

Team #12

Juls Hizarsa

Mark Ashinhust

Samuel Arenson

Sara Kane

Tanishq Mor

## **Functional Requirements**

### **1. Flow of a visit:**

#### 1.1: Vitals

The nurse will take in the patient and take vitals. In the vitals the nurse will take the patient's Weight, Height, Body Temperature, Age, and Date and Time of visit. If the patient is over the age of 12 the nurse will also take the blood pressure.

#### 1.2: Reason of Visit

The nurse will ask the patient for the reason for visit. The nurse will input the reason for the visit into a note. The nurse then adds that to the database for the doctor to see. The nurse can now look at the patient's history like known health issues, immunization history, and prescribed medications.

#### 1.3: Physical Examination

The doctor comes into the room. The doctor can see notes created by the nurse. The doctor then examines the patient and creates a note that describes what the problem was and how it is solved. Doctors can click on a button to send the pharmacy the prescribed medication. There will be note space assigned for the medication.

### **2. Patient Portal:**

#### 2.1 Creating Account:

To create a new patient the user will need to click on a button saying to create an account. After clicking the button, the page would ask the user for their First Name, Last Name, Birthday Combination, and Phone number.

#### 2.2 Authentication:

The patient can login using their info by clicking the login button and enter their information to login. They will need their First Name; Last Name and their password would just be their birthday combination. If the information is correct, then the patient is redirected to the post-Authentication page. If the information does not match the patient can try again or create an account.

#### 2.3 Post-Authentication:

Once the patients are authenticated, they can now see a page with tabs. There will be three tabs: Account, Visit History, Help.

### *2.3.1 Account:*

In the Account tab the patient can see their name, medical history, immunization record and contact information which is the patient's phone number. The phone number can be changed.

### *2.3.2 Visit History:*

In the Visit tab the patient can see their previous visits. The tab should list all the previous visits in a sorted order so that the most recent first visit comes first. They can click the list to get more information about the visit. When they click the visit, the patient will see the notes from the nurse and doctor about the visit.

### *2.3.3 Help:*

In the Help tab the patient can contact their doctor. The patient can ask the doctor any question they had about the visit or in general questions. After the message is sent the doctor or the nurse can reply to the question asked by the user.

## **3. Doctor & Nurse Portal:**

### **3.1 Creating Account:**

To create an account for a doctor or nurse they will need to enter a special number that will be assigned to them when they are hired.

### **3.2 Authentication:**

To login into a doctor or a nurse portal they will need their login which is an assigned sequence of digits. There will be two types of numbers, one for doctors and another for nurses.

### **3.3 Post-Authentication:**

The doctor or the Nurse can see a page where they can see their respective patients.

#### *3.3.1 Doctor:*

After the doctor authentication the doctor can access the information for the patients and the messages that might have been sent from patients. They can also reply to the questions asked by the patient.

#### *3.3.2 Nurse:*

Nurses would be able to see the doctors' patients, patient's history and will be able to reply to the patient. One Nurse can be associated with multiple doctors.

## **Non-Functional requirements**

### **1. Product Requirements**

#### **1.1 Usability and Accessibility:**

Patient Portal is a GUI-based desktop application using JavaFX. It is implemented to be user-friendly and accessible software used by patients and medical professionals alike to document

patient visits and records. During a visit, a nurse will create a “new appointment” with options to create notes and changes for a patient file. New information will be updated to the database immediately upon saving the input by medical personnel. The most recent appointments will be tracked within the software. Should the patient require updates to their account information, they have the liberties to do so within Patient Portal.

## 1.2 Security:

Patient data in Patient Portal is tracked using an account created by a patient, parent, or guardian associated with the patient’s file. User accounts are secured by a security system based on the patient’s full name, date of birth, and contact information.

## 1.3 Data Integrity:

Medical professionals using Patient Portal will have varying permissions depending on their position. As such, nurses may not access or edit any notes to be made or saved by the doctor at any time and are prevented from doing so by requiring the doctor to authenticate themselves prior to accessing “the doctor’s notes.” Never at any time may a patient make notes or changes to their associated patient record without the attendance and input of a medial professional.

## 1.4 Visual Design:

Patient Portal will integrate a sleek, modern design to appeal towards a minimalist work environment for patients and medical professionals. The implemented text boxes for notes should have adequate size to fit the average amount of case notes provided by a medical professional. Additionally, visual elements to advance functional features will be of modest size to promote the minimalist style.

# 2. Organizational and External Requirements

## 2.1 Security Cont.:

Users of the Patient Portal system are verified by their full name, birth date, and phone number/contact information. With respect to HIPPA, only assigned medical personnel will have access to a patient’s file. Access to records is audited per session with the doctors having full access to all notes but limiting the nurse’s access to being “view only” for the doctor’s notes. Although notes are available, medical staff must always authenticate themselves prior to any edit of the patient record whatsoever.

## 2.2 Availability:

Should a patient need to contact their assigned doctor prior to or after a visit, the doctor must address questions and concerns proposed by the patient within 8 hours of an inquiry's receipt.

## GUI Walkthrough

### 1. General Log-In Selection Screen

#### 1.1 Overview of Log-In Selection

The Figures 1.1, 1.2 and 1.3 depict the layered design and structure of the Patient Portal selection screen. The functionality of this page allows the user to select their corresponding identity to log-in. Furthermore, the user has two options to quit the program or to request assistance (1.2). The general structure of this page consists of a main border pane which encapsulates three main interfaces. These include an anchor pane which is used as a container for other objects as well as a menu bar at the top to hold two items that allow for actions mentioned previously. Included in the first anchor pane is an image view interface which holds an image of a doctor's office to provide a visual indicator of the program use. The second anchor pane houses multiple buttons that are all accessible via the "mouse\_clicked" action in JavaFX. The three buttons, shown in Figure 1.1, allows the user to access their respective login page and continue with the program.

#### 1.2 Requesting Assistance

An additional feature on the log-in selection screen appears in the menu bar at the top. Under the tab "Help" appears a MenuItem "About" which redirects the user to the ReadMe information file of the program. This functionality is to assist the user with using the program and make it easier to understand.

#### 1.3 Login Selection Images

The following image is the first glimpse into the application and provides a visual of the login selection for the doctors, nurses, and patients.

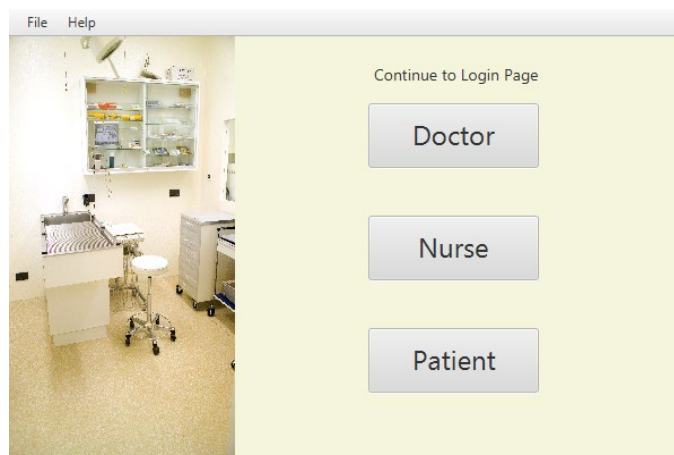


Figure 1.1: Log-In Selection Screen

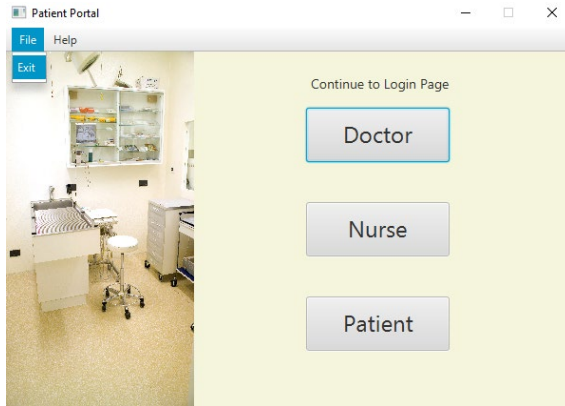


Figure 1.2: Exit MenuItem

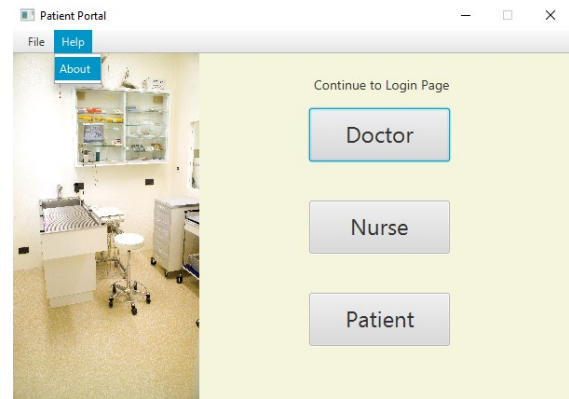


Figure 1.3 About MenuItem

The images above depict the versatility of the menu item. By accessing these menu's, any user can choose to exit the program or receive information on how to use the program. Figure 1.4 depicts what would appear had the user selected "About" from the menu.

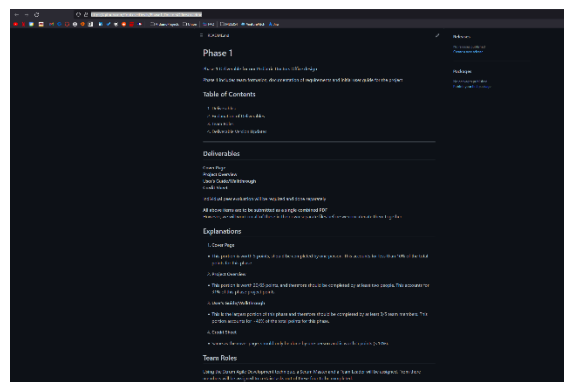


Figure 1.4: ReadMe Redirection of the About MenuItem

## 2. Doctor Log-In Authentication

### 2.1 Overview of Doctor Log-In Page

The doctor log-in page is comprised of a similar structure to the general log-in page with a carry over of the menu functionality to exit/logout of the program and request assistance. The structure of this page houses the same BorderLayout and AnchorPane layout to hold the Buttons, Labels and Text/Password fields. The password field provides security and encryption depicted in Figure 2.3 giving the doctor confidentiality with the care that they provide. The structure of this layout continues in Figure 2.1.

## 2.2 Doctor Log-In Images

Panes	Level	Quantity	Location
BorderPane	1	1	
MenuBar	2	1	Top of screen with File and Help functions
Anchor Pane	2	2	Left and Right BorderPane
ImageView	3	1	Image on right anchor
Label	3	3	Username, Password and blank output for missing information
TextField	3	1	Username
PasswordField	3	1	Encrypted Password info
Button	3	1	To Submit login information

Figure 2.1: General Structure and Layout of the Doctor Log-In Page Elements

Note: Level refers to its's location within the screen depth. Something housed on level 3 is encapsulated by level 2 and 1.

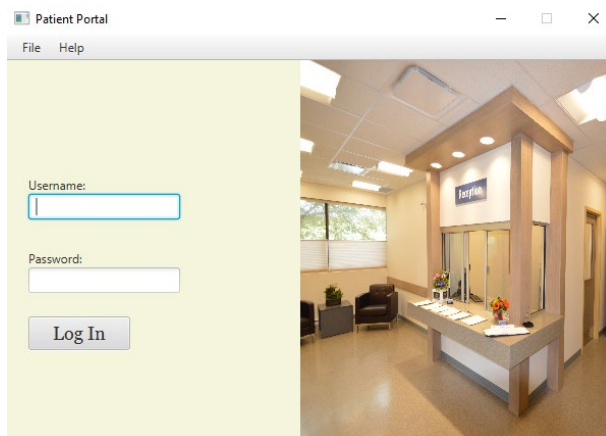


Figure 2.2: General Log-In Page w/ No Input

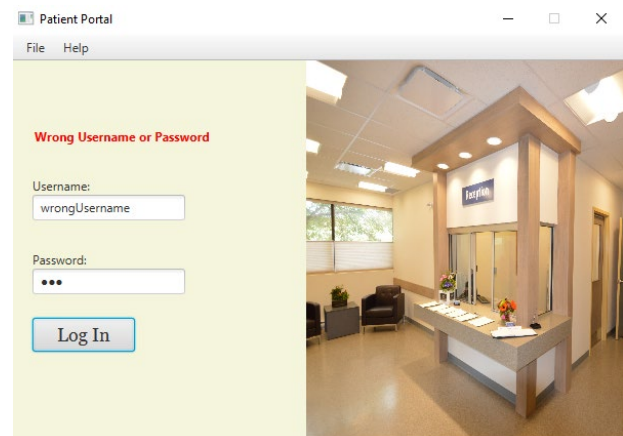


Figure 2.3: Log-In Authentication

The images above provide a detailed look into how the doctor's login page performs. The user is asked to input a username and password for their account. Then, the user clicks the enter button to enter the information. The program will check for authentication and if provided wrong information alerts the user to attempt to login again with alternate credentials. It is to be noted the password field contains encrypted data that is not shown to the user or anyone accessing the shell.

### 3. Nurse Log-In Authentication

#### 3.1 Overview of Nurse Log-In Page

The nurse log-in page has a uniform structure in relation to the doctor log-in as well as the patient (added functionality). While still comprised of the same layout the nurse log-in has an inverted appearance to provide further distinction between itself and the doctors log-in. The same authentication principles apply to the nurse; however, different credentials must be used. A doctor cannot access a nurse portal and a nurse cannot access a doctor portal, making these two pages independent.

	Panes	Level	Quantity	Location
1	BorderPane	1	1	Main
2	MenuBar	2	1	Top Row
3	Anchor Pane	2	2	BorderPane Left and Right
4	ImageView	2	1	Left of the BorderPane
5	Label	3	3	Username, Password and wrong information label [hidden]
6	TextField	3	1	Username input
7	PasswordField	3	1	Password input [encrypted]
8	Button	3	1	To submit login information

Figure 3.1: General Structure of the Nurse Log-In Page Elements



### 3.2 Nurse Log-In Images

Note the difference in layout between the nurse log-in and the doctor log-in. Although they house the same elements, the layout has been inverted to provide a distinction between the two pages shown in Figure 3.2.

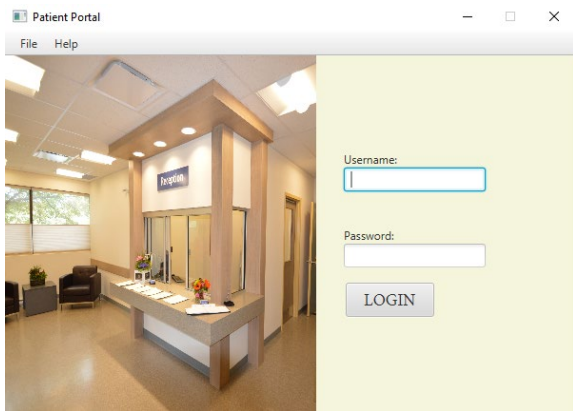


Figure 3.2: General Nurse Log-In

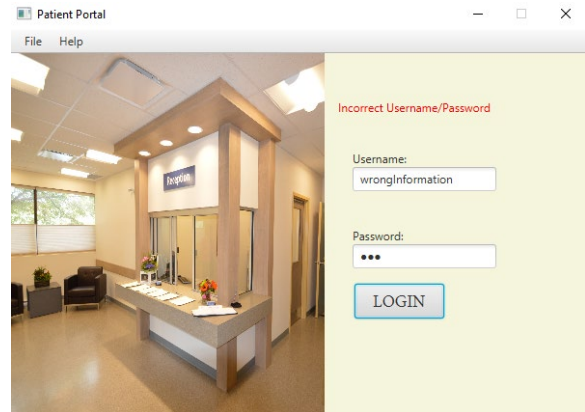


Figure 3.3: Nurse Log-In Error Handling

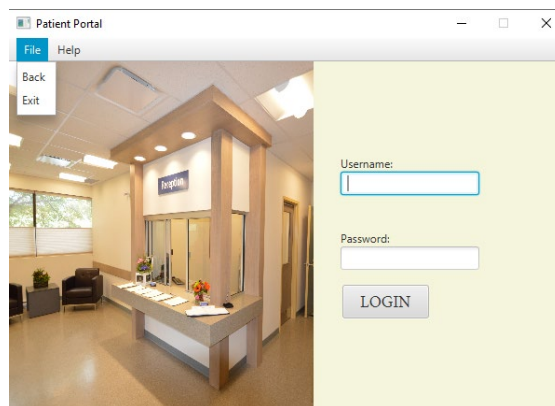


Figure 3.4: Return to Previous Page

Furthermore, Figure 3.4 shows the ability for the user to return to the log-in selection screen. This can be for a multitude of reasons, the most common being a user error incorrect selection of their identity.

## 4. Patient Log-In Authentication and Create Account

### 4.1 Overview of Patient Log-In and Create Account Page

While the patient log-in page is simple and follows the same design structure as the doctor and nurse log-in page. This page has an additional Label and Button which allows the user to create an account with the portal if they are a new patient.

Furthermore, the design of this login page has more formatting and is more visually appealing to the customer. The patient is greeted with the same error messages when validating their log-in information and given the ability to return to the previous log-in selection screen if required. Figure 4.1 details the complexity of the layout and the layers of the patient log-in/create account design.

Pane	Level	Quantity	Location
BorderPane	1	1	Main Screen
MenuBar	2	1	Top Row with File and Help
MenuBar Subcontents	2	2	Help assistance redirect, go back one page, close application
AnchorPane	2	3	Left, Center and Right
Label	3	4	Center and Right Anchor
TextField	3	1	Center Anchor for username
PasswordField	3	1	Center Anchor for Password [Encrypted]
Button	3	2	Login button and Create Account button

Figure 4.1: General Structure of the Patient Log-In/Create Account Page Elements

## 4.2 Patient Log-In Images

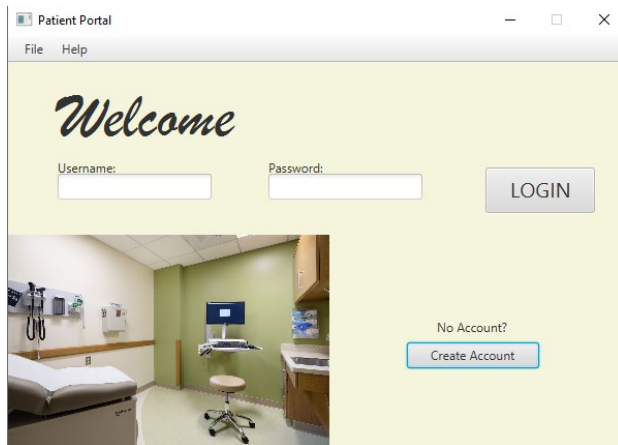


Figure 4.2: General Patient Log-In

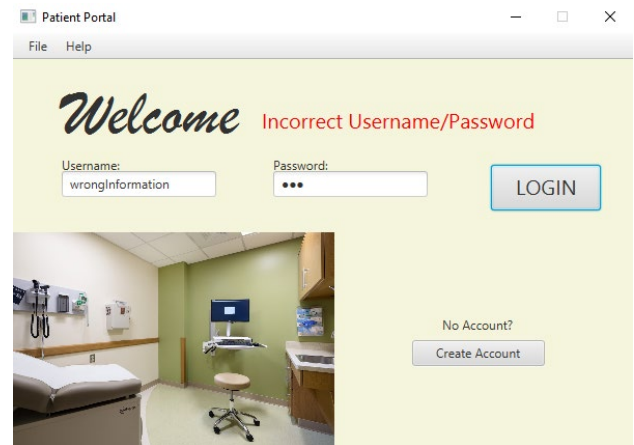


Figure 4.3: Patient Log-In Error Handling

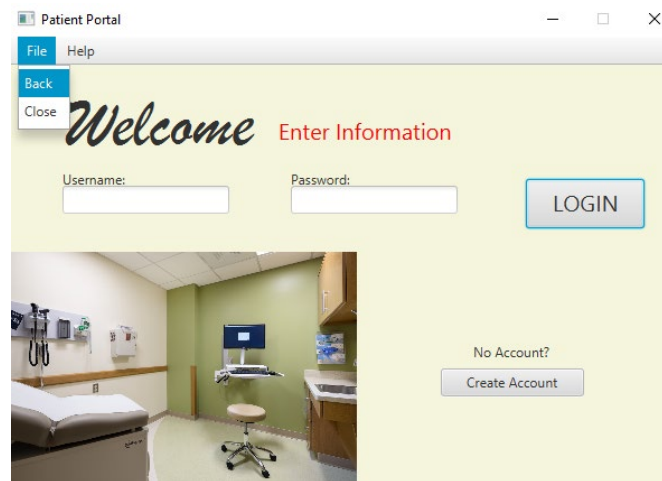


Figure 4.4: Patient Return Page Functionality

These pages are synonymous with the previous two logins of the nurse and doctor, with added functionality of the “Create Account” button which re-directs the patient to a new create account screen. The “LOGIN” button invokes the method of user authentication to provide feedback to the user indicating incorrect information or passes the user to Section 7, the Patient Portal.

## 5. Doctor Main Access Page

### 5.1 Overview of Doctor Main Access Page

Upon entering valid credentials, a doctor will be presented with a landing page. There is a drop-down menu to select a patient of the doctor who has logged in. There are two radio buttons, which when clicked, will display vitals, messages from the patient, or both. This page I

comprised of similar elements to the login screen with a few new ones to provide further functionality.

## 5.2 Doctor Main Access Page Images

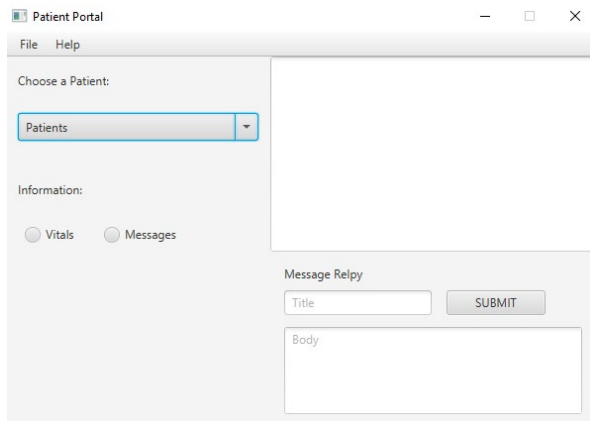


Figure 5.1: Doctor Landing Page

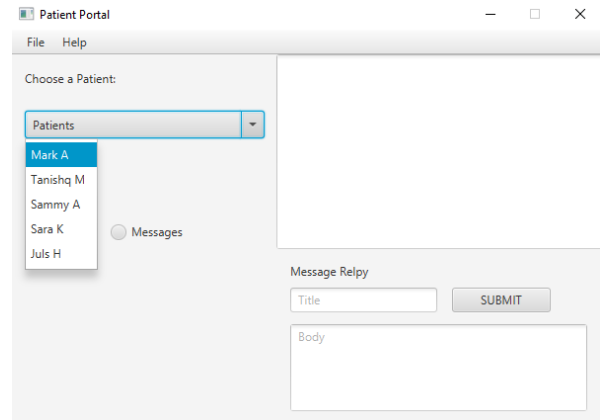


Figure 5.2: Doctor Select Patient

Figure 5.2 and 5.3 show the added functionality of a drop-down menu as well as radio buttons to provide the doctor with necessary information in gathering details of their patients.

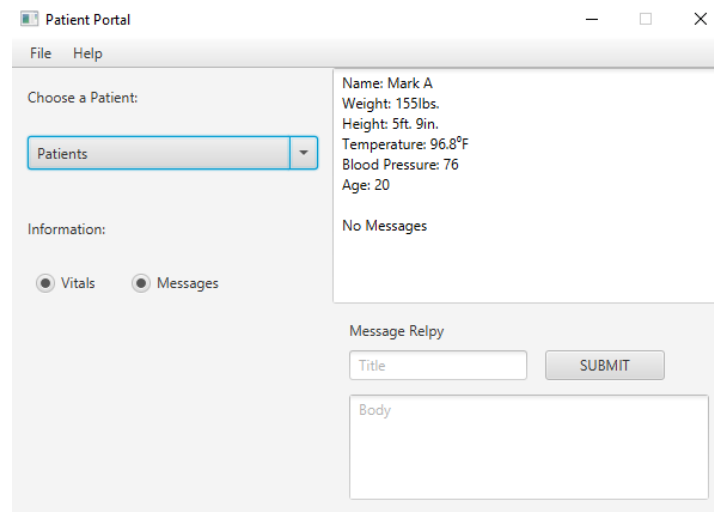


Figure 5.3: Doctor View of Vitals and Important Information

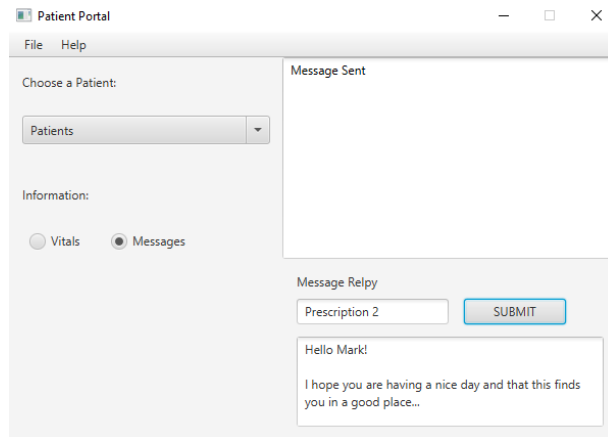


Figure 5.4: Confidential Patient Messaging

Figure 5.4 details the confidential messaging between the doctor and patient. This allows the doctor to speak indirectly with patient allowing for crucial transfer of information.

## 6. Nurse Main Access Page

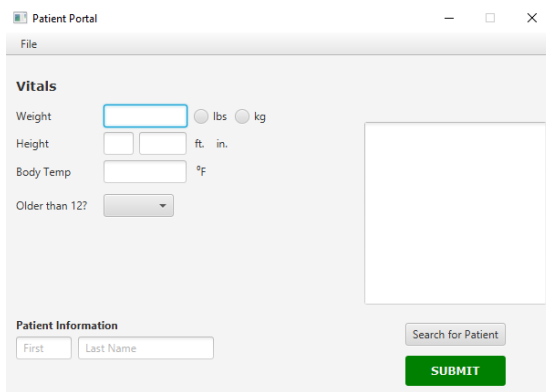
### 6.1 Overview of Nurse Main Access Page

After a nurse successfully logs in, they reach a landing page set up for the collection of the patient's vital information. There are four different text fields meant for values corresponding to the patient's weight, height, and body temperature. For the weight value entered, it may be in either imperial or metric (lbs. or kgs), though only one may be selected or it will trigger an error handler temporary disabling submission until it is fixed (Figure 6.5). If neither lbs or kg are selected, error handling is triggered and gives a missing parameter warning (Figure 6.6).

The combo box following these text fields allows the nurse to note whether the patient is under or over the age of 12. If true, a patient over 12 requires an additional two values: one for their current age and one for their blood pressure in mmHg as shown in Figure 6.2 and 6.3. If false, a patient under 12 only requires the input of their current age. The remaining text fields on the left-hand side are for the entry of the patient's first and last name.

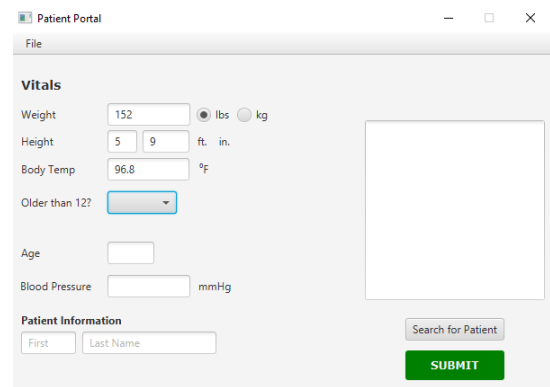
The buttons on the right-hand side of the panel are "Search for Patient" and "Submit". "Search for Patient" will match the entered information to any prior history they have had at the clinic. "Submit" will finalize the information into a text file for clinic records. The nurse also has the option to logout in the top left corner of the window with "File" > "Logout" (Figure 6.4).

## 6.2 Nurse Main Access Images



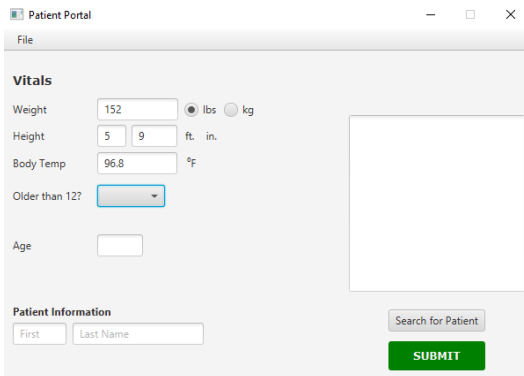
The screenshot shows the 'Patient Portal' window with the 'Vitals' section. The 'Weight' field is highlighted with a blue border. Below it are 'Height' (ft. in.), 'Body Temp' (°F), and 'Older than 12?' (dropdown). The 'Patient Information' section has 'First' and 'Last Name' fields. A 'Search for Patient' button and a green 'SUBMIT' button are at the bottom right.

Figure 6.1: Nurse Landing Page



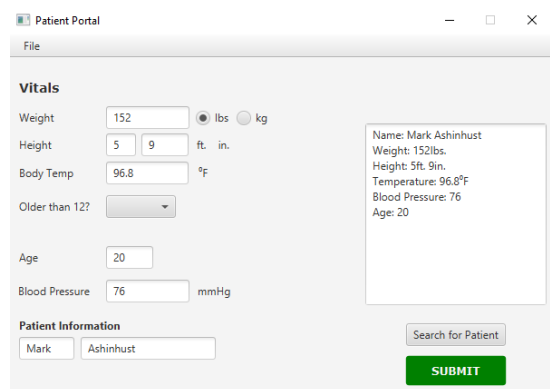
The screenshot shows the 'Patient Portal' window with the 'Vitals' section. The 'Weight' field is set to 152 lbs. The 'Height' field is set to 5 ft. 9 in. The 'Body Temp' field is set to 96.8 °F. The 'Older than 12?' dropdown is set to 'Older than 12?'. The 'Age' field is empty. The 'Blood Pressure' field is empty. The 'Patient Information' section has 'First' and 'Last Name' fields. A 'Search for Patient' button and a green 'SUBMIT' button are at the bottom right.

Figure 6.2: Patient Age &gt; 12



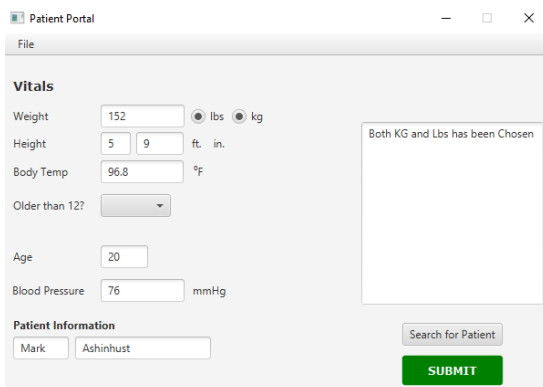
The screenshot shows the 'Patient Portal' window with the 'Vitals' section. The 'Weight' field is set to 152 lbs. The 'Height' field is set to 5 ft. 9 in. The 'Body Temp' field is set to 96.8 °F. The 'Older than 12?' dropdown is set to 'Older than 12?'. The 'Age' field is empty. The 'Patient Information' section has 'First' and 'Last Name' fields. A 'Search for Patient' button and a green 'SUBMIT' button are at the bottom right.

Figure 6.3: Patient Age &lt; 12



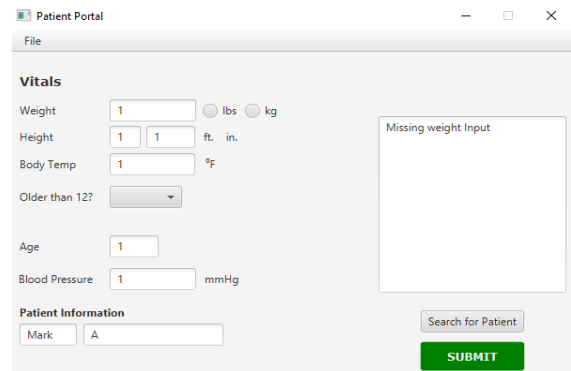
The screenshot shows the 'Patient Portal' window with the 'Vitals' section. The 'Weight' field is set to 152 lbs. The 'Height' field is set to 5 ft. 9 in. The 'Body Temp' field is set to 96.8 °F. The 'Older than 12?' dropdown is set to 'Older than 12?'. The 'Age' field is set to 20. The 'Blood Pressure' field is set to 76 mmHg. The 'Patient Information' section has 'First' and 'Last Name' fields. A 'Search for Patient' button and a green 'SUBMIT' button are at the bottom right. A summary box on the right displays: Name: Mark Ashinhust, Weight: 152lbs, Height: 5ft. 9in, Temperature: 96.8°F, Blood Pressure: 76, Age: 20.

Figure 6.4: Nurse Submit Information



The screenshot shows the 'Patient Portal' window with the 'Vitals' section. The 'Weight' field is set to 152 lbs. The 'Height' field is set to 5 ft. 9 in. The 'Body Temp' field is set to 96.8 °F. The 'Older than 12?' dropdown is set to 'Older than 12?'. The 'Age' field is set to 20. The 'Blood Pressure' field is set to 76 mmHg. The 'Patient Information' section has 'First' and 'Last Name' fields. A 'Search for Patient' button and a green 'SUBMIT' button are at the bottom right. A message box on the right displays: Both KG and Lbs has been Chosen.

Figure 6.5: lbs. and kg. Error Handling



The screenshot shows the 'Patient Portal' window with the 'Vitals' section. The 'Weight' field is set to 1. The 'Height' field is set to 1 ft. 1 in. The 'Body Temp' field is set to 1 °F. The 'Older than 12?' dropdown is set to 'Older than 12?'. The 'Age' field is set to 1. The 'Blood Pressure' field is set to 1 mmHg. The 'Patient Information' section has 'First' and 'Last Name' fields. A 'Search for Patient' button and a green 'SUBMIT' button are at the bottom right. A message box on the right displays: Missing weight Input.

Figure 6.6: Missing Weight Information

The screenshot shows a web application window titled "Patient Portal". On the left, there is a vertical menu with "File" and "Logout" (highlighted in blue) and a "vitals" section. The main area contains a form for entering patient vitals:
 

- Weight: A text input with "1", followed by radio buttons for "lbs" and "kg".
- Height: Two text inputs with "1" and "1", followed by "ft." and "in." labels.
- Body Temp: A text input with "1" and an "°F" label.
- Older than 12?: A dropdown menu.
- Age: A text input with "1".
- Blood Pressure: A text input with "1" and a "mmHg" label.

 Below these is a "Patient Information" section with a "Mark" dropdown menu and a text input containing "A". To the right of the vitals form is a large white box with the text "Missing weight Input". At the bottom right, there is a "Search for Patient" button and a prominent green "SUBMIT" button.

Figure 6.7: Nurse Logout

## 7. Patient Main Access Page

### 7.1 Overview of Patient Main Access Page

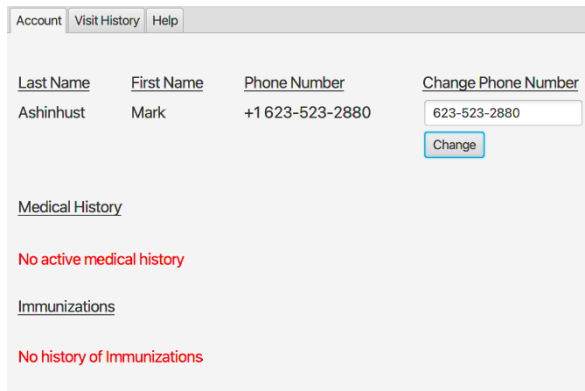
After a patient has successfully authenticated on the login page, they are able to view their account information, appointment history, and a help tab (Figure 7.1). By default, they are sent to their account information page.

The **Account** page displays their first and last name, currently documented phone number, medical history, and immunizations history. On the right-hand side, the text field under “Change Phone Number” allows them to change their current phone number recorded at the clinic (Figure 7.2). After typing in a valid phone number, pressing the “Change” button finalizes this and changes it in the display on their account page.

The **Visit History** tab allows the patient to access information from any previous appointments they have had at the clinic (Figure 7.3). The combo box “Choose Visit” will drop down to display prior appointments and their dates, allowing the patient to choose and view their evaluation (Figure 7.4). Having **no visits** selected will give an invalid visit date warning.

The **Help** tab gives the patient access to contacting their doctor or viewing messages coming from the clinic (Figure 7.5). The top text field is for entering a message header, and the larger text field below is for writing their main message. Clicking the “Send” button finalizes the message in a text file and displays a “Message Sent” validation in the message body text field (Figure 7.6). “Incoming Messages” displays any new or previous messages sent from the clinic, and one may be chosen from the combo box to display (Figure 7.7).

## 7.2 Patient Main Log-In Page Images



Account Visit History Help

Last Name	First Name	Phone Number	Change Phone Number
Ashinhust	Mark	+1 623-523-2880	623-523-2880 Change

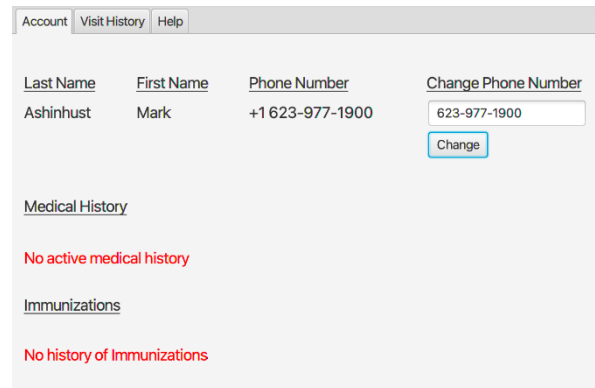
Medical History

No active medical history

Immunizations

No history of Immunizations

Figure 7.1: Patient Main Account



Account Visit History Help

Last Name	First Name	Phone Number	Change Phone Number
Ashinhust	Mark	+1 623-977-1900	623-977-1900 Change

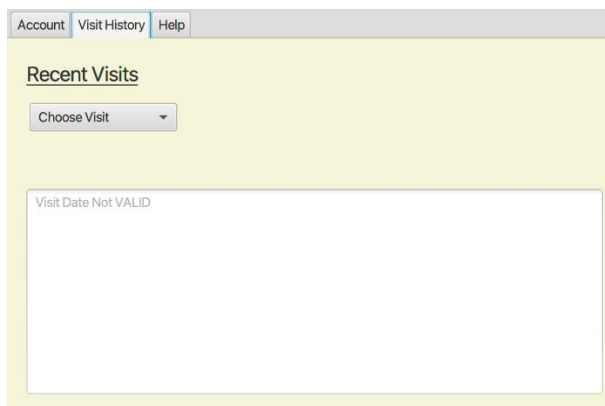
Medical History

No active medical history

Immunizations

No history of Immunizations

Figure 7.2: Patient Change Phone Number



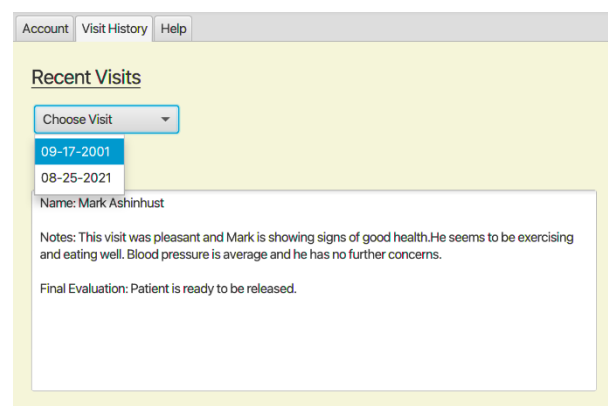
Account Visit History Help

Recent Visits

Choose Visit

Visit Date Not VALID

Figure 7.3: Patient Visit History (EMPTY)



Account Visit History Help

Recent Visits

Choose Visit

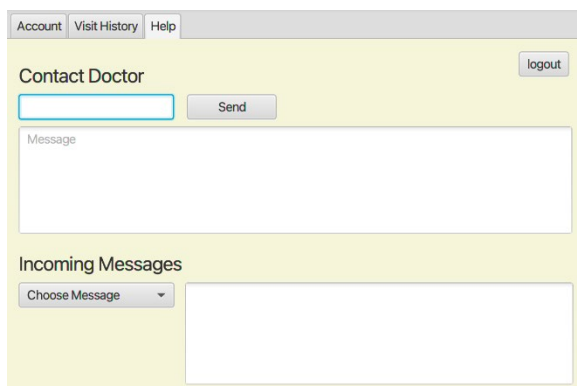
09-17-2001  
08-25-2021

Name: Mark Ashinhust

Notes: This visit was pleasant and Mark is showing signs of good health. He seems to be exercising and eating well. Blood pressure is average and he has no further concerns.

Final Evaluation: Patient is ready to be released.

Figure 7.4: Patient Visit History Example



Account Visit History Help

Contact Doctor

Message

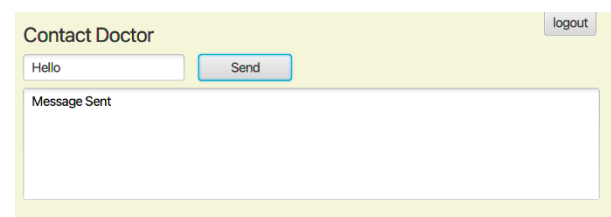
Send

logout

Incoming Messages

Choose Message

Figure 7.5: Patient Help Page



Contact Doctor

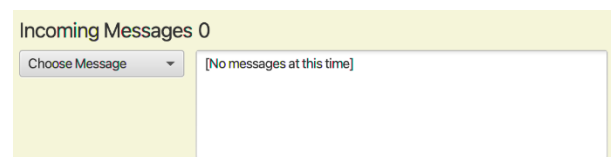
Hello

Send

Message Sent

logout

Figure 7.6: Patient Message Sent Confirmation



Incoming Messages 0

Choose Message

[No messages at this time]

Figure 7.7: Patient Incoming Messages



Along with these images is the required patient information which is as follows:

Provided by Patient:

- First and last name
- Phone number

Provided by Nurse:

- Weight (lbs. or kgs.)
- Height (ft. in.)
- Body temperature (°F)
- Over/Under 12 years old
- 12+ years old: Blood Pressure (mmHg)

Provided by Doctor:

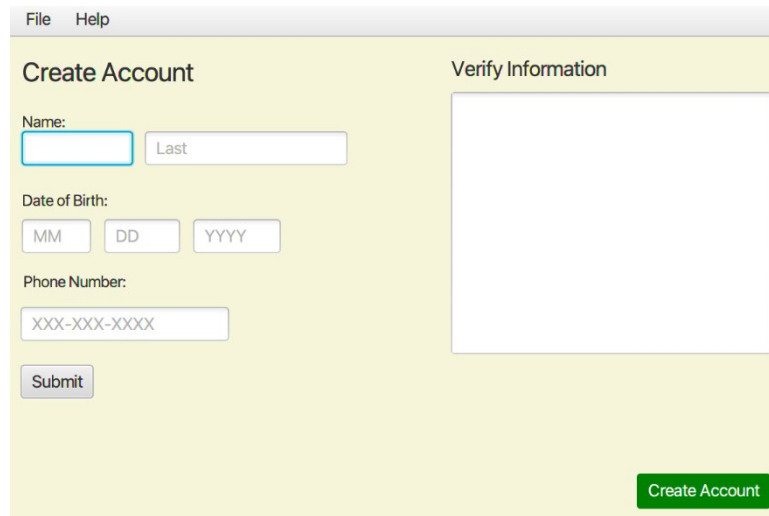
- Final Evaluations
- Prescriptions for Pharmacy

## **8. Patient Create Account Page**

### **8.1 *Overview of Patient Create Account Page***

The final page allows the patient to create their personal user account if they had not been a patient before. If the patient already has an account and attempts to use that same information, they will be redirected back to the login screen. This page is comprised of similar elements as before and requires the first and last name, birthdate, and phone number of the patient. As Figure X.X depicts, the patient is asked to verify their information before it is put into the system and allows them to access their login page. This page consists of multiple Labels, TextFields, Buttons for submission and TextArea for information validation.

## 8.2 Patient Create Account Page Images

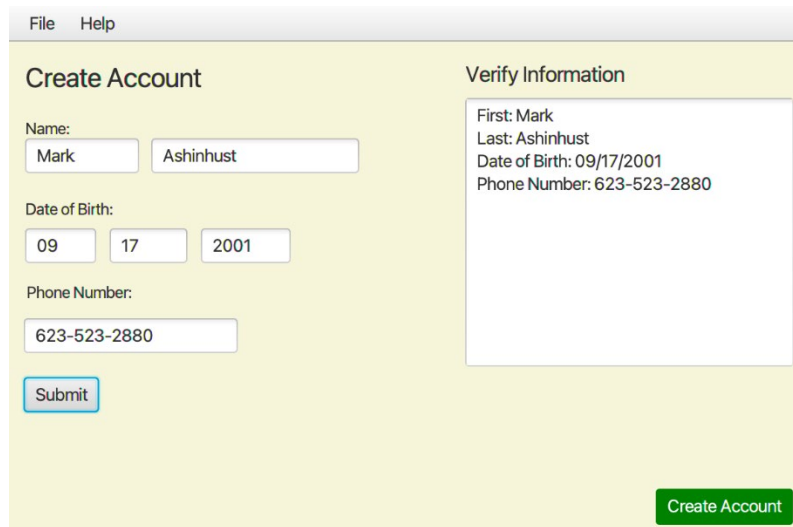


The screenshot shows a web application window with a menu bar containing 'File' and 'Help'. The main content area is divided into two sections: 'Create Account' on the left and 'Verify Information' on the right. The 'Create Account' section contains the following fields and controls:

- Name:** Two text input fields, the first containing 'Last'.
- Date of Birth:** Three text input fields labeled 'MM', 'DD', and 'YYYY'.
- Phone Number:** A text input field with the placeholder 'XXX-XXX-XXXX'.
- Submit:** A button.

The 'Verify Information' section is currently empty. At the bottom right of the window is a green button labeled 'Create Account'.

Figure 8.1: Patient Create Account Main Page



The screenshot shows the same web application window as Figure 8.1, but with the 'Verify Information' section populated with the user's details:

- First:** Mark
- Last:** Ashinhust
- Date of Birth:** 09/17/2001
- Phone Number:** 623-523-2880

The 'Create Account' section now has the 'Submit' button highlighted with a blue border. The green 'Create Account' button remains at the bottom right.

Figure 8.2: Patient Create Account Verification of Information

Once the user account has been created the user is redirected to the patient login where they can use their new login information.

Credits:

### Contributions of the Top Level Devils

Member	Contributions
Mark Ashinhust	Team Lead, User's Guide Demo, JavaFX Mockup, Cover Page
Tanishq Mor	Phase 1 Scrum Master, Project Overview, Software Requirements Specification
Samuel Arenson	Project Overview, User's Guide
Juls Hizarsa	Project Overview, Software Requirements Specification, Credits
Sara Kane	User's Guide, Table of Contents