



AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

Dept. of Computer Science
Faculty of Science and Technology

CSC2210: OBJECT ORIENTED PROGRAMMING 2

Spring 2023-2024

Section:

Group No:04

Project Report On
Music Player (HARMONY)

Supervised By

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Submitted By:

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CO2: Display and verify the mean of a real-life Project using the concepts of C# Graphical User Interface based environment with database integration to depict a desktop-based application.					
Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	Evaluation Definition				Total = 15
Requirement fulfillment	Properly demonstrate a real-life scenario-based project with proper functional requirement identification for the Object-Oriented Programming project development activities.				5
Validation	Ensuring the ability of students’ proper demonstration on validation forms in their system in terms of dealing with the data.				5
Verification	Identifying if the students can verify the system data along with proper functional requirements in terms of data flow.				5

CO3: Prepare and Explain a real life desktop based application synthesizing several component of C# along with development tools to adhere the given requirements.

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	Evaluation Definition				
Organization of the application	Fails to identify any suitable real time application or requirements for project development activities related to OOP.	Limited understanding about the project scopes and scenarios or identification of functional requirements .	Lacks depth or relevance to OOP project development activities and may contain inaccuracies. Real-life scenarios are mentioned, but the discussion lacks depth or clarity.	Consider and integrate the idea of several core aspects of the project along with relevance to real-life scenarios. Demonstrating a solid understanding of the application presentation.	Generalize and exhibits an exceptional understanding of project preparation according to a to real-life scenarios. Also contains proper and insightful identification of the system which is comprehensive and precise.
Representation and Integration of Database	Fails to identify and present any understanding or implementation of database. Also failed to integrate the data with the project itself.	Limited understanding of the database concepts or their proper way of using in a real time project. While some attempt may be made to implement but it is incomplete or poorly executed, leading to inadequate design.	Lacks depth or relevance to database integration with the application. Shows a basic understanding but some aspects may be missing or incorrectly implemented, resulting in partial or inconsistency . May lack proper normalization .	Integrate the database with the forms properly and implements it with proper validation which is mostly accurate and comprehensive, ensuring the proper handling of data input and verification along with general normalization.	Exhibits an exceptional understanding and implementation of database ensuring attention to detail, and robust data manipulation procedures and contributing to the overall clarity.
Graphical User Interface	Fails to present or prepare GUI based application interfaces. There is no evidence of creating or	Limited understanding of graphical user interfaces. Lack of design knowledge.	Shows a basic understanding of creating user interfaces. Most of them are interconnecte	Effectively identifies and meet the consider the simplicity. Design related works are mostly accurate and	Exhibits an exceptional work design following a high standard of simple and elegant work. Several controls and

	integrating such things according to their usefulness.	Very poor attempt to make such things which are currently obsolete or can't be identified as coherent.	d but maybe some of them lack it. However, most of it can be described as user friendly.	taken proper attention to ensuring a user-friendly coherent system.	mechanism has been organized in a preferred way according to the coherent usage.

Chapter 1:

Introduction

The music player project, designed with C# and utilizing Windows Forms for the user interface, aims to provide an immersive and user-friendly listening experience. This application leverages Object-Oriented Programming (OOP) principles to ensure a modular, maintainable, and scalable system. By incorporating an n-tier architecture, the project delineates clear separation between the presentation, business logic, and data access layers, enhancing both development and maintenance efficiency.

The core functionality of the music player includes the ability to import and manage a personal music collection, create and customize playlists, and utilize playback controls such as play, pause, and volume adjustment. Additionally, the application features an equalizer to fine-tune audio output and a customizable UI to suit individual user preferences.

Objectives

- **User Management:** Implement a system to support multiple user roles, specifically Artists and Listeners, each with distinct functionalities. Artists can upload and manage their music content, while Listeners can organize their music collection and create playlists.
- **Secure Login:** Utilize a dedicated login table to securely store and manage user credentials, ensuring secure access to the system.
- **Database Operations:** Implement CRUD operations to facilitate the creation, retrieval, updating, and deletion of music-related data within the database.
- **OOP Principles:** Adhere to core OOP principles—Encapsulation, Inheritance, Polymorphism, and Abstraction—to promote code reusability and robustness.
- **Seamless Navigation:** Design all forms to be interconnected, providing a seamless navigation experience for users.
- **Visually Appealing Interface:** Develop an intuitive and visually appealing Windows Forms interface to enhance user experience.
- **Repository Pattern:** Implement a repository pattern to manage data access logic, ensuring a clean separation of concerns and improving code maintainability.

Features

- **User Roles:** The system will support at least two types of users—Artists and Listeners—each with unique functionalities. Artists can upload their music, while Listeners can create playlists and manage their music collection.
- **Playlist Management:** Users can create, edit, and delete playlists to organize their music collection based on their preferences.

- **Search and Discovery:** Built-in search tools allow users to find specific songs, artists, or albums within the music library.
- **Playback Controls:** Simple and intuitive playback controls, including play, pause, and volume adjustment, ensure a smooth listening experience.
- **Equalizer:** An equalizer feature allows users to adjust the sound quality to their liking.
- **Offline Playback:** Users can download songs for offline playback, ensuring uninterrupted access to their music collection.
- **Profile Management:** Users can update their account information and manage their subscription plans.

Technologies and Tools

- **Programming Language:** C#
- **User Interface:** Windows Forms
- **Database:** SQL Server or any other suitable relational database
- **Architecture:** n-Tier Architecture
- **Design Patterns:** Repository Pattern

Chapter 2:

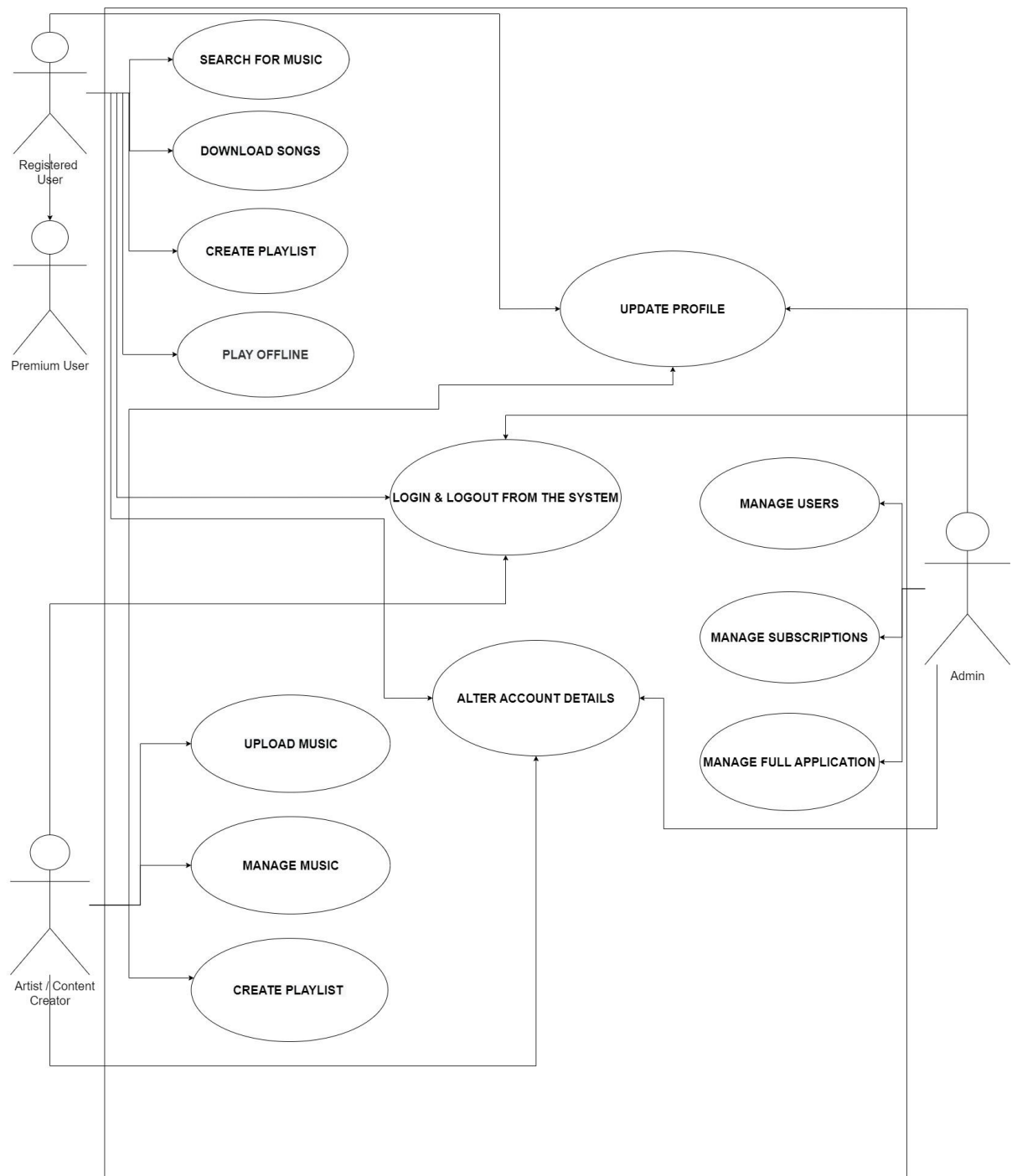
User stories

Use Case Name	Actor	User Story
Admin	Admin	As an Admin, I want to manage users in the full application, so that I can ensure the security and proper functioning of the system.
Register User	Artist, Listener, Visitor	The registered user wants to create a new playlist to organize their music collection.
Premium User	Artist, Listener	The premium user wants to access high-quality audio streaming within the music player system.
Artist	Artist	The artist wants to upload their music content to the music player system for distribution and streaming.
Search For Music	Admin, Register User, Premium User	The registered user wants to find specific songs, artists, or albums within the music player system's library.
Download Songs	Admin, Register User, Premium User, Artists	The user wants to download songs for offline playback within the music player system
Create Playlist	Register User, Premium User, Artists	The registered user wants to create a new playlist to organize their music collection.
Play Offline	Admin, Register User, Premium User, Artists	The user wants to listen to their music library even without an internet connection
Login and Logout from the system	Admin, Register User, Premium User, Artists	The user wants to securely access their account within the music player system and log out when finished.
Update profile	Admin, Register User, Premium User, Artists	The registered user wants to modify their account information within the music player system.
Manage User	Admin	The administrator wants to manage user accounts within the music player system, ensuring a healthy user base and system functionality.
Manage Subscription	Admin, Register User, Premium User, Artists	The registered user wants to manage their subscription plan within the music player system. This use case can be adapted for Admins managing system-wide plans as well.
Manage Full Application	Admin	I want to manage users in the full application, so that I can ensure the security and proper functioning of the system.
Alter Account Details	Admin, Register User, Premium User, Artists	The registered user wants to modify their account information within the music player
Upload Music	Admin, Artists	The artist wants to upload their music content to the music player system for distribution and streaming.
Manage Music	Admin, Register User, Premium User, Artists	Manages their uploaded music. Manages their music library within the music player system

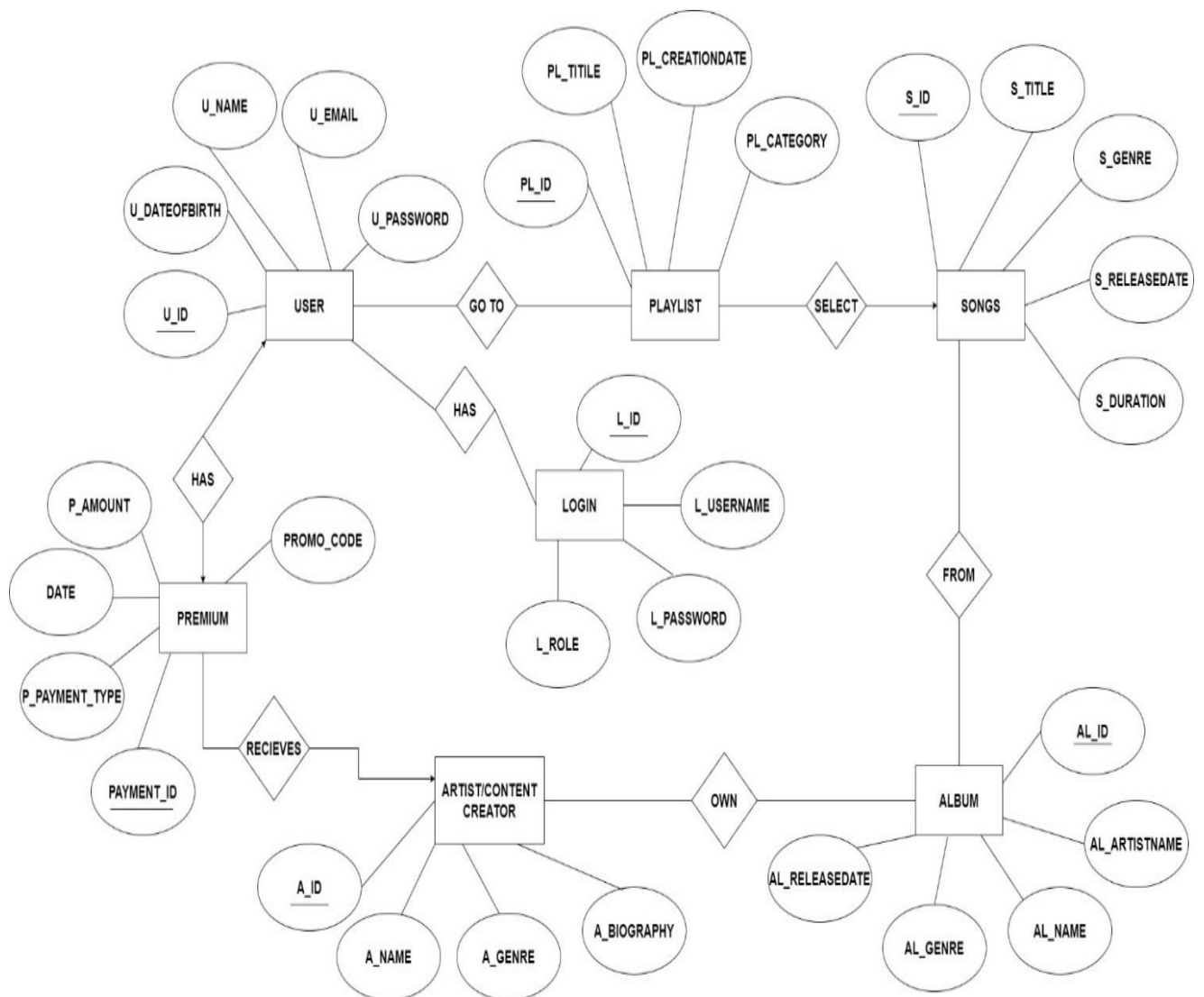
Chapter 3:

Database

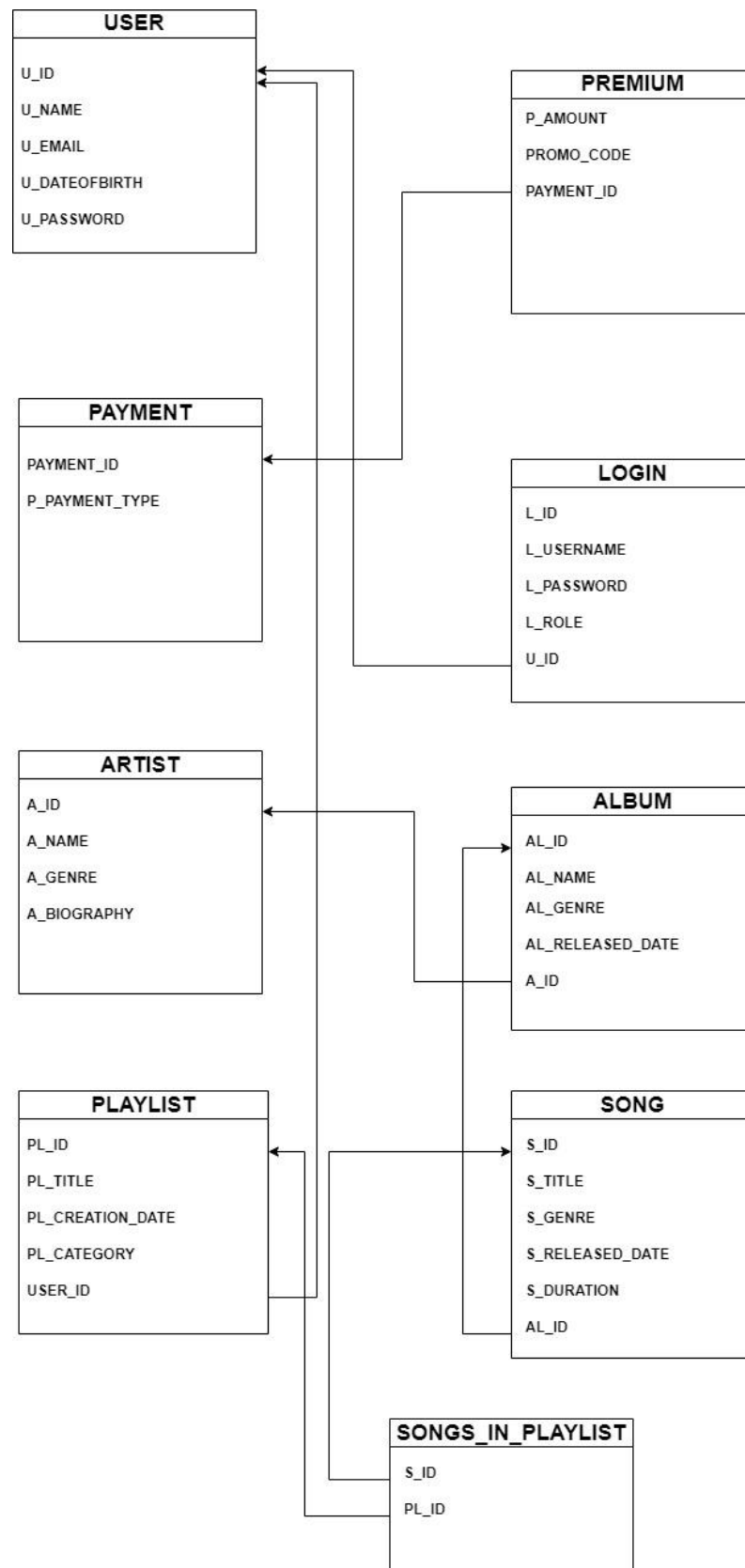
- Use case diagram



- **ER- Diagram:**



- **Class diagram**

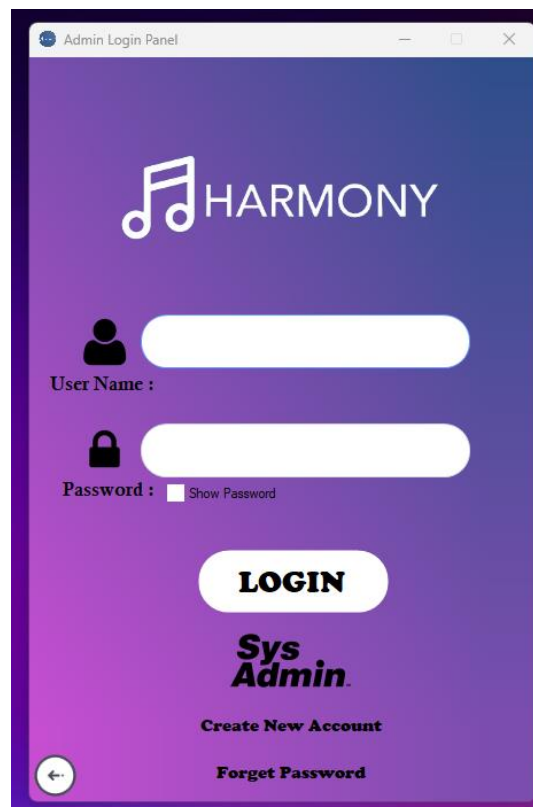
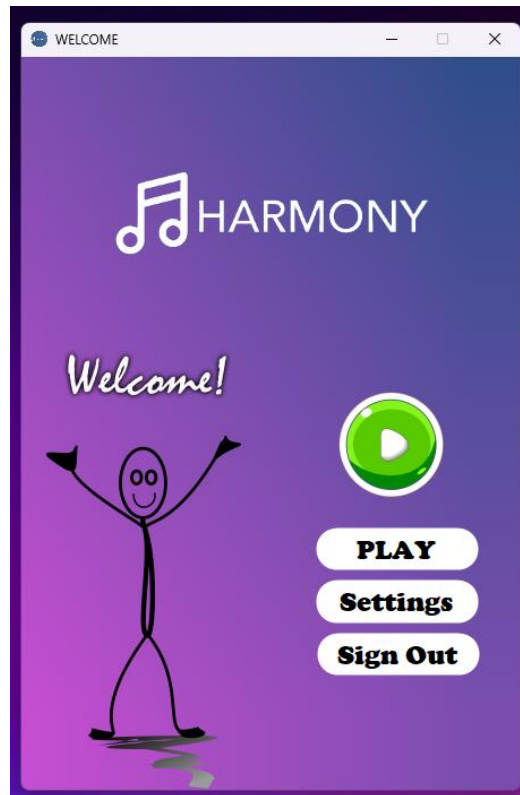


- **Data dictionary**


Key	Name	Data Type	Length	Nullable
<u>USER</u>				
PRIMARY	U_ID	INTEGER	10	NO
	U_NAME	VARCHAR	30	NO
	U_DATEOFBIRTH	VARCHAR	30	NO
	U_EMAIL	VARCHAR	20	NO
	U_PASSWORD	VARCHAR	20	NO
<u>PLAYLIST</u>				
PRIMARY	PL_ID	INTEGER	10	NO
	PL_TITLE	VARCHAR	30	NO
	PL_CREATIONDATE	VARCHAR	30	NO
	PL_CATEGORY	VARCHAR	30	NO
FOREIGN	U_ID	INTEGER	10	NO
<u>SONG</u>				
PRIMARY	S_ID	INTEGER	10	NO
	S_TITLE	VARCHAR	20	NO
	S_GENRE	VARCHAR	30	NO
	S_RELEASEDATE	VARCHAR	20	NO
	S_DURATION	VARCHAR	50	NO
FOREIGN	AL_ID	INTEGER	10	NO
<u>ARTIST</u>				
PRIMARY	A_ID	INTEGER	10	NO
	A_NAME	VARCHAR	20	NO
	A_GENRE	VARCHAR	20	NO
	A_BIOGRAPHY	VARCHAR	50	NO
<u>ALBUM</u>				
PRIMARY	AL_ID	INTEGER	10	NO
	AL_NAME	VARCHAR	20	NO
	AL_GENRE	VARCHAR	50	YES
	AL_CATEGORY	VARCHAR	20	NO
	AL_RELEASEDATE	VARCHAR	20	NO
FOREIGN	A_ID	INTEGER	10	NO
<u>LOGIN</u>				
PRIMARY	L_ID	INTEGER	10	NO
	L_USERNAME	VARCHAR	30	NO
	L_PASSWORD	VARCHAR	30	NO
	L_ROLE	VARCHAR	30	NO
FOREIGN	U_ID	INTEGER	10	NO
<u>PREMIUM</u>				
FOREIGN	PAYMENT_ID	INTEGER	10	NO
	P_AMOUNT	INTEGER	10	NO
	DATE	VARCHAR	30	NO
	PROMOCODE	VARCHAR	30	YES
<u>PAYMENT</u>				
PRIMARY	PAYMENT_ID	INTEGER	10	NO
	P_PAYMENT_TYPE	VARCHAR	30	NO
<u>SONGS IN PLAYLIST</u>				
FOREIGN	S_ID	INTEGER	10	NO
FOREIGN	PL_ID	INTEGER	10	NO


Chapter 4:

Screenshot of forms




LOGIN






User Name :



Password : ☐ Show Password

LOGIN



Admin Login

Create New Account

Forget Password

Register



Full Name :

User Name :

Email :

D.O.B :

Gender :

Role :

Password :

☐ Show Password


Phone No :



CONFIRM



Forget Password



User Name :

Phone Number :

Role :

User

New Password :


Confirm Password :

Show Password

Show Password

Change Password

User Panel




Search

Show All

Admin Settings

Settings



Update Profile :

User Name :

Full Name :

D.O.B :

2024-05-07

Password Change :


☐ Show Password

Phone No :


Email :

←

SUBMIT


Sign Out

User Settings



User Name :

Full Name :

Email :

Gender :

Male

DOB :

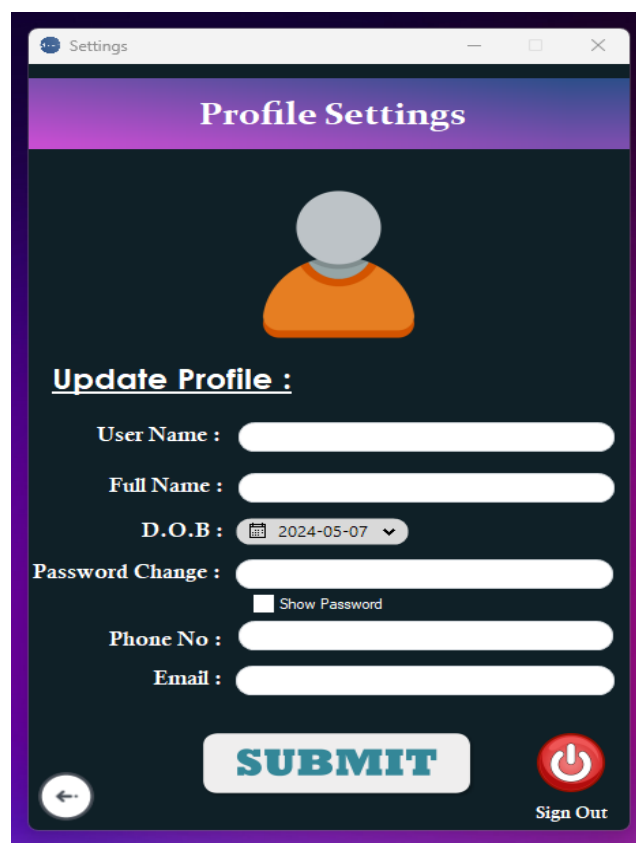
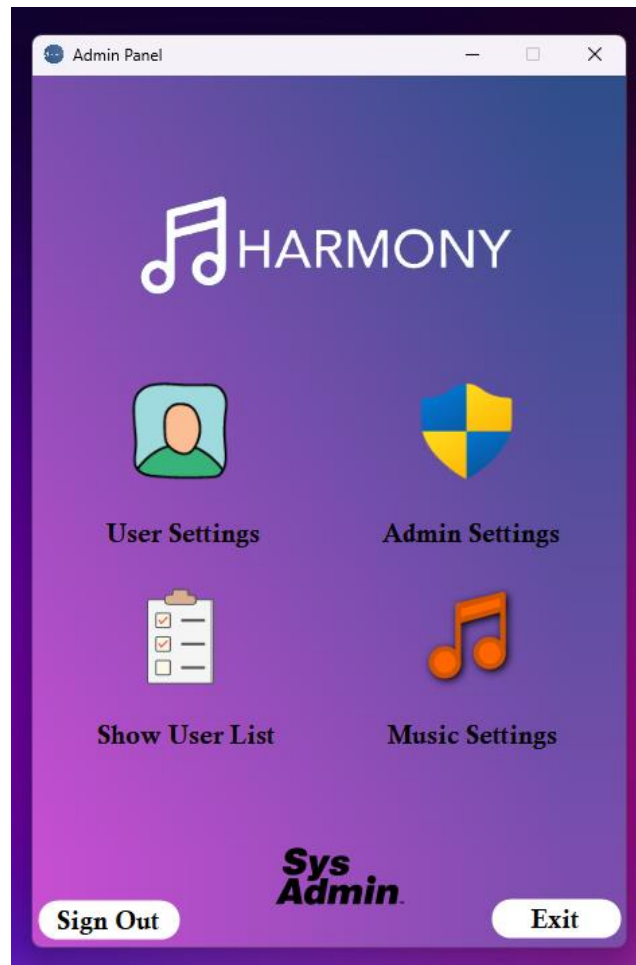
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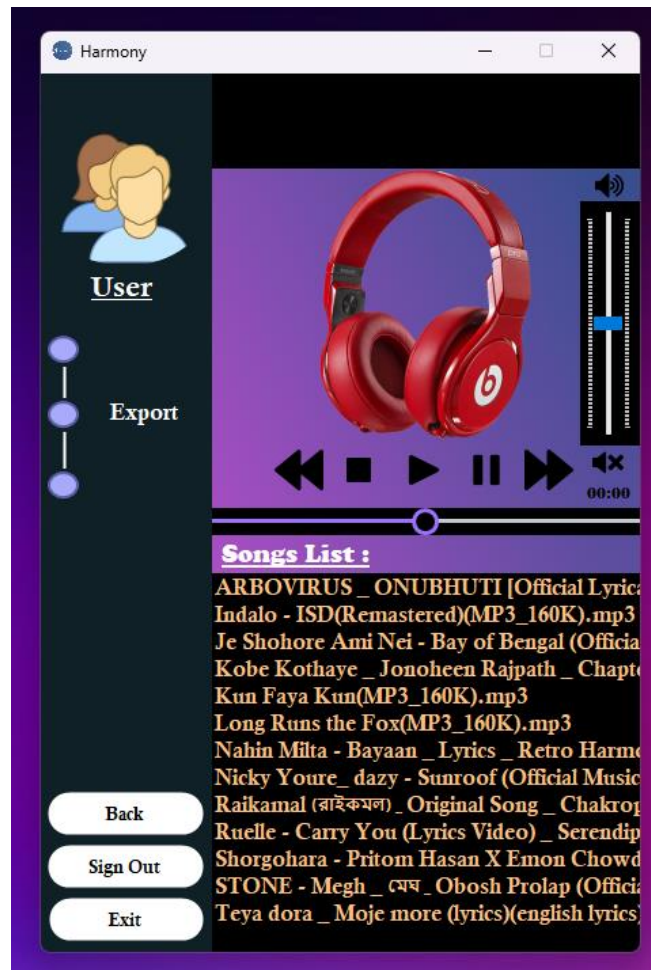
Phone No :

Update User

Delete User

←





CONCLUSION:

This music player project aims to provide a comprehensive and enjoyable listening experience, integrating various functionalities that cater to different user needs. By leveraging modern software design principles and patterns, the project not only ensures a high-quality user experience but also promotes maintainability and scalability, making it a robust solution for managing and enjoying a personal music library.