Programming Assignment 2

Submission Date : 26.03.2021
Due Date : 16.04.2021 (23:59)
Programming Languages: Java
Subject : Inheritance, Access Modifiers

1 Introduction

Object-oriented programming has advantages such as modeling problems with less complexity and more code reuse. In this experiment, you will observe these advantages by using inheritance mechanism which is an important property of object-oriented programming. By the help of this experiment, you will learn the concept of inheritance, relationships among classes by using object references, control of multiple instances of classes, access modifiers in Java.

2 Useful Information

Under this section you will find some introductory information about the OOP concepts you might use in the project. Please make your own research for more information.

2.1 Inheritance

Object-oriented programming (OOP) covers software in terms similar to those that people use to describe real-world objects. It takes advantage of class relationships, where objects of a certain class, such as a class of vehicles, have the same characteristics cars, trucks, little red wagons and roller skates have much in common. Inheritance is one of important property of OOP. OOP takes advantage of inheritance relationships, where new classes of objects are derived by absorbing characteristics of existing classes and adding unique characteristics of their own. In Java, a class (called the derived class or subclass) extends from another class (called the base class or super class).

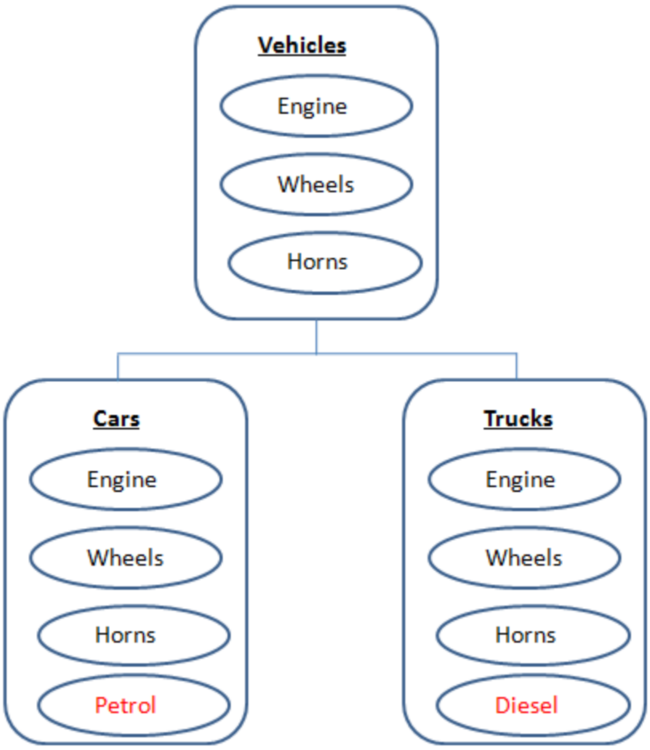


Figure 1: A hierarchy of Vehicle class

In Figure 1, vehicle class hierarchy is seen. Vehicle class is super class of all other classes. Derived classes which are Cars and Trucks have certain common properties; all have engine, wheels, horns etc. Thus they can be grouped under a Class called Vehicles. Apart from sharing these common features, each Derived Class has its own particular features - Cars use petrol while Trucks use diesel.

2.1.1 Method Overriding

When a class extend another class, the subclass can use the super class' methods. However sometimes the subclass should change the behavior of a method which provided by super class. The method implementation in the subclass overrides (replaces) the implementation in the super class. The method in the subclass and its corresponding method in the super class method have the same name, parameters and the same return type. That is called method overriding.

2.2 Method Overloading

Method overloading is another important concept of OOP. When programmers need more than one method with the same functionality, they don't have to declare new methods with different names for each one. By using method overloading feature, they declare each methods with same name but with different signatures (different argument list, argument types or orders). *System.out.println()* is an example of overloading method in Java. This method takes float, int, double or String as arguments.

2.3 Access Modifiers

In Java, there are three access modifiers which provide access levels for classes and members of classes: private (visible to the class only), protected (visible to the package and all subclasses) and public (visible to the everywhere). The default is visible to the package.

3 Experiment

This section contains four subsections. The first section introduces the problem that you need to solve and gives its details. In the second subsection, the content of reports are described. The constraints are given in the third subsection. Information about the submission is given in the last subsection.

3.1 Problem Definition

In this experiment, you are supposed to develop a simple Movie Database System similar to IMDB. You are responsible for using inheritance mechanism and access modifiers in Java programming language. The system will process several data input files and will generate results of commands which will be read from a command input file. All input files will be error free only syntactically. The requirements and rules for the system are given below:

- The system includes information about people and films.
- Each Person has name, surname, country and a unique id. A person in the system could be either Artist or User.
- Each User has a unique id, name, surname and country.
- There are three kinds of Artist: Performer, Director and Writer. Each Director has a unique id, name, surname, country and agent where he/she works. Each Writer has a unique id, name, surname, country and writing style/type.
- There are also three types of Performers which are Actor, ChildActor and StuntPerformer. Each Actor has a unique id, name, surname, country and height. Each ChildActor has a unique id, name, surname, country and age. Each StuntPerformer has a unique id, name, surname, country, height and real actors' ids.
- There are four types of films in the system: Feature Film, Short Film, Documentary and TV Series. Each film (Feature Film, Short Film, Documentary and TV Series) has a rating score which calculated from users' average rating scores for that film.
- A unique film id, film title, language, runtime, country, directors of a film and cast are common in all film types.
- Feature Films have a release date, budget, writers of movie and film genre in addition to the common data.
- A Short Film has a release date, writers and genre in addition to the common data. A Short Film' runtime should be less (or equal) than 40 min.

- Documentaries have only a release date in addition to the common film data.
- TV Series have start date and end date of series, number of seasons, number of episodes, genre of series and writers in addition to the common film data.
- A film may have more than one directors, writers, performers and genres in this system. A comma will be used to separate these data.

3.1.1 The Way of Execution

The program will be executed with four command line arguments:

```
<people_file><films_file><commands_file><output_file>
```

Usage example:

```
>javac Main.java
>java Main people.txt films.txt commands.txt output.txt
```

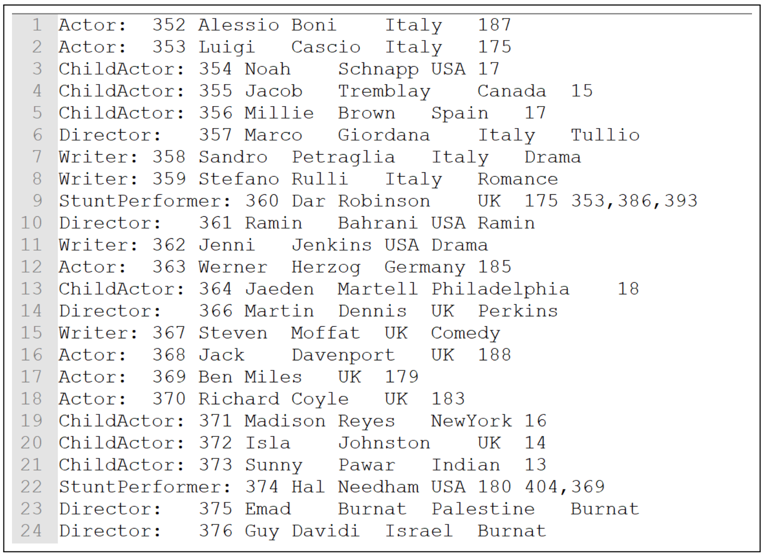
There are three types of data input files and one output file. All the file names will be taken as program arguments. The format of each file is given below.

3.1.2 People File

There are six different recording samples in this file. These are:

```
DIRECTOR:<tab><ID><tab><NAME><tab><SURNAME><tab><COUNTRY><tab><AGENT>
WRITER:<tab><ID><tab><NAME><tab><SURNAME><tab><COUNTRY><tab><TYPE>
ACTOR:<tab><ID><tab><NAME><tab><SURNAME><tab><COUNTRY><tab><HEIGHT>
CHILDACTOR:<tab><ID><tab><NAME><tab><SURNAME><tab><COUNTRY><tab><AGE>
STUNTPERFORMER:<tab><ID><tab><NAME><tab><SURNAME><tab><COUNTRY><tab><HEIGHT><tab>
<ACTOR1ID,...,ACTORnID>
USER:<tab><ID><tab><NAME><tab><SURNAME><tab><COUNTRY>
```

An exemplar people file is shown in Figure 2. As shown in Figure 2, the person type is specified at the beginning of each line, and then attributes are given according to the person type, separated by tab characters.



```
Actor:  352 Alessio Boni    Italy   187
Actor:  353 Luigi   Cascio  Italy   175
ChildActor: 354 Noah    Schnapp USA 17
ChildActor: 355 Jacob   Tremblay    Canada  15
ChildActor: 356 Millie  Brown   Spain   17
Director:   357 Marco   Giordana    Italy   Tullio
Writer: 358 Sandro  Petraglia   Italy   Drama
Writer: 359 Stefano Rulli   Italy   Romance
StuntPerformer: 360 Dar Robinson    UK  175 353,386,393
Director:   361 Ramin   Bahrani USA Ramin
Writer: 362 Jenni   Jenkins USA Drama
Actor:  363 Werner  Herzog  Germany 185
ChildActor: 364 Jaeden  Martell Philadelphia    18
Director:   366 Martin  Dennis  UK  Perkins
Writer: 367 Steven  Moffat  UK  Comedy
Actor:  368 Jack    Davenport   UK  188
Actor:  369 Ben Miles   UK  179
Actor:  370 Richard Coyle   UK  183
ChildActor: 371 Madison Reyes   NewYork 16
ChildActor: 372 Isla    Johnston    UK  14
ChildActor: 373 Sunny   Pawar   Indian  13
StuntPerformer: 374 Hal Needham USA 180 404,369
Director:   375 Emad    Burnat  Palestine   Burnat
Director:   376 Guy Davidi  Israel  Burnat
```

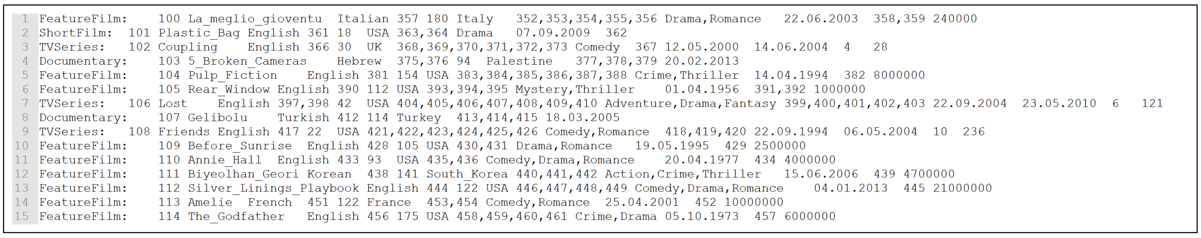
Figure 2: Sample people file

3.1.3 Films File

Since there are four different film types in this system, there are also four different record samples in this file.

```
FeatureFilm:<tab><ID><tab><TITLE><tab><LANGUAGE><tab><DIRECTOR1ID,..,DIRECTORnID>
<tab><LENGTH><tab><COUNTRY><tab><PERFORMER1ID,..,PERFORMERnID><tab><GENRE1,...,
GENREn><tab><RELEASEDATE><tab><WRITER1ID,...,WRITERnID><tab><BUDGET>

ShortFilm:<tab><ID><tab><TITLE><tab><LANGUAGE><tab><DIRECTOR1ID,...,DIRECTORnID>
<tab><LENGTH><tab><COUNTRY><tab><PERFORMER1ID,...,PERFORMERnID><tab><GENRE1,...,
GENREn><tab><RELEASEDATE><tab><WRITER1ID,...,WRITERnID>


Documentary:<tab><ID><tab><TITLE><tab><LANGUAGE><tab><DIRECTOR1ID,...,<DIRECTORnID>
<tab><LENGTH><tab><COUNTRY><tab><PERFORMER1ID,...,PERFORMERnID><tab><RELEASEDATE>

TVSeries:<tab><ID><tab><TITLE><tab><LANGUAGE><tab><DIRECTOR1ID,...,DIRECTORnID>
<tab><LENGTH><tab><COUNTRY><tab><PERFORMER1ID,...,PERFORMERnID><tab><GENRE1,...,
GENREn><tab><WRITER1ID,...,WRITERnID><tab><STARTDATE><tab><ENDDATE><tab><SEASONS>
<tab><EPISODES>
```

An exemplar film file is given in Figure 3. In this file, the film type is specified at the beginning of each line, and then attributes are given according to the film type, separated by tab characters.



```
FeatureFilm:    100 La_meglio_gioventu  Italian 357 180 Italy   352,353,354,355,356 Drama,Romance   22.06.2003  358,359 240000
ShortFilm:  101 Plastic_Bag English 361 18  USA 363,364 Drama   07.09.2009  362
TVSeries:   102 Coupling    English 366 30  UK  368,369,370,371,372,373 Comedy  367 12.05.2000  14.06.2004  4   28
Documentary:    103 5_Broken_Cameras    Hebrew  375,376 94  Palestine   377,378,379 20.02.2013
FeatureFilm:    104 Pulp_Fiction    English 381 154 USA 383,384,385,386,387,388 Crime,Thriller  14.04.1994  382 8000000
FeatureFilm:    105 Rear_Window English 390 112 USA 393,394,395 Mystery,Thriller    01.04.1956  391,392 1000000
TVSeries:   106 Lost    English 397,398 42  USA 404,405,406,407,408,409,410 Adventure,Drama,Fantasy 399,400,401,402,403 22.09.2004  23.05.2010  6   121
Documentary:    107 Gelibolu    Turkish 412 114 Turkey  413,414,415 18.03.2005
TVSeries:   108 Friends English 417 22  USA 421,422,423,424,425,426 Comedy,Romance  418,419,420 22.09.1994  06.05.2004  10  236
FeatureFilm:    109 Before_Sunrise  English 428 105 USA 430,431 Drama,Romance   19.05.1995  429 2500000
FeatureFilm:    110 Annie_Hall  English 433 93  USA 435,436 Comedy,Drama,Romance    20.04.1977  434 4000000
FeatureFilm:    111 Biyeolhan_Geori Korean  438 141 South_Korea 440,441,442 Action,Crime,Thriller   15.06.2006  439 4700000
FeatureFilm:    112 Silver_Linings_Playbook English 444 122 USA 446,447,448,449 Comedy,Drama,Romance    04.01.2013  445 21000000
FeatureFilm:    113 Amelie  French  451 122 France  453,454 Comedy,Romance  25.04.2001  452 10000000
FeatureFilm:    114 The_Godfather   English 456 175 USA 458,459,460,461 Crime,Drama 05.10.1973  457 6000000
```

Figure 3: Sample films file

3.1.4 Commands File

All data input files (people and films) will be processed according to the commands which will be given in a commands file. The command file contains 12 types of commands whose definitions and formats are given below.

1. A user can rate a film so that film will be saved to his/her rate list. Rating score must be between 1 and 10 integers.

   RATE<tab><USERID><tab><FILMID><tab><RATINGPOINT>

2. It's possible to add a new Feature Film to the system.

   ADD<tab>**FEATUREFILM**<tab><ID><tab><TITLE><tab><LANGUAGE><tab><DIRECTOR1ID,..., DIRECTORnID><tab><LENGTH><tab><COUNTRY><tab><PERFORMER1ID,...,PERFORMERnID> <tab><GENRE1,...,GENREn><tab><RELEASEDATE><tab><WRITER1ID,...,WRITERnID><tab> <BUDGET>

3. Details of a film are displayed by using below command.

   VIEWFILM<tab><FILMID>

4. A user can list all films which he/she rated so far.

   LIST<tab>**USER**<tab><USERID><tab>**RATES**

5. A user can edit a film which he/she rated before.

   EDIT<tab>**RATE**<tab><USERID><tab><FILMID><tab><NEWRATINGPOINT>

6. A user can remove one of his/her rated films.

   REMOVE<tab>**RATE**<tab><USERID><tab><FILMID>

7. List all the TV Series in the system.

   LIST<tab>**FILM**<tab>**SERIES**

8. List all the films from a specified country.

   LIST<tab>**FILMS**<tab>**BY**<tab>**COUNTRY**<tab><COUNTRY>

9. List all the films released before a specified year.

   LIST<tab>**FEATUREFILMS**<tab>**BEFORE**<tab><YEAR>

10. List all the films released after a specified year.

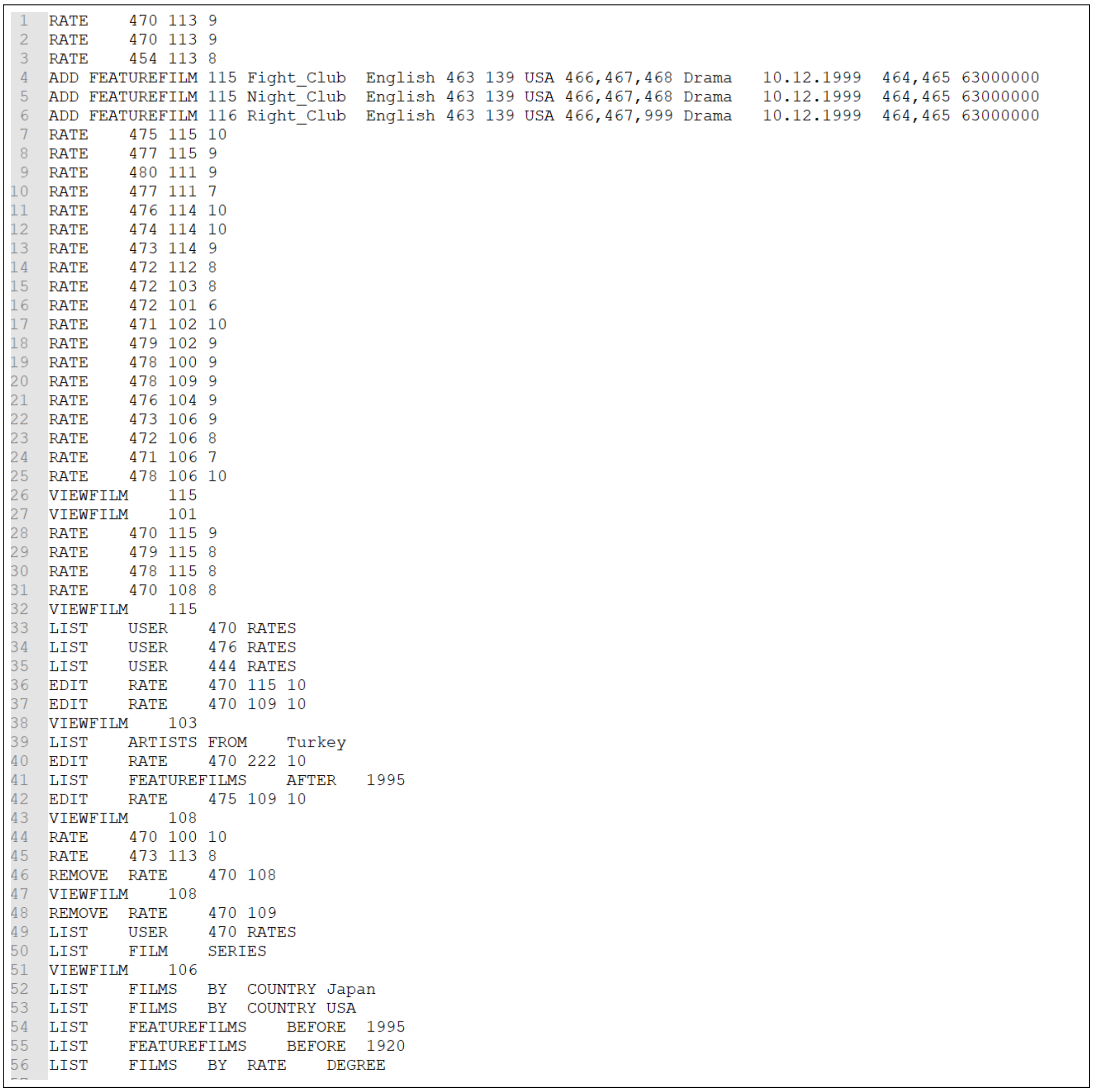
    LIST<tab>**FEATUREFILMS**<tab>**AFTER**<tab><YEAR>

11. List all the films in descending order and categorized according to film rating degrees.

    LIST<tab>**FILMS**<tab>**BY**<tab>**RATE**<tab>**DEGREE**

12. List all the artists from a specified country and display in a categorized order.

    LIST<tab>**ARTISTS**<tab>**FROM**<tab><COUNTRY>



```
RATE    470 113 9
RATE    470 113 9
RATE    454 113 8
ADD FEATUREFILM 115 Fight_Club  English 463 139 USA 466,467,468 Drama   10.12.1999  464,465 63000000
ADD FEATUREFILM 115 Night_Club  English 463 139 USA 466,467,468 Drama   10.12.1999  464,465 63000000
ADD FEATUREFILM 116 Right_Club  English 463 139 USA 466,467,999 Drama   10.12.1999  464,465 63000000
RATE    475 115 10
RATE    477 115 9
RATE    480 111 9
RATE    477 111 7
RATE    476 114 10
RATE    474 114 10
RATE    473 114 9
RATE    472 112 8
RATE    472 103 8
RATE    472 101 6
RATE    471 102 10
RATE    479 102 9
RATE    478 100 9
RATE    478 109 9
RATE    476 104 9
RATE    473 106 9
RATE    472 106 8
RATE    471 106 7
RATE    478 106 10
VIEWFILM    115
VIEWFILM    101
RATE    470 115 9
RATE    479 115 8
RATE    478 115 8
RATE    470 108 8
VIEWFILM    115
LIST    USER    470 RATES
LIST    USER    476 RATES
LIST    USER    444 RATES
EDIT    RATE    470 115 10
EDIT    RATE    470 109 10
VIEWFILM    103
LIST    ARTISTS FROM    Turkey
EDIT    RATE    470 222 10
LIST    FEATUREFILMS    AFTER   1995
EDIT    RATE    475 109 10
VIEWFILM    108
RATE    470 100 10
RATE    473 113 8
REMOVE  RATE    470 108
VIEWFILM    108
REMOVE  RATE    470 109
LIST    USER    470 RATES
LIST    FILM    SERIES
VIEWFILM    106
LIST    FILMS   BY  COUNTRY Japan
LIST    FILMS   BY  COUNTRY USA
LIST    FEATUREFILMS    BEFORE  1995
LIST    FEATUREFILMS    BEFORE  1920
LIST    FILMS   BY  RATE    DEGREE
```

Figure 4: Sample commands file

3.1.5 Output File

The output of the commands will be printed to the specified output file. Each command's output will include the command itself as read from the command file and the result (error message if necessary) of its execution. The general format of the output file is shown below:

```
<COMMAND>
<NEWLINE>
<RESULT>
<NEWLINE>
<------------------------------------------------------------------->
```

Detailed format of<RESULT> (mentioned above in the general format) output for each command type is given below (WS represents Whitespace).

1. *Film rated successfully*
   Film type:<WS><FILMTYPE>
   Film title:<WS><TITLE>

   If there is not any user or film with specified ID the <RESULT> should be as follows:

   Command Failed
   User ID:<WS><USERID>
   Film ID:<WS><FILMID>

   If the specified film was already rated by the given user, then there should be a warning message as follows:

   This film was earlier rated

2. *FeatureFilm added successfully*
   Film ID:<WS><FILMID>
   Film title:<WS><TITLE>

   If there is already a film with specified <FILMID> or if there is not any specified director, writer or performer in the system, the <RESULT> should be as follows:

   Command Failed
   Film ID:<WS><FILMID>
   Film title:<WS><TITLE>

3. If specified film is Feature Film or Short Film the result will be as follows:

   <TITLE><WS>(<RELEASEDATE>)
   <GENRE>
   Writers:<WS><NAME><WS><SURNAME>
   Directors:<WS><NAME><WS><SURNAME>
   Stars:<WS><NAME><WS><SURNAME>
   <RATINGS>/10 from<VOTECOUNT>users

   If specified film is Documentary; since a documentary doesn't have writers and genre in the system, the result will be as follows:

<TITLE><WS>(<RELEASEDATE>)
Directors:<WS><NAME><WS><SURNAME>
Stars:<WS><NAME><WS><SURNAME>
<RATINGS>/10 from<VOTECOUNT>users

If specified film is TV Series the result will be as follows:

<TITLE><WS>(<STARTDATE>-<ENDDATE>)
<SEASONS><WS>seasons,<WS><EPISODES><WS>episodes
<GENRE>
Writers:<WS><NAME><WS><SURNAME>
Directors:<WS><NAME><WS><SURNAME>
Stars:<WS>¡NAME¿<WS><SURNAME>
<RATINGS>/10 from<VOTECOUNT>users

If there is not any film with specified <FILMID> the <RESULT> should be as follows:

Command Failed
Film ID:<WS><FILMID>

If there is not any rating votes for that film, then below warning message should be printed:

Awaiting for votes

4. <TITLE>:<WS> <RATINGSCORE>

   If there is not any ratings of the specified user, then a warning message will be printed to the output file as follows:

   There is not any ratings so far

   If there is not any user with specified <USERID> the <RESULT> should be as follows:

   Command Failed
   User ID:<WS><USERID>

5. *New ratings done successfully*

   Film title:<WS><TITLE>
   Your rating:<WS><NEWRATINGSCORE>

   If there is not any user or film with specified IDs and if the user has no rating score for the specified film, then the <RESULT> should be as follows:

   Command Failed
   User ID:<WS><USERID>
   Film ID:<WS><FILMID>

6. *Your film rating was removed successfully*
   Film title:<WS><TITLE>

   If there is not any user or film with specified IDs and if the user has no rating score for the specified film, then the <RESULT> should be as follows:

Command Failed
User ID:<WS><USERID>
Film ID:<WS><FILMID>

7. *<TITLE><WS>(<STARTDATE>-<ENDDATE>)*
   <SEASONS><WS>seasons and<WS><EPISODES><WS>episodes

   If there is not any TV Series in the system, then a warning message will be printed to the output file as follows:

   No result

8. *Film title:<WS><TITLE>*
   <LENGTH><WS>min
   Language:<WS><LANGUAGE>

   If there is not any film for the specified country in the system, then a warning message will be printed to the output file as follows:

   No result

9. *Film title:<TITLE><WS>(<RELEASEDATE>)*
   <LENGTH><WS>min
   Language:<WS><LANGUAGE>

   If there is not any film released before the specified date in the system, then a warning message will be printed to the output file as follows:

   No result

10. *Film title:<TITLE><WS>(<RELEASEDATE>)*
    <LENGTH><WS>min
    Language:<WS><LANGUAGE>

    If there is not any film released after specified date in the system, then a warning mes-sage will be printed to the output file as follows:

    No result

11. *FeatureFilm:*
    <TITLE><WS>(<RELEASEDATE>) Ratings:<WS><RATINGS>/10 from<VOTECOUNT>user

    ShortFilm:
    <TITLE><WS>(<RELEASEDATE>) Ratings:<WS><RATINGS>/10 from<VOTECOUNT>user

    Documentary:<TITLE><WS>(<RELEASEDATE>) Ratings:<WS><RATINGS>/10 from<VOTECOUNT>users

    TVSeries:
    <TITLE><WS>(<STARTDATE>-<ENDDATE>) Ratings:<WS><RATINGS>/10 from<VOTECOUNT>users

    All the results should be printed in descending order.

If there is not any result for a category, then a warning message will be printed to the output file for that category as follows:

No result

12. *Directors:*
<NAME>< WS><SURNAME>< WS><AGENT>

Writers:
<NAME>< WS><SURNAME>< WS>< TYPE>

Actors:
<NAME>< WS><SURNAME>< WS><HEIGHT>< WS>cm

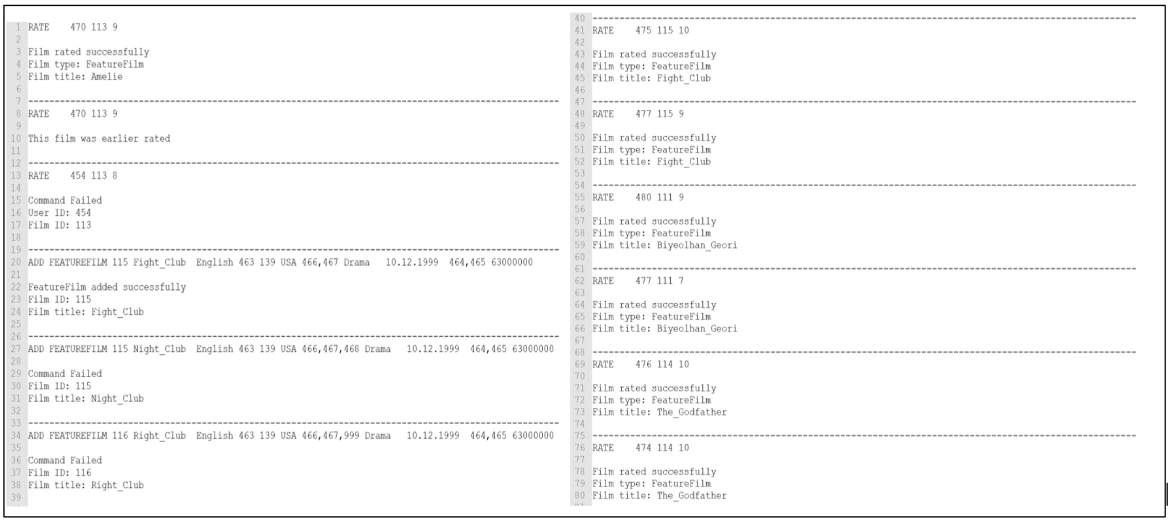
ChildActors:
<NAME>< WS><SURNAME>< WS><AGE>

StuntPerformers:
<NAME>< WS><SURNAME>< WS><HEIGHT>< WS>cm

If there is not any result for a category, then a warning message will be printed to the output file for that category as follows:

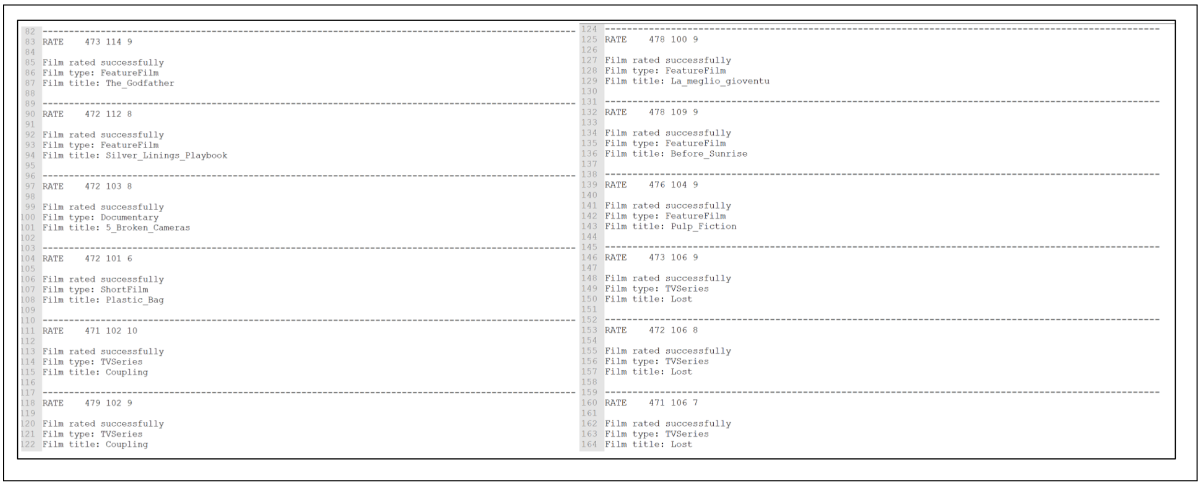
No result

According to these definitions a sample output file is given in Figure 5 and Figure 6. This output file is not complete. The rest will be provided to you as sample input and output on the Piazza page. Further examples which give more details will be provided at the course's Piazza page.



```
RATE    470 113 9

Film rated successfully
Film type: FeatureFilm
Film title: Amelie

----------------------------------------------------------------------------------------------------
RATE    470 113 9

This film was earlier rated

----------------------------------------------------------------------------------------------------
RATE    454 113 8

Command Failed
User ID: 454
Film ID: 113

----------------------------------------------------------------------------------------------------
ADD FEATUREFILM 115 Fight_Club  English 463 139 USA 466,467 Drama   10.12.1999  464,465 63000000

FeatureFilm added successfully
Film ID: 115
Film title: Fight_Club

----------------------------------------------------------------------------------------------------
ADD FEATUREFILM 115 Night_Club  English 463 139 USA 466,467,468 Drama   10.12.1999  464,465 63000000

Command Failed
Film ID: 115
Film title: Night_Club

----------------------------------------------------------------------------------------------------
ADD FEATUREFILM 116 Right_Club  English 463 139 USA 466,467,999 Drama   10.12.1999  464,465 63000000

Command Failed
Film ID: 116
Film title: Right_Club

----------------------------------------------------------------------------------------------------
RATE    475 115 10

Film rated successfully
Film type: FeatureFilm
Film title: Fight_Club

----------------------------------------------------------------------------------------------------
RATE    477 115 9

Film rated successfully
Film type: FeatureFilm
Film title: Fight_Club

----------------------------------------------------------------------------------------------------
RATE    480 111 9

Film rated successfully
Film type: FeatureFilm
Film title: Biyeolhan_Geori

----------------------------------------------------------------------------------------------------
RATE    477 111 7

Film rated successfully
Film type: FeatureFilm
Film title: Biyeolhan_Geori

----------------------------------------------------------------------------------------------------
RATE    476 114 10

Film rated successfully
Film type: FeatureFilm
Film title: The_Godfather

----------------------------------------------------------------------------------------------------
RATE    474 114 10

Film rated successfully
Film type: FeatureFilm
Film title: The_Godfather
```

Figure 5: Sample output file part1



```
-----------------------------------------------------------------------------------------------------
RATE    473 114 9

Film rated successfully
Film type: FeatureFilm
Film title: The_Godfather

-----------------------------------------------------------------------------------------------------
RATE    472 112 8

Film rated successfully
Film type: FeatureFilm
Film title: Silver_Linings_Playbook

-----------------------------------------------------------------------------------------------------
RATE    472 103 8

Film rated successfully
Film type: Documentary
Film title: 5_Broken_Cameras

-----------------------------------------------------------------------------------------------------
RATE    472 101 6

Film rated successfully
Film type: ShortFilm
Film title: Plastic_Bag

-----------------------------------------------------------------------------------------------------
RATE    471 102 10

Film rated successfully
Film type: TVSeries
Film title: Coupling

-----------------------------------------------------------------------------------------------------
RATE    479 102 9

Film rated successfully
Film type: TVSeries
Film title: Coupling
-----------------------------------------------------------------------------------------------------
RATE    478 100 9

Film rated successfully
Film type: FeatureFilm
Film title: La_meglio_gioventu

-----------------------------------------------------------------------------------------------------
RATE    478 109 9

Film rated successfully
Film type: FeatureFilm
Film title: Before_Sunrise

-----------------------------------------------------------------------------------------------------
RATE    476 104 9

Film rated successfully
Film type: FeatureFilm
Film title: Pulp_Fiction

-----------------------------------------------------------------------------------------------------
RATE    473 106 9

Film rated successfully
Film type: TVSeries
Film title: Lost

-----------------------------------------------------------------------------------------------------
RATE    472 106 8

Film rated successfully
Film type: TVSeries
Film title: Lost

-----------------------------------------------------------------------------------------------------
RATE    471 106 7

Film rated successfully
Film type: TVSeries
Film title: Lost
```

Figure 6: Sample output file part 2

3.2 Report

The structure of report is described below:

- Cover Page
- Class Diagram and Solution, describe details of your solution, stating its advantages and disadvantages technically. Draw class diagram. Show attributes and method names of each class in your diagram.
- Comments, give feedback about problem, problem description, and solution constraints.
- References, give the references you used throughout your work at the end of your report.

3.3 Constraints

1. The methods' and attributes' names should be satisfied the most common naming conventions in Java.
2. You should model entities of the system with classes.
3. Your design will be graded. You are expected to propose a suitable design for the problem.
4. You should use inheritance mechanism and correct access modifiers.
5. All the input files and output file will be taken as command line arguments.

3.4 Submit Format

- File hierarchy must be zipped before submitted (Not .rar, only .zip files are supported by the system)

- $\langle studentid \rangle .zip(example : 1234567.zip)$

- [src]
    - Main.java
    - *.java
- [report]
    - report.pdf
    - *.jpg or .*jpeg

4 Grading Policy

Task	Point
Compiled	10
Report	15
Code design, clean and readable code, comments	15
Output of program	60
Total	100

5 Notes

- The assignment must be original, individual work. Downloaded or modified source codes will be considered as cheating. Also the students who share their works will be punished in the same way.
- We will be using the Measure of Software Similarity (MOSS) to identify cases of possible plagiarism. Our department takes the act of plagiarism very seriously. Those caught plagiarizing (both originators and copiers) will be sanctioned.
- Please do not miss that the name of the input and output files will be fixed. Use the file names as indicated in the leaflet. File names with different names will not be evaluated.
- You can ask your questions through course's piazza group and you are supposed to be aware of everything discussed in the piazza group. General discussion of the problem is allowed, but DO NOT SHARE answers, algorithms, source codes and reports .
- Ignore the cases which are not stated in this assignment and do not ask questions on Piazza for such extreme cases.
- Don't forget to write comments of your codes when necessary.
- The names of classes', attributes' and methods' should obey to Java naming convention.
- Do not submit your project without first compiling it on dev machine.
- Save all work until the assignment is graded.
- Do not miss the deadline. Submission will be end at 16/04/2021 23:59, the system will be open until 23:59:59. The problem about submission after 23:59 will not be considered.

- There will be again 3 days extensions (each day degraded by 10 points) in this project.
- Your grades will be announced within 15 days at the latest. Objections about your grades can be made within specified days given by TAs. Objections made outside of the specified days will not be accepted.