

Department of Computer Engineering
CENG201 – Object-oriented Programming

Fall 2018 - 2019
Lab Guide #3 – Week 4

OBJECTIVE: Introduction to classes and object creation, Visibility Modifiers - Encapsulation

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1. Write a Java program that keeps and displays the information of the books in the library.
- Create a **Book** class which has private members: String **title**, int **publishYear**, and double **price**.

Book
- title: String
- publishYear: int
- price: double
+ Book()
+ display():void

- No-args constructor initializes the values as "NoBookTitle", 0, 0.0.
- Member method display will display the information of the book.

For main:

- Create the class **Library**.
- Create an object using the following statement:
`Book b1 = new Book();`
- Display the book information.

Example Run:

NoBookTitle, 0, 0.0 TL

2. Modify the first question:

Book
- title: String
- publishYear: int
- price: double
+ Book()
+ Book(String, int, double)
+ Book(String, int)
+ Book(String)
+ display():void

- The no-arg constructor's method will set the data members with the following values:
title: NoBookTitle, **publishYear:** 0, **price:** 0.0
- Write a **non-default constructor**; set the **title**, **publishYear**, **price** as the new incoming title, publishYear, price.
- Write a **non-default constructor**; set the **title**, **publishYear** as the new incoming title, publishYear.
- Write a **non-default constructor**; set the **title** as the new incoming title.

For main:

- Create 4 objects using the following statements:
`Book b1 = new Book();`
`Book b2 = new Book("The Java Tutorial");`
`Book b3 = new Book("Accounting Principles", 2005, 135.8);`
`Book b4 = new Book("Algorithms in C", 2008, 45.5);`
- Display the information of all books in the library.
- Compile and run the program.

Example Run:

NoBookTitle, 0, 0.0 TL
The Java Tutorial, 0, 0.0 TL
Accounting Principles, 2005, 135.8 TL
Algorithms in C, 2008, 45.5 TL

3. Write a Java program that stores and displays the information of the movie.

Movie
- title: String
- year: int
- rating: double
+ Movie()
+ Movie(String, int, double)
+ Movie(String, int)
+ Movie(String)
+ display(): void

- Create a **Movie** class with the following data members: String **title**, int **year**, and double **rating**.
- Do **NOT** write a **no-arg constructor** yet.
- Write a **non-default constructor**; set the **title**, **year**, **rating** as the new incoming title, year, rating.
- Write a **non-default constructor**; set the **title**, **year** as the new incoming title, year.
- Write a **non-default constructor**; set the **title** as the new incoming title.
- Member method display will display the information of the movie.

For main:

- Try to create an object using the no-arg constructor as follows and try to find why there is an error:

```
Movie m = new Movie();
```
- Create 4 objects and get user input as in example run.

```
Movie m1= new Movie("La La Land", 2016, 8.5);
Movie m2= new Movie("The Godfather", 1972, 9.2);
Movie m3 = new Movie();
Movie m4 = new Movie("Night on Earth",1991);
```
- Display the information of all the movies.
- Compile and run the program.

Example Run:

```
*****
Movies' Info
La La Land, 2016, 8.5 points.
The Godfather, 1972, 9.2 points.
null, 0, 0.0 points.
Night on Earth, 1991, 0.0 points.
```

Additional Question:

Write a Java program by following the below instructions.

Class Name: Director	Explanations
- name: String	The name of the Director
- numberOfFilms: int	Movie count of the Director
- oscars: int	Count of Oscars (Wins & Nominations) if the Director has any
- info: String	The information about the Director
+Director()	No-args constructor: initialize the data members with specific values
+ Director(String,int,String,String)	Non-default constructor: initialize the data members with input values
+getName():String	Returns the name of the Director
+setName(String)	Sets the name of the Director
+getNumberOfFilms	Returns the film count
+getOscars():int	Returns the count of oscar wins and nominations of the Director.
+getInfo(): String	Returns the information of the Director.
+display(): void	Prints and displays the name , numberOfFilms and Oscar of the Director
+earnings():int	Calculates the earnings per movie of the Director.

- Create a Java Class (**NOT** Java Main Class) named **Director** with the information given as above.
 - The No-args constructor's initialization values are as stated below.

Name: **Alejandro González Iñárritu**

numberOfFilms: **16**

Oscars: **7**

Info: **is well known with the movies like: Birdman, The Revenant**

- **earningsPerMovie()** method returns the earnings of the director according to his/her number of film and Oscar counts. It means that earnings can vary up to the directors Oscar winnings in an amount of movies (**Hint:** number of films / oscars)

The following rule is used for determining the earning.

- <5 number of films / Oscars 10.000.000 \$
- >=5 and <10 5.000.000 \$
- >=10 and <15 1.000.000 \$
- >=15 500.000 \$

➤ Create a Java **Main Class** named **Cinema**.

a) In main method, create two **Director** objects.

- For the first Director object, use the no-args **constructor**. Then, set the name of the first Director object to "Evren Aykac". Lastly, display the Director's information.

```
//create object
Director d1 = new Director( );

// set the name
d1.setName("Evren Aykac");

//display the Directorinfo
d1.display();

//display information on console
System.out.println(d1.getName() + d1.getInfo() + ", earns "+d1.earnings() + "$ per film");
```

- For the second director object, use the **non-default constructor**. Then display the information of the second director object by calling the display method.

```
Director d2 = new Director ("Steven Spielberg", 161, 17," is well known with Schindler's List
and Saving Private Ryan");
```

Example Run:

Director Information:

Name: Evren Aykac

Number of Films: 16

Oscar Wins and Nominees: 7

Evren Aykac is well known with the movies like: Birdman, The Revenant, earns 10000000\$ per film

Director Information:

Name: Steven Spielberg

Number of Films: 161

Oscar Wins and Nominees: 17

Steven Spielberg is well known with Schindler's List and Saving Private Ryan, earns 5000000\$ per film