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SUBJECT

Information
Technology

DATE

June 2023

**GRADE
PAPER**

11
Practical Examination

**MARKS
MODERATOR
DURATION**

100
Ms Kench
120 minutes + 30
minutes printing

NAME

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The details of movies released in South Africa in 2022 that have earned more than \$1 000 000 are stored in a text file called **movies.txt**. The total dollar earnings (income) for 2022 are stored along with the first-weekend income.

The file contains the details of each movie as follows:

- Movie name
- Income for the movie in 2022
- Income for the movie for the first weekend.
- Release date
- Distributor name

name#movieIncome#firstWeekendIncome#releaseDate#distributor

```
TopGun: Maverick#$5,309,671#$1,189,336#May 27 2022#United International Pictures
Avatar: The Way of Water#$4,763,881#$772,239#Dec 16 2022#Ster-Kinekor Pictures
Black Panther: Wakanda Forever#$4,389,565#$962,500#Nov 11 2022#Ster-Kinekor Pictures
Minions: The Rise of Gru#$2,591,492#$411,661#Jul 01 2022#United International Pictures
Thor: Love and Thunder#$2,097,460#$579,390#Jul 08 2022#Ster-Kinekor Pictures
Doctor Strange in the Multiverse of Madness#$1,882,765#$690,156#May 06 2022#Ster-Kinekor Pictures
Jurassic World: Dominion#$1,568,863#$321,454#Jun 10 2022#United International Pictures
Sonic the Hedgehog 2#$1,489,059#$215,000#Apr 01 2022#Paramount Pictures International
Puss in Boots: The Last Wish#$1,390,070#$89,436#Dec 09 2022#Times Media Films
Uncharted#$1,389,570#$212,435#Feb 18 2022#Ster-Kinekor Pictures
The Batman#$1,382,311#$93,086#Apr 03 2022#Universal Pictures
Black Adam#$1,152,031#$251,726#Oct 21 2022#Universal Pictures
The Lost City#$1,068,102#$151,670#Apr 22 2022#United International Picture1
```

Write a program to determine the total movie income for 2022 and count the number of movies in the text file.

¹ <https://www.boxofficemojo.com/chart/topGrossing/?year=2022/dec=14&pos=0&sort=totalGrosses&sortCrossToDate>

QUESTION 1

56 MARKS

The details of each movie must be stored in a **Movie** object, as shown in the class diagram.

Movie
- name : string - movieIncome : string - firstWeekendIncome : string - releaseDate : Date - distributor : string + <u>UNIVERSAL : string = "Universal Pictures"</u> + <u>UNITED : string = "United International Pictures"</u> + <u>STERKINEKOR : string = "Ster-Kinekor Pictures"</u> - <u>totalIncome : real</u> - <u>movieCount : integer</u>
+ Constructor (n: string, m: string, f: string, rD: string, d: string) + <u>getTotalIncome() : real</u> + <u>getMovieCount() : integer</u> - convertIncome(income: string) : real + getMonths() : integer + calcFirstWeekendPerc : real + generateCode() : string + toString() : string

- 1.1 Create a class called **Movie** (1)
- 1.2 Add fields to store the name, movie income, first-weekend income, release date and distributor using given data types. (3)
- 1.3 Add public constant static fields to set **UNIVERSAL** to "Universal Pictures", **UNITED** to "United International Pictures" and **STERKINEKOR** to "Ster-Kinekor Pictures". (4)
- 1.4 Add private static fields **totalIncome** (to sum the **movieIncome** of each movie) and **movieCount** (to count the number of movies). (3)
- 1.5 Code a parameterised constructor to assign values to the name, movie income, first-weekend income and distributor fields (4)
 - 1.5.1 Add code to convert the string parameter **rD** to a **Date** type and assign it to the **releaseDate** field, using the format given in the text file.
For example, May 27 2022. (3)
 - 1.5.2 Add code to the constructor to increment the **movieCount** field. (1)
- 1.6 Add accessor methods for the **totalIncome** and **movieCount** fields. (4)

- 1.7 Add a private method **convertIncome** to convert an income field (**movieIncome** or **firstWeekendIncome**) from a string to a double (real) field. (1)
 For example, convert "\$5,309,671" to 5309671.0
 - 1.7.1 The method must accept a String parameter called **income**. (1)
 - 1.7.2 Remove the \$ sign from the beginning of the string. (2)
 - 1.7.3 If the remaining string contains a comma, remove the comma. Repeat this process until the string no longer contains any commas. [You may not use the replace method in the String class]. (6)
 - 1.7.4 Convert the string to a double and return this value. (2)
 - 1.7.5 Add code to the constructor to add the **movieIncome** to the **totalIncome**, using the **convertIncome** method. (3)
- 1.8 Add a public method **getMonths** to calculate and return how many months have passed since the movie was released, i.e. between the movie **releaseDate** and today. The method must return an integer. (5)
- 1.9 Add a public method **calcFirstWeekendPerc** that calculates the first weekend's income as a percentage of the total income for the movie. Use the **convertIncome** method to convert the **firstWeekendIncome** and **movieIncome** fields to a double type. Return the rounded result to two decimal places. (6)
- 1.10 Add a **toString** method to display the uppercase **name**, months since release (using the **getMonths** method), **distributor**, **movieIncome**, **firstWeekendIncome** and % of movie income using the **calcFirstWeekendPerc** method.

Your output should appear as follows:

name

```
<Tab>"Months since release:"<space>months
<Tab>"Distributor:"<space>distributor
<Tab>"Movie Income:"<space>movieIncome
<Tab>"First-Weekend Income:"<space>firstWeekendIncome
<Tab>"Percentage of Movie Income:"<space>percMovieIncome%"
```

For example:

```
JURASSIC WORLD: DOMINION
Months since release: 9
Distributor: United International Pictures
Total Movie Income in 2022: $1,568,863
First-Weekend Income: $321,454
Percentage of Movie Income: 20.49%
```

(7)

QUESTION 2**24 MARKS**

- 2.1 Create a text-based user interface called **MovieUI**. (1)
- 2.2 In the main method, add code to read the data in the text file and instantiate a **Movie** object called **myMovie**. Your code must:
- 2.2.1 Open the text file called **movies.txt**. Add code to display a suitable message if the file is not found. (4)
 - 2.2.2 Extract the name, movie income, first-weekend income, release date and distributor for each line in the text file. (5)
 - 2.2.3 Using the public constant fields **UNIVERSAL**, **UNITED** and **STERKINEKOR** from the **Movie** class, change the value of the distributor field as follows:
 Universal Pictures = **UNV**
 United International Pictures = **UNT**
 Ster-Kinekor Pictures = **STK**
 Other distributors = **OTHER** (5)
 - 2.2.4 Instantiate a **Movie** object called **myMovie** using the name, movie income, first-weekend income and distributor fields. (3)
 - 2.2.5 Display the **Movie** object using the **toString** method in the **Movie** class. (2)
- 2.3 Add code to display the values in the **totalIncome** and **movieCount** fields. The correct output is shown below:
- ```
Total Income: 3.047484E7
No. of Movies: 13
```
- NOTE:** The total income value is displayed in scientific notation.
- $$3.047484E7 = 3.047484 \times 10^7 = 30\,474\,840$$
- (4)

**QUESTION 3****20 MARKS**

- 3.1 Add a public method **generateCode** to the **Movie** class to generate a movie code to identify each movie. The method will return a String. (1)
- 3.1.1 Convert the movie name to uppercase. (1)
  - 3.1.2 If the movie name consists of only one word, then extract the first and last letter of the title.  
 For example, "Uncharted" would become UD. (4)
  - 3.1.3 If the movie name consists of more than one word, then extract the first letter of each word.  
 For example, "Top Gun: Maverick" would become TGM. (8)
  - 3.1.4 Calculate a random number between 20 and 99 and add this number to the extracted characters and return the code.  
 For example, "Top Gun: Maverick" will be TGM43 if 43 was generated. (5)

- 3.2 In the **toString** method in the **Movie** class, insert the code created by the **generateCode** method before the movie name.

For example:

```
JWD99 JURASSIC WORLD: DOMINION
Months since release: 9
Distributor: UNT
Total Movie Income in 2022: $1,568,863
First-Weekend Income: $321,454
Percentage of Movie Income: 20.49%
```

(1)

## SAMPLE OUTPUT

```
TM62 TOPGUN: MAVERICK
Months since release: 10
Distributor: UNT
Total Movie Income in 2022: $5,309,671
First-Weekend Income: $1,189,336
Percentage of Movie Income: 22.4%
ATWOW89 AVATAR: THE WAY OF WATER
Months since release: 3
Distributor: STK
Total Movie Income in 2022: $4,763,881
First-Weekend Income: $772,239
Percentage of Movie Income: 16.21%
BPWF62 BLACK PANTHER: WAKANDA FOREVER
Months since release: 4
Distributor: STK
Total Movie Income in 2022: $4,389,565
First-Weekend Income: $962,500
Percentage of Movie Income: 21.93%
MTROG61 MINIONS: THE RISE OF GRU
Months since release: 9
Distributor: UNT
Total Movie Income in 2022: $2,591,492
First-Weekend Income: $411,661
Percentage of Movie Income: 15.89%
TLAT78 THOR: LOVE AND THUNDER
Months since release: 8
Distributor: STK
Total Movie Income in 2022: $2,097,460
First-Weekend Income: $579,390
Percentage of Movie Income: 27.62%
DSITMOM33 DOCTOR STRANGE IN THE MULTIVERSE OF MADNESS
Months since release: 10
Distributor: STK
Total Movie Income in 2022: $1,882,765
First-Weekend Income: $690,156
Percentage of Movie Income: 36.66%
JWD46 JURASSIC WORLD: DOMINION
Months since release: 9
Distributor: UNT
Total Movie Income in 2022: $1,568,863
First-Weekend Income: $321,454
Percentage of Movie Income: 20.49%
STH21 SONIC THE HEDGEHOG 2
Months since release: 0
Distributor: OTHER
Total Movie Income in 2022: $1,489,059
```

First-Weekend Income: \$215,000  
Percentage of Movie Income: 14.44%  
PIBTLW80 PUSS IN BOOTS: THE LAST WISH  
Months since release: 3  
Distributor: OTHER  
Total Movie Income in 2022: \$1,390,070  
First-Weekend Income: \$89,436  
Percentage of Movie Income: 6.43%  
UD79 UNCHARTED  
Months since release: 1  
Distributor: STK  
Total Movie Income in 2022: \$1,389,570  
First-Weekend Income: \$212,435  
Percentage of Movie Income: 15.29%  
TB39 THE BATMAN  
Months since release: 0  
Distributor: UNV  
Total Movie Income in 2022: \$1,382,311  
First-Weekend Income: \$93,086  
Percentage of Movie Income: 6.73%  
BA40 BLACK ADAM  
Months since release: 5  
Distributor: UNV  
Total Movie Income in 2022: \$1,152,031  
First-Weekend Income: \$251,726  
Percentage of Movie Income: 21.85%  
TLC72 THE LOST CITY  
Months since release: 11  
Distributor: UNT  
Total Movie Income in 2022: \$1,068,102  
First-Weekend Income: \$151,670  
Percentage of Movie Income: 14.2%

Total Income: 3.047484E7  
No. of Movies: 13