



# "Faculty of Computers and Artificial Intelligence, Cairo University"

## *CS213: Object-Oriented Programming*

- Dr.Mohammad El-Ramly  
*Assignment 2-Final Phase*

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## *Prepared by:*

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**did Task1, Task11, Task 12, Task 13, Task 14, A pdf report, class diagram**

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**did Task1,Task 4,Task7,Task10, Task11**

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**did Task1,Task3,Task6,Task9, Task11**

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**did Task1, Task2, Task5, Task8, Task11, playing two tracks, mixer, hotkeys(innovative feature),Video**

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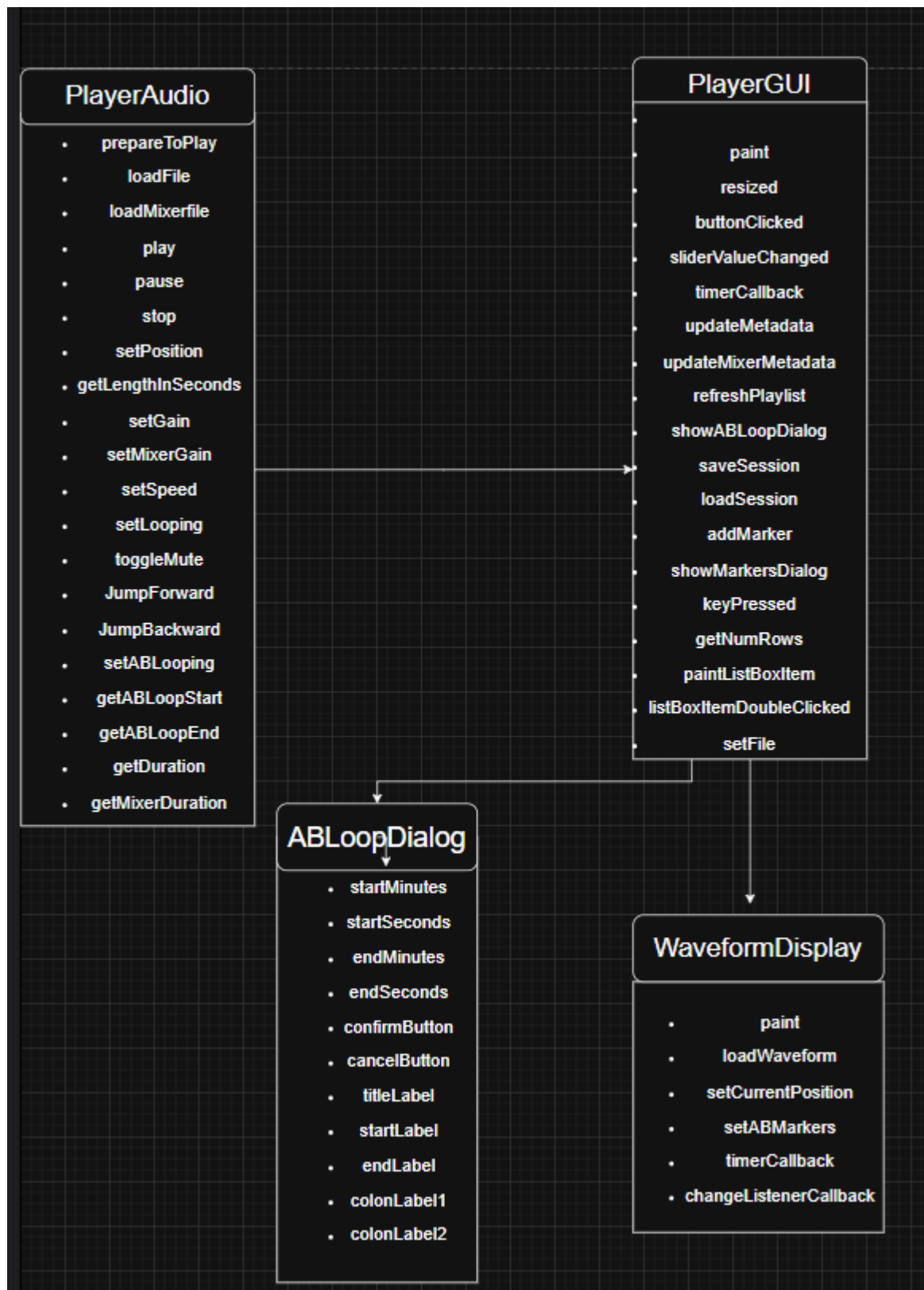
## *class diagram*

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The image shows a **Class Diagram** representing the architecture of **Audio Player** project.

- **PlayerAudio**: Handles all audio processing tasks, including playing, pausing, stopping, adjusting gain and speed, and setting AB loop points.
- **PlayerGUI**: The graphical user interface that manages user interactions (buttons, sliders, playlist, etc.). It communicates with PlayerAudio, WaveformDisplay, and ABLoopDialog.
- **WaveformDisplay**: Responsible for visually displaying the audio waveform, updating the playback position, and managing waveform markers.
- **ABLoopDialog**: A dialog window that allows users to set the start and end points for AB looping.

The relationships between the classes show that **PlayerGUI** acts as the central controller — interacting with **PlayerAudio** for playback control, **WaveformDisplay** for visual feedback, and **ABLoopDialog** for defining loop boundaries.



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## *“A PIE” OOP 4 principles in our program*

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### **Abstraction:**

The complex operations are abstracted from the user, so they only interact with simple interfaces like **play()** and **stop()**. The user does not need to know how the audio is processed or how **transportSource** or **mixerTransportSource** are controlled. This is achieved by encapsulating the complex functions within these interfaces to simplify usage.

### **Polymorphism:**

Although **transportSource** and **mixerTransportSource** may be of different types, they both provide the same interfaces like **setPosition()** and **start()**, allowing them to be treated in the same way. This enhances expansion and future modifications, making it easy to add other audio sources in the same manner.

### **Inheritance:**

The structure shows strong potential for using inheritance in the future. For example, powerful functions like loading audio, playing it, and controlling speed and gain can be extended through inheritance to provide additional features without rewriting existing code. Classes like **PlayerGUI** or **PlayerEffects** can inherit from **PlayerAudio** to add advanced user interfaces or apply additional audio effects. This allows for easy code reuse and system expansion in an organized and secure manner.

### **Encapsulation:**

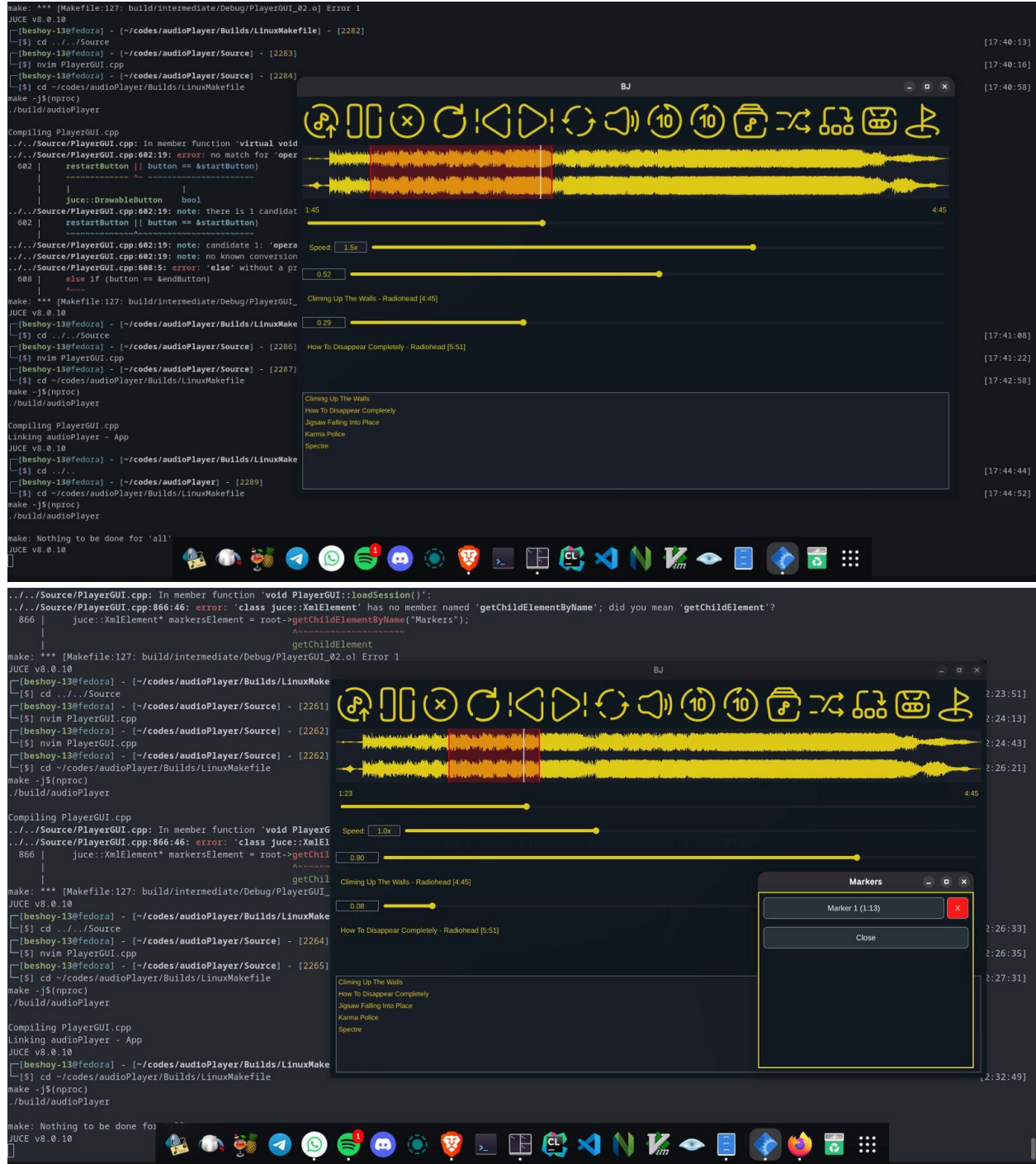
Data such as **currentFile**, **title**, and **artist** are stored privately within the **PlayerAudio** object. They can only be accessed through specific interfaces like **loadFile()** and **setPosition()**. This prevents direct manipulation of the data, improves security, and makes the code more flexible.

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### **In Summary:**

The program uses these principles to facilitate flexible, secure, and easily expandable audio handling, ensuring a well-structured and extendable system in the future.

# Screen shots of program user interface






# Screen shots of GitHub

## Commits

History for `Audio-Player` / Source on `main`




All users All time

Commits on Nov 5, 2025

added: speed slider, progress bar, waveform, segment looping, saving session modification, track markers, and as an innovative feature  
i've added Hotkeys  
f325f06   




beshey-13 committed 5 minutes ago

Commits on Nov 4, 2025




backward & forward modified and position slider added  
d6e8a4d   

beshey-13 committed 2 days ago

Commits on Nov 1, 2025




mixer added  
72523b9   

beshey-13 committed 4 days ago

playlist feature has been added  
9936124   




beshey-13 committed 5 days ago

Commits on Oct 31, 2025

meta data added  
223545c   

beshey-13 committed 5 days ago

Commits on Oct 24, 2025

adding mute button & some enhancements  
f395232   

beshey-13 committed 2 weeks ago

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## *Video Link*

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[https://drive.google.com/file/d/1waxAWQvwDZxLTaD8H\\_kfE1slvjZJGp47/view?usp=sharing](https://drive.google.com/file/d/1waxAWQvwDZxLTaD8H_kfE1slvjZJGp47/view?usp=sharing)