

MEDICAL PORTAL

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Introduction:

Health is the most important thing that every living being needs. In order to make healthcare easier to access, we here propose a doctor patient handling, managing system that helps doctors in their work and also patients to book doctor appointments and view medical progress. Patients are allowed to book empty slots online and those slots are reserved in their name. The system manages the appointment data for multiple doctors for various date and times. Each time a user visits a doctor his/her medical entry is stored in the database by doctor. Next time a user logs in he may view his/her entire medical history as and when needed. At the same time a doctor may view patient's medical history even before the patient visits him. With this information, the doctor learn more about the patient's medical condition and treat him accordingly .Every time after his appointment with the patient, the doctor adds the proposed treatment through his interface. This allows for an automated patient doctor handling system through an online interface.

Database Definition:

Our application uses a database to store all the data and retrieve it when needed. I used a MySQL database which is stored on the [cloud](#). I created an account in [freesqldatabase.com](#) and then created the database using [phpMyAdmin](#). FreeSQLDatabase.com is web based service which provides sql database functionality. The database contains five tables with their schema as given below.

LOGIN	
ID – Primary Key	Number(4)
Type	Varchar(1)
Password	Varchar(30)

PATIENT	
Pid - Primary Key, Foreign key(ID)	Int(4)
Firstname	Varchar(20)
Lastname	Varchar(20)
Sex	Varchar(1)

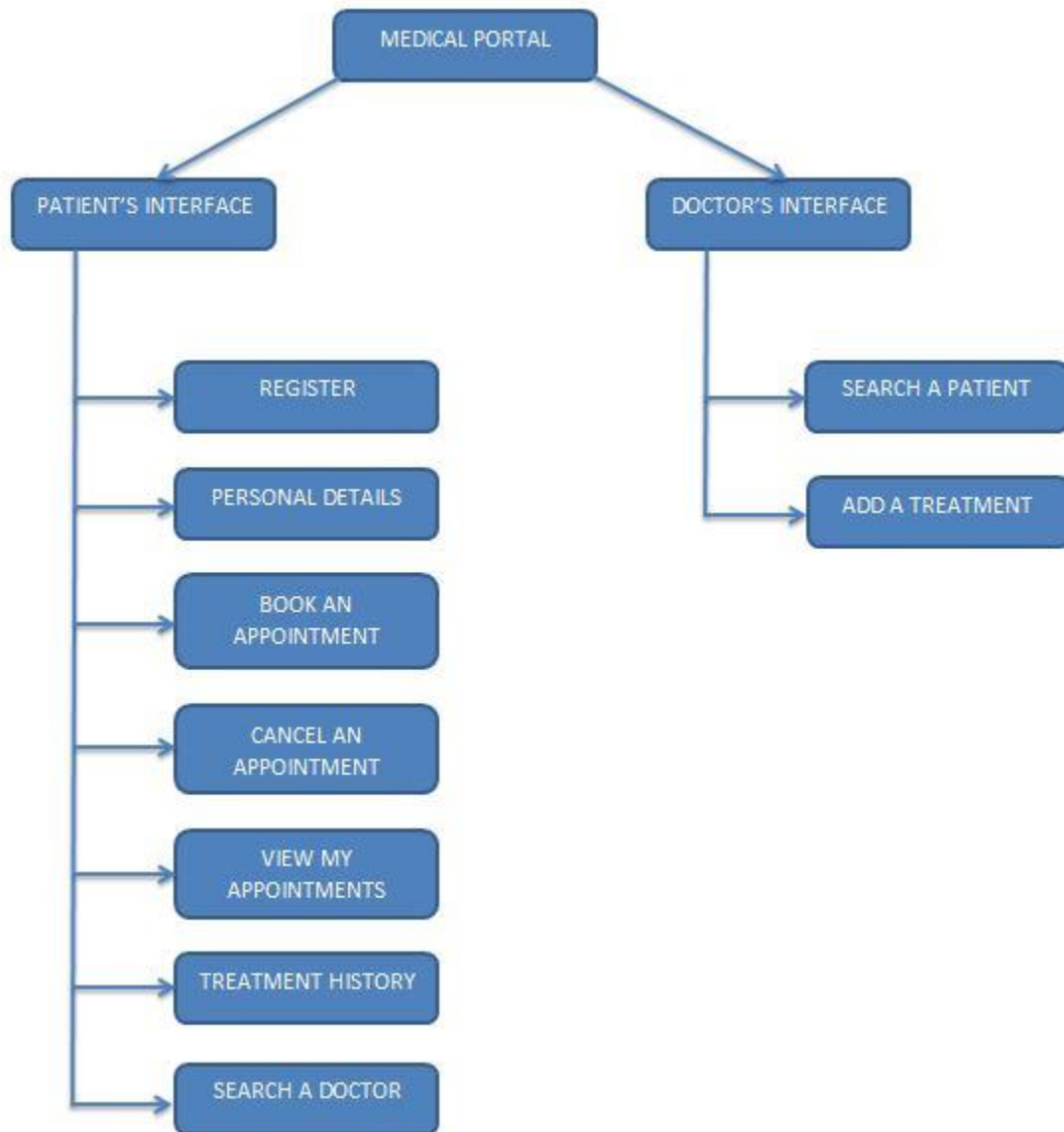
Email	Varchar(30)
phone	Varchar(12)

DOCTOR	
Did - Primary Key, Foregn key(ID)	Int(4)
Firstname	Varchar(20)
Lastname	Varchar(20)
Sex	Varchar(1)
Email	Varchar(30)
phone	Varchar(12)
Address	Varchar(50)
Category	Varchar(20)

BOOKING	
Bid – Primary Key	Int(10)
Did - Foreign key(DID)	Int(4)
Pid - Foreign key(PID)	Int(4)
Category	Varchar(20)
Bdate	Varchar(10)
Time	Varchar(8)

TREATMENT	
Bid – Primary Key, Foreign key(BID)	Int(10)
Did - Foreign key(DID)	Int(4)
Pid - Foreign key(PID)	Int(4)
Category	Varchar(20)
Treatment	Varchar(2000)
Note	Varchar(2000)
Bdate	Varchar(10)
Time	Varchar(8)

Hierarchical Representation:



Working of Modules:

Every module is explained below with the corresponding figures.


- **Patient login/registration:** Patients have to first register themselves to login into the system

LOGIN

Login ID

Password

Not registered yet?? Click

- □ ×

Back

REGISTER HERE

Login ID *	<input type="text" value="1003"/>
First Name *	<input type="text" value="Jackie"/>
Last Name *	<input type="text" value="Chan"/>
Sex *	<input type="text" value="M"/>
Password *	<input type="password" value="*****"/>
Re-enter Password *	<input type="password" value="*****"/>
Email Address *	<input type="text" value="jackie@pitt.edu"/>
Phone Number	<input type="text" value="4121111111"/>

Submit

Cancel

Registration Successful!!!

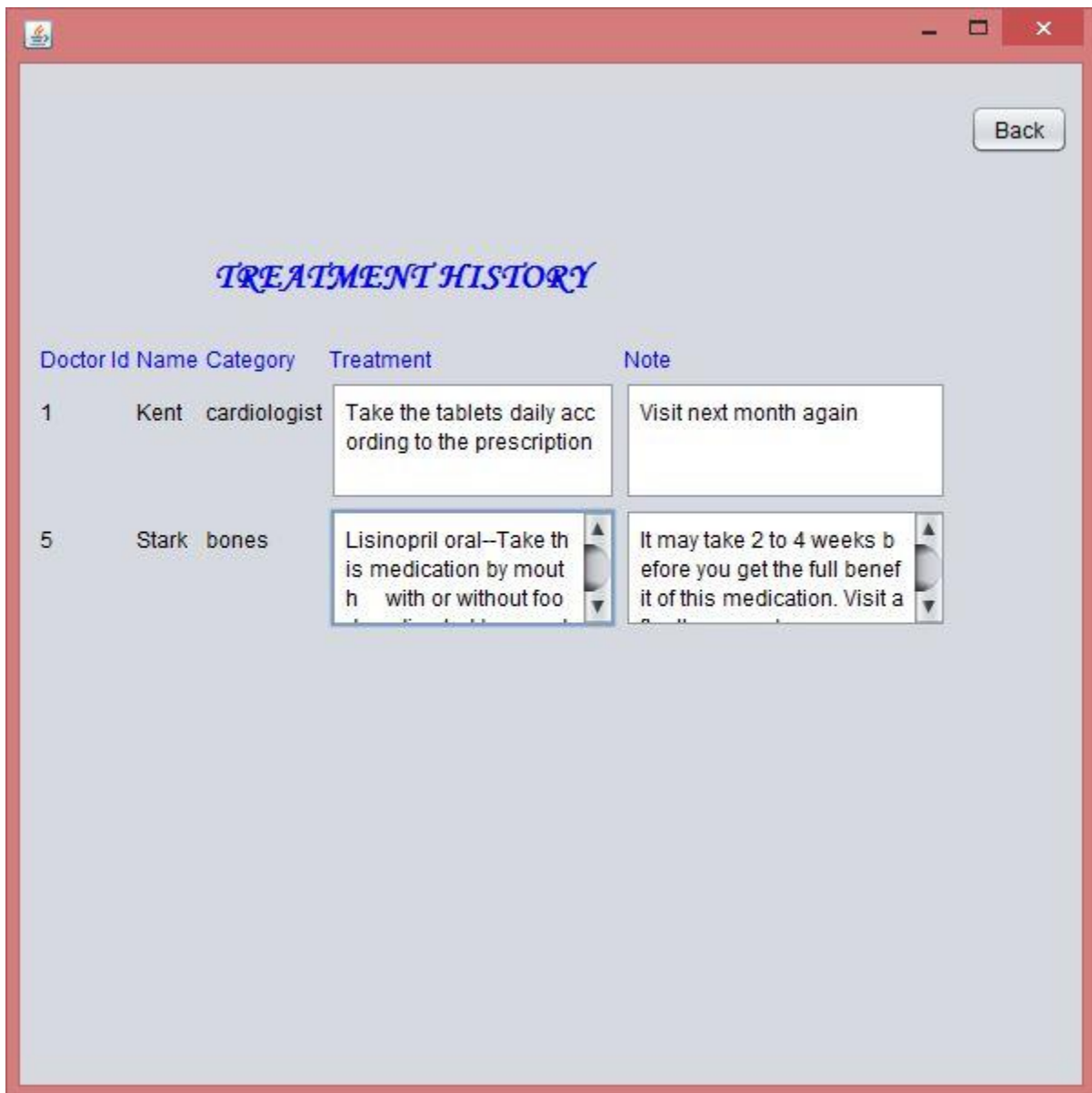
- **Personal Details:** Patient can view his own details here.



The screenshot shows a web application window with a red title bar. The window contains a 'Back' button in the top right corner. The main content area has a light blue background and is titled 'MY PROFILE' in a stylized blue font. Below the title, there is a form with the following fields:

User ID	1001
FirstName	sam
Last Name	sam
Sex	M
Email	sam@pitt.edu
Phone	4125194288

- **Treatment History:** System allows to update and view patient's medical history. He can view his past treatments at any time and see the prescription and notes of it.



Back

TREATMENT HISTORY

Doctor Id	Name	Category	Treatment	Note
1	Kent	cardiologist	Take the tablets daily according to the prescription	Visit next month again
5	Stark	bones	Lisinopril oral--Take this medication by mouth with or without food	It may take 2 to 4 weeks before you get the full benefit of this medication. Visit a

- **Doctor Search:** System allows for doctor search through his id or last name.

Back

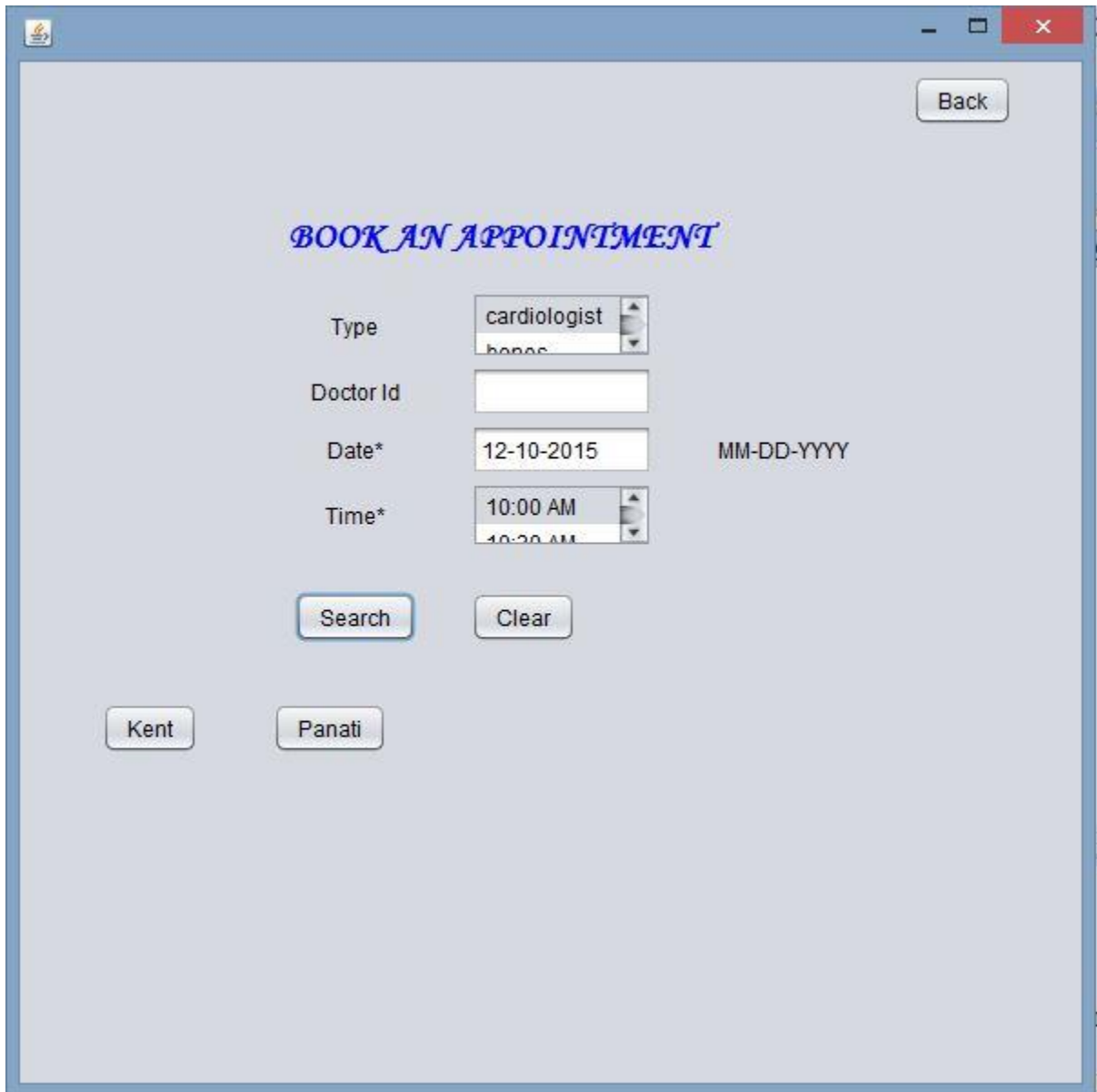
SEARCH A DOCTOR

Doctor Id Search

Last Name Search

Doctor Id	First Name	Last Name	Sex Category
7	Sam	Panati	M cardiologist

- **Appointment booking for date and time:** Users can book appointment for their required date and time. Here he has the flexibility to choose his doctor based on doctor's id or category. He can select one of the categories present (For ex: cardiologist) on his required dates and times. Then the availability of the doctors is shown. He can select any doctor who is available to book an appointment.



The screenshot shows a web application window titled "BOOK AN APPOINTMENT". The form contains the following elements:

- Back**: A button in the top right corner.
- BOOK AN APPOINTMENT**: The title of the form, displayed in a stylized blue font.
- Type**: A dropdown menu with "cardiologist" selected.
- Doctor Id**: An empty text input field.
- Date***: A text input field containing "12-10-2015". To its right is the label "MM-DD-YYYY".
- Time***: A dropdown menu with "10:00 AM" selected.
- Search**: A button located below the date and time fields.
- Clear**: A button located to the right of the search button.
- Kent**: A button located at the bottom left.
- Panati**: A button located at the bottom center.

Back

BOOK AN APPOINTMENT

Type

cardiologist
home

Doctor Id

4

Date*

12-10-2015

MM-DD-YYYY

Time*

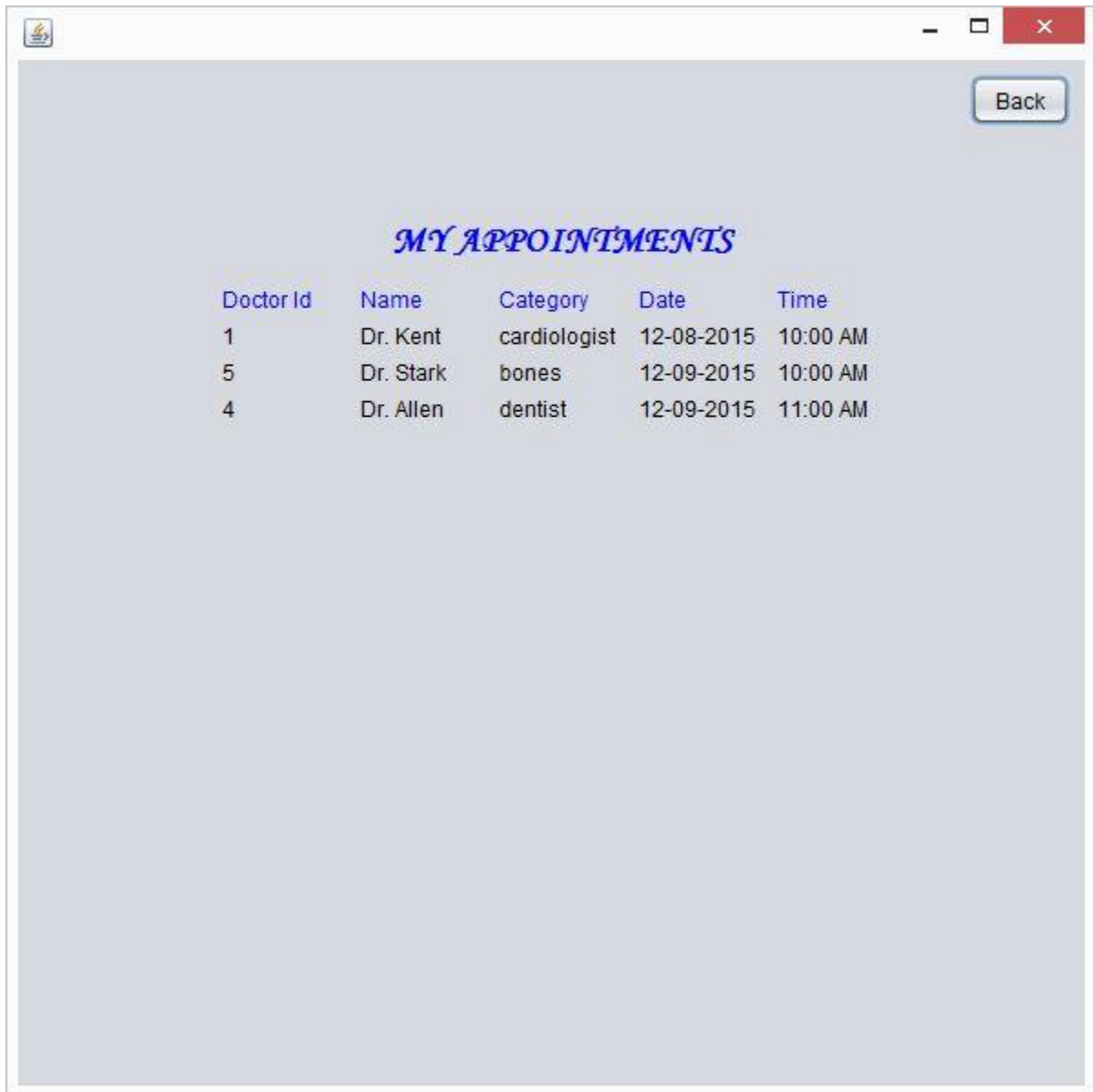
11:00 AM
11:20 AM

Search

Clear

Allen

- **View my appointments:** The patient can look at his future appointments anytime with the help of this feature.



- **Booking cancellation:** User may even cancel their bookings by login into the system anytime. After clicking this option, the user is shown his future appointments with a cancel button for each of them. He can cancel any of the appointments with just one click.

The screenshot shows a web application window with a blue border and standard Windows-style window controls (minimize, maximize, close) in the top right corner. The window has a light blue background. In the top right corner of the window, there is a 'Back' button. Centered in the window is the title *CANCEL AN APPOINTMENT* in a blue, italicized serif font. Below the title is a table with four columns: 'Doctor Id', 'Name', 'Category', 'Date', and 'Time'. The table contains three rows of appointment data. To the left of each row is a 'Cancel' button with a corresponding number (1, 2, and 3 respectively).

	Doctor Id	Name	Category	Date	Time
Cancel 1	1	Dr. Kent	cardiologist	12-08-2015	10:00 AM
Cancel 2	5	Dr. Stark	bones	12-09-2015	10:00 AM
Cancel 3	4	Dr. Allen	dentist	12-09-2015	11:00 AM

- **Doctor Login:** Doctor can login using his credentials which are already set by the admin.



A screenshot of a web application window titled "DOCTOR LOGIN". The window has a light blue background and a standard Windows-style title bar with a minimize button, a maximize button, and a close button. The login form is centered and contains the following elements:

- The title "DOCTOR LOGIN" in a blue, stylized font.
- A "Login ID" label followed by a text input field containing the number "1".
- A "Password" label followed by a text input field containing an asterisk "*" to indicate masked characters.
- Two buttons at the bottom: "Submit" and "Cancel".

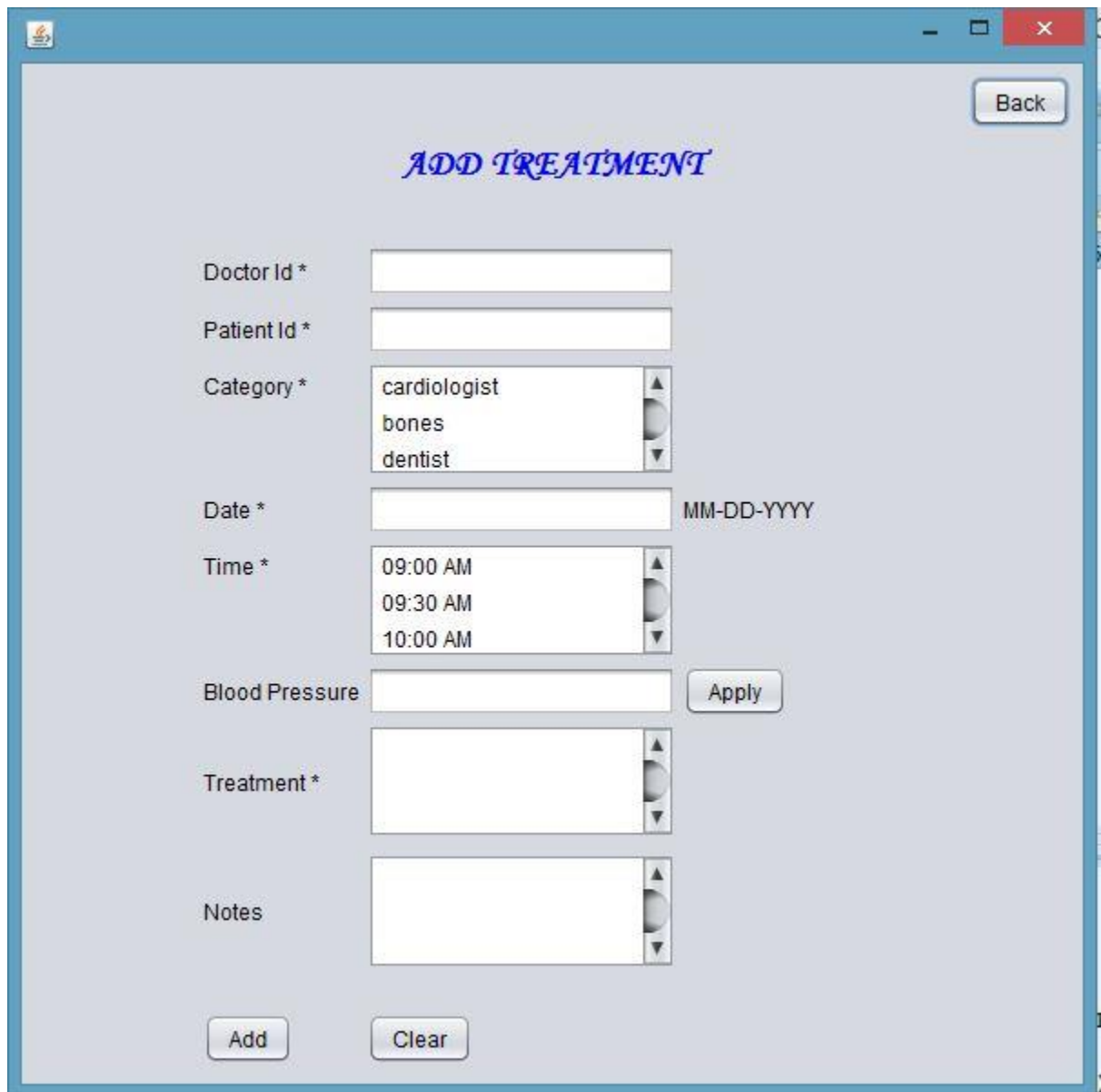
- **Patient Search:** Doctor can search a patient by giving the patient's id or his last name. Then he can view the patient details. Along with those details, he can also see the patient's treatment history with the dates and times. By looking at this, the doctor can get to know more about the patient's medical condition. In this way, he can be ready for the patient even before his appointment.

The screenshot shows a web application window titled "SEARCH A PATIENT". It features a search interface with two input fields: "Patient Id" (containing "1001") and "Last Name" (empty). Each field has a "Search" button next to it. A "Back" button is located in the top right corner. Below the search fields, the patient's details are displayed in a table-like format. The details include Patient Id (1001), First Name (sam), Last Name (sam), Sex (M), and Email (sam@pitt.edu). Below this, a table shows the patient's treatment history with columns for Category, Date, Time, Treatment, and Note. The first entry is for a cardiologist appointment on 12-08-2015 at 10:00 AM, with treatment instructions and a note about the next visit. The second entry is for a bones appointment on 12-09-2015 at 10:00 AM, with treatment instructions and a note about medication benefits.

Patient Id	First Name	Last Name	Sex	Email
1001	sam	sam	M	sam@pitt.edu

Category	Date	Time	Treatment	Note	
	12-08-2015	10:00 AM	cardiologist	Take the tablets daily according to the prescription	Visit next month again
	12-09-2015	10:00 AM	bones	medication by mouth with or without food as directed by your doctor, usually once daily.	fore you get the full benefit of this medication. Visit aft

- **Add a treatment:** The doctor can add a treatment to the patient after he meets the patient. Here there is an option to enter blood pressure reading.



The screenshot shows a window titled "ADD TREATMENT" with a light blue background. The window has a standard Windows-style title bar with a minimize button, a maximize button, and a close button (red X). In the top right corner, there is a "Back" button. The main content area contains several input fields and buttons:

- Doctor Id ***: A text input field.
- Patient Id ***: A text input field.
- Category ***: A dropdown menu with three visible options: "cardiologist", "bones", and "dentist".
- Date ***: A text input field with the placeholder "MM-DD-YYYY" to its right.
- Time ***: A dropdown menu with three visible options: "09:00 AM", "09:30 AM", and "10:00 AM".
- Blood Pressure**: A text input field with an "Apply" button to its right.
- Treatment ***: A dropdown menu.
- Notes**: A text input field.

At the bottom of the window, there are two buttons: "Add" and "Clear".

We have assumed the sensor reading will be written to a file. The doctor can just click one button and then **automatically** the **simulated sensor reading** will be appeared in the text field. If the patient has a normal blood pressure, a normal pop-up message will be shown. Suppose if the patient has a high/low blood pressure, a warning message is shown stating the same and a new button “apply” appears beside text area of the ‘treatment’.

The screenshot shows a web application window titled "ADD TREATMENT". The window has a light blue background and a standard Windows-style title bar with minimize, maximize, and close buttons. In the top right corner, there is a "Back" button. The main content area contains several form fields and buttons:

- Doctor Id ***: A text input field containing the value "1".
- Patient Id ***: A text input field containing the value "1001".
- Category**: A text input field that is partially obscured by a pop-up window.
- Date ***: A text input field.
- Time ***: A text input field containing the value "10:00 AM".
- Blood Pressure**: A text input field containing the value "systolic: 130, diastolic: 100". To its right is an "Apply" button.
- Treatment ***: A text area with a vertical scrollbar. To its right is an "Apply" button.
- Notes**: A text area with a vertical scrollbar.
- At the bottom left, there are two buttons: "Add" and "Clear".

A red-bordered pop-up window titled "Medication Required" is centered over the form. It features a yellow warning triangle icon on the left and the text "High Blood Pressure!!!" on the right. An "OK" button is located in the bottom right corner of the pop-up window.

On clicking this, the **default treatment** for the blood pressure problem automatically appears on the 'treatment' and 'notes' text areas. The doctor can just click 'add' and then the treatment will be added.

ADD TREATMENT

Back

Doctor Id * 1

Patient Id * 1001

Category *
cardiologist
bones
dentist

Date * 12-10-2015 MM-DD-YYYY

Time *
09:00 AM
09:30 AM
10:00 AM

Blood Pressure systolic: 130, diastolic: 100 Apply

Treatment *
Lisinopril oral--Take this medication by mouth with or without food as di Apply

Notes
It may take 2 to 4 weeks before you get the full be nefit of this medication. V

Add Clear

All the required corresponding messages are shown after the operations are done. Some of the screen shots are given below. Positive messages are shown in green and the negative messages are shown in red.



LOGIN

Login ID

Password

Not registered yet?? Click

Username or Password is incorrect..Please try again

Conclusion:

This application can help the patients to easily manage their appointments. It also helps them to see their treatment history whenever needed. It helps the doctors to search for a patient and see his treatment history even before meeting him. He can also add the treatments in an easy way. It makes use of the simulated blood pressure sensor data and helps the doctors to automatically add the default treatment for that disease. As this application's database is on the cloud, it can be accessed from anywhere at any time. It works as an efficient portal between doctor and patient. The demo of the application can be found at <https://www.youtube.com/watch?v=lydpcbhJQmQ>. The source code of the application can be found and

downloaded from the following shared folder
https://drive.google.com/folderview?id=0B48z_cRXfVaBUGNnZVNJOXpnaXc&usp=sharing .

Future Work:

The data from some other sensors like SPO2, EKG, heart rate can be integrated into this application. Also, these values required some data cleaning before integration. The application can be developed for mobiles so that the users can access it on the fly.