PatientFlow: Efficient Patient Appointment Management for Rural Clinics

Overview

PatientFlow is a lightweight desktop-based appointment booking and queue management system designed to streamline Outpatient Department (OPD) processes, especially for rural clinics with limited resources. The system enables patients to book appointments through a simple GUI while allowing doctors or receptionists to manage and monitor the appointment queue in real time.

Objectives

- Reduce long wait times in rural OPDs.
- Allow patients to pre-book 10-minute slots within preferred time brackets.
- Provide a live-updating dashboard for doctors to monitor, check in, or mark absentees.
- Ensure clean UI/UX with support for dark and light modes.
- Build a system ready for future cloud-based multi-device syncing.

Key Features

1. Patient-Side Application

- Built using **Tkinter** for a clean and responsive GUI.
- Allows users to enter:
- Full Name
- Age
- Gender
- Preferred Time Bracket (e.g., 10:00–11:00 AM)
- Automatically assigns the next available 10-minute time slot within the selected bracket.
- Prevents double-booking by checking existing reservations from a shared JSON file (queue_data.json).
- Notifies patients of successful bookings or if a time bracket is full.
- Dynamic theming based on dark/light mode (Mac).

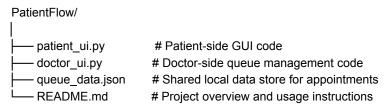
2. Doctor-Side Application

- Loads and displays the current queue from the same JSON file.
- Auto-sorts appointments based on time.
- Allows searching and filtering by patient name.
- Supports:
- Mark Checked
- Mark Absent
- Reset Filters
- Uses color-coding for status:
- Pending (Grey)
- Checked (Green)
- Absent (Red)
- Auto-refresh every 3 seconds to simulate real-time updates.

Technology Stack

- Frontend & Logic: Python 3, Tkinter
- Local Data Store: JSON (queue data.json)
- Platform Support: Mac, Windows (Dark mode supported on Mac)

File Structure



Future Enhancements

- **Firebase Integration:** Replace local JSON with real-time Firestore DB to support syncing across multiple devices.
- Slot Customization: Add the ability to configure slot duration and clinic timings.
- Mobile App: Flutter-based interface for broader accessibility.
- Notifications: Email or SMS reminders for upcoming appointments.

Conclusion

PatientFlow offers a practical and scalable foundation for digitising appointment workflows in under-resourced clinics. It enhances patient experience, reduces idle time for doctors, and lays the groundwork for a fully cloud-based healthcare system.