

shsh

by Muhammad Ibrahim

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1. Introduction

Tranquility app will be available Android, iOS, and web as well. The app is targeted towards generic audience but can be recommended to highly stressed and depressed people. The app needs a registered account to operate and to access its features. The anonymous access is also available for the user who are privacy conscious. In case of interaction with doctors, the app provides features to book an appointment with the doctors and meet with them online through text, video, and audio calls. Four different types of exercises along with both text manuals and video tutorials are available to help user minimize his/her stress and anxiety levels. The routine manager lets the user customize the routine of his/her daily exercise sessions and keeps a check on user exercise history. The music module is available to the user to listen to the soothing music to calm down and relax. The user can search for a specific song along with options to play, pause, skip, like and download a song. Emergency protocol is implemented in case a user is having negative thoughts and needs someone by his/her side. It sends a SOS message to the emergency contacts set by the user as well as nearby hospitals and clinics registered on the app. Motivational quotes are available to motivate user in a positive way and to increase self-worth and morale of the user. These can be displayed on launching the app as well as can be browsed in the app. The app provides user a space where he/she can connect with other patients all around the world. The user can add other patients as friends along with chatting with them in personal or public rooms. The anxiety check is available to automatically record user's heartbeat using fitness band. It can measure anxiety levels and recommends best course of actions to the user using app notifications.

2. Design methodology and Software Process Model

Design Methodology:

Object oriented Methodology will be used to develop the app. As the app is meant to be used by different patients with their own specific data and set of details, the OOP is most suitable for this purpose. For web, JavaScript will be used in object-oriented form.

For OOP, Java and Kotlin are used to produce Android app and swift in used to develop iOS app.

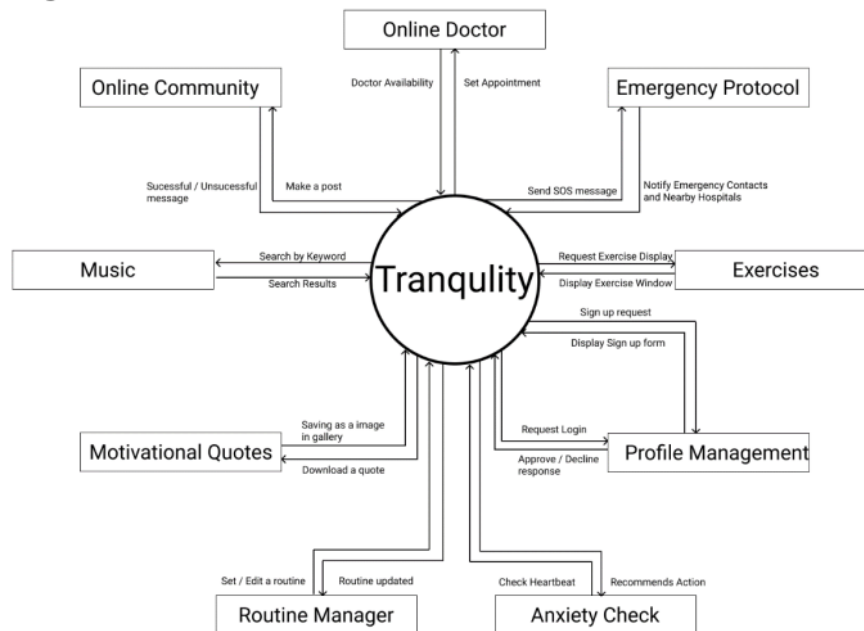
As OOP is implemented, SDS will mostly include Class Diagrams representing inheritance, composition, and relations etc.

Software Process Model:

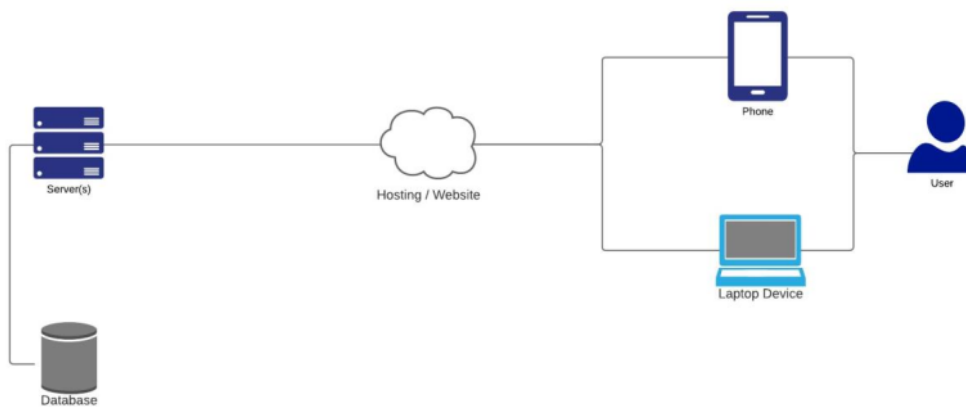
We will use evolutionary process model. A lot of requirements are known upfront but can be changed under development. Mostly, the UI can be requested to change under development so evolutionary process model is used as there will be room for improvement. The main core part of the system will be delivered first and then the system will be updated in incremental order according to the requirements.

3. System overview

Context Diagram:



3.1 Architectural Design



3.2 Process flow/Representation

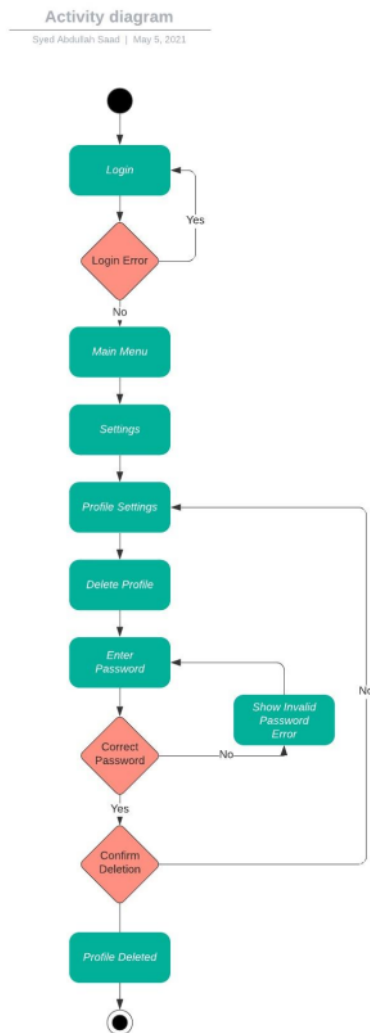


Figure 1: Login Process

Activity diagram

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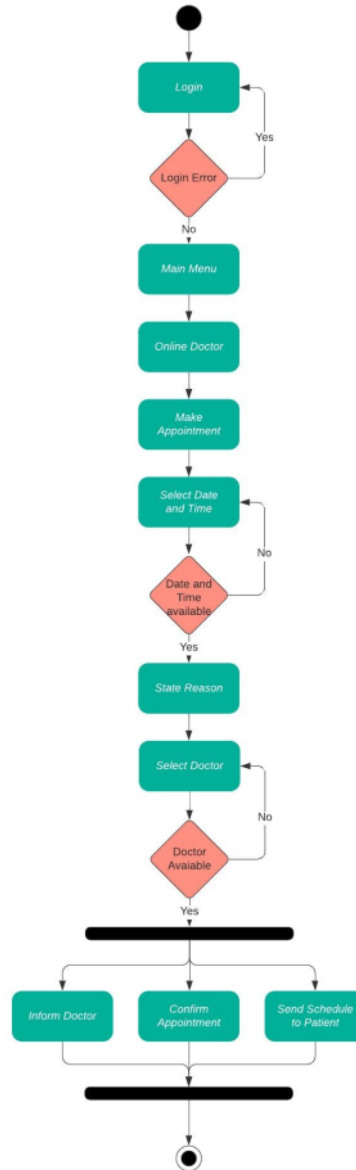


Figure 2: Set Appointment Process

Activity diagram

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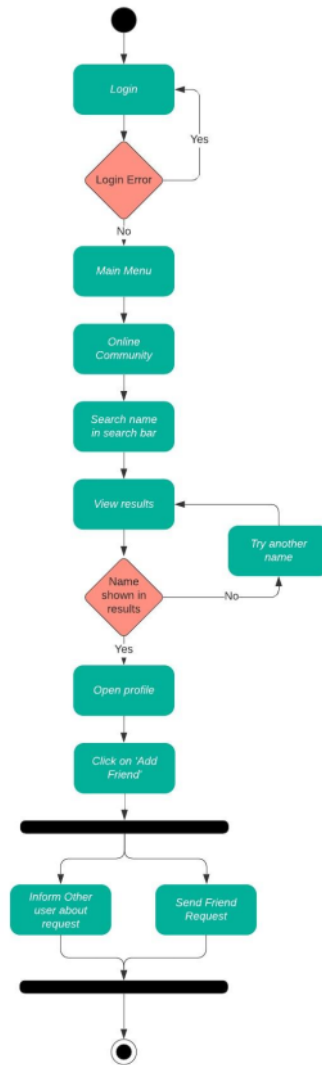


Figure 3: Add Friend Process

Activity diagram

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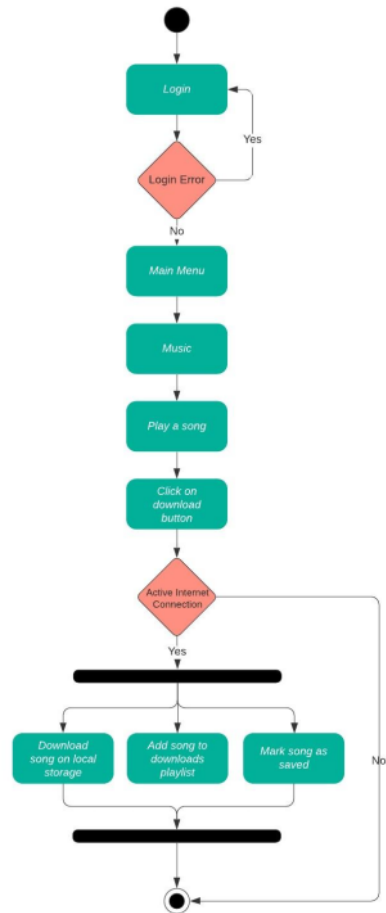


Figure 4: Download Song Process

Activity diagram

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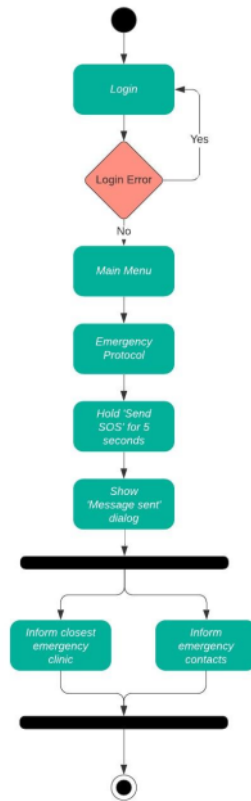


Figure 5: Send SOS Message Process

Activity diagram

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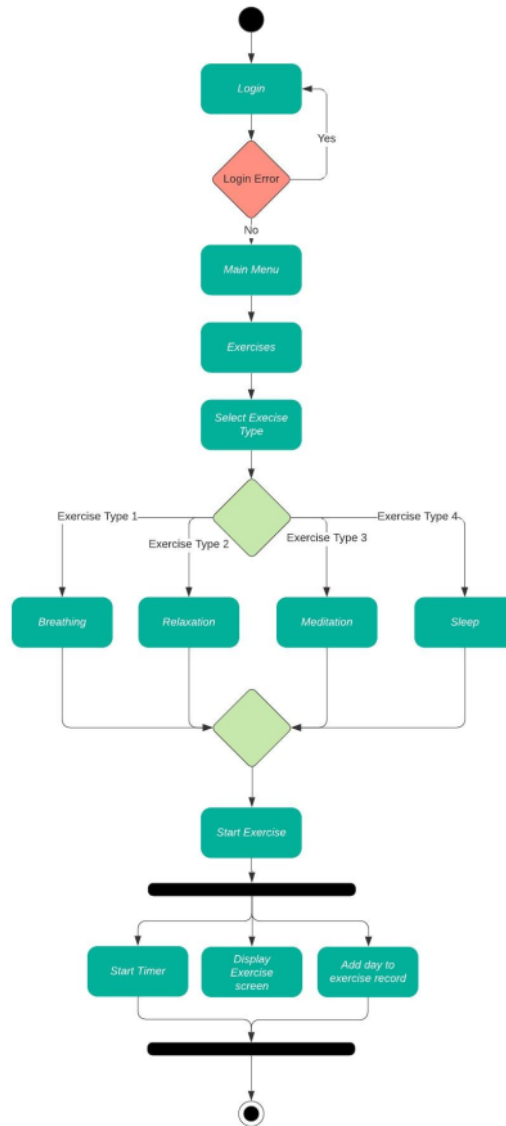


Figure 6: Exercise Process

Activity diagram

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Figure 7: Like Motivational Quotes Process

Activity diagram

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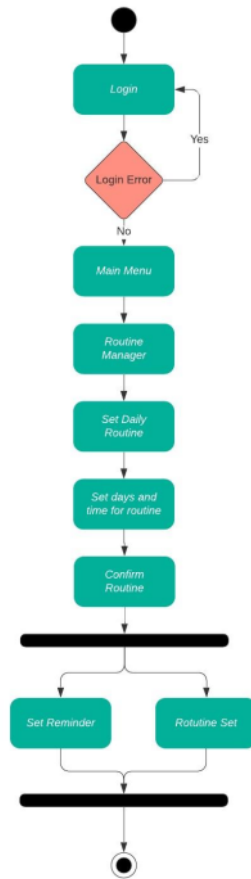


Figure 8: Set Routine Process

4. Design models [along with descriptions]

1 Class Diagram:

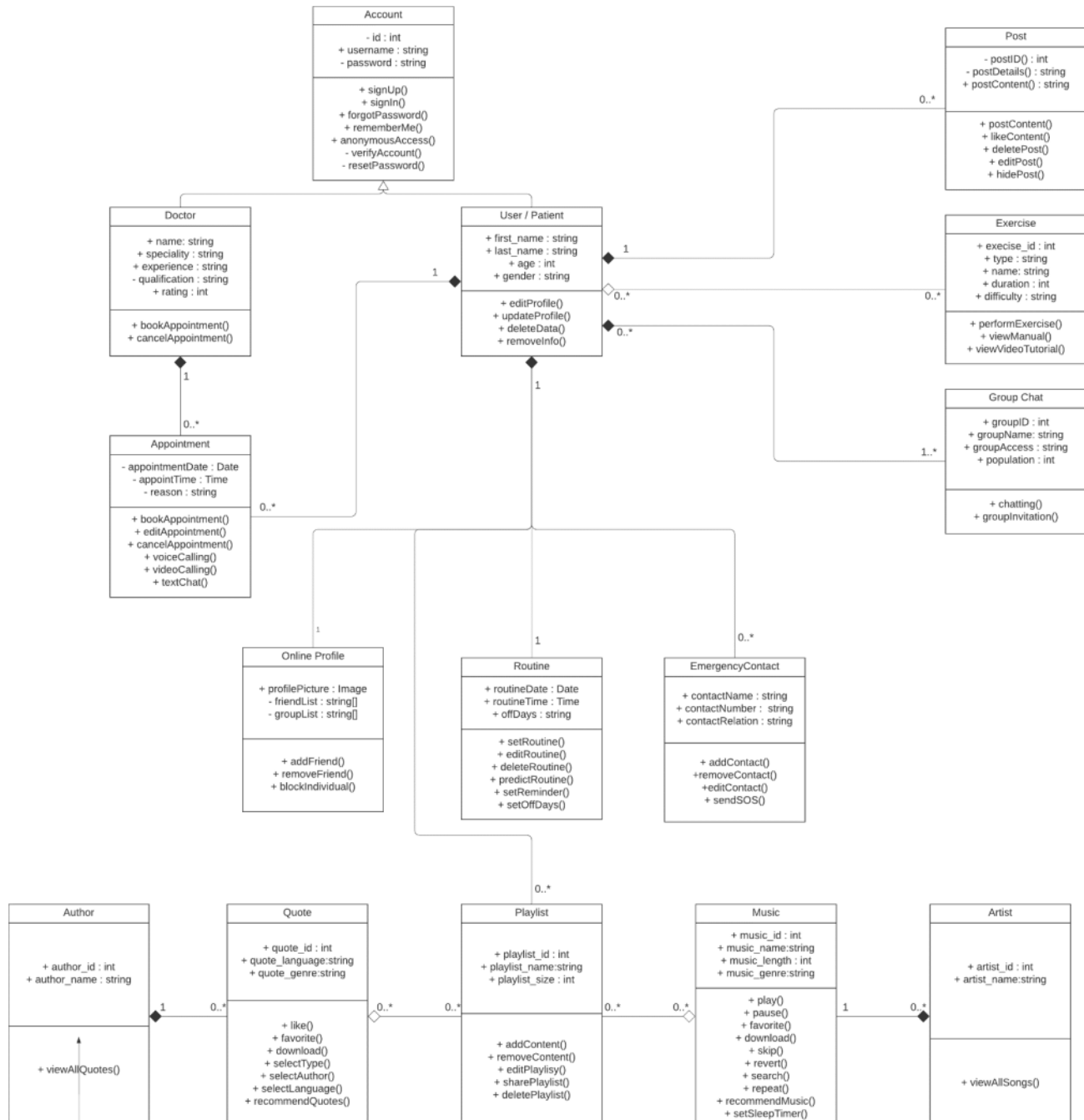


Figure 9: Class Diagram for Tranquility

Sequence Diagrams:

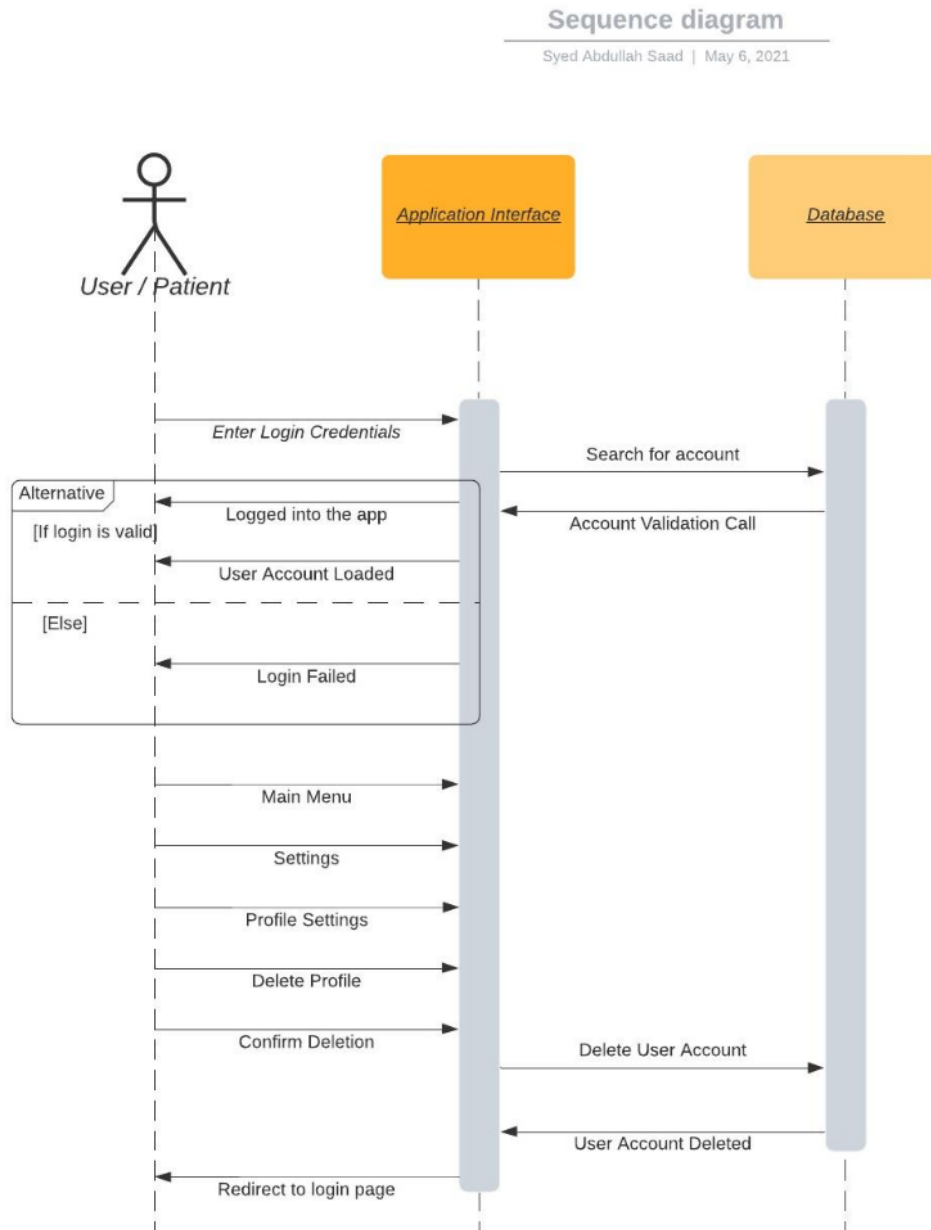


Figure 10: Login Sequence

Sequence diagram

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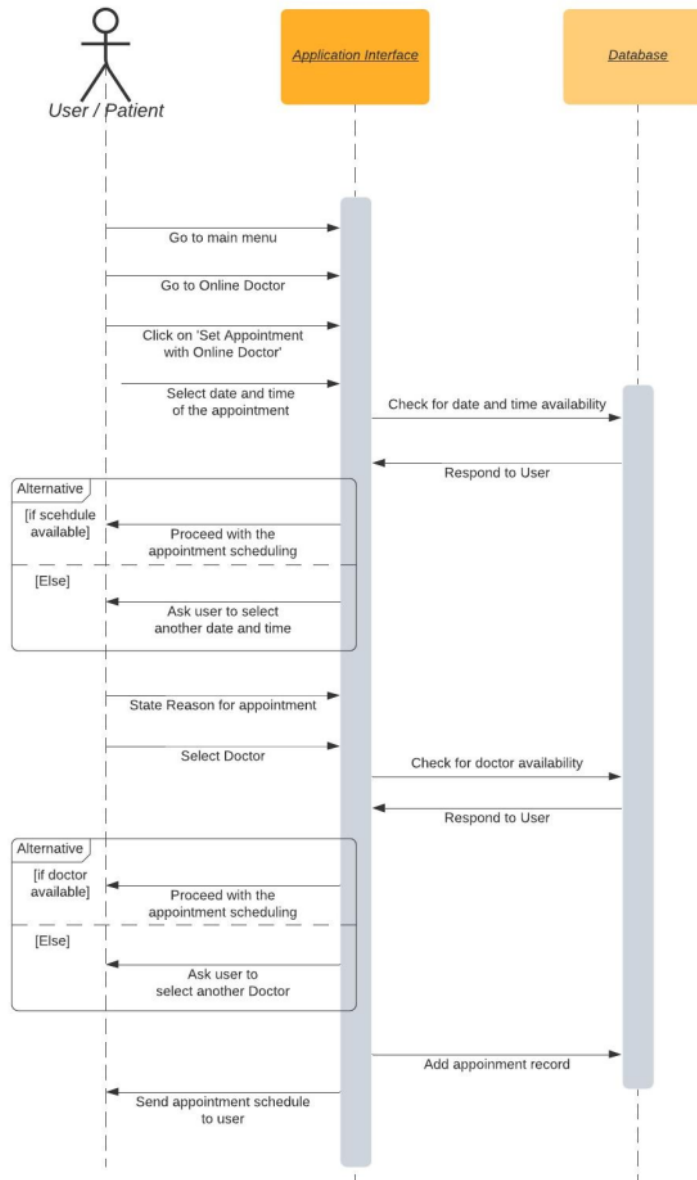


Figure 11: Set Appointment Sequence

Sequence diagram

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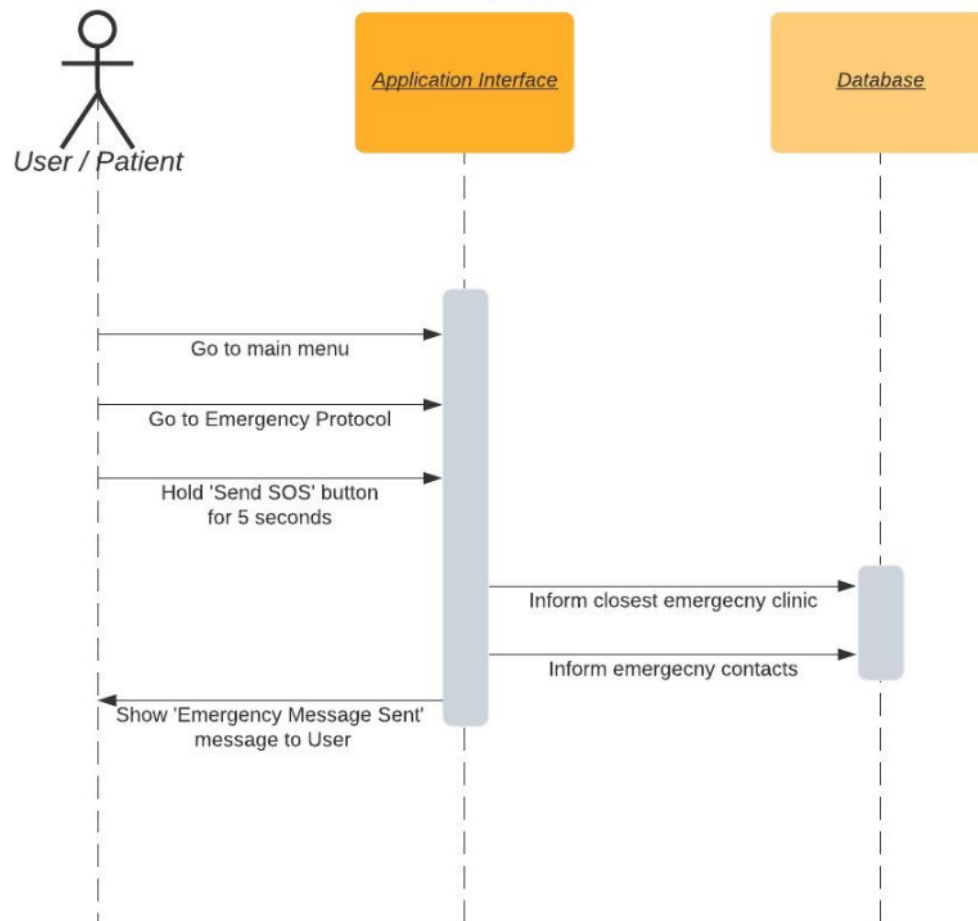


Figure 12: Send SOS Message Sequence

Sequence diagram

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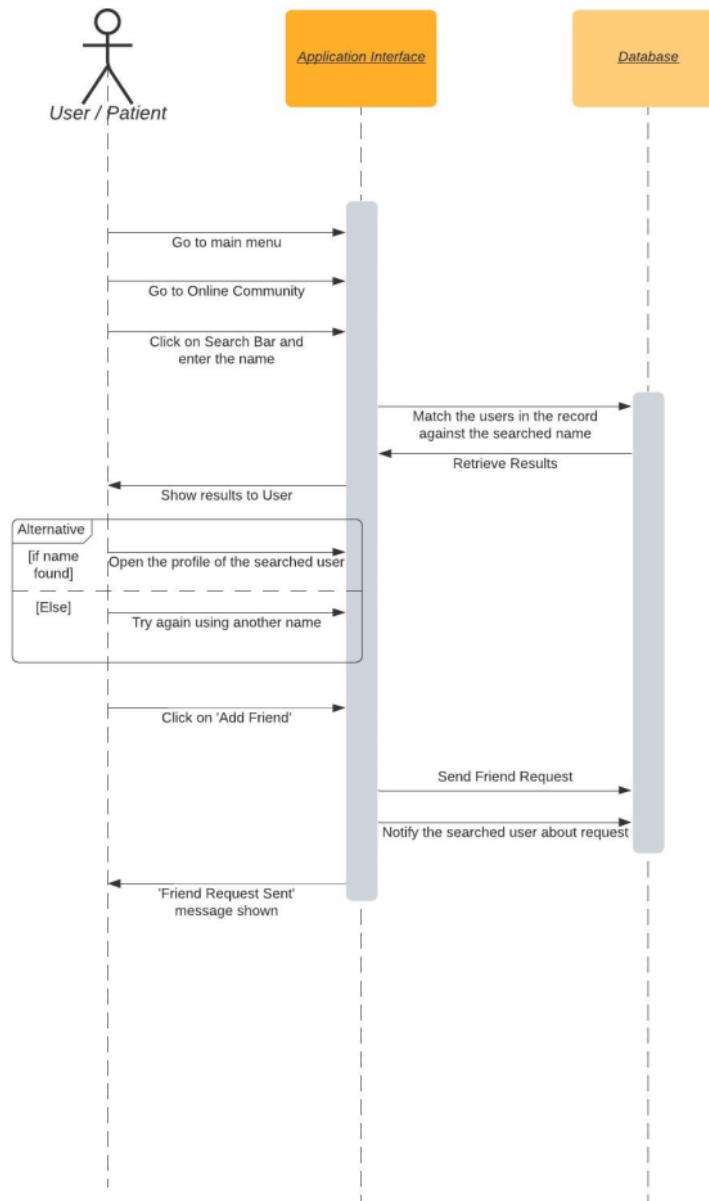


Figure 13: Add Friend Sequence

Sequence diagram

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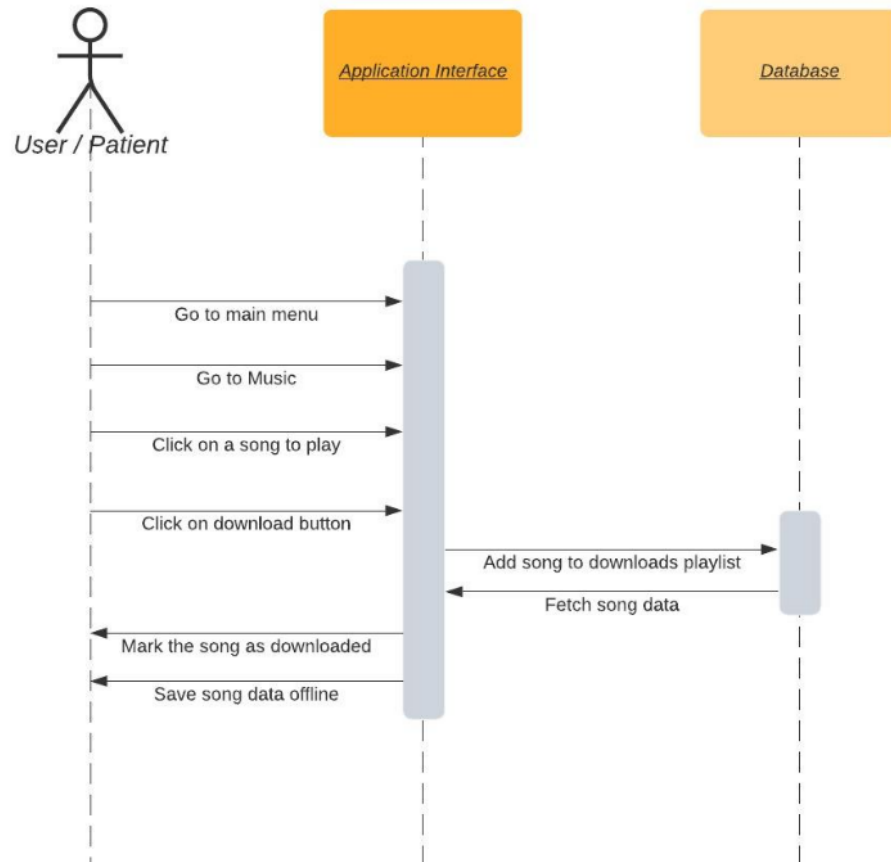


Figure 14: Download Song Sequence

Sequence diagram

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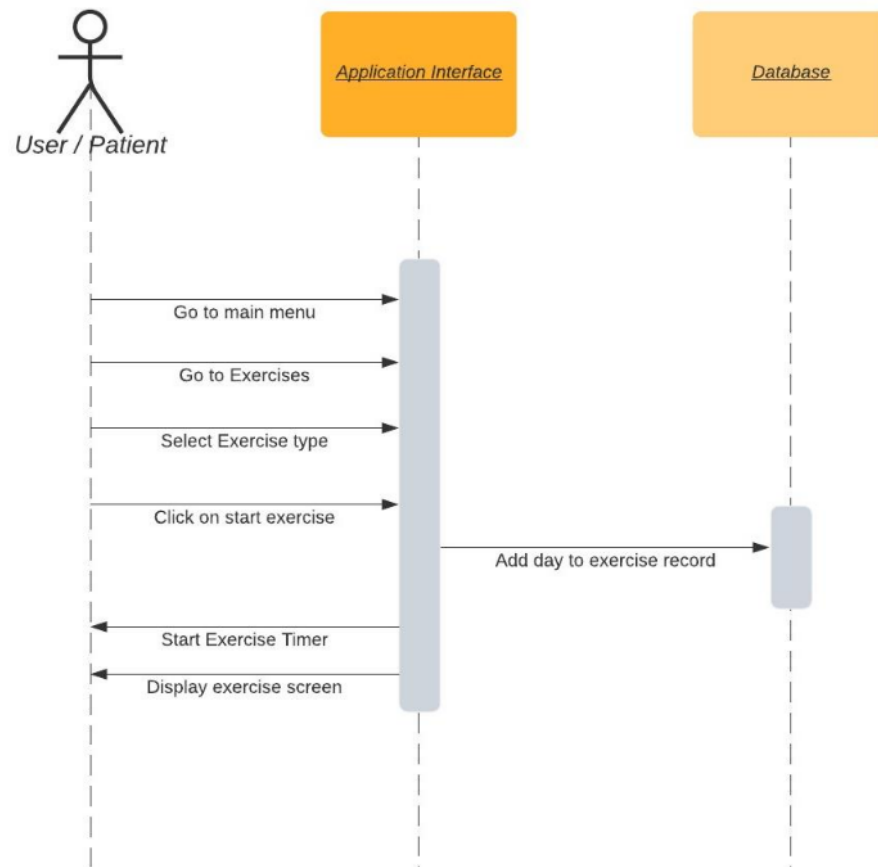


Figure 15: Start Exercise Sequence

Sequence diagram

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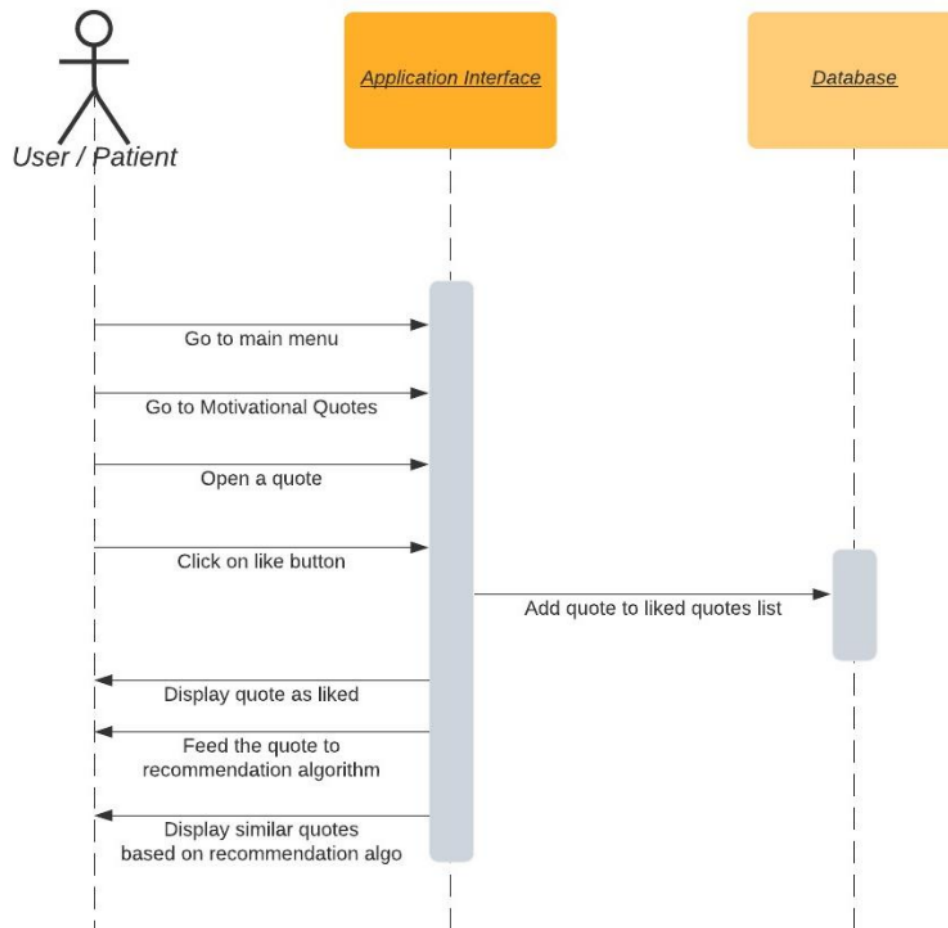


Figure 16: Like Quote Sequence

Sequence diagram

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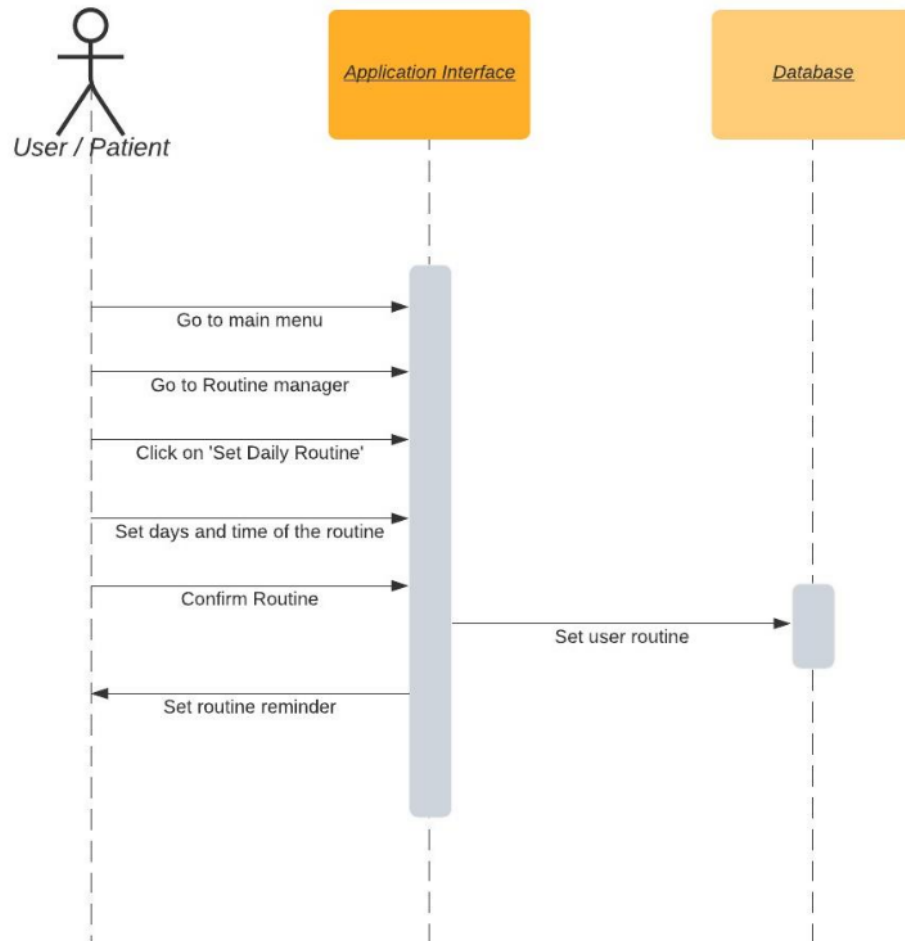


Figure 17: Set Routine Sequence

State Transition Diagram:

5. Data design

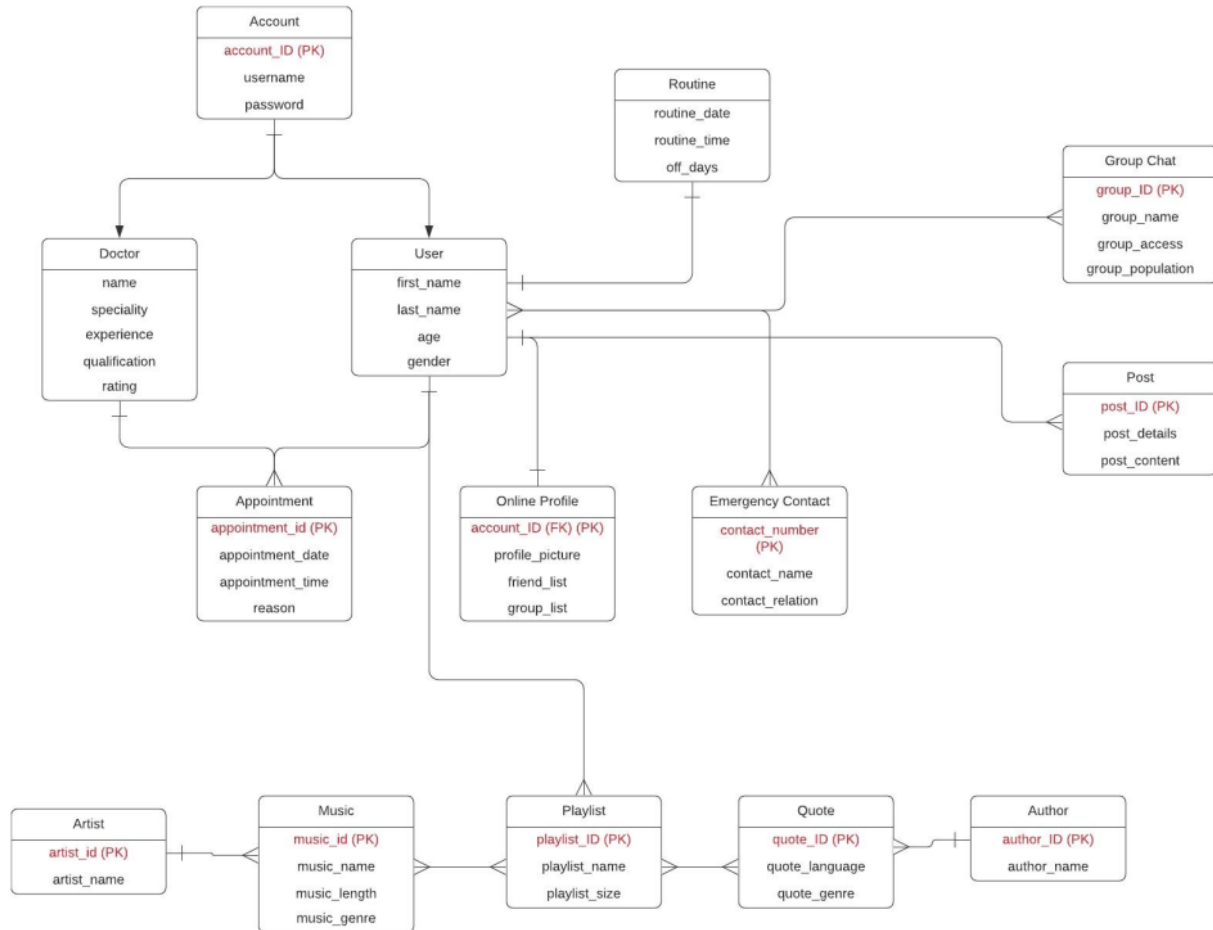


Figure 18: ERD Diagram for Tranquility

5.1 Data dictionary

Database Relations:

Account(account_id(PK), username, password)
Author(author_ID(PK), author_name)
Appointment(appointment_id(PK), appointment_date, appointment_time, reason)
Artist(artist_id(PK), artist_name)
Doctor(name, specialty, experience, qualification, rating)
Emergency Contact(contact_number(PK), contact_name, contact_relation)
Group Chat(group_id(PK), group_name, group_access, group_population)
Music(music_id(PK), music_name, music_length, music_genre)
Online Profile(account_ID(FK)(PK), profile_picture, friend_list, group_list)
Post(post_ID(PK), post_details, post_content)
Playlist(playlist_id(PK), playlist_name, playlist_size)
Quote(quote_id(PK), quote_language, quote_genre)
Routine(routine_date, routine time, off_days)
User(first_name, last_name, age, gender)

6. Algorithm & Implementation

Deep Learning technique is used in our application, deep learning is generally known as a subfield of machine learning which is inspired by the algorithms which are inspired and structured by keeping in view the functionality of human brain. In deep learning, the system trains itself by keeping in view the same pattern as a human brain follows, in liking or hating something. Deep learning is now a days a very vast field and the entire future is based on it. Deep learning algorithms are used in many sections of our project such as,

In **Music** section, the application recommends the user with the music which he/she likes. Our system uses the **BART (Bandits for recommendations as treatments)** algorithm. By using this, the system analysis the previous raw data of the user and runs the algorithm. The user is recommended with the songs of his/her taste as it keeps the record of the most listened artist as well as the most songs listened of a genre. It works in such a way it tries to avoid recommendations of such songs which are being skipped by the user in the past. If the user listens to a song more than 30 seconds then the songs of that type are put on a higher priority of recommendation. The system always tries to recommend all the unlisten songs or the new ones. So, that the recommendation can be made according to the user taste.

In **Motivational Quotes** section, the application analyzes the liked quotes and the downloaded ones by the user. The system uses the deep learning algorithm which filters the quotes according to the user taste and then it recommends those quotes to the user in the notification section or in the motivational quotes section in our application.

In **Daily Routine** section, our system recommends exercises and sleep time by using deep learning algorithm that works on the daily activity of the user on the application. This algorithm analyses the routine of the user for 14 straight days and after that it uses the neural networks to recommend and predict the sleeping and exercising patterns of the user.

7. Software requirements traceability matrix

Table1: Software requirements traceability matrix

Reg. Number	Use case title	Design Component	Component item
1.1	Sign Up	Class Diagram	signUp()
1.2	Sign In	Class Diagram	signIn()
1.3	Forgot Password	Class Diagram	forgotPassword()
1.4	Remember Me	Class Diagram	rememberMe()
1.5	Edit Info	Class Diagram	editProfile()
1.6	Delete Profile	Class Diagram	deleteData()
1.7	Anonymous Access	Class Diagram	
2.1	Making Appointment	Class Diagram	bookAppointment()
2.2	Canceling Appointment	Class Diagram	cancelAppointment()
2.3	Modifying Appointment	Class Diagram	editAppointment()
2.4	Choosing Doctor	Class Diagram	bookAppointment()
2.5	Voice Calling with Doctor	Class Diagram	voiceCalling()
2.6	Video Calling with Doctor	Class Diagram	videoCalling()
2.7	Chatting with Doctor	Class Diagram	textChat()
3.1	Chatting	Class Diagram	textChat()
3.2	Group Invitation	Class Diagram	groupInvitation()
3.3	Add Friend	Class Diagram	addFriend()
3.4	Remove Friend	Class Diagram	removeFriend()
3.5	Block Individual	Class Diagram	blockIndividual()
3.6	Post	Class Diagram	postContent()
3.7	Like	Class Diagram	Like()
4.1	Send SOS	Class Diagram	sendSOS()
4.2	Add Emergency Contacts	Class Diagram	addContact()
4.3	Remove Emergency Contacts	Class Diagram	removeContact()
4.4	Edit Emergency Contacts	Class Diagram	editContact()
5.1	Set Daily Routine	Class Diagram	setRoutine()
5.2	Modify Routine	Class Diagram	editRoutine()
5.3	Set Remainder	Class Diagram	setRemainder()
5.4	Set Off Days	Class Diagram	setOffDays()
5.5	Predict Routine	Class Diagram	predictRoutine()
6.1	Listen Song	Class Diagram	play()
6.2	Search Song	Class Diagram	search()
6.3	Skip / Revert Song	Class Diagram	skip()
6.4	Favorite Song	Class Diagram	favorite()
6.5	Download Song	Class Diagram	download()
6.6	Play / Pause	Class Diagram	play()
6.7	Repeat	Class Diagram	revert()
6.8	Sleep Timer	Class Diagram	setSleepTimer()
6.9	Recommend Music	Class Diagram	recommendMusic()
7.1	Breathing	Class Diagram	performExercise()

7.2	Meditation	Class Diagram	performExercise()
7.3	Sleep	Class Diagram	performExercise()
7.4	Relaxation	Class Diagram	performExercise()
7.5	View Manual	Class Diagram	viewManual()
7.6	View Video Tutorial	Class Diagram	viewVideoTutorial()
8.1	Like Quote	Class Diagram	Like()
8.2	Favorite Quote	Class Diagram	favorite()
8.3	Download as Wallpaper	Class Diagram	download()
8.4	Select Quote Types	Class Diagram	selectType()
8.5	Select Authors	Class Diagram	selectAuthor()
8.6	Select Language	Class Diagram	selectLanguage()
8.7	Recommend Quotes	Class Diagram	recommendQuotes()

8. Human Interface Design

Describe the functionality of the system from the user's perspective. Explain how the user will be able to use your system to complete all the expected features and the feedback information that will be displayed for the user.

8.1 Screen images

The screenshot shows a web browser window with the 'Tranquility' logo in the top left. The main heading is 'Set Appointment'. Below this, there are three input fields: 'Select Date' with a dropdown arrow, 'Select Time' with a dropdown arrow, and 'State Reason' as a text input. At the bottom, there are two buttons: 'Go Back' and 'Confirm'.

Figure 19: Interface-1-Set Appointment of Tranquility (Web)

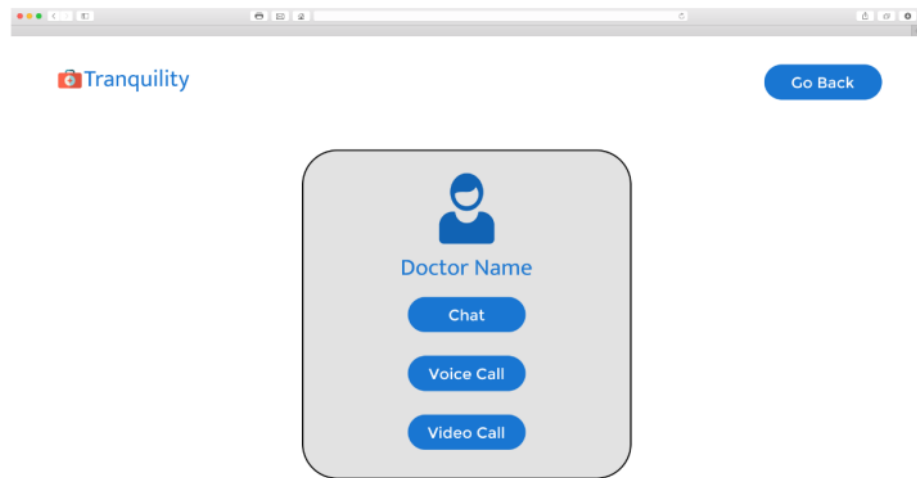


Figure 20: Interface-2-Call Doctor of Tranquility (Web)



Figure 21: Interface-3-Emergency Protocol of Tranquility (Web)

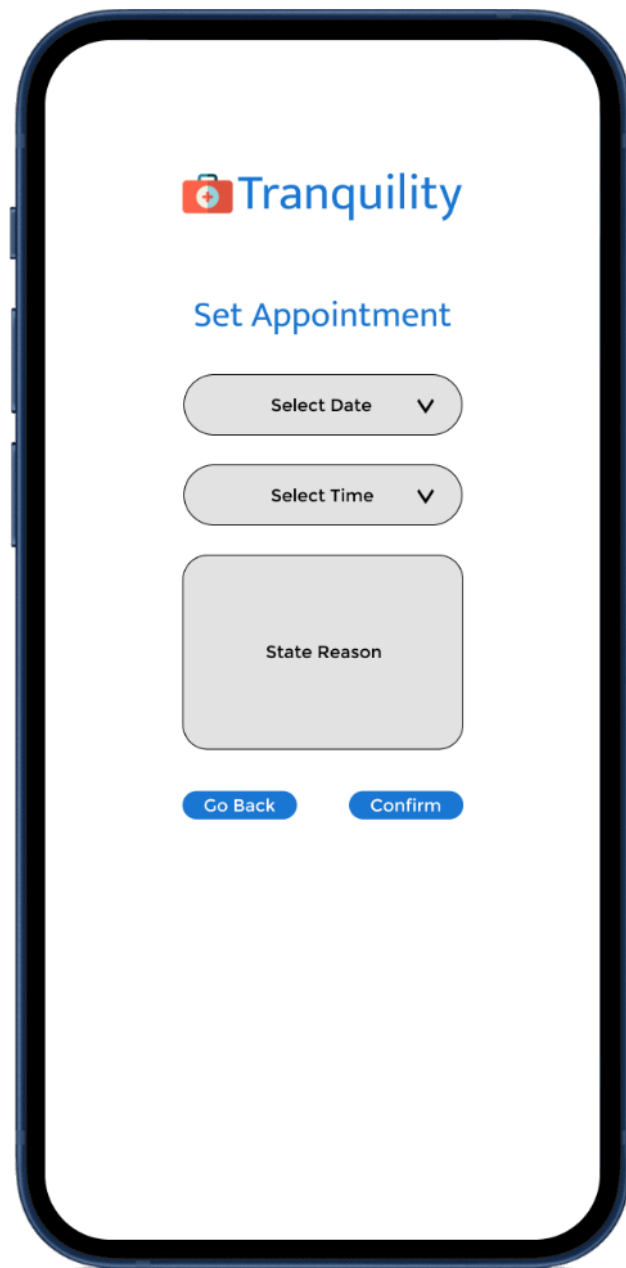


Figure 22: Interface-4-Set Appointment of Tranquility (Smartphone)

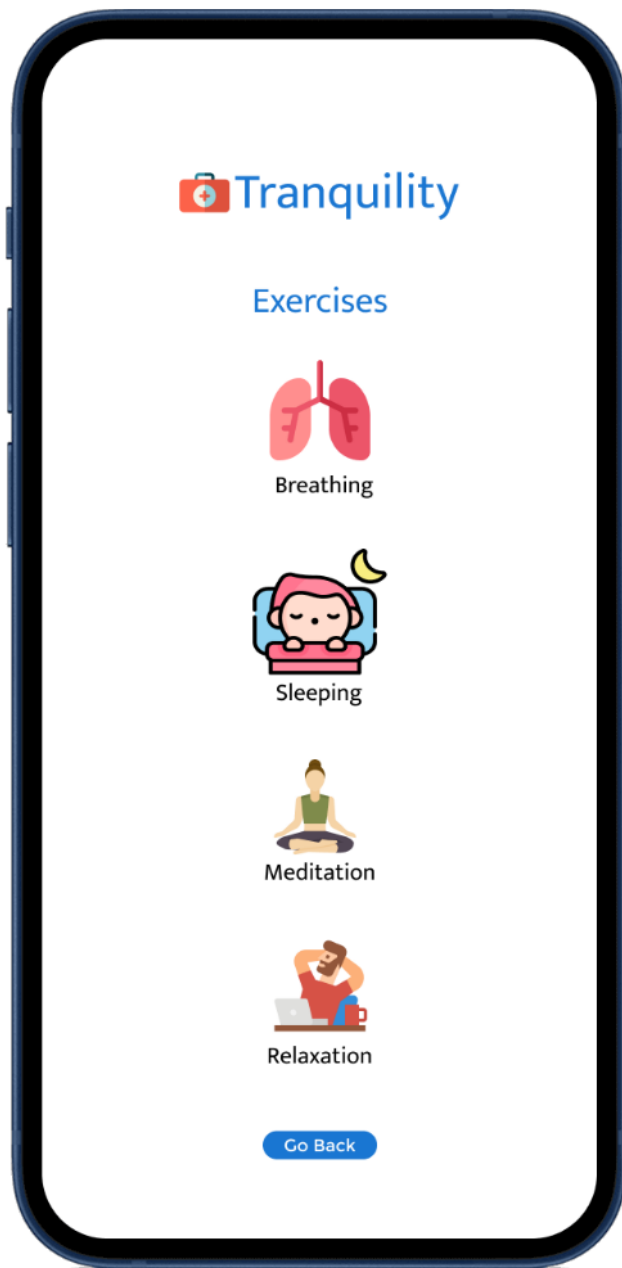


Figure 23: Interface-5-Exercises of Tranquility (Smartphone)

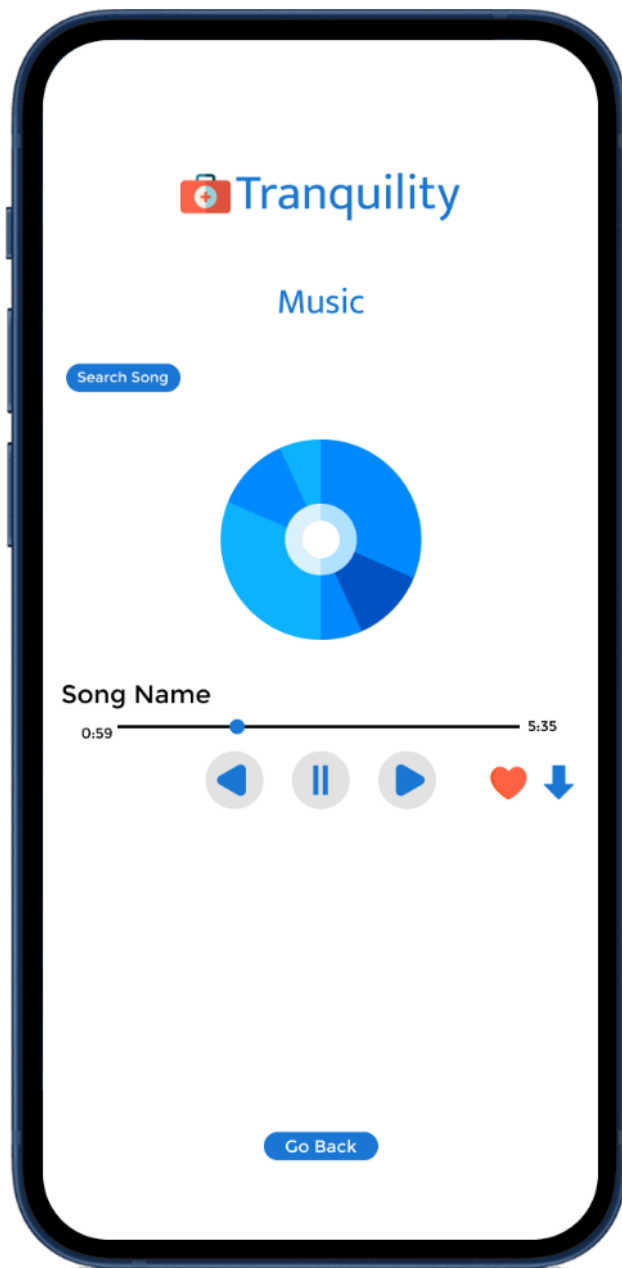


Figure 24: Interface-6-Music of Tranquility (Smartphone)

8.2 Screen objects and actions

Screen	Object	Name	Action
Sign-in	Text field	Email	User will enter their email.
Sign-in	Text field	Password	User will enter their password
Sign-in	Button	Forgotten password	Redirect user to reset password window
Sign-in	Button	Sign Up	Redirect user to sign up window
Sign-in	Button	Sign-in	Verify credentials and sign user in
Sign-in	Button	Anonymous Access	Access user to app without login
Sign Up	Text field	Email	User will enter their email.
Sign Up	Text field	Password	User will enter their password
Sign Up	Text field	Name	User will enter their name
Sign Up	Combo Box	Gender	User will select their gender
Sign Up	Text field	Age	User will enter their age
Sign Up	Button	Sign-up	Checks data and updates database.
Sign Up	Button	Sign In	Redirect user to sign-in window
Main Menu	Button	Online Doctor	Redirects user to online doctor window
Main Menu	Button	Online Community	Redirects user to online community window
Main Menu	Button	Emergency Protocol	Redirects user to emergency protocol window
Main Menu	Button	Music	Redirects user to music window
Main Menu	Button	Routine Manager	Redirects user to routine manager window
Main Menu	Button	Exercises	Redirects user to exercises window
Main Menu	Button	Motivational Quotes	Redirects user to motivational quotes window
Main Menu	Button	Profile Management	Redirects user to profile management window
Main Menu	Button	Logout	Logs user out and redirects user to login window
Set Appointment	Date Box	Select Date	User will select the user to select a date for appointment
Set Appointment	Time Box	Select Time	User will the user to select a time for appointment
Set Appointment	Text field	State Reason	User will state the reason for appointment
Set Appointment	Button	Confirm	User will confirm details of appointment and DB stores data
Set Appointment	Button	Go Back	Redirect user to main menu window
Doctor Profile	Button	Chat	User can chat with the doctor
Doctor Profile	Button	Voice Call	User can voice call the doctor
Doctor Profile	Button	Video Call	User can video call the doctor
Doctor Profile	Button	Go Back	Redirect user to main menu window

Exercise	Button	Breathing	User can conduct breathing exercises
Exercise	Button	Relaxation	User can conduct relaxation exercises
Exercise	Button	Meditation	User can conduct meditation exercises
Exercise	Button	Sleeping	User can conduct sleeping exercises
Emergency Protocol	Button	Send SOS Message	User can send SOS message
Emergency Protocol	Button	Edit Emergency Contacts	User can edit emergency contacts
Emergency Protocol	Button	Go Back	Redirect user to main menu window
Music	Button	Play / Pause	Allows the user to play/pause the music
Music	Button	Skip	Allows the user to skip the music
Music	Button	Revert	Allows the user to revert the music
Music	Button	Search Song	Allows the user to search the music
Music	Button	Favorite	Allows the user to favorite the current music
Music	Button	Download	Allows the user to download the current music
Music	Button	Go Back	Redirect user to main menu window
Music	Streaming line		Shows the music progress against time bar

9. Conclusion

This document includes all the design work of every aspect of the project. The implementation will be done based on the design described in the document. The OOP programming will be done according to the class diagram provided and the sequence of use cases will be implemented using process flow diagrams. The interaction between the app and the servers will be implemented using sequence diagrams. Thus, the document provides the complete design and structure of the project to be implemented.

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