

IT2030 – Object Oriented Programming**Semester 1, 2020**

Assignment submission link is visible only for **48 hours**. Make sure to submit within the given period.

This is an individual assignment.

Assignment is given 100 marks and it is the substitution for the conventional SLIIT mid-term examination.

This assignment covers **basic Java concepts, OOP concepts, array manipulation, keyboard input and exceptions handling**.

Your code needs to be executed with no compilation errors.

You can test your code for the sample outputs we have provided at the end of the assignment.

Submission guidelines

Assignment is **opened from 9.00 am on 30th March, 2020 till 9.00 am on 1st April, 2020** and the submission link is available in the SLIIT Courseweb page.

Please upload one zip file with the following. The zip file should be named using your registration number.

Source code file (PlayASong.java) which contains all relevant classes and their implementations. At the beginning of the file mention your name, student ID number and the batch as comments.

A word document (a report) containing all the screen captures showing the console outputs retrieved when executing various functionalities.

For any submission with no report (the word document) 50 marks are deducted.

Good coding practices (eg., code indentation, comments, line spacing, naming conventions, etc.) must be adhered.

Any student answer which is not following the correct instructions when submitting, will not be assessed. “TokenDiff” and “Turnitin” tools will be used to detect plagiarism and Plagiarism will be penalized.

“WeCode” is a small rising software development company that provides novel software solutions mainly using Java technologies. After several initial discussions, WeCode has been hired by “PlayASong” music label to automate their processes and be more effective when serving its customers. As an initiative, PlayASong wants a standalone application that can handle basic functionalities within the office. After some brainstorming session between the two companies, they have agreed upon the below set of functionalities to be delivered.

Description of functionalities

There are two main User categories in the system, namely “Operators” and “Artists”.

All Users are registered in the system using their name and email when they enter the system for the first time.

Artists can be registered by providing their name, email, music genre (like classical, jazz, rock, pop, techno, disco, etc..), the number of songs intended to be included and his song list. A song list has the song name and the rate of the song (pricing).

Operators are the employees of PlayASong. Other than the name and the email, they are required to provide their employee number and the job title when registering initially.

User class has a “printDetails” method to display user information. Yet, the details to print should vary based on the type of the user (e.g., an operator will be printing his name, email, employee number and the job title whereas an artist will be showing name, email, music genre, the number of songs and his song list).

An Artist can have a list of up to 5 songs. Songs are stored in a 2D array where song name and song rate are taken as keyboard inputs. Artist class needs to implement a method using arrays to store song details and display those.

The company operator will be manually adding the song(s) file(s) to the system when the artist brought the song(s) file(s) in a physical device like a USB drive.

It was decided to generate an interface called “Calculations” to be responsible all sorts of calculations that the company must handle. Initially it has only “calculateRevenue” method which takes an Artist object as an argument.

Operators calculate the revenue for each artist. Already created Artist objects have their song list and the respective rates. Since each song has a different rate, PlayASong company has a policy to consider the average rate of each artist for revenue calculation. Hence, the revenue is the multiplication of number of downloads and average song rate. Number of downloads is entered by the operator as a keyboard input.

Tasks

- Implement the above scenario using appropriate classes, methods and object oriented programming concepts like inheritance, overloading, abstract classes, interfaces, etc.. Your code needs to be error-proof and clear.
- Implement a constructor in the User class to initialize the data members: name and email
- Overload this User constructor to take a User object as a parameter and initialize values
- Implement constructors for the Artist and Operator classes to initialize data members (Hint: use “super()” constructor call to use parent constructor)

Year 2
MID Assignment**IT2030 – Object Oriented Programming****Semester 1, 2020**

- Operator class should implemented a method to calculate revenue for each artist using the interface “Calculations”.
- You need to handle the exceptions that may occur when reading keyboard inputs; e.g., when entering song details, only strings are expected and though song rate is a string, it needs to be in correct format since that value is used to calculate revenue later. Furthermore, accessing an array element may cause exceptions too.
- Create a public class called “PlayASong” with the main method and generate the following outputs using appropriate objects, constructors and method invocation.

❖ Song details are entered to the system iteratively.

```
Enter song:
```

```
Iris
```

```
Enter rate:
```

```
2500
```

```
Enter song:
```

```
Staying Alive
```

```
Enter rate:
```

```
2000
```

❖ Then artist’s details and his song list with respective rates are displayed.

```
Artist name is Pablo Albo
Artist email is pablo@gmail.com
Artist music genre is pop
Number of songs is 5
Song list is :
Iris      2500
Staying Alive  2000
Unsung    2200
With you   1800
Horizon    1500
```

- ❖ Operators details along with the revenue gained need to be displayed as given below.

```
Operator name is Simon
Operator email is simon@playasong.com
Operator employee number is 123
Operator designation is accountant
```

```
Enter number of downloads: 60
```

```
Artist: Pablo Albo
Album revenue is LKR 120000.0
```

Also, prepare a report indicating different outputs retrieved when executing above listed tasks and functionalities.

Mark Distribution

Source Code	Description	Mark
	Correct Application of OOP	05 marks
	Usage of keywords	05 marks
	Apply polymorphism, usage of interfaces	05 marks
	Constructor implementation & overloading	10 marks
	Keyboard Inputs	05 marks
	Exception Handling	10 marks
	Array manipulations	10 marks
	Correct Calculations	20 marks
	Displaying details	15 marks
	Compile, Following Coding standards, Overall completeness	05 marks
Report		10 marks