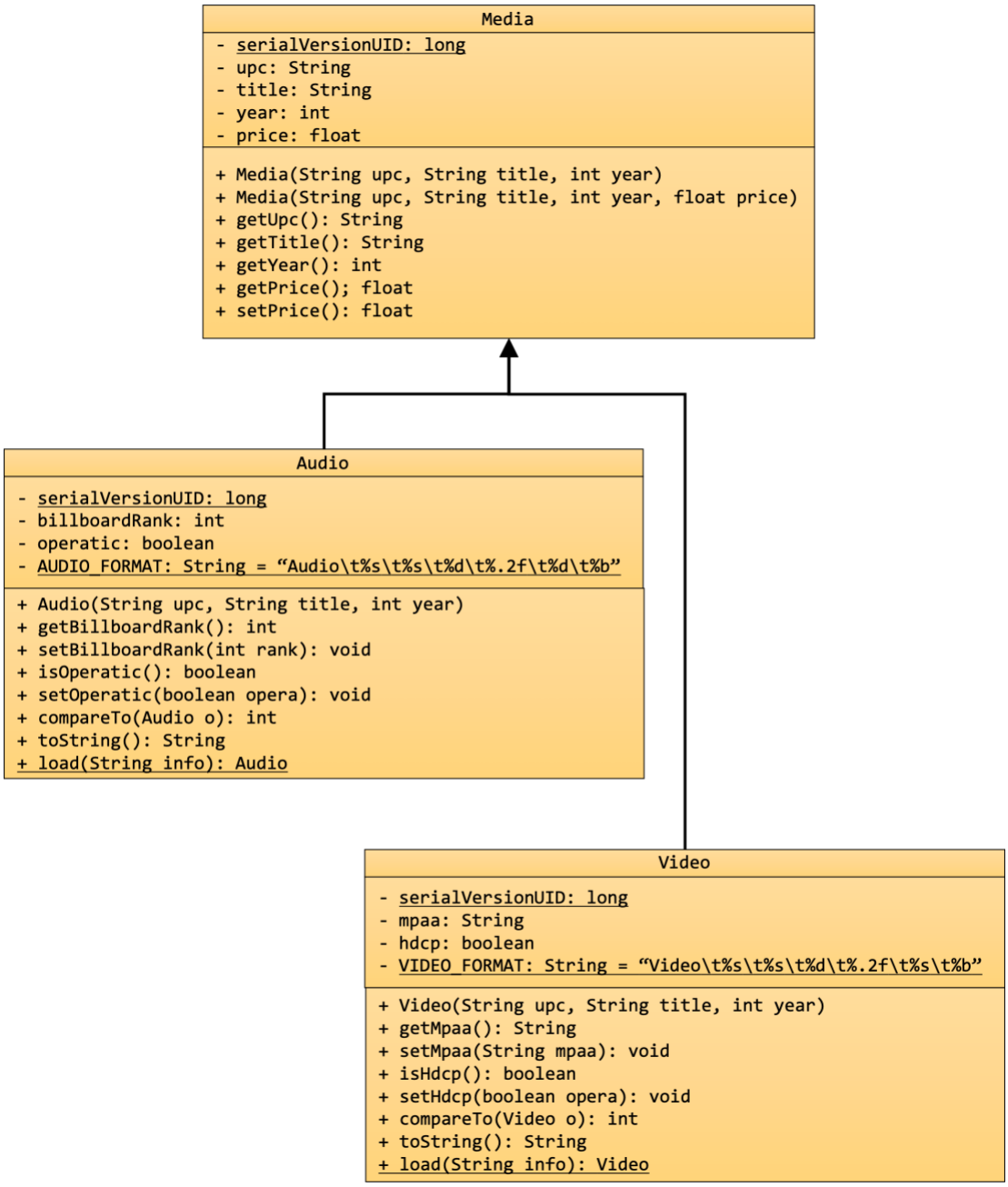
## Grading Rubric:

The source code submitted for this homework **must pass necessary base case test(s) in order to qualify for earning any score at all**. Programs that do not meet basic requirements or just skeleton code will be assigned zero score! Programs that do not compile, **have even 1 method longer than 25 lines**, or just some skeleton code will be assigned zero score.

- **NOTE:** Violating CSE programming style guidelines is an error! Your program should not have any style errors.
- **Conciseness, Formatting & Documentation: 5 points** – Reserved for concise solution, good Javadoc, and formatting.
- **Points**: 4 points per class for `Media`, `Audio`, and `Video` – 4×3=**12 points** total. `MediaWarehouse`: 8 points. **Total 20 points**.
- **Delayed submission: Only 80% points:** Submission delayed by no more than 24-hours will be accepted for a partial credit of maximum 80% of the points.

## *Project Overview:*

An object-oriented solution is being developed for a media company that warehouses audio and video media item. Analyzing the user's requirements, a hierarchy of classes (see UML diagram below) have been designed. You are required to develop the Java source code corresponding to the class hierarchies and complete the `MediaWarehouse` software system.



## *Notes on classes and methods*

1. Notes on interfaces implemented by the classes:
   - The `Media` class implements the `Serializable` interface only.
   - The `Audio` and `Video` classes implement both `Serializable` and `Comparable` interfaces.
   - The `serialVersionUID` is generated using Eclipse.

2. Notes on the constructors:
   - The constructors are straightforward and merely initialize instance variables using parameters.

3. Notes on the getter and setter methods
   - These are relatively straightforward.

4. Note the following `toString` output format:
   - For `Audio` and Video classes the String representation is generated using the format string `AUDIO_FORMAT` and `VIDEO_FORMAT` shown in the UML

5. Notes for the `compareTo` methods in `Audio` and `Video` classes:
   - Two `Audio` objects are compared using the following rules in the order specified:
     - First, compare on `billboardRank`
     - If `billboardRank` is the same, then compare based on `price`.
     - If `billboardRank` and `price` are equal, then compare using `title`.
   - Two `Video` objects are compared using the following rules in the order specified:
     - First, compare on `mpaa` rating
     - If `mpaa` is the same, then compare based on `price`.
     - If `mpaa` rating and `price` are equal, then compare using `title`.

6. Notes on `Video.load` and `Audio.load` methods:
   - The parameter info contains data for the corresponding media item exactly generated by the output from the `toString` method in the respective classes. For examples, see lines in `90s_media.txt`.
   - Use a `Scanner` to read data from the line. Ensure you the set the delimiter to tab (i.e., `"\t"`) via the `Scanner.useDelimiter` method before reading the data.

## *Unit testing:*

Once you have developed the above 3 classes, you should test them. You are given `VideoTest.java` and `AudioTest.java` unit tests to test the classes. **Note**: The tester used by CODE (on Canvas) performs similar tests.

See the Configuring Eclipse for Java programming page on Canvas for video on how to add `JUnit4` to your Java project for running the supplied unit tests.

## *Implement methods in the MediaWarehouse.java*

Starter code for the `MediaWarehouse.java` is given to you. The starter code includes Javadoc for each method. Use the Javadoc to suitably implement each method.

If you have questions or need clarifications you can post your questions on the Discussions (on Canvas) or talk to your TA or instructor.

## *Overall Functional Testing*

Once you have implemented the necessary methods in all of the classes, you can use the supplied MediaMart.java program to test the overall functionality of your program. Sample inputs and expected outputs are shown below (user inputs are in **green color**):

**Test #1: Loading media from a text file (Base case – this test must pass to earn any points for this project)**

```
+----------------------------+
|    Welcome to Media Mart   |
+----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 90s_media.txt
9 new media items added.

What would you like to do (9: Show menu): 2
Currently loaded media:

Audio  m_90_1 Hold On       1990   1.99   1      false
Audio  m_90_2 Thunderstruck 1990   1.75   39     false
Audio  m_90_3 My Secret Passion    1990   1.85   -1     true
Video  lo_90_1       Prescription for Death     1990   0.99   PG     false
Video  lo_91_1       Confession    1991   0.99   PG     false
Video  lo_92_1       Skin Deep     1992   0.99   PG     false
Video  lo_94_1       Second Opinion       1994   0.99   PG13   true
Video  lo_93_1       Sweeps 1993   0.99   G      false
Video  lo_95_1       Bitter Fruit  1995   0.99   PG     true

What would you like to do (9: Show menu): 0
```

**Test #2: Ignore duplicates**

```
+----------------------------+
|    Welcome to Media Mart   |
+----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 90s_media.txt
9 new media items added.

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 90s_media.txt
Duplicate media with upc m_90_1 ignored.
Duplicate media with upc m_90_2 ignored.
Duplicate media with upc m_90_3 ignored.
Duplicate media with upc lo_90_1 ignored.
Duplicate media with upc lo_91_1 ignored.
```

```
Duplicate media with upc lo_92_1 ignored.
Duplicate media with upc lo_94_1 ignored.
Duplicate media with upc lo_93_1 ignored.
Duplicate media with upc lo_95_1 ignored.
0 new media items added.

What would you like to do (9: Show menu): 0
```

### Test #3: Load multiple text files

```
+----------------------------+
|    Welcome to Media Mart   |
+----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 90s_media.txt
9 new media items added.

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 2000s_media.txt
8 new media items added.

What would you like to do (9: Show menu): 2
Currently loaded media:

Audio  m_90_1 Hold On       1990   1.99   1      false
Audio  m_90_2 Thunderstruck 1990   1.75   39     false
Audio  m_90_3 My Secret Passion    1990   1.85   -1     true
Video  lo_90_1       Prescription for Death     1990   0.99   PG     false
Video  lo_91_1       Confession    1991   0.99   PG     false
Video  lo_92_1       Skin Deep     1992   0.99   PG     false
Video  lo_94_1       Second Opinion       1994   0.99   PG13   true
Video  lo_93_1       Sweeps 1993   0.99   G      false
Video  lo_95_1       Bitter Fruit  1995   0.99   PG     true
Video  lo_00_1       Loco Parentis 2000   0.99   PG     false
Video  lo_01_1       Hubris 2001   0.99   PG13   false
Video  lo_02_1       The Collar    2002   0.99   PG     false
Video  lo_03_1       Mother's Day  2003   0.99   PG     false
Video  lo_04_1       Darwinian     2004   0.99   PG     false
Audio  bs_03_1       Toxic  2003   0.99   10     false
Audio  ri_07_1       Umbrella      2007   1.25   25     false
Audio  sd_04_1       Drop It Like It's Hot      2004   0.75   -1     false

What would you like to do (9: Show menu): 0
```

### Test #4: Write to text file

```
+----------------------------+
|    Welcome to Media Mart   |
+----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 90s_media.txt
9 new media items added.

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 2000s_media.txt
8 new media items added.

What would you like to do (9: Show menu): 4
Enter path to file to write media: media_data.txt

What would you like to do (9: Show menu): 0
```

### Test #5: Write to binary file (note previous test must be run first)

```
+-----------------------------+
|    Welcome to Media Mart    |
+-----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: media_data.txt
17 new media items added.

What would you like to do (9: Show menu): 4
Enter path to file to write media: media_data.bin

What would you like to do (9: Show menu): 0
```

### Test #6: Read from binary file (note test #5 must be run first)

```
+-----------------------------+
|    Welcome to Media Mart    |
+-----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: media_data.bin
17 new media items added.

What would you like to do (9: Show menu): 0
```

### Test #7: Search from binary file (note test #5 must be run first)

```
+-----------------------------+
|    Welcome to Media Mart    |
+-----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: media_data.bin
17 new media items added.

What would you like to do (9: Show menu): 3
Enter search phrase: conf
Media with the phrase are:
Video  lo_91_1      Confession    1991   0.99   PG     false
Found 1 matches, out of 17 media items.

What would you like to do (9: Show menu): 3
Enter search phrase: lo
Media with the phrase are:
Video  lo_90_1      Prescription for Death     1990   0.99   PG     false
Video  lo_91_1      Confession    1991   0.99   PG     false
Video  lo_92_1      Skin Deep     1992   0.99   PG     false
Video  lo_94_1      Second Opinion      1994   0.99   PG13   true
Video  lo_93_1      Sweeps 1993   0.99   G      false
Video  lo_95_1      Bitter Fruit  1995   0.99   PG     true
Video  lo_00_1      Loco Parentis 2000   0.99   PG     false
Video  lo_01_1      Hubris 2001   0.99   PG13   false
Video  lo_02_1      The Collar    2002   0.99   PG     false
Video  lo_03_1      Mother's Day  2003   0.99   PG     false
Video  lo_04_1      Darwinian     2004   0.99   PG     false
Found 11 matches, out of 17 media items.

What would you like to do (9: Show menu): 3
Enter search phrase: my
Media with the phrase are:
Audio  m_90_3 My Secret Passion   1990   1.85   -1     true
Found 1 matches, out of 17 media items.
```

```
What would you like to do (9: Show menu): 0
```

**Test #8: Pricing test basic (note test #5 must be run first)**

```
+----------------------------+
|    Welcome to Media Mart   |
+----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: media_data.bin
17 new media items added.

What would you like to do (9: Show menu): 5
Enter UPCs of media to price as a bundle: lo_00_1 m_90_1 lo_92_1
Price of bundle: 3.97

What would you like to do (9: Show menu): 0
```

**Test #9: Pricing test HDCP & opera**

```
+----------------------------+
|    Welcome to Media Mart   |
+----------------------------+

What would you like to do (9: Show menu): 1
Enter path to media text or binary file: 90s_media.txt
9 new media items added.

What would you like to do (9: Show menu): 5
Enter UPCs of media to price as a bundle: m_90_1 m_90_3 lo_92_1 lo_94_1 lo_95_1
lo_93_1
Price of bundle: 7.95

What would you like to do (9: Show menu): 0
```

## Submission:

This homework assignment must be turned-in electronically via Canvas CODE plug-in. Ensure your program compiles successfully, without any warnings or style errors. Ensure you have documented the methods. Ensure you have tested operations of your program as indicated. Upload the following to Canvas via the CODE plug-in:

- `Media.java`, `Audio.java`, `Video.java`, and `MediaWarehouse.java`