A

Mini Project Report

on

CarePlus: A Smart Clinic for Personalized Healthcare

Submitted in partial fulfillment of the requirements for the degree

Second Year Engineering – Computer Science Engineering (Data Science)

by

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Under the guidance of

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UNIVERSITY OF MUMBAI

Academic year: 2024-25

CERTIFICATE

This to certify that the Mini Project report on **CarePlus: A Smart Clinic for Personalized Healthcare** has been submitted by Sara Rajpurkar (23107096), Rutuja Sawant (23107143) , Aryan Shelar (24207012) and Harsh Patil (23107090) who are bonafide students of A. P. Shah Institute of Technology, Thane as a partial fulfillment of the requirement for the degree in **Computer Science Engineering (Data Science)**, during the academic year **2024-2025** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

Dr. Veena Trivedi
Guide

Ms. Anagha Aher
HOD, CSE (Data Science)

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External Examiner:
1.

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1.

Place: A. P. Shah Institute of Technology, Thane
Date:11/04/2025

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This project would not have come to fruition without the invaluable help of our guide. **Dr. Veena Trivedi**. Expressing gratitude towards our HOD, **Ms. Anagha Aher**, and the Department of Computer Science Engineering (Data Science) for providing us with the opportunity as well as the support required to pursue this project. We would also like to thank our project coordinator **Ms. Richa Singh** who gave us her valuable suggestions and ideas when we were in need of them. We would also like to thank our peers for their helpful suggestions.

TABLE OF CONTENTS

Chapter 1

Introduction

In today's fast-paced world, healthcare systems face significant challenges, including a lack of personalized care, inefficiencies in appointment scheduling, fragmented patient records, and limited remote consultation options. These issues lead to delayed medical attention, reduced patient engagement, and inconvenience for both doctors and patients. To address these concerns, CarePlus offers an innovative solution that enhances patient care through automated appointment reminders via app notifications. The platform enables seamless virtual consultations, allowing patients to connect with doctors from the comfort of their homes. Additionally, CarePlus streamlines the prescription process by generating digital prescriptions and integrating with pharmacies for home delivery, ensuring a more efficient and patient-centric healthcare experience.

1.1 Purpose:

The purpose of this report is to present CarePlus, a healthcare management system designed to automate appointment scheduling, patient registration, and billing while enhancing communication between patients and clinics. Many small private clinics, diagnostic centers, and physiotherapy facilities struggle with manual record-keeping, inefficient scheduling, and lack of real-time patient interaction. CarePlus aims to address these challenges by digitizing patient records, enabling chat-based consultations, and integrating automated reminders and notifications. This system not only improves operational efficiency for doctors, nurses, and clinic staff but also ensures a seamless healthcare experience for patients by offering online appointment booking, digital prescriptions, and real-time updates.

1.2 Problem Statement:

In many small clinics and healthcare centers, managing patient records, scheduling appointments, and handling communication remains a manual and time-consuming process. Paper-based record-keeping often leads to data loss, appointment conflicts, and difficulty in accessing patient history. Additionally, patients face challenges in booking appointments, consulting doctors remotely, and receiving timely updates about their health. The lack of an automated system results in long wait times, mismanagement of schedules, and poor patient engagement.

1.3 Objectives:

- To automate appointment scheduling, registration and billing.
- To provide a feedback system for doctors and patients.
- To build reminders and notification system
- To provide patients with quick and reliable answers through chat support.

1.4 Scope:

- **Application in Small Private Clinics and Diagnostic Centers:**

CarePlus can be implemented in small private clinics and diagnostic centers to streamline patient management, automate scheduling, and improve overall healthcare efficiency.

- **Assistance for Doctors, Nurses, and Receptionists:**

The system helps medical professionals and clinic staff manage patient records efficiently, reducing manual paperwork errors and improving workflow.

- **Application in Physiotherapy and Rehabilitation Centers:**

Physiotherapy and rehabilitation centers can use CarePlus to manage patient appointments, track treatment schedules, and ensure seamless coordination between therapists and patients.

- **Convenience for Patients:**

Patients can easily book appointments, consult doctors online, and receive timely updates, making healthcare more accessible and hassle-free.

- **Convinince for physiotheraphist:**

Can be useful to physiotherapists and therapy coordinators for managing patient appointments and treatment schedules without any problems.

Chapter 2

Proposed System

The CarePlus healthcare management system is designed to automate appointment scheduling, patient registration, billing, and communication, ensuring a seamless experience for both clinics and patients. By digitizing patient records, the system eliminates the risks of data loss and inefficiencies associated with manual record-keeping. CarePlus features an online appointment booking system that allows patients to schedule, reschedule, or cancel appointments with ease. It also provides chat-based consultations, enabling remote communication between patients and doctors. Additionally, automated notifications and reminders via SMS, WhatsApp, email, and in-app alerts help reduce missed appointments. The integration of digital prescriptions with pharmacy services ensures medication accessibility for patients. CarePlus is particularly beneficial for small private clinics, diagnostic centers, physiotherapy, and rehabilitation centers, enhancing healthcare efficiency and patient engagement.

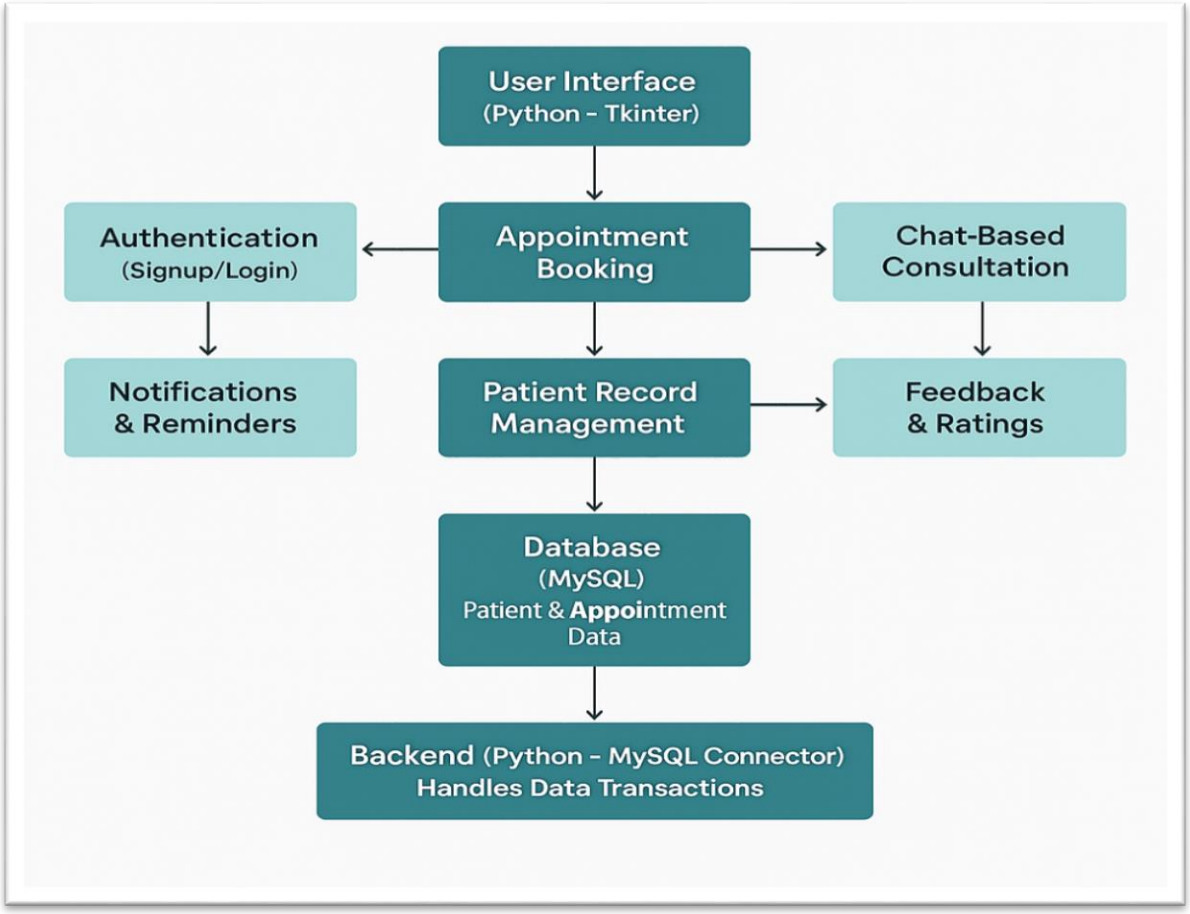


Figure 2.1 Block Diagram

This diagram represents the system architecture of a clinic management application developed using Python and MySQL. The user interacts with the system through a graphical interface built using Tkinter. The core functionalities include user authentication (signup and login), appointment booking, and chat-based consultation. Once authenticated, users can receive notifications and reminders related to their appointments. The system also allows patients to provide feedback and ratings after consultations. All booking activities are linked to patient record management, which maintains and updates patient data. This information is stored in a MySQL database that holds both patient and appointment details. The backend, developed using Python with a MySQL connector, is responsible for handling all data transactions between the application and the database, ensuring smooth and secure operations throughout the system.

2.1. Features & Functionality:

- **Online Appointment Booking System:**

A Patients can select a preferred date and time to book their appointments online. The system also allows them to reschedule or cancel appointments as needed, ensuring flexibility and convenience.

- **Chat-Based Doctor Consultation:**

E CarePlus provides a messaging feature where patients can consult doctors online, discuss symptoms, and receive medical advice without the need for a physical visit to the clinic.

- **Patient Records Management:**

The system maintains a digital record of patient details, including previous consultations and medical history. This helps doctors access complete patient information quickly during appointments.

- **In-App Notifications & Reminders**

Patients can select a preferred date and time to book their appointments online. The system also allows them to reschedule or cancel appointments as needed, ensuring flexibility and convenience.

- **Patient Feedback & Ratings**

After consultations, patients can provide feedback and rate their experience with doctors. This feature helps clinics improve their services and maintain quality healthcare standards.

Chapter 3

Project Outcomes

- **User Authentication and Account Management**

Patients can sign up by creating an account with a username and password. Existing users can log in securely, and a password reset option is available if needed.

- **Appointment Booking and Management**

Patients can book, reschedule, or cancel appointments online. They can also view past appointments for reference.

- **An Online Consultation and Communication**

Accurate Patients can consult doctors through chat, discuss health concerns, and receive medical advice without visiting the clinic.

- **Notifications, Reminders, and Feedback**

Patients receive notifications and reminders for upcoming appointments. After consultations, they can rate doctors and provide feedback to help improve healthcare services.

Chapter 4

Software Requirements

CarePlus: A Smart Clinic

To develop and deploy the CarePlus project we have used following technologies:

1. Programming Language:

- Python (Version 3.13)

Used for implementing the core logic and backend functionality of the project. Python provides a simple and efficient programming environment, making it suitable for developing the project's logic and database interactions.

2.Integrated Development Environment (IDE):

- PyCharm

Utilized for writing, debugging, and running Python code. PyCharm offers features such as intelligent code completion, debugging tools, and seamless integration with databases, making development efficient.

3.Graphical User Interface (GUI) Framework:

- Tkinter

A built-in Python library used for developing the graphical user interface of the project. Tkinter provides various widgets such as buttons, labels, entry fields, and tables, enabling an interactive and user-friendly interface.

4.Database Management System (DBMS):

- MySQL

The CarePlus system utilizes MySQL as the backend database to efficiently manage patient records, appointment scheduling, and other critical healthcare data. MySQL provides a structured and secure way to store and retrieve patient details, ensuring data integrity and easy access for doctors and clinic staff. It allows seamless management of appointments, past medical records, prescription details, and patient feedback, enabling healthcare providers to deliver personalized and efficient services.. By leveraging SQL queries, the system can perform operations like storing patient data, updating appointment statuses, fetching consultation history, and generating reports, making it a robust and scalable solution for clinic manage

Chapter 5

Project Design

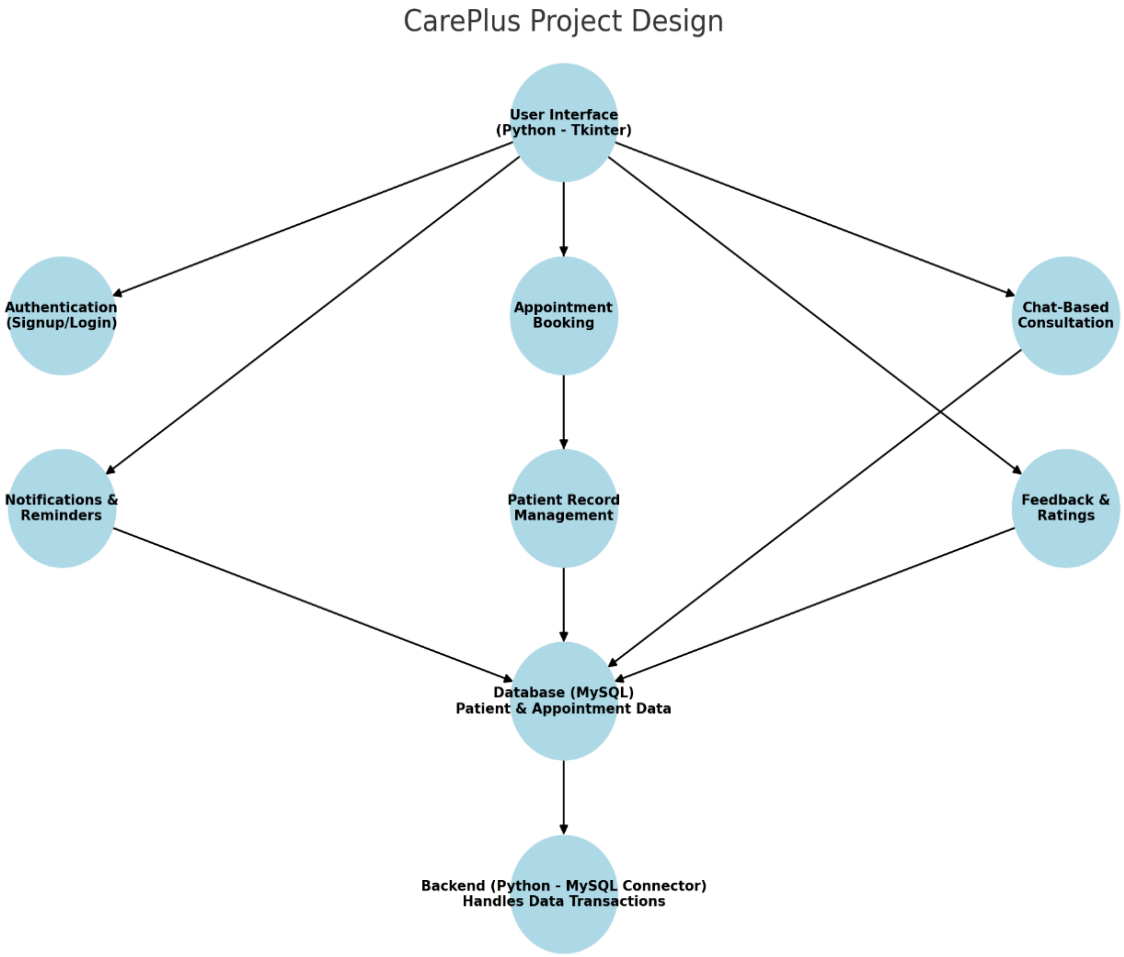


Figure 5.1

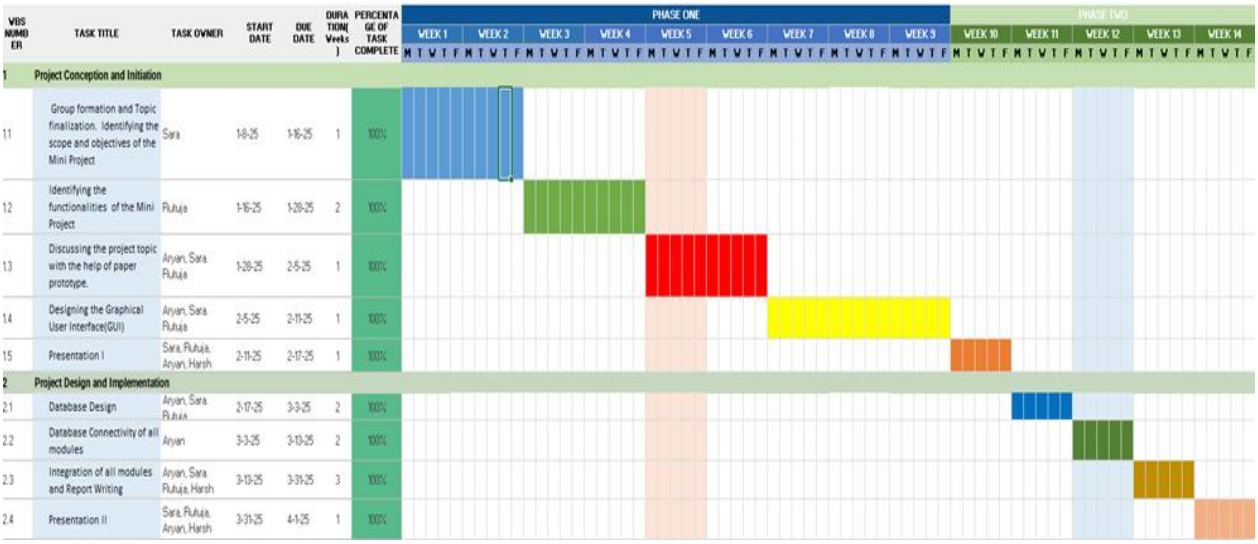
In figure 5.1, we have the introductory page for carePlus where overall user inter flow has been shown. It highlights key features such as account creation, secure login, online appointment booking, chat-based consultations, and real-time notifications. Patients can easily manage appointments, view past visits, and provide feedback. Healthcare providers can efficiently handle patient records, treatment schedules. This design streamlines clinic operations and enhances communication for a seamless healthcare experience.

Chapter 6

Project Scheduling.

GANTT CHART

PROJECT TITLE: CarePlus: A Smart Clinic for Personalized Healthcare
INSTITUTE & DEPARTMENT N
PROJECT GUIDE: Mrs. Veena Trivedi.
DATE:



WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION(Weeks)	PERCENTAGE OF TASK COMPLETE
1	Project Conception and Initiation					
1.1	Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project	Sara	1-8-25	1-16-25	1	100%
1.2	Identifying the functionalities of the Mini Project	Rutuja	1-16-25	1-28-25	2	100%
1.3	Discussing the project topic with the help of paper prototype.	Aryan, Sara, Rutuja	1-28-25	2-5-25	1	100%
1.4	Designing the Graphical User Interface(GUI)	Aryan, Sara, Rutuja	2-5-25	2-11-25	1	100%
1.5	Presentation I	Sara, Rutuja, Aryan, Harsh	2-11-25	2-17-25	1	100%
2	Project Design and Implementation					
2.1	Database Design	Aryan, Sara, Rutuja	2-17-25	3-3-25	2	100%
2.2	Database Connectivity of all modules	Aryan	3-3-25	3-13-25	2	100%
2.3	Integration of all modules and Report Writing	Aryan, Sara, Rutuja, Harsh	3-13-25	3-31-25	3	100%
2.4	Presentation II	Sara, Rutuja, Aryan, Harsh	3-31-25	4-1-25	1	100%

The Gantt chart for the CarePlus project would outline the timeline and sequence of tasks involved in the development of the healthcare management system. It would include key milestones such as system design, feature development, testing, and deployment, helping to manage deadlines and track progress efficiently throughout the project's life cycle.

From Week 1 to Week 14, our mini project titled "CarePlus: A SmartCare Clinic" progressed steadily through key development phases. Initially, we focused on requirement gathering and system design, followed by building the frontend using Tkinter in Python. In the following weeks, we developed modules for patient registration, doctor profiles, appointment booking, and a simple consultation messaging feature. The system was connected to a backend database to store user and appointment data efficiently. By Week 10, we integrated features to view past appointments, and in the final weeks, we conducted testing, debugging, and prepared documentation for submission.

Chapter 7

Results

CarePlus: The CarePlus portal enhances clinic efficiency by automating appointment scheduling, patient management, and billing. It improves communication through chat-based consultations and real-time notifications while ensuring secure digital record-keeping. Patients benefit from easy appointment booking, online consultations, and feedback mechanisms, while healthcare providers can efficiently manage records and schedules. CarePlus streamlines operations, reduces manual errors, and enhances the overall healthcare experience.

- **Welcome Page**

:

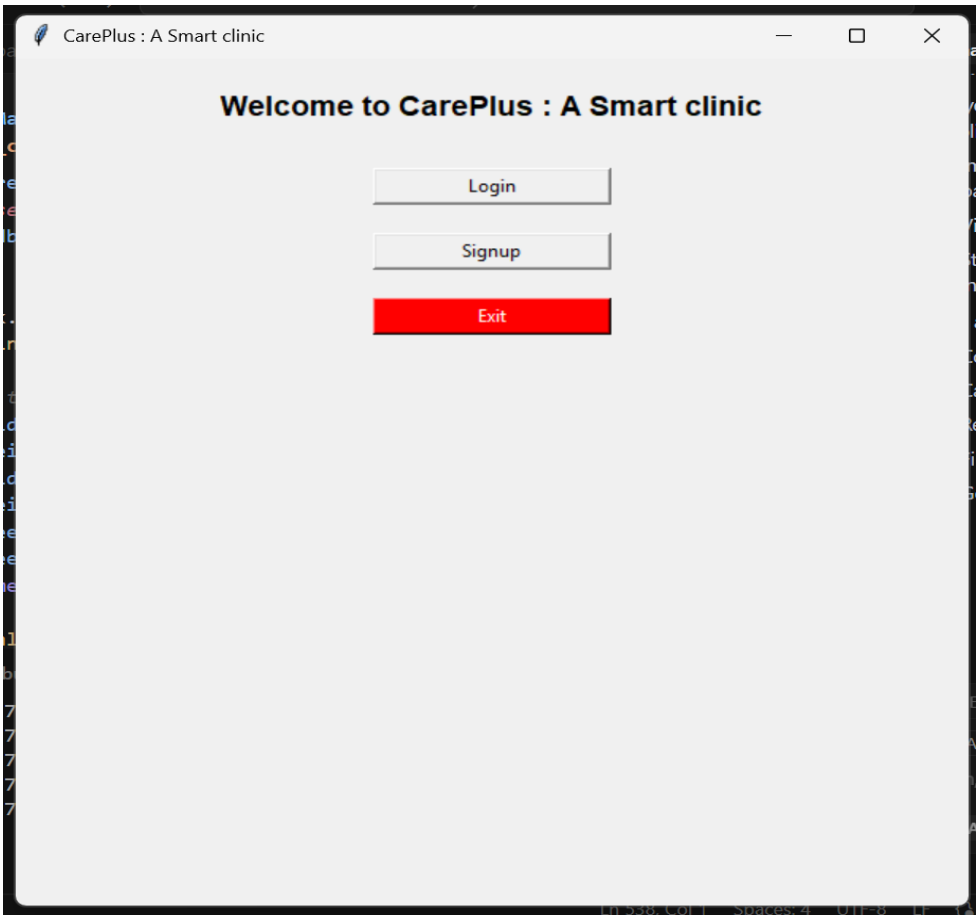


Figure No. 7.1

The page is a welcome page interface for patient using careplus for the first time.

Figure No. 7.2

In Figure 7.2, The page displays the login page and signup page pop up.

- **MAIN MENU UI**

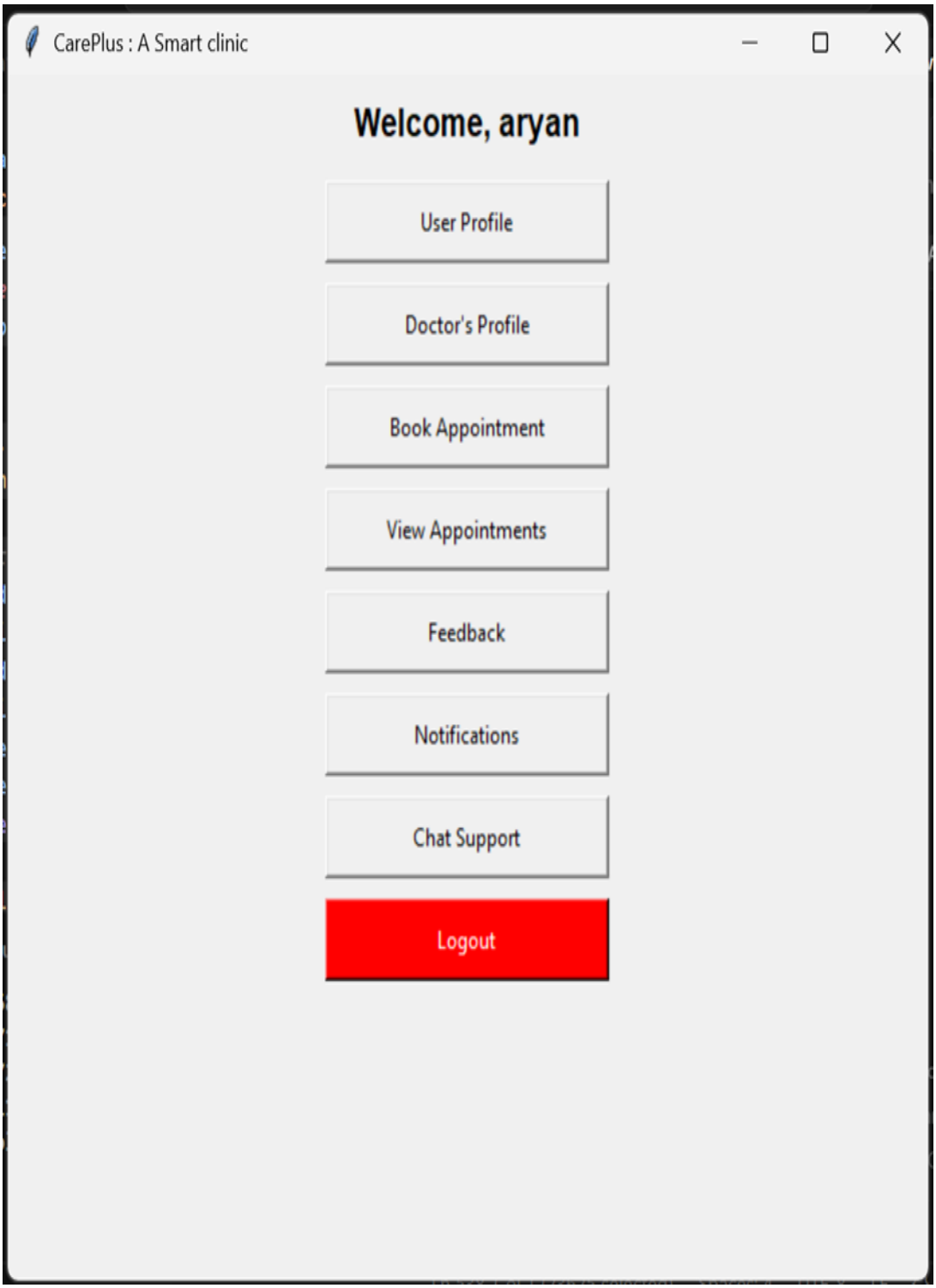


Figure No. 7.3

In Figure No. 7.3, Shows the home page.

- **PATIENT DETAILS UI**

Figure No. 7.4

The above image displays the patient details page where user can add the pesonal details.

- **BOOKED APPOINTMENT UI**

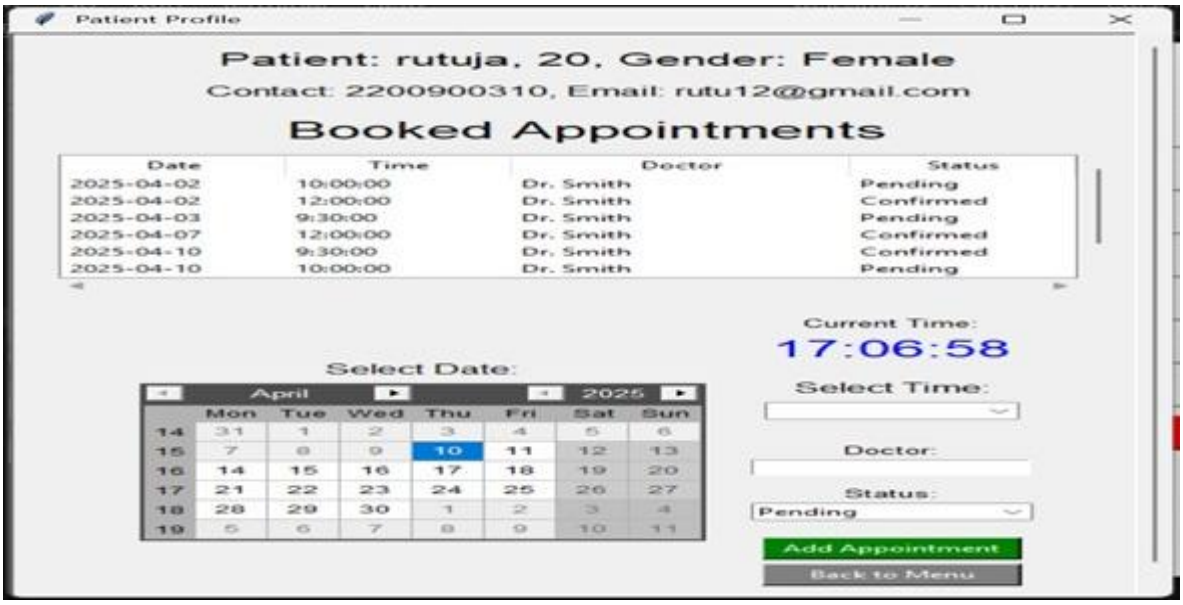


Figure No. 7.5

The above image displays the pending appointments booked by the patient.

- **DOCTORS DETAILS UI**

Figure No. 7.6

In Figure No. 7.4, The image displays the information of doctor including his Experince and Qualification.

- **PATIENT INFO UI**

Figure No. 7.7

The image displays how the patient would book his appointment with providing the details.

- **SLOT SELECTION UI**

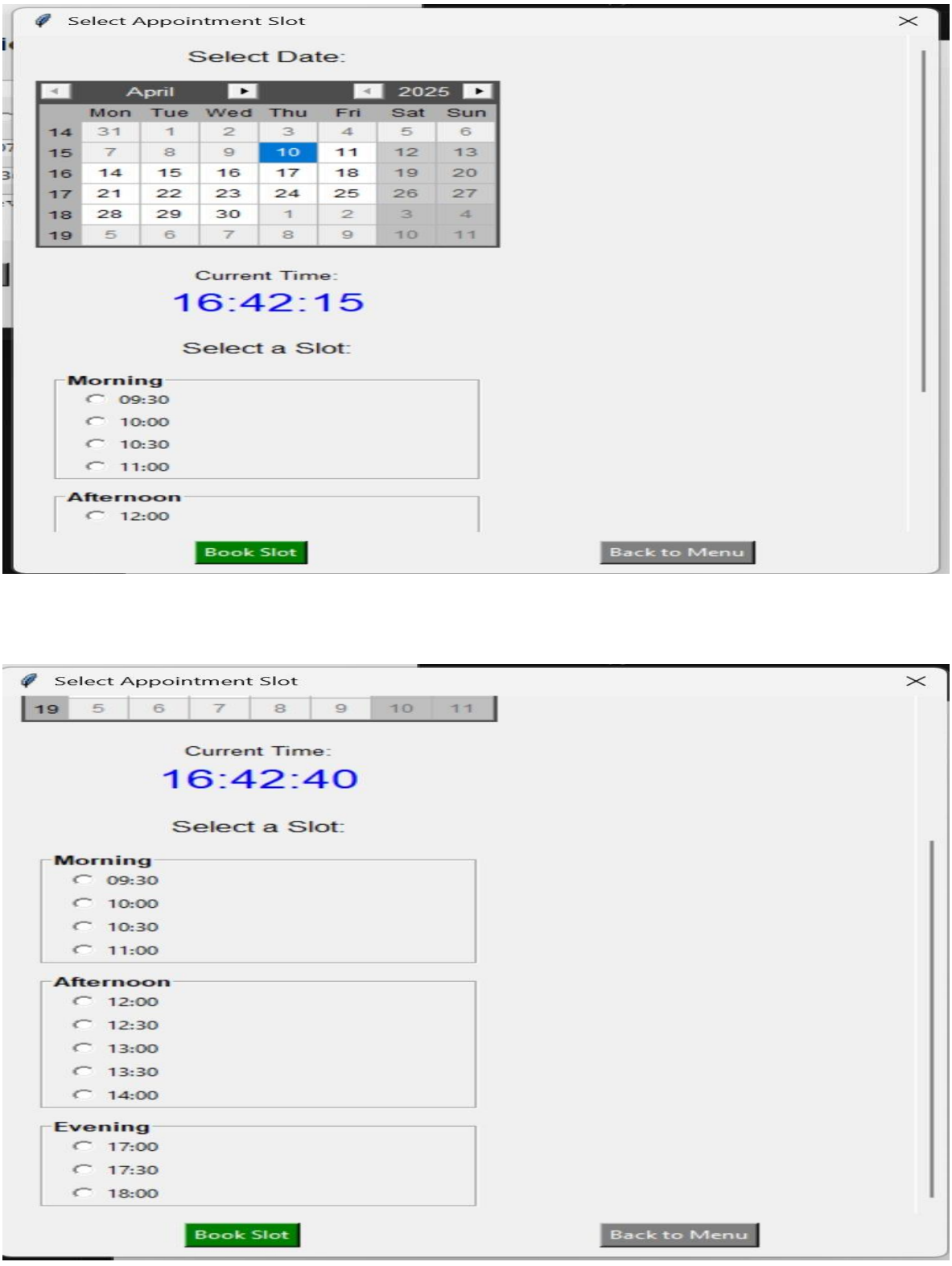


Figure 7.8

The image displays how the patient select his appointment slot.

- **VIEW APPOINTMENT UI**

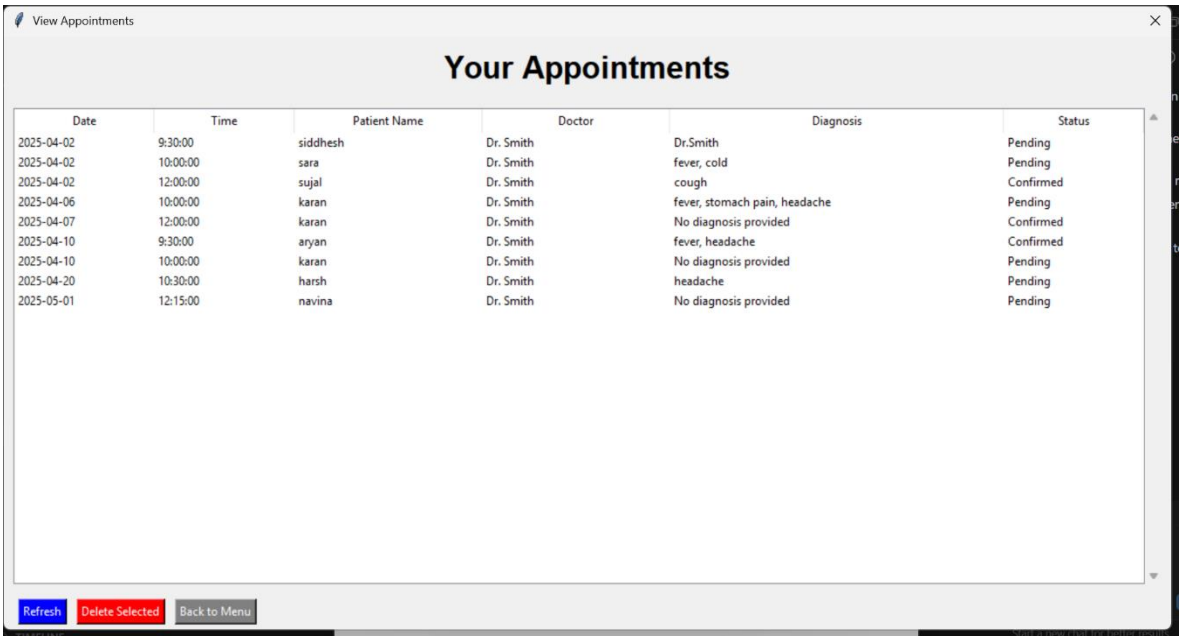


Figure No. 7.9

The image displays users Recent Appointments with details (date, time, patient name, doctor, Diagnosis, Status.

- **FEEDBACK UI**

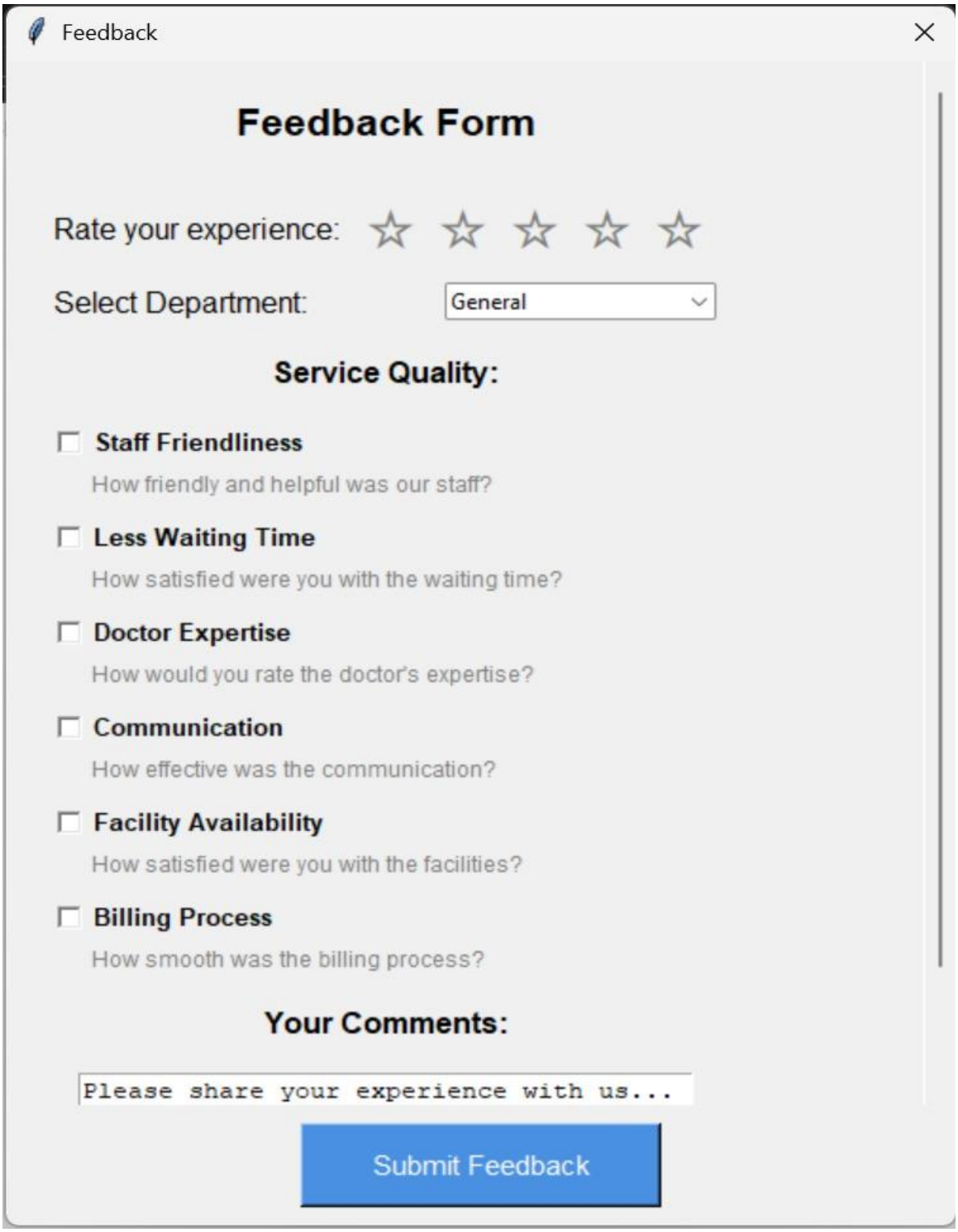


Figure No. 7.11

The The CarePlus Feedback Form allows patients to rate their experience and provide valuable insights on doctor consultations and clinic services. This helps improve healthcare quality and patient satisfaction.

- **CHAT SUPPORT UI**

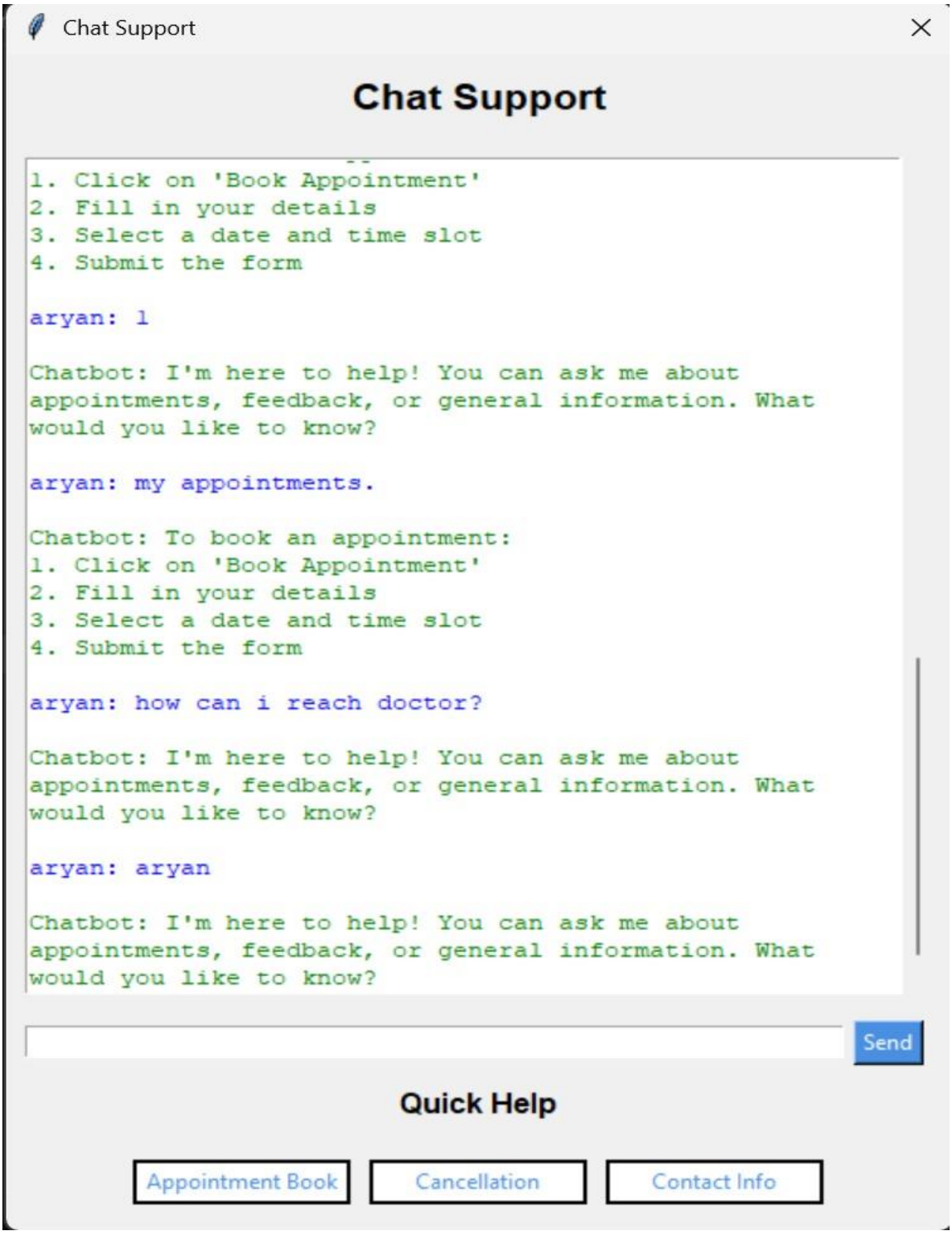


Figure No. 7.12

In Figure No. 7.8, The CarePlus Chat Support feature enables real-time communication between patients and doctors, allowing quick consultations and timely responses to health concerns. This enhances accessibility for the patient

- **Notification UI**

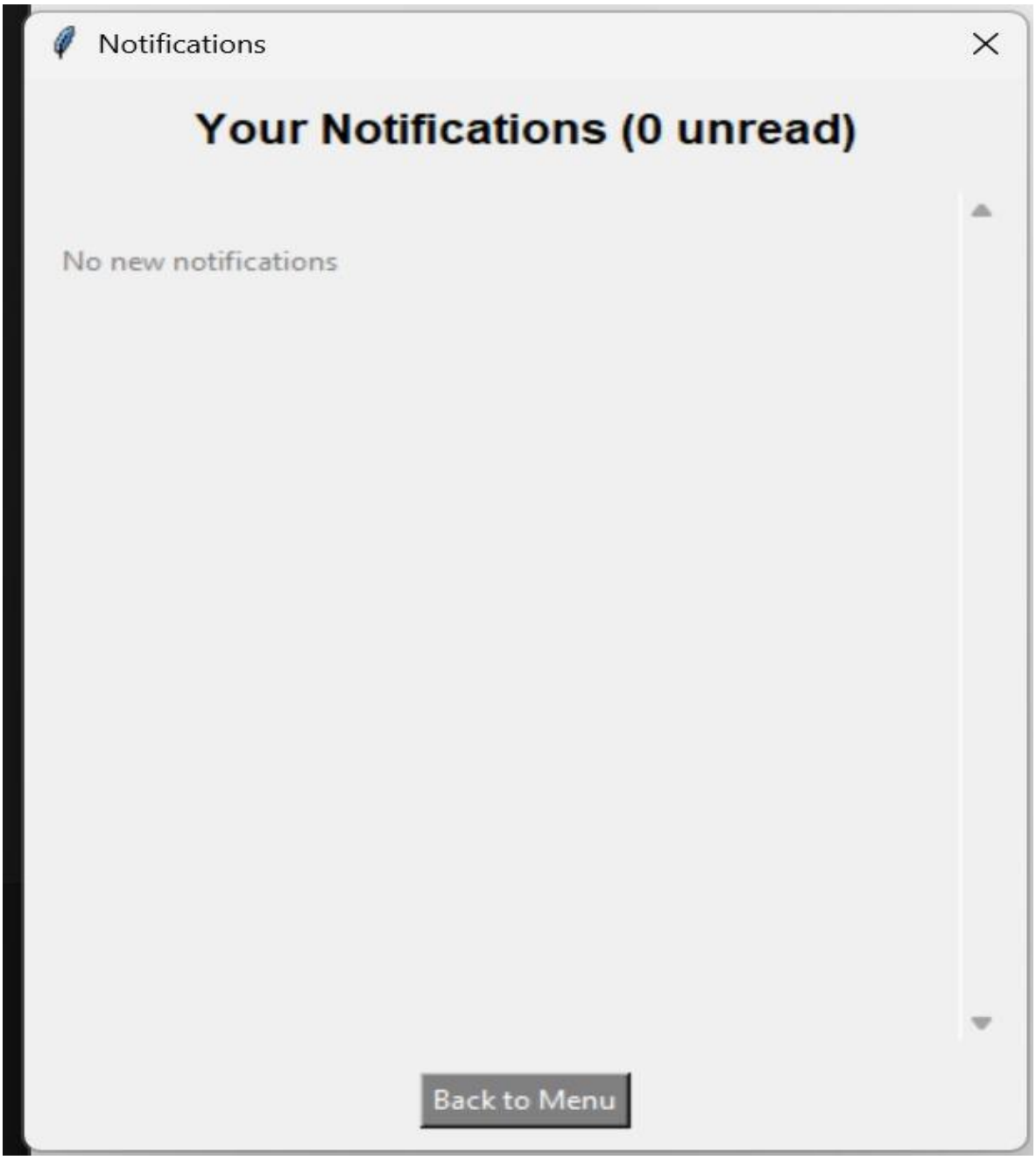


Fig 7.13

The notification UI is designed to alert users about important updates.

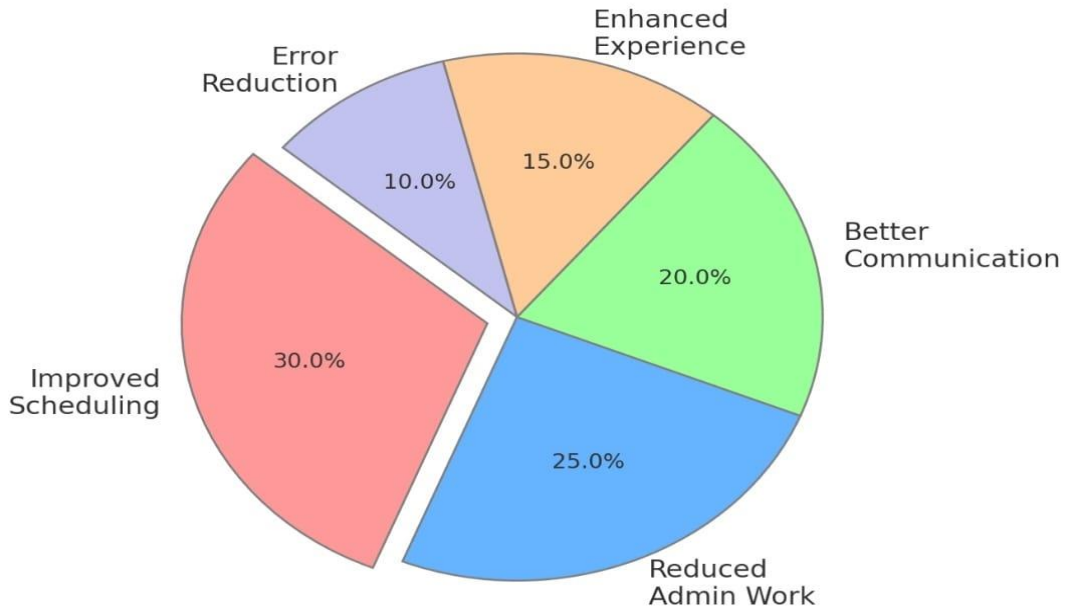


Figure 7.14

Figure 7.14 shows a pie chart representating improved scheduilng, error reduction, enhamced experience, better communication, reduced admin work.

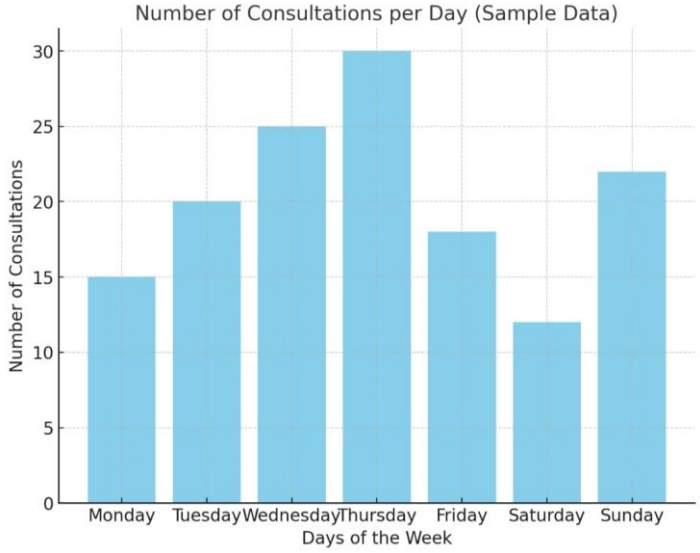


Figure 7.15

Figure 7.15 shows bar graph representing no. of consultations of patients per day in a week.

Chapter 8

Conclusion

The CarePlus Healthcare Management System transforms traditional clinic operations by automating appointment scheduling, patient registration, billing, and record management. By replacing manual processes with a digital platform, it minimizes errors, enhances efficiency, and ensures seamless communication between patients and healthcare providers. Features such as online appointment booking, chat-based consultations, real-time notifications, and feedback mechanisms improve patient accessibility and engagement, making healthcare services more convenient and responsive. With a user-friendly interface built using Python (Tkinter) and a secure MySQL backend, CarePlus provides a scalable solution suitable for small clinics, diagnostic centers, and physiotherapy facilities. It simplifies workflow management for doctors, nurses, and receptionists while ensuring a smooth experience for patients. By integrating automation and digital record-keeping, CarePlus enhances service quality, reduces administrative burdens, and contributes to a more efficient and patient-centered healthcare system.

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