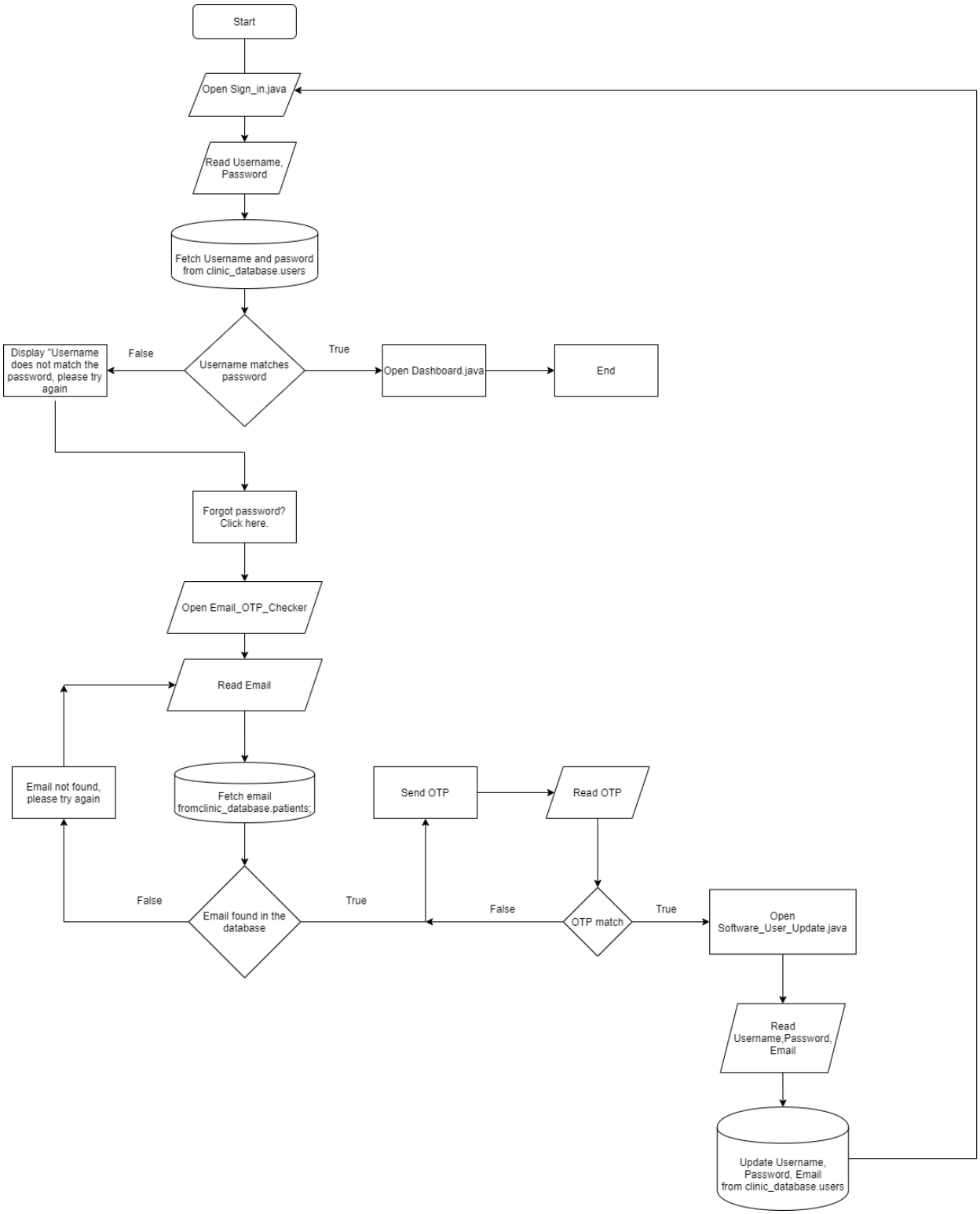
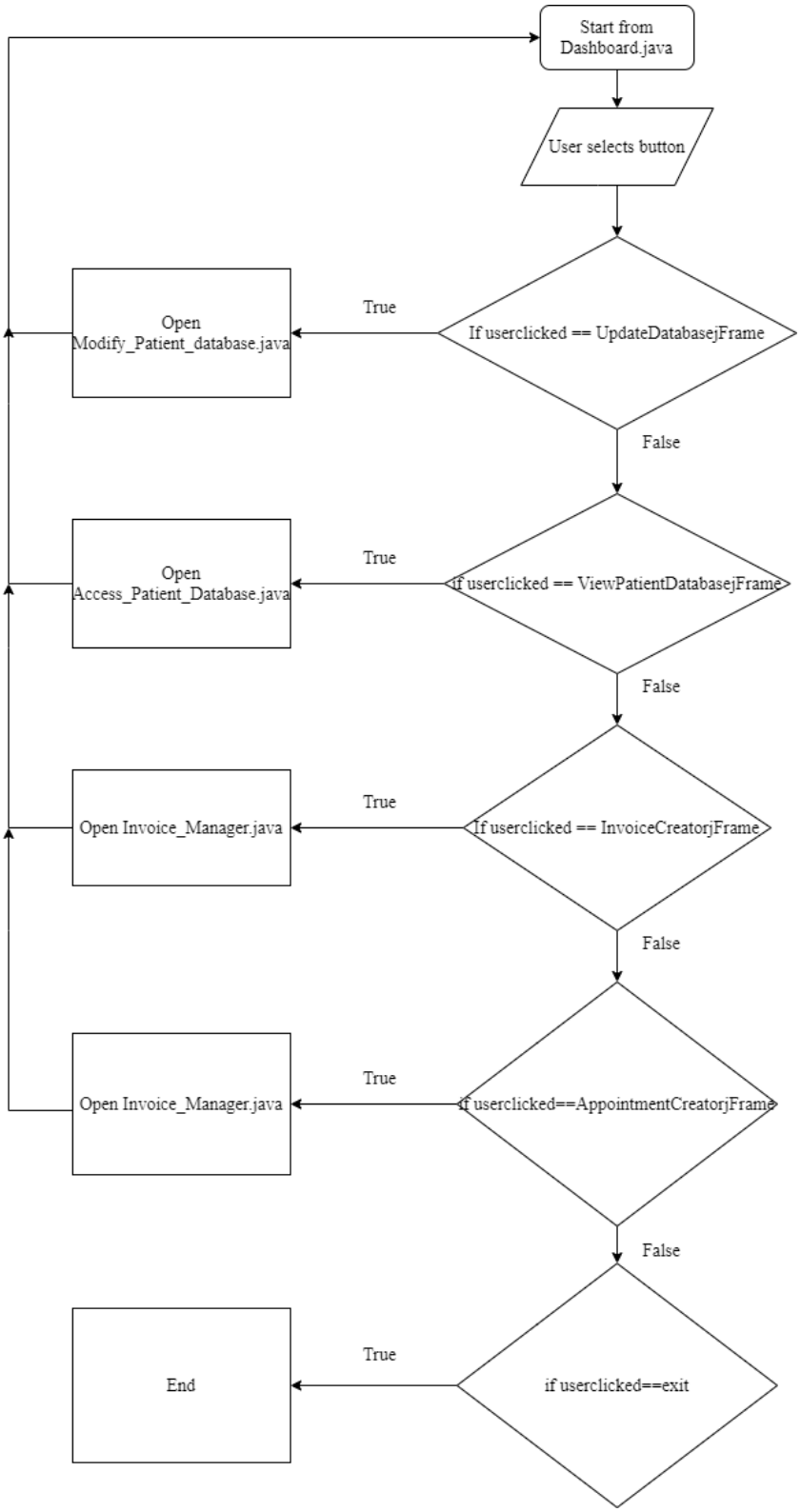
Flowcharts

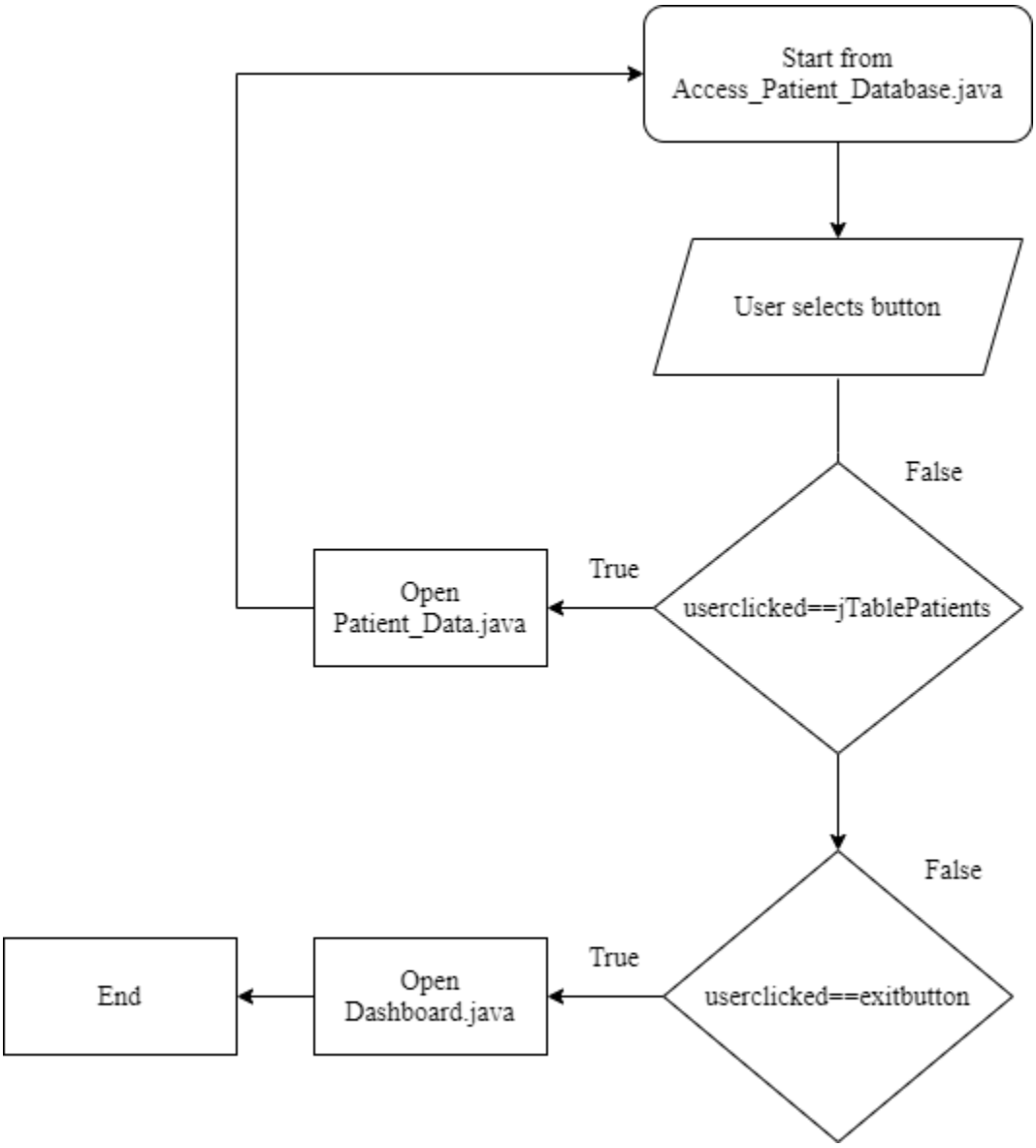
(Figure 1.) Starting the programme



(Figure 2.) Dashboard navigation



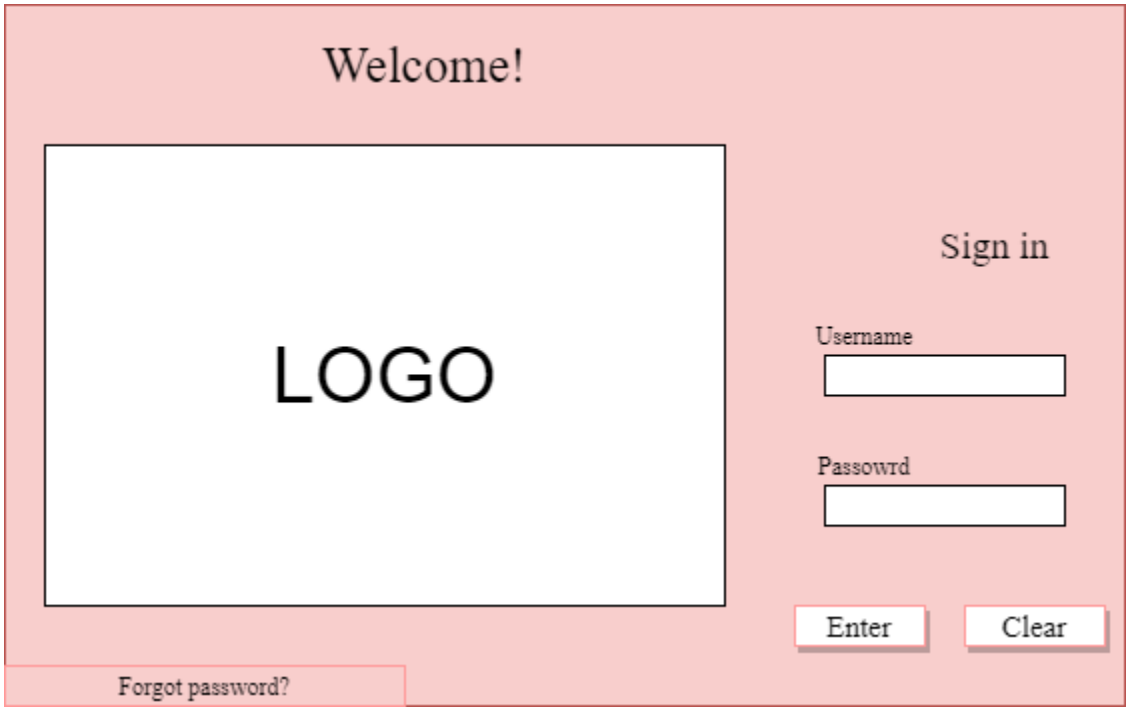
(Figure 3.) Individual patient view



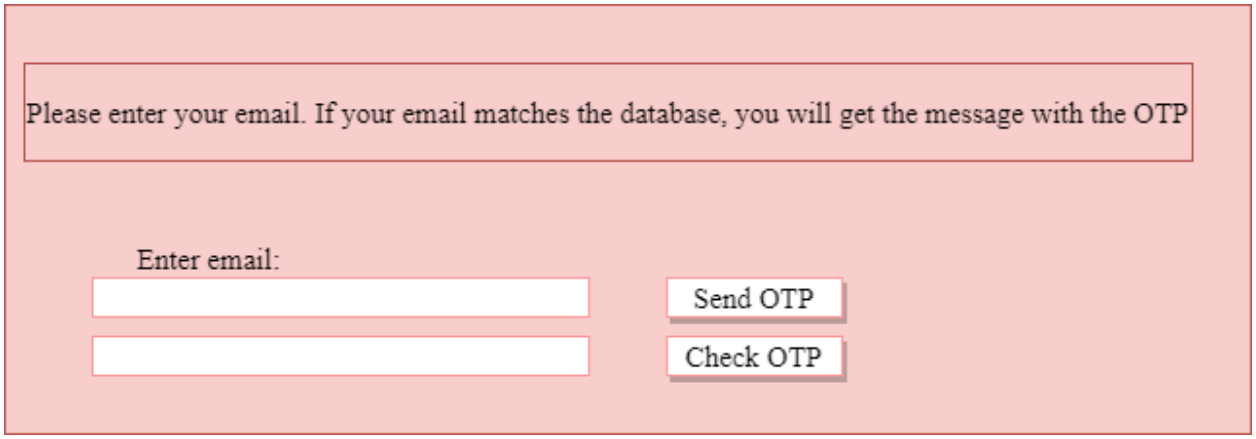
User Interface Design

The following is the program's user interface. The color palette and the logo on the login page were both reviewed and accepted by the client and are a close match of the actual design. Every input field is a jTextField (blank white rectangles), which were incorporated with jButton (white shadowed rectangles) in order to manipulate data from jTextField. In addition, jTable was used to represent data from the MySQL database. In order to avoid clashes and inconsistencies of values which have a small range (Doctor, Sex, etc.), jComboBox and jCheckbox were used.

(**Figure 4.**) Login screen

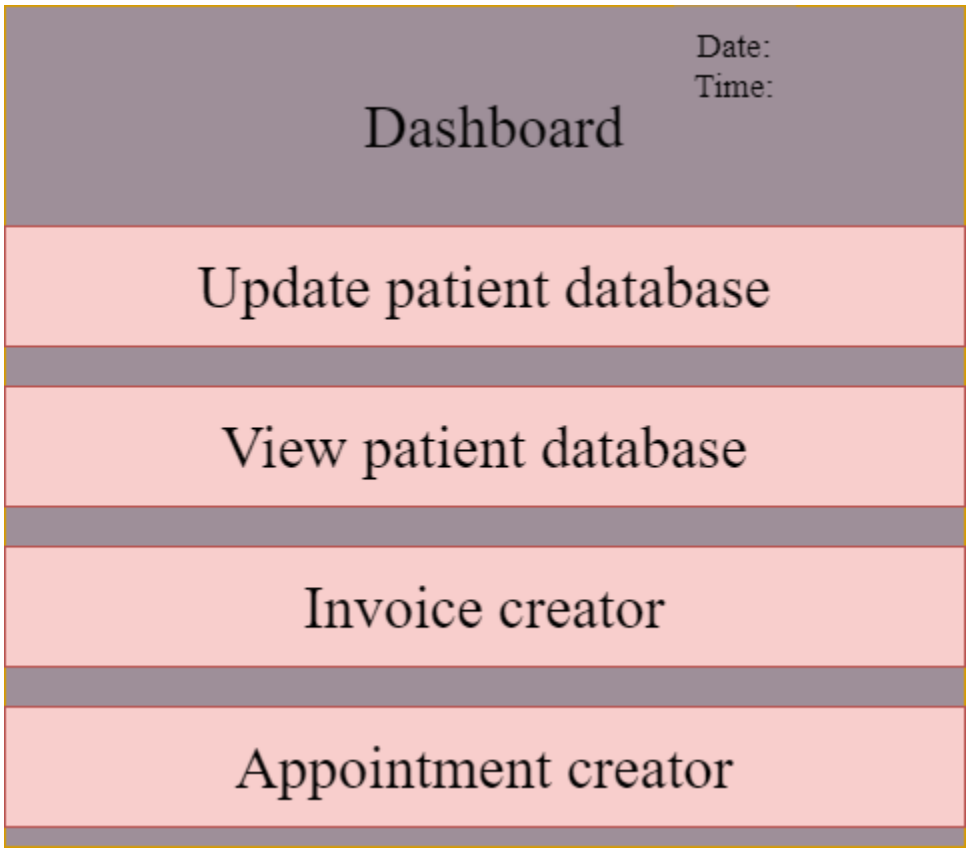


(Figure 5.) OTP request panel

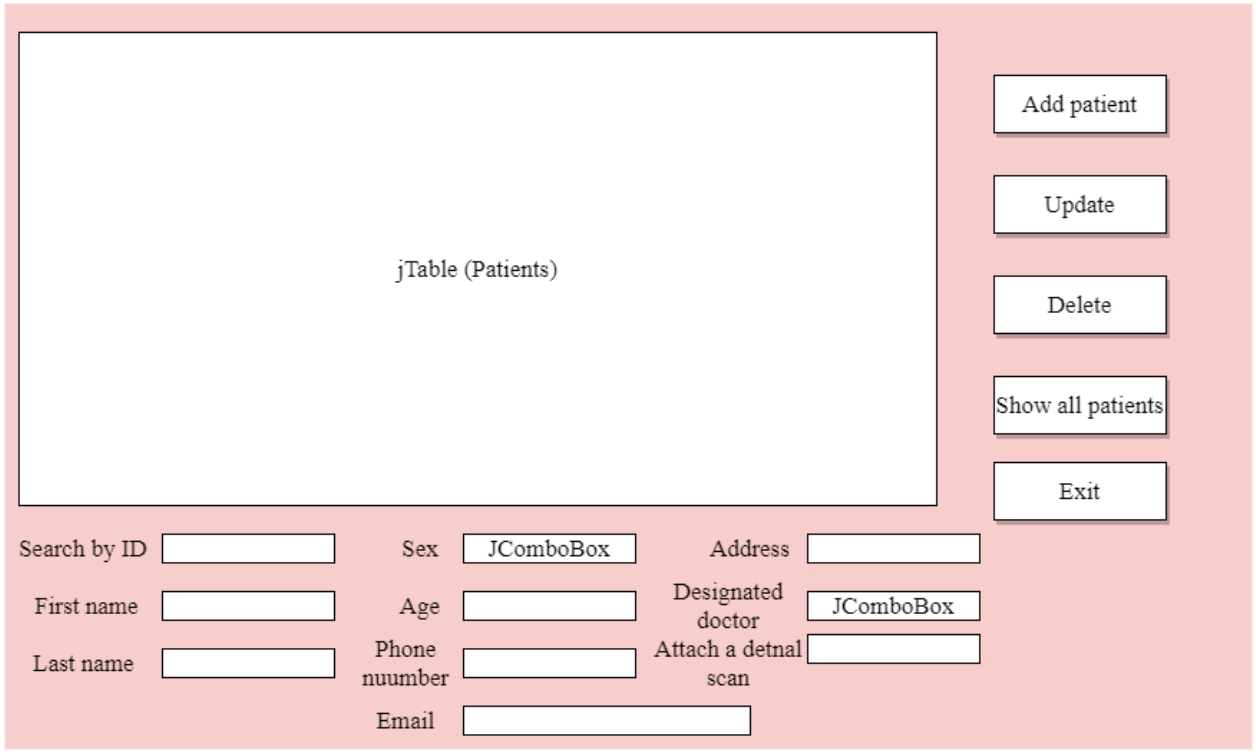


(Figure 6.) Admin data update page

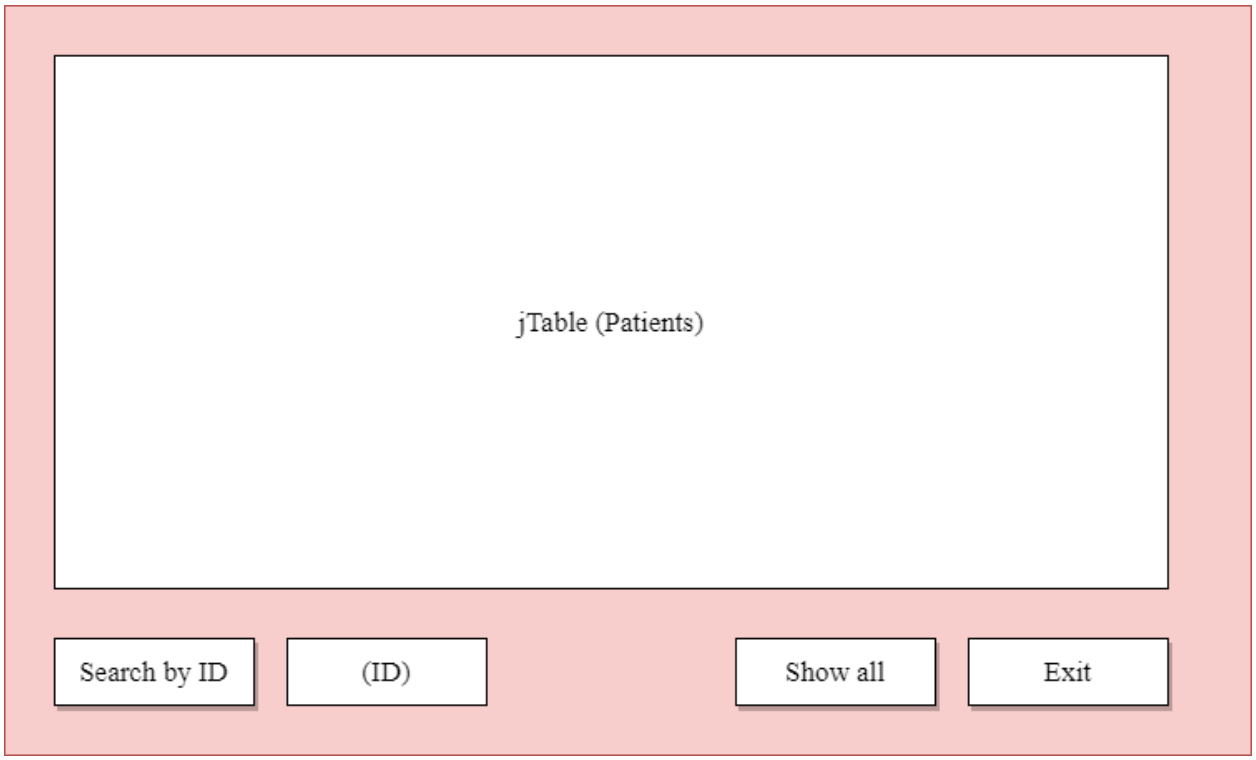
(Figure 7.) Non-edit access to the database



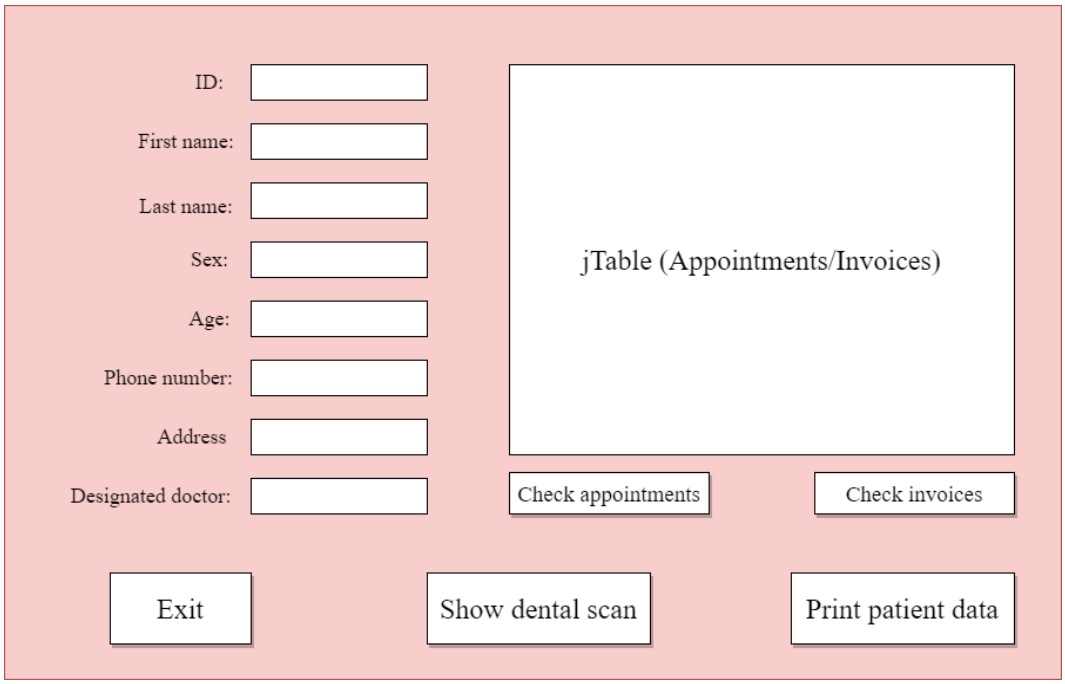
(Figure 8.) Individual user data



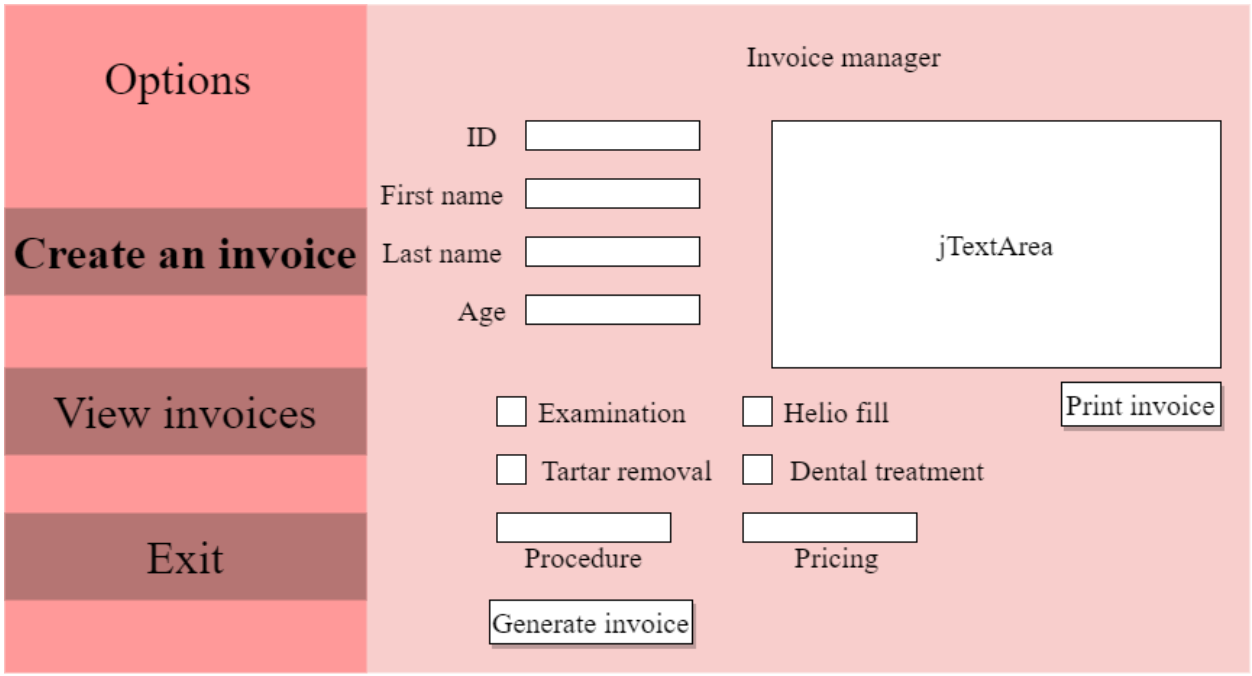
(Figure 9.) Invoice manager (Create invoice panel)



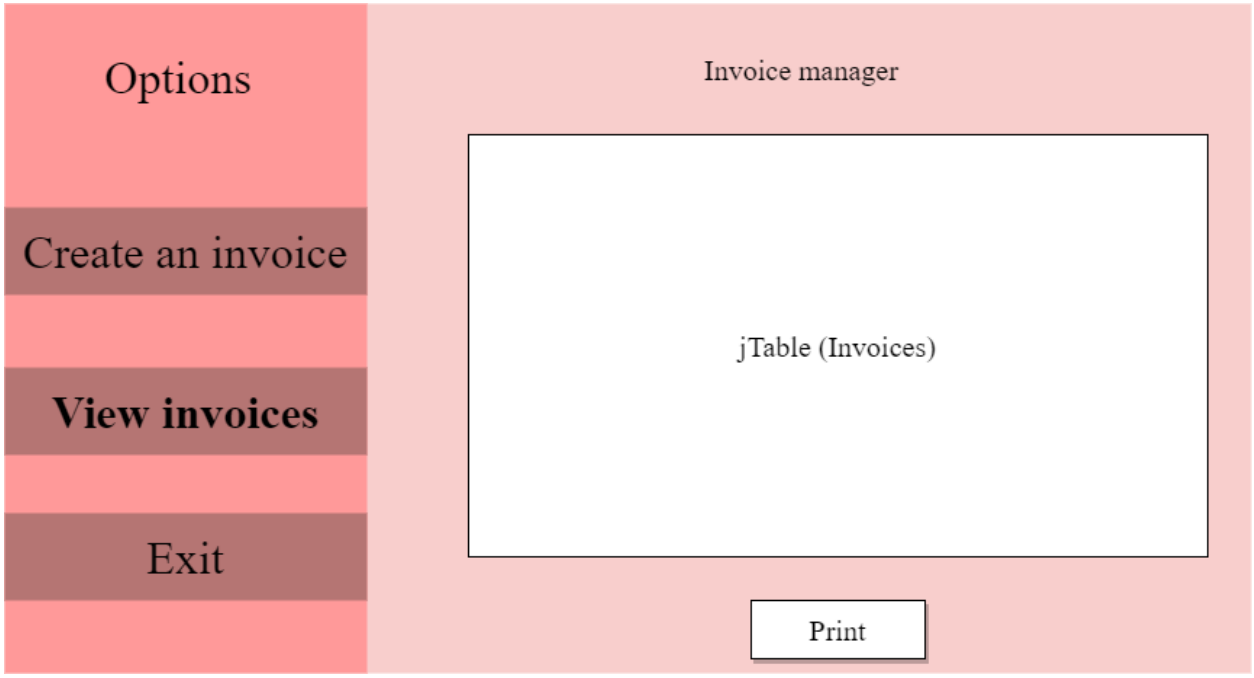
(Figure 10.) Invoice manager (View invoices panel)



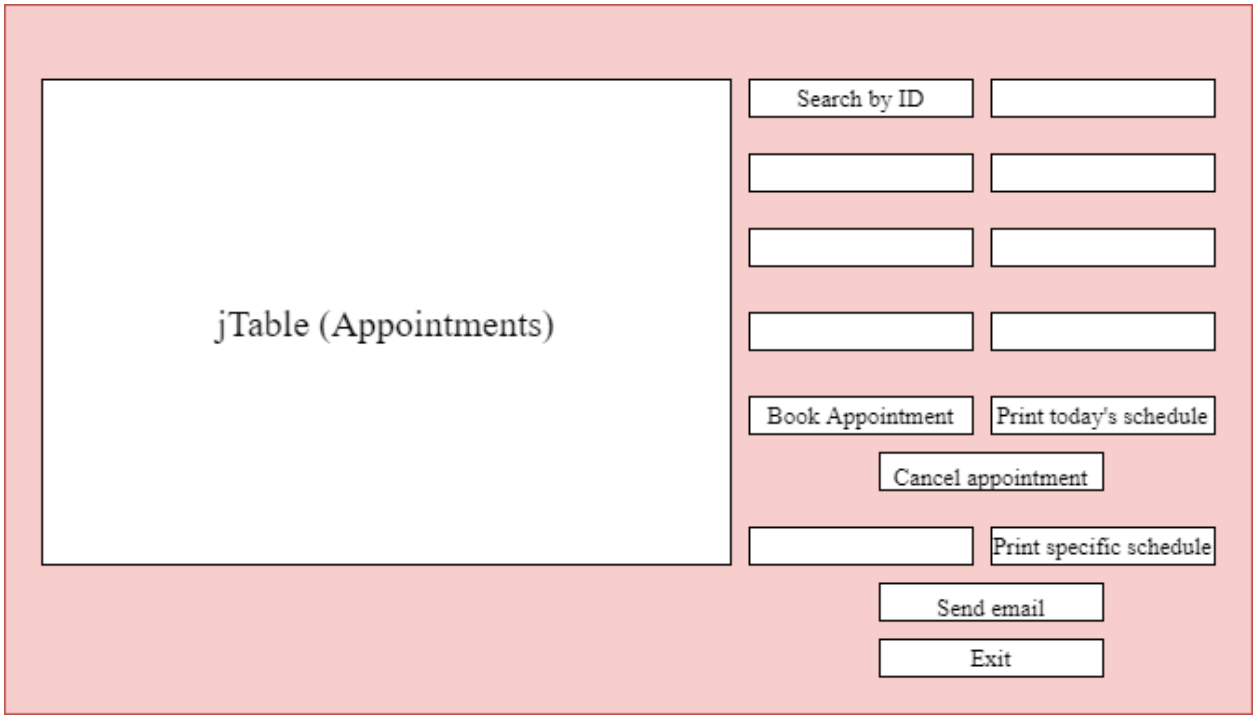
(Figure 11.) Appointment maker



(Figure 12.) Invoice Manager



(Figure 13.) Appointment creator



Database tables

(Figure 12.) User table

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G
Username	VARCHAR(45)	☐	☑	☐	☐	☐	☐	☐	☐
Password	VARCHAR(45)	☐	☑	☐	☐	☐	☐	☐	☐
Email	VARCHAR(45)	☑	☑	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐

(Figure 13.) Patient table

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
ID	INT	☑	☑	☐	☐	☐	☐	☐	☐	
First name	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Last name	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Gender	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Age	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Phone number	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Address	VARCHAR(200)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Dentist	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Dental scan	VARCHAR(200)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
Email	VARCHAR(150)	☐	☐	☐	☐	☐	☐	☐	☐	NULL
		☐	☐	☐	☐	☐	☐	☐	☐	

(Figure 15.) Invoice table

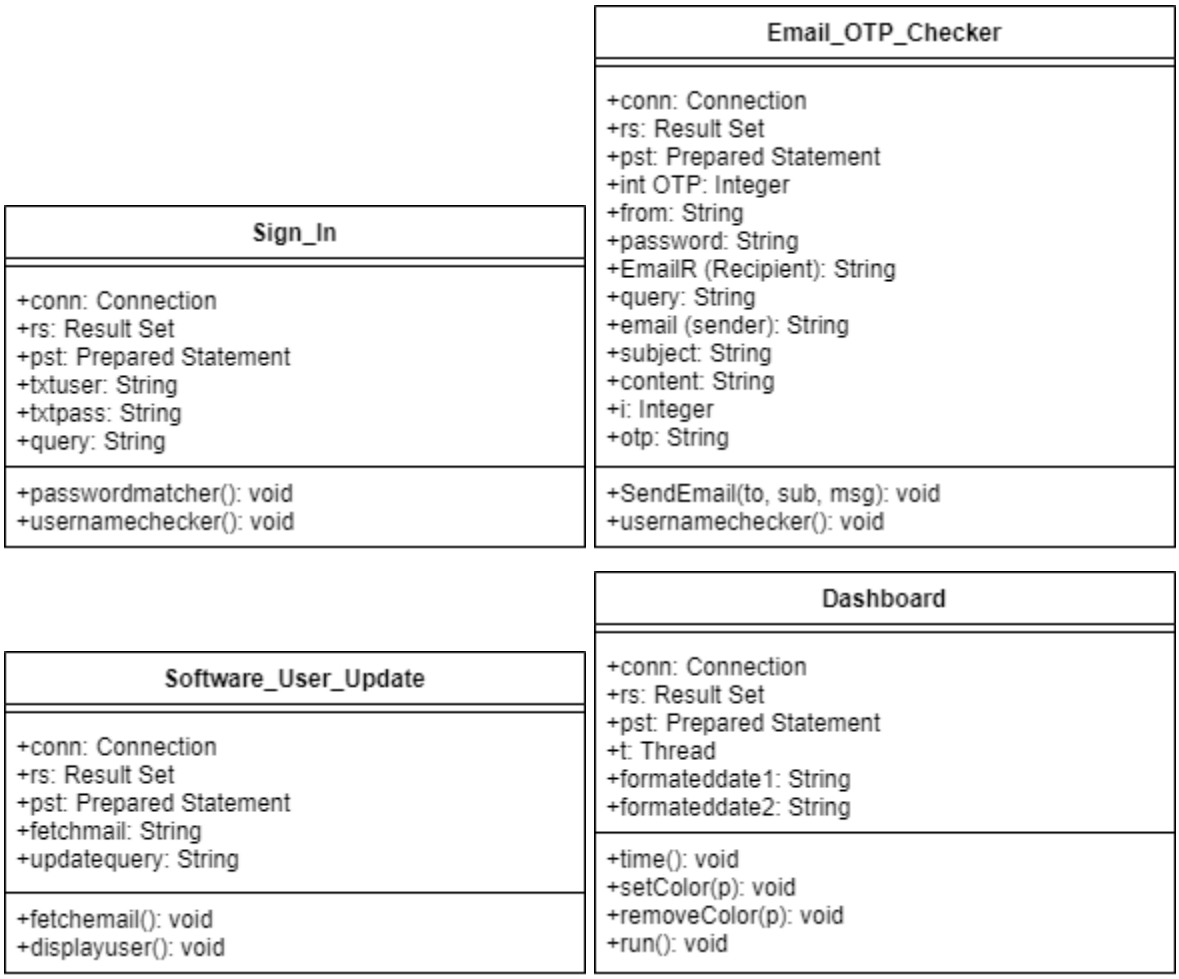
Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G
InvoiceID	INT	☑	☑	☐	☐	☐	☐	☐	☐
First Name	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Last Name	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
PatientID	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Price	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Date	DATE	☐	☐	☐	☐	☐	☐	☐	☐
Procedure	MEDIUMTEXT	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐

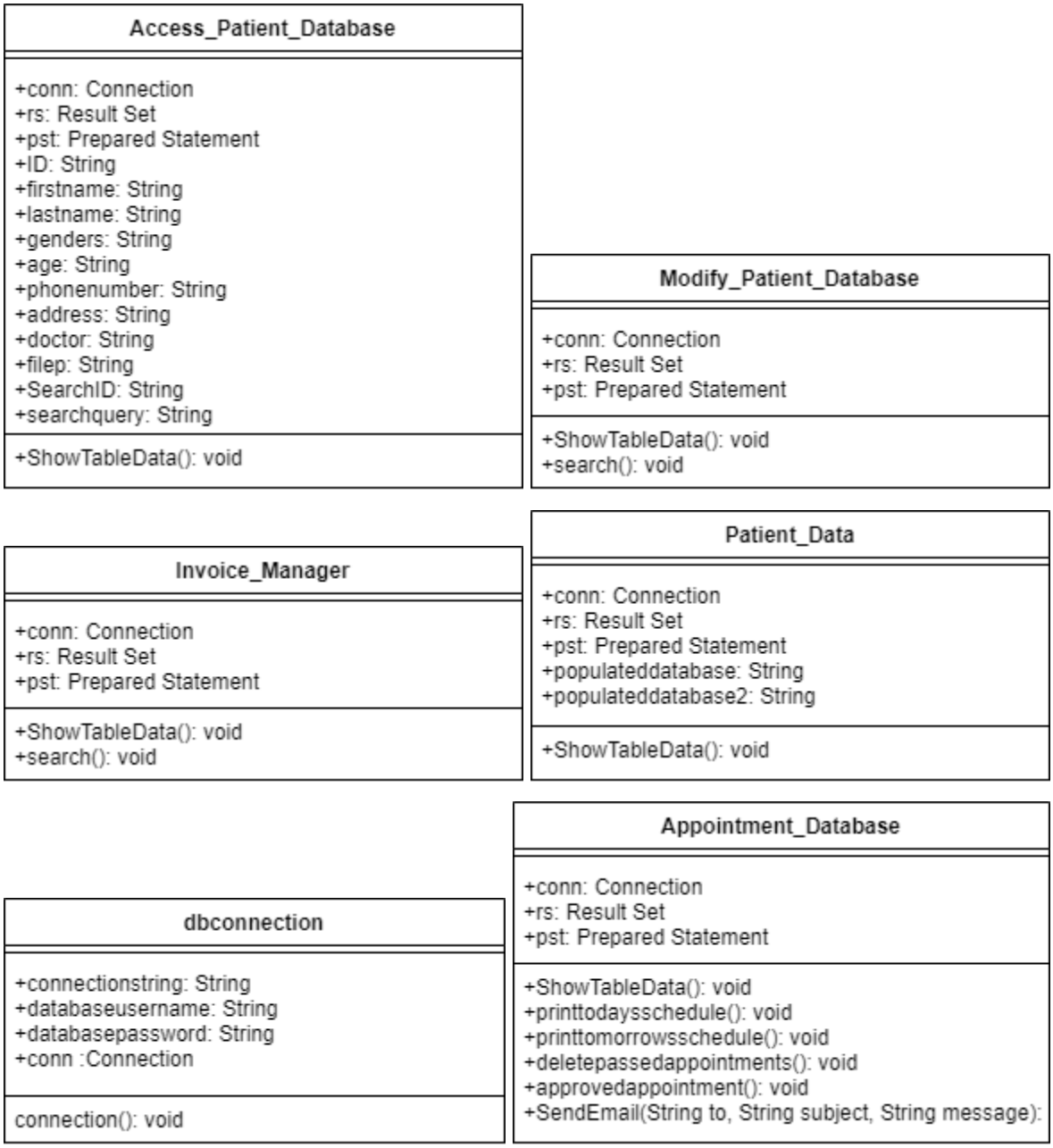
(Figure 16.) Appointment table

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G
First name	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Last name	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Patient ID	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Doctor	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Chair	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Time slot	VARCHAR(45)	☐	☐	☐	☐	☐	☐	☐	☐
Date	DATE	☐	☐	☐	☐	☐	☐	☐	☐
ID	VARCHAR(45)	☑	☑	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐

All of the column data types have been shown.

UML Diagrams





Word count: 92

Testing plan

Testing type	Test	Example
GUI Test	All of the GUI components run and display successfully	Class Modify_Database runs and displays all of the GUI components
GUI Navigation	The user can easily navigate between jFrames.	Class Dashboard is easily navigable and all of the classes are accessible on both ends (to and from)
Confirming that the authentication is accurate	The software starts with the login page. Once the user enters the login credentials, the programme should check whether the information matches. Appropriate responses should also be given	
Ensuring that the OTP system is working	In case the user wants to alter login credentials, the database checks whether the inserted email matches the database. If a match occurs, it should send an 6-digit random code to the user's email.	The class Email_OTP_Checker successfully communicates with the email server, allowing for an OTP security system
Database connection	Testing the communication of the program with the MySQL Database	Class dbconnection returns connection to respective Classes, enabling access to the database
SQL data insertion	All of the values from jTextfield, jComboBox	Class Modify_Database successfully inserts and

	and jCheckbox should be entered and stored in the MySQL Database	data
SQL data deletion	User is able to remove data from the MySQL Database directly from the program	Appointment class gives the option to the user to cancel any appointments.
SQL data modification	The user is able to edit specific rows and data entries in case of an error or update.	Modify patient database displays selected row in appropriate jTextfields which the user can then update or modify
Individual user profiles	The user is able to access individual user profiles	Patient data class displays individual user information along with upcoming appointments and past invoices.
Invoice creator	Invoices are capable of being created from a template with predetermined prices.	Invoice manager class successfully creates invoices from a template, which could then be printed.
Invoice storage/access	The invoices should be stored in the database and should be accessible.	Invoice manager stores invoices along with the option of accessing and printing them.
Appointment clashes	User is able to successfully create an appointment and is able to prevent any clashes	The Appointments Class ensures that no two identical appointments can be made, prompting the user to change the appointment parameters if the programme finds anything clashing

Appointment chronology	Appointment schedule should be displayed in chronological order	Data in jTable from Appointment class is represented chronologically, both in dates and time
Printing data from MySQL database	Data extracted from MySQL is able to be printed	ViewOnly Class gives the user the ability to print Patient Data
Printing tables from MySQL database	jTables already populated from MySQL are printable	Receipt class gives the ability to print the receipt table.
Creating PDFs of both the data and the tables from MySQL	Data and jTables extracted from MySQL are able to be transformed into PDFs	Appointment class gives the ability to create a PDF of the schedule of an appointment in any given future date.
Sending reminder emails to patients regarding appointments	The ser is able to extract emails from database and send data to those emails directly from the app	The user can send reminder emails about schedule appointments