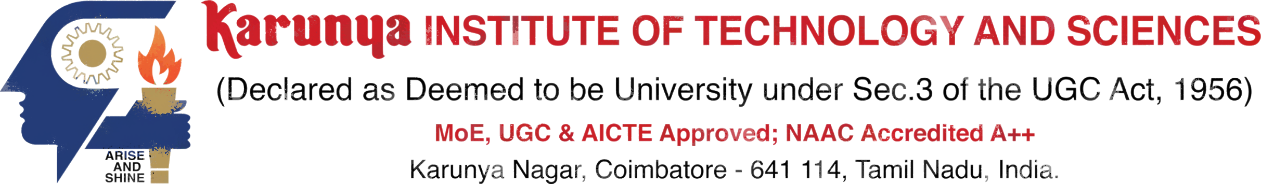
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**DOCTOR-PATIENT DATABASE**

***A Mini Project report submitted by***

**JONATHAN THOMAS MATHEWS - URK21CS2036**

***in partial fulfillment for the award of the degree of***

**BACHELOR OF TECHNOLOGY**

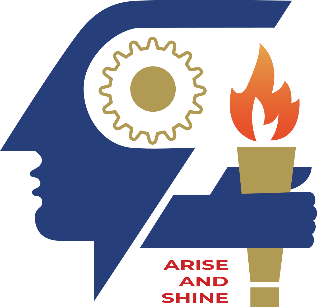
***in***

**COMPUTER SCIENCE AND ENGINEERING**

***under the supervision of***

**Dr. E. Grace Mary Kanaga (M.Tech. Ph.D)**

**Professor**



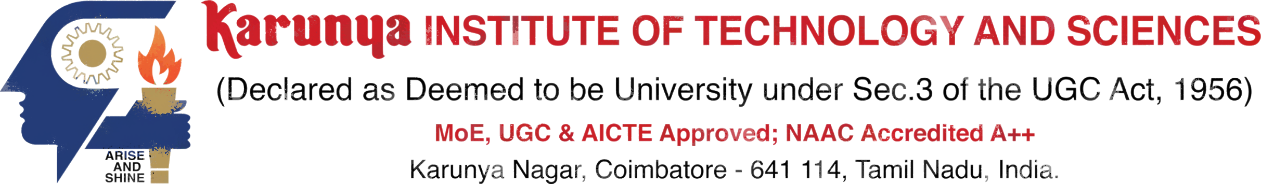
**DIVISION** **OF COMPUTER SCIENCE AND ENGINEERING**

**SCHOOL OF COMPUTER SCIENCE AND TECHNOLOGY**

**KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES**

(Declared as Deemed to be University under Sec-3 of the UGC Act, 1956)

**Karunya Nagar, Coimbatore - 641 114. INDIA**

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**DIVISION OF COMPUTER SCIENCE AND ENGINEERING**

**BONAFIDE CERTIFICATE**

This is to certify that the project report entitled, “DOCTOR-PATIENT DATABASE” is a bonafide record of Mini Project work done for the subject 20CS2016 – DATABASE MANAGEMENT SYSTEMS during the academic year 2023-2024 by

**JONATHAN THOMAS MATHEWS (Reg. No: URK21CS2036)**

in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering of Karunya Institute of Technology and Sciences.

**Guide Signature**

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7. **ACKNOWLEDGEMENT**

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1. **INTRODUCTION**
   1. **ABSTRACT**

Modern healthcare systems rely on efficient and secure information management. This paper presents the design and implementation of a comprehensive doctor-patient application utilizing an SQLite database to facilitate interactions and data storage within the healthcare domain. The application comprises four main components: patient management, doctor management, medical records storage, and login credentials management. A robust database schema captures patient and doctor information, forging relationships between them and ensuring data consistency through various integrity triggers.

The "patients" table stores essential patient details such as name, date of birth, gender, and their associated doctors. The application's architecture allows for the seamless addition of new patients and doctors. A companion "doctors" table is dedicated to managing healthcare providers, recording their names and specializations.

Security and privacy are paramount in healthcare applications. The "patient\_credentials" and "doctor\_credentials" tables enable secure authentication for both patients and doctors, safeguarding sensitive patient data.

To maintain data integrity, this application employs triggers. These triggers validate input data, checking the age, doctor IDs, and gender provided, ensuring they conform to predefined constraints. This safeguards the database from incorrect or malicious data.

The "doctor\_reports" table provides a framework for recording medical reports, linking patients and doctors. The structure allows healthcare providers to maintain patient medical records, including vital signs and diagnostic information.

The doctor-patient application presented herein demonstrates a well-structured database schema, secure authentication, and data integrity enforcement, crucial for the successful operation of modern healthcare systems. This application can be used as a foundation for healthcare providers to improve patient care, streamline processes, and maintain the security and privacy of sensitive medical data.

The doctor-patient application stands as a practical solution to the challenges of managing healthcare information in an era of digital transformation. By combining structured database management, security measures, and data integrity enforcement, it provides a solid foundation for healthcare institutions aiming to deliver quality care, streamline operations, and uphold the privacy and confidentiality of patient records. This application serves as a model for the development of advanced healthcare information systems that contribute to improved patient outcomes and enhanced doctor-patient relationships.

* 1. **SCOPE AND OBJECTIVES**

The doctor-patient application project represents a holistic approach to healthcare management, encompassing several key aspects:

1. Patient Registration and Management: The application facilitates the seamless registration and management of patients, including their personal information, medical history, and assigned healthcare providers (doctors).
2. Doctor Management: The system also provides a comprehensive database for doctors, including their credentials and areas of specialization. This ensures that patients are matched with the most appropriate healthcare providers.
3. Security and Access Control: Robust security measures, including user authentication, ensure that patient data remains confidential and is accessible only to authorized individuals.
4. Patient-Doctor Interaction: The application promotes effective communication between patients and their doctors, allowing for the sharing of medical reports and updates.
5. Medical Records: The system securely stores and manages detailed medical records, including diagnosis, assessments, and treatment plans.

**Project Objectives:**

1. To design and implement a database that efficiently handles patient and doctor information, establishing a robust foundation for the application.
2. To create user-friendly interfaces for both patients and doctors, offering intuitive access to relevant information.
3. To enforce stringent security measures, safeguarding sensitive medical data in compliance with privacy regulations.
4. To establish communication channels between patients and doctors, enabling remote monitoring and consultations.
5. To provide a centralized repository for medical records, ensuring easy retrieval of patient history and reports.
6. **ANALYSIS AND DESIGN**

The doctor-patient application is a comprehensive healthcare management system designed to streamline the interactions between healthcare providers and their patients. The analysis and design of this system encompass various critical aspects, from data storage and management to user interfaces and security features.

1. Database Design:

Analysis: The foundation of the doctor-patient application is the database, which stores and manages patient and doctor information. The database schema consists of three primary tables: patients, doctors, and patient\_credentials. The patients table includes essential patient details such as name, date of birth, gender, and assigned doctor. The doctors table stores doctor information, including their name and specialization. The patient\_credentials table contains login credentials for patients.

Design: The database design ensures data integrity and relationships between patients, doctors, and their respective credentials. Foreign key constraints maintain the association between patients and their assigned doctors. Additionally, triggers are implemented to enforce data validation rules, such as checking for valid ages, doctor IDs, and gender values. These measures contribute to the reliability and accuracy of the stored data.

2. User Interfaces:

Analysis: User interfaces play a pivotal role in ensuring a user-friendly experience for both patients and doctors. Patients can access and update their personal information, while doctors can view their profiles and specialization details. This analysis involves understanding the specific data fields and functionalities needed for each user type.

Design: The user interface design involves creating forms and views that allow patients to manage their profiles and communicate with their doctors. Doctors, on the other hand, can access their profiles and specialization details through their interfaces. The design ensures that data is presented in an organized and intuitive manner, enhancing user experience.

3. Security Measures:

Analysis: Security is a paramount concern, given the sensitive medical data stored in the application. Unauthorized access to patient information can lead to privacy breaches and legal consequences.

Design: To address this concern, the application incorporates robust security measures. The patient\_credentials and doctor\_credentials tables store login information securely. User authentication is required to access the application. Additionally, foreign key constraints are used to maintain data integrity, and triggers ensure the validation of data before insertion. All of these security features collectively safeguard patient information from unauthorized access.

4. Patient-Doctor Interaction:

Analysis: Effective communication between patients and doctors is a fundamental requirement of the application, allowing patients to share their medical reports and updates with their healthcare providers.

Design: To facilitate this interaction, the doctor\_reports table is designed to store medical reports, including vital signs, examinations, assessments, and diagnoses. This information can be accessed and updated by both patients and doctors through their respective interfaces, enabling remote monitoring and consultations.

5. Extensibility:

Analysis: An important aspect of the design is the potential for future growth and extension of the application. Healthcare is a dynamic field with evolving needs, and the system should be adaptable to accommodate these changes.

Design: The system is designed to be extensible, allowing for the addition of new features, modules, or data fields in response to changing requirements. For example, the application can easily incorporate telemedicine capabilities, electronic health records (EHR) integration, and data analytics for improved patient care. This adaptability ensures that the application remains relevant and useful over time.

6. Scalability:

Analysis: Scalability is crucial to handle a growing number of patients and doctors who may use the application. The system must efficiently manage increased data and user loads.

Design: The database design is structured to handle scalability by optimizing queries and indexing key fields. The use of triggers for data validation helps maintain system performance even with a growing dataset. Additionally, the application's architecture can be hosted on scalable cloud infrastructure to handle increased traffic and data storage requirements.

7. User Training and Support:

Analysis: Effective user training and support are essential to ensure that patients and doctors can use the application confidently and efficiently.

Design: The design includes provisions for user training materials, guides, and a support system. Video tutorials, FAQs, and a responsive helpdesk are planned to assist users in navigating the application and addressing any queries or issues they may encounter.

1. **IMPLEMENTATION**

**4.1 THEORY**

The implementation phase of the doctor-patient application involves translating the designed system into functional code. It covers the creation and deployment of the two main components: the patient management system and the doctor's reporting system. Let's delve into the details of their implementation.

1. Patient Management System:

The patient management system is designed to handle patient records, appointments, and user authentication.

Implementation Steps:

Database Creation: SQLite is used as the relational database management system. The code includes SQL statements to create tables for patients, doctors, patient credentials, doctor reports, and doctor credentials. The schema ensures data integrity and supports relationships between patients and doctors.

Data Population: The code inserts sample data into the patient and doctor tables using the executemany method. This populates the database with initial patient and doctor information, including names, genders, and specialization.

User Authentication: The system provides a basic form of user authentication by creating a patient credentials table to store usernames and passwords. The executemany method inserts sample login data.

Triggers for Data Validation: Triggers are created to enforce data validation rules before inserting patient information. These triggers ensure that data such as age, doctor IDs, and gender conform to expected formats.

2. Doctor's Reporting System:

The doctor's reporting system focuses on storing and managing medical reports generated by doctors.

Implementation Steps:

Report Table Creation: A dedicated table, 'doctor\_reports,' is created to store medical reports. This table captures essential data, including patient details, report date, vital signs, and medical assessments.

Database Relationships: Foreign key constraints are applied to establish relationships between the 'doctor\_reports' table and the 'patients' and 'doctors' tables. This ensures that reports are associated with the correct patients and doctors.

Database Triggers: A trigger is used to disable foreign key constraints temporarily while inserting data to avoid conflicts, and then re-enables them afterward.

Doctor Credential Table: A table is created to manage doctor credentials, providing a secure login mechanism for doctors. Sample login data is inserted.

Implementation of Extensibility and Scalability:

The design ensures extensibility and scalability. The application structure allows for future additions of features, such as telemedicine capabilities or electronic health records integration, without major architectural changes. Additionally, the use of SQLite as a backend database facilitates scalability, and the system can be hosted on scalable cloud infrastructure to manage increased user loads efficiently.

Implementation of User Interface:

The doctor-patient application's user interface is a critical aspect of the implementation. The GUI would allow doctors to access patient records, create medical reports, and manage patients. Patients would use the interface to access their medical history and doctor details so that they may book their next appointment.

Implementation of Report Generation:

For the doctor's reporting system, the code establishes a 'doctor\_reports' table for storing medical reports. The actual implementation would involve a user-friendly interface for doctors to generate, edit, and save medical reports. These reports may include structured forms for entering patient information and medical findings. Implementation would include generating PDF reports for printing or digital sharing, ensuring the records are easily accessible and can be shared securely.

Implementation of Data Security:

While the code initializes tables and triggers for data validation, a complete implementation would include comprehensive data security measures. This involves encryption of sensitive data, securing communication channels, and regular data backups to prevent data loss. It's essential to protect patient information, comply with data protection laws, and maintain the confidentiality of medical records.

**4.2 SOURCE CODE**

1. **medical\_app.py**

import sqlite3

from datetime import date

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute('''

CREATE TABLE IF NOT EXISTS patients (

patient\_id INTEGER PRIMARY KEY,

name TEXT NOT NULL,

dob DATE NOT NULL,

gender TEXT NOT NULL,

doctor\_id INTEGER,

FOREIGN KEY (doctor\_id) REFERENCES doctors(doctor\_id)

);

''')

patients\_data = [

(1, 'John Doe', date(1988, 5, 12), 'Male', 1),

(2, 'Jane Smith', date(1995, 9, 23), 'Female', 2),

(3, 'Bob Johnson', date(1978, 11, 3), 'Male', 1),

(4, 'Alice Brown', date(1990, 7, 15), 'Female', 3),

(5, 'Michael Wilson', date(1973, 3, 30), 'Male', 2),

(6, 'Sarah Davis', date(1981, 12, 8), 'Female', 1),

(7, 'David Lee', date(1963, 8, 21), 'Male', 2),

(8, 'Emily White', date(1996, 2, 14), 'Female', 3),

(9, 'James Clark', date(1975, 6, 6), 'Male', 1),

(10, 'Olivia Taylor', date(1990, 10, 7), 'Female', 2)

]

cursor.executemany("INSERT INTO patients (patient\_id, name, dob, gender, doctor\_id) VALUES (?, ?, ?, ?, ?)", patients\_data)

cursor.execute("""

CREATE TABLE IF NOT EXISTS doctors (

doctor\_id INTEGER PRIMARY KEY,

name TEXT,

specialization TEXT

)

""")

doctors\_data = [

(1, "Dr. John Doe", "Cardiologist"),

(2, "Dr. Jane Smith", "Pediatrician"),

(3, "Dr. Robert Johnson", "Dermatologist"),

(4, "Dr. Rita Suresh", "General Practioner")

]

cursor.executemany("INSERT INTO doctors (doctor\_id, name, specialization) VALUES (?, ?, ?)", doctors\_data)

cursor.execute('''

CREATE TABLE IF NOT EXISTS patient\_credentials (

patient\_id INTEGER PRIMARY KEY,

username TEXT,

password TEXT NOT NULL

);

''')

login\_data = [

(1, "jeevan", "jk123"),

(2, "jobin", "joby746"),

(3, "sharon", "sherry1234"),

(4, "harold", "cooper1968")

]

cursor.executemany("INSERT INTO patient\_credentials (patient\_id, username, password) VALUES (?, ?, ?)", login\_data)

cursor.execute("""

CREATE TABLE IF NOT EXISTS doctor\_reports (

report\_id INTEGER PRIMARY KEY,

patient\_id INTEGER,

patient\_name TEXT,

doctor\_id INTEGER,

report\_date TEXT,

blood\_pressure TEXT,

pulse\_rate TEXT,

respiratory\_rate TEXT,

body\_temperature TEXT,

oxygen\_saturation TEXT,

head\_exam TEXT,

chest\_exam TEXT,

abdominal\_exam TEXT,

extremities\_exam TEXT,

assessment TEXT,

diagnosis TEXT,

FOREIGN KEY (patient\_id) REFERENCES patients (patient\_id),

FOREIGN KEY (doctor\_id) REFERENCES doctors (doctor\_id)

)

""")

cursor.execute('''

CREATE TABLE IF NOT EXISTS doctor\_credentials (

doctor\_id INTEGER PRIMARY KEY,

username TEXT,

password TEXT NOT NULL

);

''')

login1\_data = [

(1, "johndoe", "jd123"),

(2, "janesmith", "janes123"),

(3, "robertjohnson", "robert123"),

(4, "ritasuresh", "rita123")

]

cursor.executemany("INSERT INTO doctor\_credentials (doctor\_id, username, password) VALUES (?, ?, ?)", login1\_data)

cursor.execute('''PRAGMA foreign\_keys = OFF;''')

cursor.execute('''CREATE TRIGGER check\_age

BEFORE INSERT ON patients

BEGIN

SELECT CASE

WHEN (NEW.age NOT NULL AND NEW.age NOT LIKE '%[^0-9]%') THEN

RAISE(IGNORE)

ELSE

RAISE(ROLLBACK, 'Age must be a valid integer')

END;

END;''')

cursor.execute('''CREATE TRIGGER check\_doctor\_id

BEFORE INSERT ON patients

BEGIN

SELECT CASE

WHEN (NEW.doctor\_id NOT NULL AND NEW.doctor\_id NOT LIKE '%[^0-9]%') THEN

RAISE(IGNORE)

ELSE

RAISE(ROLLBACK, 'Doctor ID must be a valid integer')

END;

END;''')

cursor.execute('''CREATE TRIGGER check\_gender

BEFORE INSERT ON patients

BEGIN

SELECT CASE

WHEN (NEW.gender IS NULL OR NEW.gender IN ('Male', 'Female', 'Other')) THEN

RAISE(IGNORE)

ELSE

RAISE(ROLLBACK, 'Invalid gender')

END;

END;''')

cursor.execute('''PRAGMA foreign\_keys = ON;''')

conn.commit()

conn.close()

1. **login.py**

import tkinter as tk

from tkinter import ttk, messagebox

import sqlite3

from datetime import datetime

from tkcalendar import DateEntry

current\_doctor\_id = None

current\_patient\_id = None

def clear\_entry\_fields():

doctor\_username\_entry.delete(0, "end")

doctor\_password\_entry.delete(0, "end")

patient\_username\_entry.delete(0, "end")

patient\_password\_entry.delete(0, "end")

def doctor\_login():

global current\_doctor\_id

username = doctor\_username\_entry.get()

password = doctor\_password\_entry.get()

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute("SELECT \* FROM doctor\_credentials WHERE username = ? AND password = ?", (username, password))

doctor = cursor.fetchone()

conn.close()

if doctor:

current\_doctor\_id = doctor[0]

clear\_entry\_fields()

open\_doctor\_app()

else:

messagebox.showerror("Login Error", "Invalid credentials for doctor.")

clear\_entry\_fields()

def patient\_login():

global current\_patient\_id

username = patient\_username\_entry.get()

password = patient\_password\_entry.get()

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute("SELECT \* FROM patient\_credentials WHERE username = ? AND password = ?", (username, password))

patient = cursor.fetchone()

conn.close()

if patient:

current\_patient\_id = patient[0]

clear\_entry\_fields()

open\_patient\_app()

else:

messagebox.showerror("Login Error", "Invalid credentials for patient.")

clear\_entry\_fields()

def open\_doctor\_app():

doctor\_window = tk.Toplevel(root)

doctor\_window.title("Doctor Application")

doctor\_window.geometry("800x600")

notebook = ttk.Notebook(doctor\_window)

notebook.pack(fill="both", expand=True)

def add\_patient():

name = add\_name\_entry.get()

dob = add\_dob\_entry.get\_date().strftime('%Y-%m-%d')

gender = add\_gender\_var.get()

doctor\_id = add\_doctorid\_entry.get()

try:

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute("INSERT INTO patients (name, dob, gender, doctor\_id) VALUES (?, ?, ?, ?)", (name, dob, gender, doctor\_id))

conn.commit()

conn.close()

messagebox.showinfo("Success", "Patient details added successfully!")

except sqlite3.Error as e:

messagebox.showerror("Error", str(e))

def view\_patients():

if current\_doctor\_id is not None:

view\_window = tk.Toplevel(root)

view\_window.title("View Patients")

view\_window.configure(bg="lightgray")

try:

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute("SELECT \* FROM patients WHERE doctor\_id=?", (current\_doctor\_id,))

patients = cursor.fetchall()

text\_widget = tk.Text(view\_window)

text\_widget.config(borderwidth=1, relief="solid")

text\_widget.pack()

for patient in patients:

text\_widget.insert(tk.END, f"Patient ID: {patient[0]}\n")

text\_widget.insert(tk.END, f"Name: {patient[1]}\n")

text\_widget.insert(tk.END, f"Age: {patient[2]}\n")

text\_widget.insert(tk.END, f"Gender: {patient[3]}\n")

text\_widget.insert(tk.END, f"Doctor ID: {patient[4]}\n")

text\_widget.insert(tk.END, "\n")

conn.close()

except sqlite3.Error as e:

messagebox.showerror("Error", str(e))

else:

messagebox.showerror("Error", "No doctor is currently logged in.")

def search\_patients():

search\_term = search\_entry.get()

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

try:

cursor.execute("SELECT \* FROM patients WHERE name LIKE ? OR patient\_id = ? AND doctor\_id = ?", ('%' + search\_term + '%', search\_term, current\_doctor\_id))

patients = cursor.fetchall()

if patients:

search\_results\_window = tk.Toplevel(root)

search\_results\_window.title("Search Results")

text\_widget = tk.Text(search\_results\_window)

text\_widget.pack()

for patient in patients:

text\_widget.insert(tk.END, f"Patient ID: {patient[0]}\n")

text\_widget.insert(tk.END, f"Name: {patient[1]}\n")

text\_widget.insert(tk.END, f"Age: {patient[2]}\n")

text\_widget.insert(tk.END, f"Gender: {patient[3]}\n")

text\_widget.insert(tk.END, f"Doctor ID: {patient[4]}\n")

text\_widget.insert(tk.END, "\n")

except sqlite3.Error as e:

messagebox.showerror("Error", str(e))

finally:

conn.close()

def update\_patient():

try:

patient\_id = new\_patient\_id\_entry.get()

new\_name = new\_name\_entry.get()

new\_dob = new\_dob\_entry.get\_date().strftime('%Y-%m-%d')

new\_gender = new\_gender\_var.get()

try:

new\_doctor\_id = int(new\_doctor\_id\_entry.get())

except ValueError:

messagebox.showerror("Error", "Invalid doctor ID. Please enter valid ID.")

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute("UPDATE patients SET name=?, dob=?, gender=?, doctor\_id=? WHERE patient\_id=?", (new\_name, new\_dob, new\_gender, new\_doctor\_id, patient\_id))

conn.commit()

conn.close()

messagebox.showinfo("Success", "Patient details updated successfully!")

except ValueError:

messagebox.showerror("Error", "Invalid patient ID or doctor ID. Please enter valid IDs.")

except sqlite3.Error as e:

messagebox.showerror("Error", str(e))

def view\_doctors():

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute("SELECT \* FROM doctors")

doctors = cursor.fetchall()

text\_widget = tk.Text(view\_doctor)

text\_widget.pack()

for doctor in doctors:

text\_widget.insert(tk.END, f"Doctor ID: {doctor[0]}\n")

text\_widget.insert(tk.END, f"Name: {doctor[1]}\n")

text\_widget.insert(tk.END, f"Specialization: {doctor[2]}\n")

text\_widget.insert(tk.END, "\n")

conn.close()

def submit\_report():

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

patient\_id = patient\_id\_entry.get()

doctor\_id = doctor\_id\_entry.get()

patient\_name = patient\_name\_entry.get()

report\_date = report\_date\_entry.get()

blood\_pressure = blood\_pressure\_entry.get()

pulse\_rate = pulse\_rate\_entry.get()

respiratory\_rate = respiratory\_rate\_entry.get()

body\_temperature = body\_temperature\_entry.get()

oxygen\_saturation = oxygen\_saturation\_entry.get()

head\_exam = head\_exam\_entry.get("1.0", tk.END)

chest\_exam = chest\_exam\_entry.get("1.0", tk.END)

abdominal\_exam = abdominal\_exam\_entry.get("1.0", tk.END)

extremities\_exam = extremities\_exam\_entry.get("1.0", tk.END)

assessment = assessment\_text.get("1.0", tk.END)

diagnosis = diagnosis\_entry.get("1.0", tk.END)

cursor.execute("INSERT INTO doctor\_reports (patient\_id, doctor\_id, patient\_name, report\_date, blood\_pressure, pulse\_rate, respiratory\_rate, body\_temperature, oxygen\_saturation, head\_exam, chest\_exam, abdominal\_exam, extremities\_exam, assessment, diagnosis) VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?)", (patient\_id, doctor\_id, patient\_name, report\_date, blood\_pressure, pulse\_rate, respiratory\_rate, body\_temperature, oxygen\_saturation, head\_exam, chest\_exam, abdominal\_exam, extremities\_exam, assessment, diagnosis))

conn.commit()

conn.close()

messagebox.showinfo("Success", "Patient Report submitted successfully!")

patient\_name\_entry.delete(0, tk.END)

doctor\_id\_entry.delete(0, tk.END)

report\_date\_entry.delete(0, tk.END)

blood\_pressure\_entry.delete(0, tk.END)

pulse\_rate\_entry.delete(0, tk.END)

respiratory\_rate\_entry.delete(0, tk.END)

body\_temperature\_entry.delete(0, tk.END)

oxygen\_saturation\_entry.delete(0, tk.END)

head\_exam\_entry.delete("1.0", tk.END)

chest\_exam\_entry.delete("1.0", tk.END)

abdominal\_exam\_entry.delete("1.0", tk.END)

extremities\_exam\_entry.delete("1.0", tk.END)

assessment\_text.delete("1.0", tk.END)

diagnosis\_entry.delete("1.0", tk.END)

# Tab 1: Add Patient

add\_patient\_frame = ttk.Frame(notebook)

notebook.add(add\_patient\_frame, text="Add Patient")

entry\_style = {"width": 22, "font": font\_style}

label\_style = {"font": font\_style}

add\_name\_label = tk.Label(add\_patient\_frame, text="Name:", \*\*label\_style)

add\_name\_label.grid(row=0, column=0, padx=10, pady=5)

add\_name\_entry = tk.Entry(add\_patient\_frame, \*\*entry\_style)

add\_name\_entry.grid(row=0, column=1, padx=10, pady=5)

add\_dob\_label = tk.Label(add\_patient\_frame, text="DOB:", \*\*label\_style)

add\_dob\_label.grid(row=1, column=0, padx=10, pady=5)

add\_dob\_entry = DateEntry(add\_patient\_frame, background="darkblue", foreground="white", width = 21, font = font\_style)

add\_dob\_entry.grid(row=1, column=1, padx=10, pady=5)

add\_gender\_label = tk.Label(add\_patient\_frame, text="Gender:", \*\*label\_style)

add\_gender\_label.grid(row=2, column=0, padx=10, pady=5)

add\_gender\_var = tk.StringVar()

add\_gender\_var.set("Male")

add\_gender\_combobox = ttk.Combobox(add\_patient\_frame, textvariable=add\_gender\_var, values=["Male", "Female", "Other"], state="readonly", width = 21, font = font\_style)

add\_gender\_combobox.grid(row=2, column=1, padx=10, pady=5)

add\_doctorid\_label = tk.Label(add\_patient\_frame, text="Doctor ID:", \*\*label\_style)

add\_doctorid\_label.grid(row=3, column=0, padx=10, pady=5)

add\_doctorid\_entry = tk.Entry(add\_patient\_frame, \*\*entry\_style)

add\_doctorid\_entry.grid(row=3, column=1, padx=10, pady=5)

add\_button = tk.Button(add\_patient\_frame, text="Add Patient", command=add\_patient, bg="blue", fg="white", font=font\_style)

add\_button.grid(row=4, columnspan=2, padx=10, pady=10)

# Tab 2: Search Patient

search\_patient = ttk.Frame(notebook)

notebook.add(search\_patient, text="Search Patients")

search\_label = tk.Label(search\_patient, text="Search:", font=font\_style)

search\_label.grid(row=0, column=0)

search\_entry = tk.Entry(search\_patient, width=22, font=font\_style)

search\_entry.grid(row=0, column=1)

search\_button = tk.Button(search\_patient, text="Search", command=search\_patients, bg="blue", fg="white", font=font\_style)

search\_button.grid(row=0, column=2)

# Tab 3: Update Patient

update\_patient\_frame = ttk.Frame(notebook)

notebook.add(update\_patient\_frame, text="Update Patient")

new\_patient\_id\_label = tk.Label(update\_patient\_frame, text="Patient ID:", \*\*label\_style)

new\_patient\_id\_label.grid(row=0, column=0, padx=10, pady=5)

new\_patient\_id\_entry = tk.Entry(update\_patient\_frame, \*\*entry\_style)

new\_patient\_id\_entry.grid(row=0, column=1, padx=10, pady=5)

new\_name\_label = tk.Label(update\_patient\_frame, text="Name:", \*\*label\_style)

new\_name\_label.grid(row=0, column=3, padx=10, pady=5)

new\_name\_entry = tk.Entry(update\_patient\_frame, \*\*entry\_style)

new\_name\_entry.grid(row=0, column=4, padx=10, pady=5)

new\_dob\_label = tk.Label(update\_patient\_frame, text="DOB:", \*\*label\_style)

new\_dob\_label.grid(row=1, column=0, padx=10, pady=5)

new\_dob\_entry = DateEntry(update\_patient\_frame, background="darkblue", foreground="white", width = 21, font = font\_style)

new\_dob\_entry.grid(row=1, column=1, padx=10, pady=5)

new\_gender\_label = tk.Label(update\_patient\_frame, text="Gender:", \*\*label\_style)

new\_gender\_label.grid(row=1, column=3, padx=10, pady=5)

new\_gender\_var = tk.StringVar()

new\_gender\_var.set("Male")

new\_gender\_combobox = ttk.Combobox(update\_patient\_frame, textvariable=new\_gender\_var, values=["Male", "Female", "Other"], state="readonly", width = 21, font = font\_style)

new\_gender\_combobox.grid(row=1, column=4, padx=10, pady=5)

new\_doctor\_id\_label = tk.Label(update\_patient\_frame, text="Doctor ID:", \*\*label\_style)

new\_doctor\_id\_label.grid(row=2, column=0, padx=10, pady=5)

new\_doctor\_id\_entry = tk.Entry(update\_patient\_frame, \*\*entry\_style)

new\_doctor\_id\_entry.grid(row=2, column=1, padx=10, pady=5)

update\_button = tk.Button(update\_patient\_frame, text="Update Patient", command=update\_patient, bg="blue", fg="white", font=font\_style)

update\_button.grid(row=4, column=4, padx=10, pady=10)

# Tab 4: View Doctors

view\_doctor = tk.Frame(notebook)

notebook.add(view\_doctor, text="View Doctor")

view\_doctors\_button = tk.Button(view\_doctor, text="View Doctors", command=view\_doctors, bg="blue", fg="white", font=font\_style)

view\_doctors\_button.pack()

# Tab 5: Add Patient Report

report\_doctors = ttk.Frame(notebook)

notebook.add(report\_doctors, text="Add Patient Report")

patient\_id\_label = tk.Label(report\_doctors, text="Patient ID:", font=font\_style)

patient\_id\_label.grid(row=0, column=0, padx=10, pady=5)

patient\_id\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

patient\_id\_entry.grid(row=0, column=1, padx=10, pady=5)

doctor\_id\_label = tk.Label(report\_doctors, text="Doctor ID:", font=font\_style)

doctor\_id\_label.grid(row=0, column=2, padx=10, pady=5)

doctor\_id\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

doctor\_id\_entry.grid(row=0, column=3, padx=10, pady=5)

patient\_name\_label = tk.Label(report\_doctors, text="Patient Name:", font=font\_style)

patient\_name\_label.grid(row=0, column=4, padx=10, pady=5)

patient\_name\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

patient\_name\_entry.grid(row=0, column=5, padx=10, pady=5)

report\_date\_label = tk.Label(report\_doctors, text="Report Date:", font=font\_style)

report\_date\_label.grid(row=1, column=0, padx=10, pady=5)

report\_date\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

report\_date\_entry.grid(row=1, column=1, padx=10, pady=5)

blood\_pressure\_label = tk.Label(report\_doctors, text="Blood Pressure:", font=font\_style)

blood\_pressure\_label.grid(row=1, column=2, padx=10, pady=5)

blood\_pressure\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

blood\_pressure\_entry.grid(row=1, column=3, padx=10, pady=5)

pulse\_rate\_label = tk.Label(report\_doctors, text="Pulse Rate:", font=font\_style)

pulse\_rate\_label.grid(row=1, column=4, padx=10, pady=5)

pulse\_rate\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

pulse\_rate\_entry.grid(row=1, column=5, padx=10, pady=5)

respiratory\_rate\_label = tk.Label(report\_doctors, text="Respiratory Rate:", font=font\_style)

respiratory\_rate\_label.grid(row=2, column=0, padx=10, pady=5)

respiratory\_rate\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

respiratory\_rate\_entry.grid(row=2, column=1, padx=10, pady=5)

body\_temperature\_label = tk.Label(report\_doctors, text="Body Temperature:", font=font\_style)

body\_temperature\_label.grid(row=2, column=2, padx=10, pady=5)

body\_temperature\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

body\_temperature\_entry.grid(row=2, column=3, padx=10, pady=5)

oxygen\_saturation\_label = tk.Label(report\_doctors, text="Oxygen Saturation:", font=font\_style)

oxygen\_saturation\_label.grid(row=2, column=4, padx=10, pady=5)

oxygen\_saturation\_entry = tk.Entry(report\_doctors, width=22, font=font\_style)

oxygen\_saturation\_entry.grid(row=2, column=5, padx=10, pady=5)

head\_exam\_label = tk.Label(report\_doctors, text="Head Exam:", font=font\_style)

head\_exam\_label.grid(row=3, column=0, padx=10, pady=5)

head\_exam\_entry = tk.Text(report\_doctors, height=4, width=30)

head\_exam\_entry.grid(row=3, column=1, padx=10, pady=5)

chest\_exam\_label = tk.Label(report\_doctors, text="Chest Exam:", font=font\_style)

chest\_exam\_label.grid(row=3, column=2, padx=10, pady=5)

chest\_exam\_entry = tk.Text(report\_doctors, height=4, width=30)

chest\_exam\_entry.grid(row=3, column=3, padx=10, pady=5)

abdominal\_exam\_label = tk.Label(report\_doctors, text="Abdominal Exam:", font=font\_style)

abdominal\_exam\_label.grid(row=3, column=4, padx=10, pady=5)

abdominal\_exam\_entry = tk.Text(report\_doctors, height=4, width=30)

abdominal\_exam\_entry.grid(row=3, column=5, padx=10, pady=5)

extremities\_exam\_label = tk.Label(report\_doctors, text="Extremities Exam:", font=font\_style)

extremities\_exam\_label.grid(row=4, column=0, padx=10, pady=5)

extremities\_exam\_entry = tk.Text(report\_doctors, height=4, width=30)

extremities\_exam\_entry.grid(row=4, column=1, padx=10, pady=5)

assessment\_text\_label = tk.Label(report\_doctors, text="Assessment:", font=font\_style)

assessment\_text\_label.grid(row=4, column=2, padx=10, pady=5)

assessment\_text = tk.Text(report\_doctors, height=4, width=30)

assessment\_text.grid(row=4, column=3, padx=10, pady=5)

diagnosis\_entry\_label = tk.Label(report\_doctors, text="Diagnosis:", font=font\_style)

diagnosis\_entry\_label.grid(row=4, column=4, padx=10, pady=5)

diagnosis\_entry = tk.Text(report\_doctors, height=4, width=30)

diagnosis\_entry.grid(row=4, column=5, padx=10, pady=5)

submit\_button = tk.Button(report\_doctors, text="Submit Report", command=submit\_report, bg="blue", fg="white", font=font\_style)

submit\_button.grid(row=7, column=3, padx=10, pady=10)

def open\_patient\_app():

patient\_window = tk.Toplevel(root)

patient\_window.title("Patient Application")

patient\_window.geometry("800x600")

notebook = ttk.Notebook(patient\_window)

notebook.pack(fill="both", expand=True)

def display\_patient\_details():

patient\_id = current\_patient\_id

db\_file = 'medical\_app.db'

try:

conn = sqlite3.connect(db\_file)

cursor = conn.cursor()

cursor.execute("SELECT \* FROM patients WHERE patient\_id = ?", (patient\_id,))

patient = cursor.fetchone()

if patient:

dob = datetime.strptime(patient[2], '%Y-%m-%d').date()

age = (datetime.now().date() - dob).days // 365

patient\_details\_text.config(state='normal')

patient\_details\_text.delete('1.0', 'end')

patient\_details\_text.insert('1.0',

f"Patient ID: {patient[0]}\n"

f"Name: {patient[1]}\n"

f"Date of Birth: {dob}\n"

f"Age: {age} years\n"

f"Gender: {patient[3]}\n"

f"Doctor ID: {patient[4]}\n")

patient\_details\_text.config(state='disabled')

else:

patient\_details\_text.config(state='normal')

patient\_details\_text.delete('1.0', 'end')

patient\_details\_text.insert('1.0', "Patient details not found.")

patient\_details\_text.config(state='disabled')

conn.close()

except sqlite3.Error as e:

patient\_details\_text.config(state='normal')

patient\_details\_text.delete('1.0', 'end')

patient\_details\_text.insert('1.0', "An error occurred while fetching patient details.")

patient\_details\_text.config(state='disabled')

print("SQLite error:", e)

def view\_doctors():

conn = sqlite3.connect('medical\_app.db')

cursor = conn.cursor()

cursor.execute("SELECT \* FROM doctors")

doctors = cursor.fetchall()

text\_widget = tk.Text(view\_doctor)

text\_widget.pack()

for doctor in doctors:

text\_widget.insert(tk.END, f"Doctor ID: {doctor[0]}\n")

text\_widget.insert(tk.END, f"Name: {doctor[1]}\n")

text\_widget.insert(tk.END, f"Specialization: {doctor[2]}\n")

text\_widget.insert(tk.END, "\n")

conn.close()

def retrieve\_doctor\_reports(db\_file, current\_patient\_id):

try:

conn = sqlite3.connect(db\_file)

cursor = conn.cursor()

cursor.execute("SELECT \* FROM doctor\_reports WHERE patient\_id=?", (current\_patient\_id,))

reports = cursor.fetchall()

conn.close()

return reports

except sqlite3.Error as e:

print("SQLite error:", e)

return []

def display\_reports():

patient\_id = current\_patient\_id

db\_file = 'medical\_app.db'

doctor\_reports = retrieve\_doctor\_reports(db\_file, patient\_id)

if not doctor\_reports:

report\_text.set("No reports found for Patient ID: " + str(patient\_id))

return

report\_text.set("Patient Reports for Patient ID " + str(patient\_id) + ":\n\n")

for index, report in enumerate(doctor\_reports, start=1):

report\_text.set(report\_text.get() +

f"Report ID: {report[0]}\n"

f"Patient ID: {report[1]}\n"

f"Patient Name: {report[2]}\n"

f"Doctor ID: {report[3]}\n"

f"Report Date: {report[4]}\n"

f"Blood Pressure: {report[5]}\n"

f"Pulse Rate: {report[6]}\n"

f"Respiratory Rate: {report[7]}\n"

f"Body Temperature: {report[8]}\n"

f"Oxygen Saturation: {report[9]}\n"

f"Head Exam:\n{report[10]}\n"

f"Chest Exam:\n{report[11]}\n"

f"Abdominal Exam:\n{report[12]}\n"

f"Extremities Exam:\n{report[13]}\n"

f"Assessment:\n{report[14]}\n"

f"Diagnosis:\n{report[15]}\n\n")

patient\_details = tk.Frame(notebook, bg="#f5f5f5")

notebook.add(patient\_details, text="Your Info")

patient\_details\_text = tk.Text(patient\_details, height=10, width=40)

patient\_details\_text.pack(pady=20)

patient\_details\_text.config(state='disabled')

notebook.bind("<<NotebookTabChanged>>", lambda event: display\_patient\_details())

display\_details\_button = tk.Button(patient\_details, text="Refresh Details", command=display\_patient\_details, bg="blue", fg="white", font=font\_style)

display\_details\_button.pack()

view\_doctor = tk.Frame(notebook)

notebook.add(view\_doctor, text="View Doctor")

view\_doctors\_button = tk.Button(view\_doctor, text="View Doctors", command=view\_doctors, bg="blue", fg="white", font=font\_style)

view\_doctors\_button.pack()

generate\_report = ttk.Frame(notebook)

notebook.add(generate\_report, text="Generate Report")

report\_text = tk.StringVar()

report\_label = tk.Label(generate\_report, textvariable=report\_text, justify=tk.LEFT)

report\_label.pack()

retrieve\_button = tk.Button(generate\_report, text="Retrieve Reports", command=display\_reports, bg="blue", fg="white", font=font\_style)

retrieve\_button.pack()

root = tk.Tk()

root.title("Login Page")

root.geometry("800x600")

style = ttk.Style()

style.configure("TNotebook", background="#D3D3D3")

style.configure("TNotebook.Tab", font=("Helvetica", 12), padding=[10, 5])

root.rowconfigure(5, minsize=20)

style.configure("TEntry", padding=5, relief="flat", font=("Helvetica", 12))

style.map("TCombobox", fieldbackground=[("readonly", "white")])

font\_style = ("Helvetica", 12)

# Doctor Login Form

doctor\_frame = ttk.LabelFrame(root, text="Doctor Login")

doctor\_frame.grid(row=0, column=0, padx=20, pady=20)

doctor\_username\_label = tk.Label(doctor\_frame, text="Username:", font=font\_style)

doctor\_username\_label.grid(row=0, column=0, padx=10, pady=5)

doctor\_username\_entry = tk.Entry(doctor\_frame, font=font\_style)

doctor\_username\_entry.grid(row=0, column=1, padx=10, pady=5)

doctor\_password\_label = tk.Label(doctor\_frame, text="Password:", font=font\_style)

doctor\_password\_label.grid(row=1, column=0, padx=10, pady=5)

doctor\_password\_entry = tk.Entry(doctor\_frame, show="\*", font=font\_style)

doctor\_password\_entry.grid(row=1, column=1, padx=10, pady=5)

doctor\_login\_button = tk.Button(doctor\_frame, text="Login", command=doctor\_login, bg="#4CAF50", fg="white",font=font\_style)

doctor\_login\_button.grid(row=2, columnspan=2, padx=10, pady=10)

# Patient Login Form

patient\_frame = ttk.LabelFrame(root, text="Patient Login")

patient\_frame.grid(row=0, column=1, padx=20, pady=20)

patient\_username\_label = tk.Label(patient\_frame, text="Username:", font=font\_style)

patient\_username\_label.grid(row=0, column=0, padx=10, pady=5)

patient\_username\_entry = tk.Entry(patient\_frame, font=font\_style)

patient\_username\_entry.grid(row=0, column=1, padx=10, pady=5)

patient\_password\_label = tk.Label(patient\_frame, text="Password:", font=font\_style)

patient\_password\_label.grid(row=1, column=0, padx=10, pady=5)

patient\_password\_entry = tk.Entry(patient\_frame, show="\*", font=font\_style)

patient\_password\_entry.grid(row=1, column=1, padx=10, pady=5)

patient\_login\_button = tk.Button(patient\_frame, text="Login", command=patient\_login, bg="#2196F3", fg="white", font=font\_style)

patient\_login\_button.grid(row=2, columnspan=2, padx=10, pady=10)

root.mainloop()

* 1. **EXPLANATION**

1. **medical\_app.py (for creating and maintaining the schema)**

Database Setup for a Doctor-Patient Application

This code snippet focuses on setting up the database for a doctor-patient application. It uses SQLite, a lightweight, embedded relational database management system. Let's break down the key components:

1. Database Connection: The code starts by importing the sqlite3 library and establishes a connection to an SQLite database file named 'medical\_app.db' using sqlite3.connect('medical\_app.db').
2. Creating Tables: The code creates several tables to store different types of data:
3. patients table: Stores patient information such as patient ID, name, date of birth, gender, and a reference to the doctor they are associated with.
4. doctors table: Contains information about doctors, including their ID, name, and specialization.
5. patient\_credentials table: Stores patient login credentials with fields for patient ID, username, and password.
6. doctor\_reports table: Designed for storing medical reports generated by doctors, including patient information, report date, and various medical parameters.
7. doctor\_credentials table: Stores login credentials for doctors, including their ID, username, and password.
8. Data Insertion: The code uses the cursor.executemany() method to insert sample data into the created tables. This includes sample patient, doctor, and login data, which is essential for testing and demonstrating the application's functionalities.
9. Triggers: Three triggers are created to enforce data integrity:
10. check\_age: Ensures that the 'age' field in the 'patients' table contains valid integer values.
11. check\_doctor\_id: Ensures that the 'doctor\_id' field in the 'patients' table contains valid integer values.
12. check\_gender: Validates the 'gender' field in the 'patients' table, allowing only 'Male,' 'Female,' or 'Other' as valid values.
13. Foreign Key Constraints: Foreign key constraints are enabled by executing PRAGMA foreign\_keys = ON;. These constraints maintain referential integrity between tables by enforcing that foreign key values in the 'patients' and 'doctor\_reports' tables correspond to primary key values in the 'doctors' table.
14. Commit and Close: After setting up the tables and inserting sample data, the code commits the changes to the database and closes the database connection using conn.commit() and conn.close().

Database Access Control for a Doctor-Patient Application

This code snippet focuses on access control and user authentication for the doctor-patient application. It extends the functionality of the previous code. Here are the key elements:

1. Database Connection: It starts by connecting to the same 'medical\_app.db' database.
2. Creating the patient\_credentials Table: Similar to the first code, this code creates the patient\_credentials table to store patient login credentials (username and password).
3. Inserting Sample Login Data: Sample patient login data is inserted into the 'patient\_credentials' table using the cursor.executemany() method.
4. Creating the doctor\_credentials Table: This table is designed to store login credentials for doctors (doctor ID, username, and password).
5. Inserting Sample Doctor Login Data: Similar to the patient data, sample doctor login data is inserted into the 'doctor\_credentials' table.
6. Triggers: The code creates triggers for patient and doctor login data to ensure that valid username and password formats are maintained, enhancing security.
7. Enabling and Disabling Foreign Key Constraints: The code includes statements to temporarily disable foreign key constraints using PRAGMA foreign\_keys = OFF; and then re-enable them using PRAGMA foreign\_keys = ON;. This is done during trigger creation to prevent foreign key constraint violations while the triggers are created.
8. Commit and Close: As in the first code, the changes are committed to the database, and the connection is closed.
9. **Login.py (for creating the GUI and applying the schema for the doctor-patient applications)**

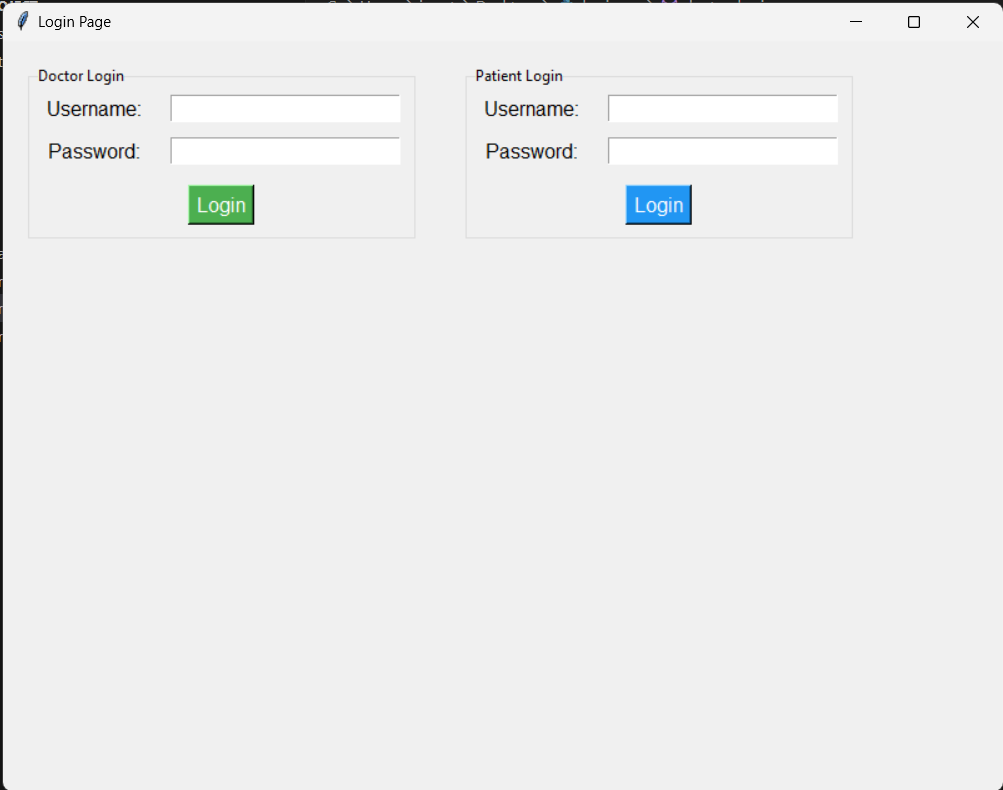
This Python code is for a simple application that uses the Tkinter library to create a graphical user interface (GUI) for a doctor-patient management system. The application allows doctors and patients to log in and access relevant information and features. Let's break down the code into its components:

1. Importing Libraries: The code begins by importing the necessary libraries, including tkinter for creating the GUI, sqlite3 for interacting with a SQLite database, datetime for handling date and time information, and ttk for additional widgets.
2. Global Variables: Two global variables, current\_doctor\_id and current\_patient\_id, are initialized as None. These variables will be used to keep track of the currently logged-in doctor and patient.
3. Clear Entry Fields Function: clear\_entry\_fields is a function that clears the input fields for doctor and patient usernames and passwords.
4. Doctor Login Function: The doctor\_login function is called when the doctor presses the "Login" button. It retrieves the doctor's input username and password, validates them against the database, and logs in if the credentials are correct.
5. Patient Login Function: The patient\_login function is similar to the doctor login function, but it validates the credentials for patients.
6. Open Doctor Application and Patient Application Functions: These functions are called when a doctor or patient successfully logs in. They open a new window for the respective user with different tabs and functionality.
7. Tabs for Doctor Application: In the doctor's application window, multiple tabs are created using the ttk.Notebook widget. These tabs include:
8. Add Patient: Allows the doctor to add patient details.
9. Search Patients: Lets the doctor search for patients.
10. Update Patient: Permits updating patient information.
11. View Doctors: Displays a list of doctors.
12. Add Patient Report: Allows doctors to submit medical reports for patients.
13. Tabs for Patient Application: In the patient's application window, there are also multiple tabs, such as:
14. Your Info: Displays patient details.
15. View Doctor: Allows patients to view a list of doctors.
16. Generate Report: Lets patients retrieve and display medical reports.
17. Main Application Initialization: The main application window is created using tkinter. It includes login forms for both doctors and patients, and the ttk.Style is used to customize the appearance of the tabs.

The code also includes various user interface elements, such as labels, entry fields, buttons, and text widgets, to provide input and display information to the users.

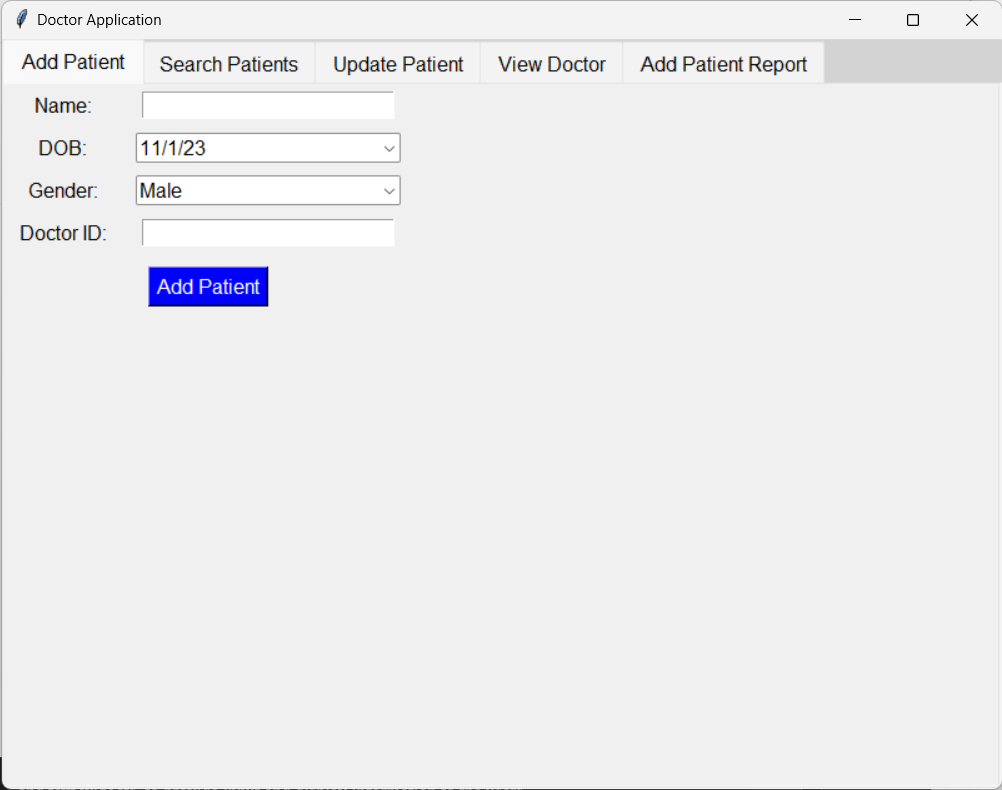
1. **INPUTS AND OUTPUTS**

**Login Page:**

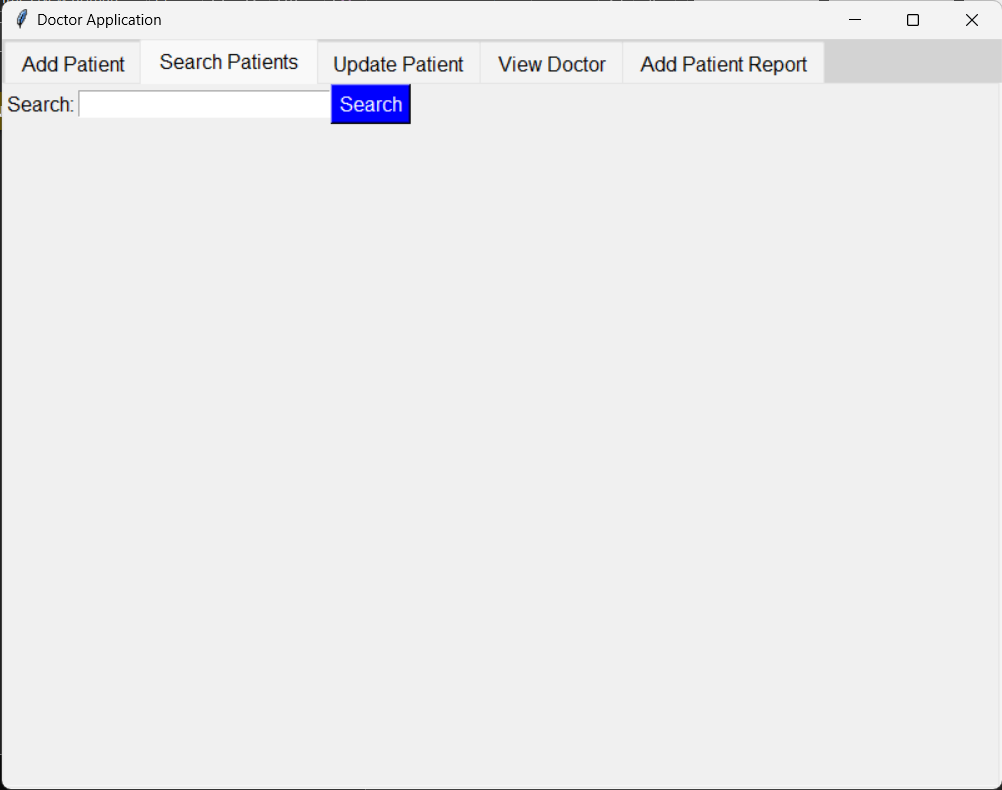
****

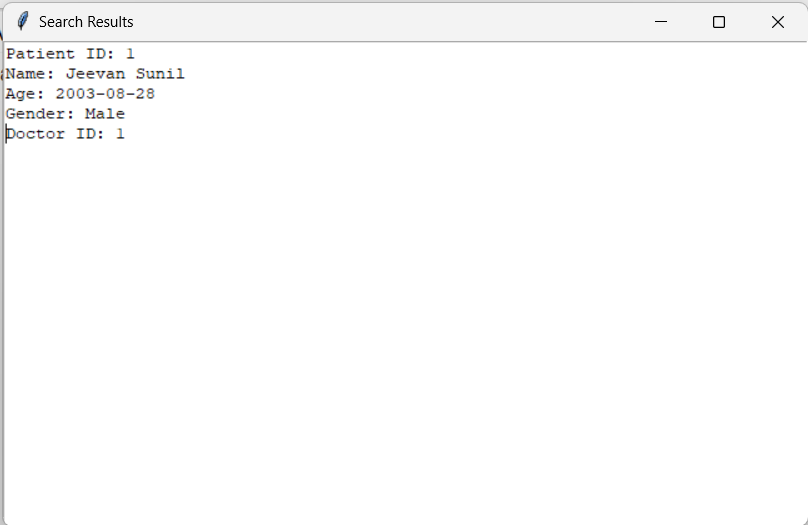
**Doctor Application:**

1. **Add Patient:**

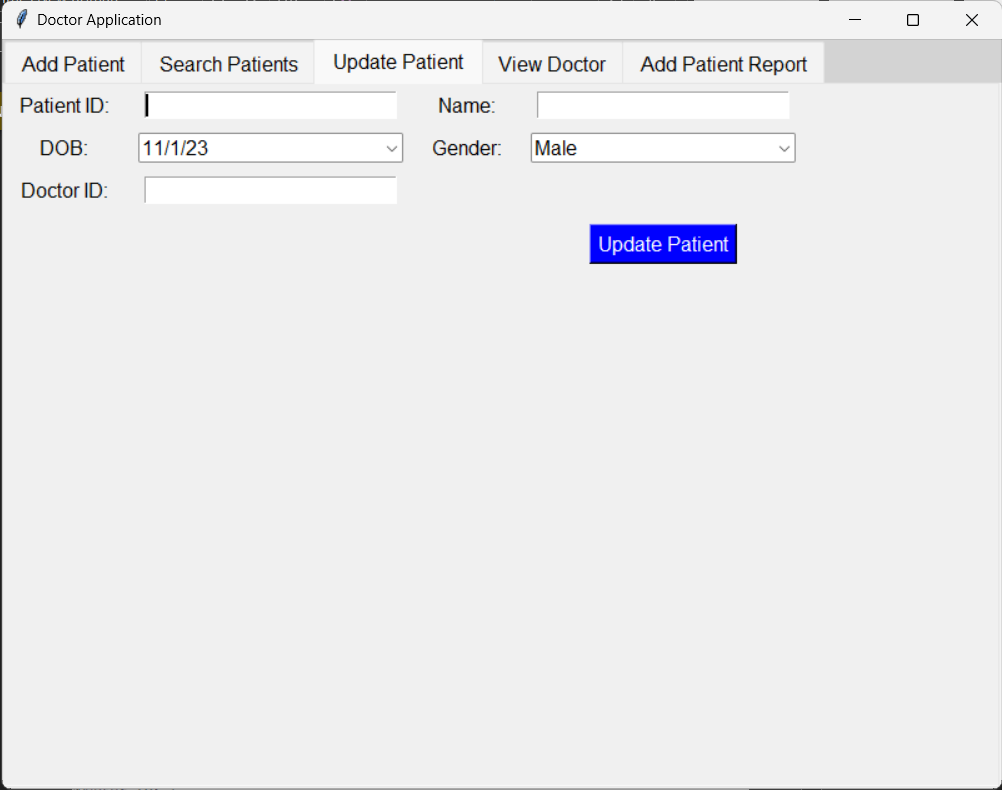
****

1. **Search Patients:**

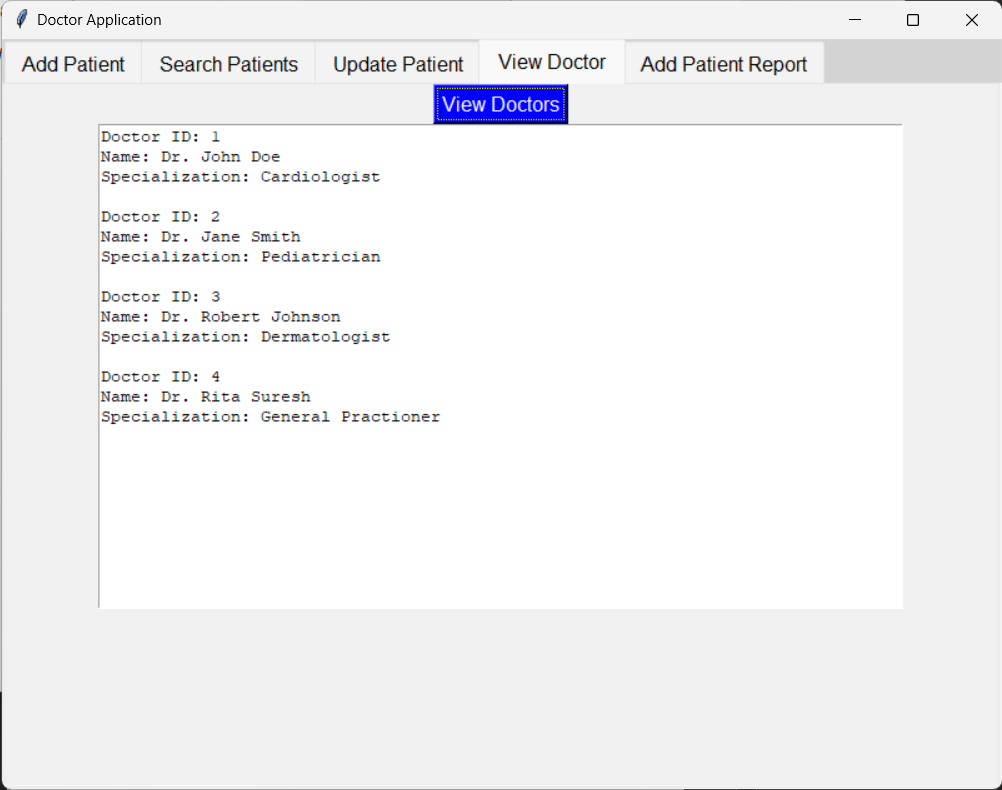
****

****

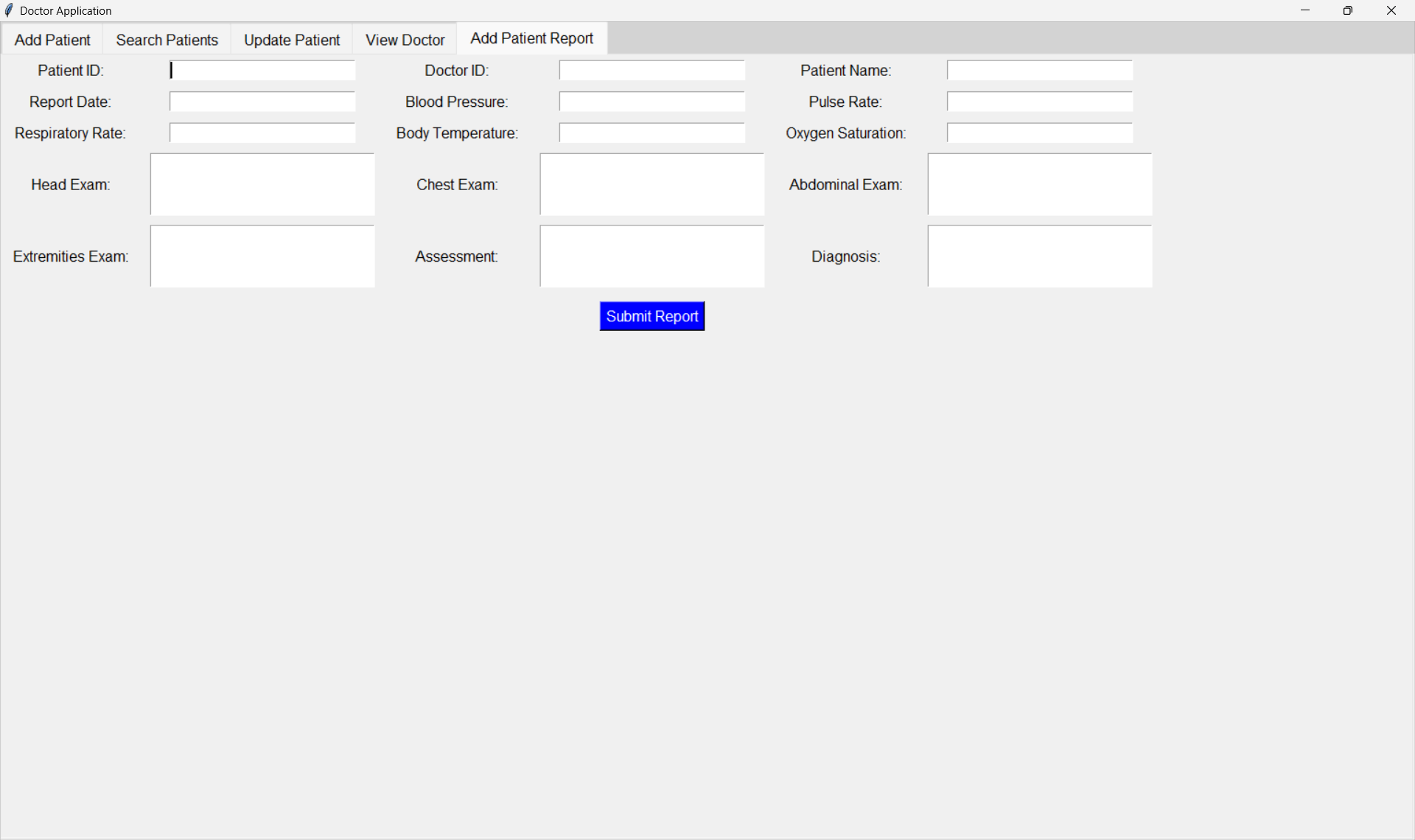
1. **Update Patient:**

****

1. **View Doctor:**

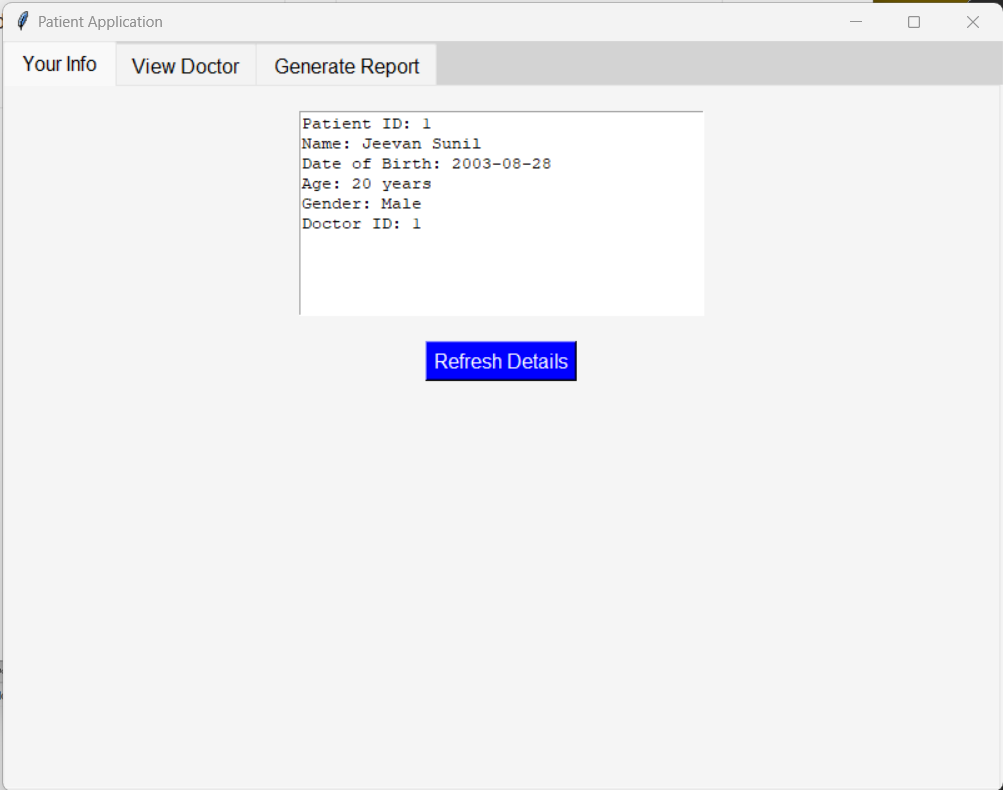
****

1. **Add Patient Report:**

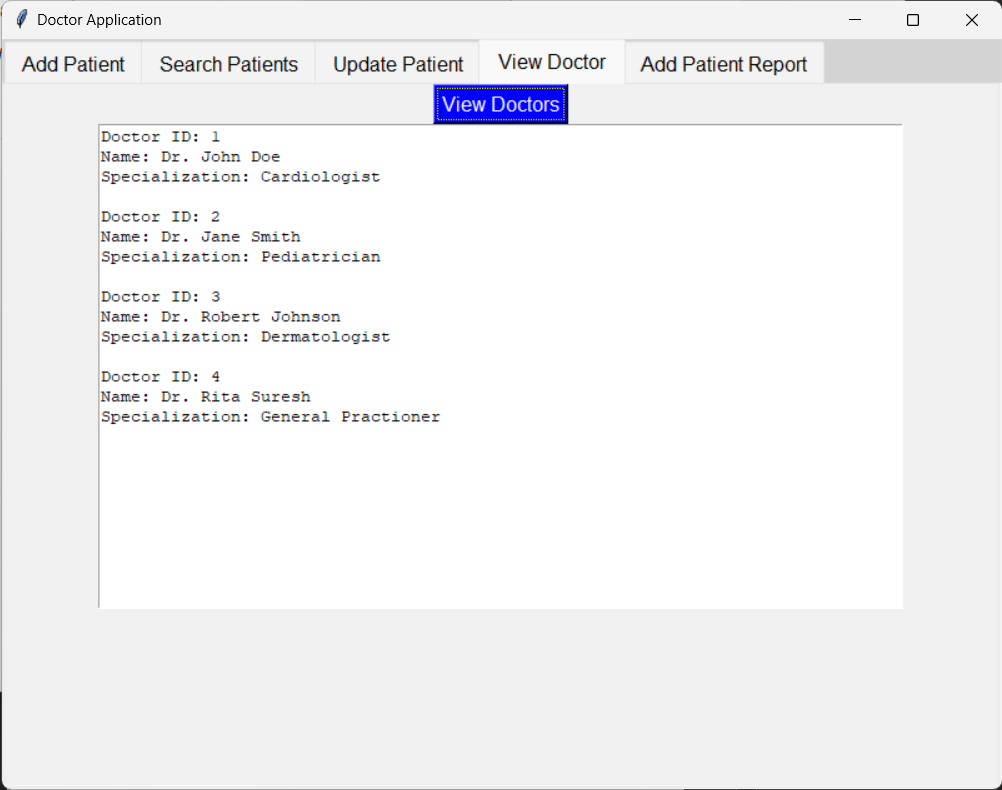
****

**Patient Application:**

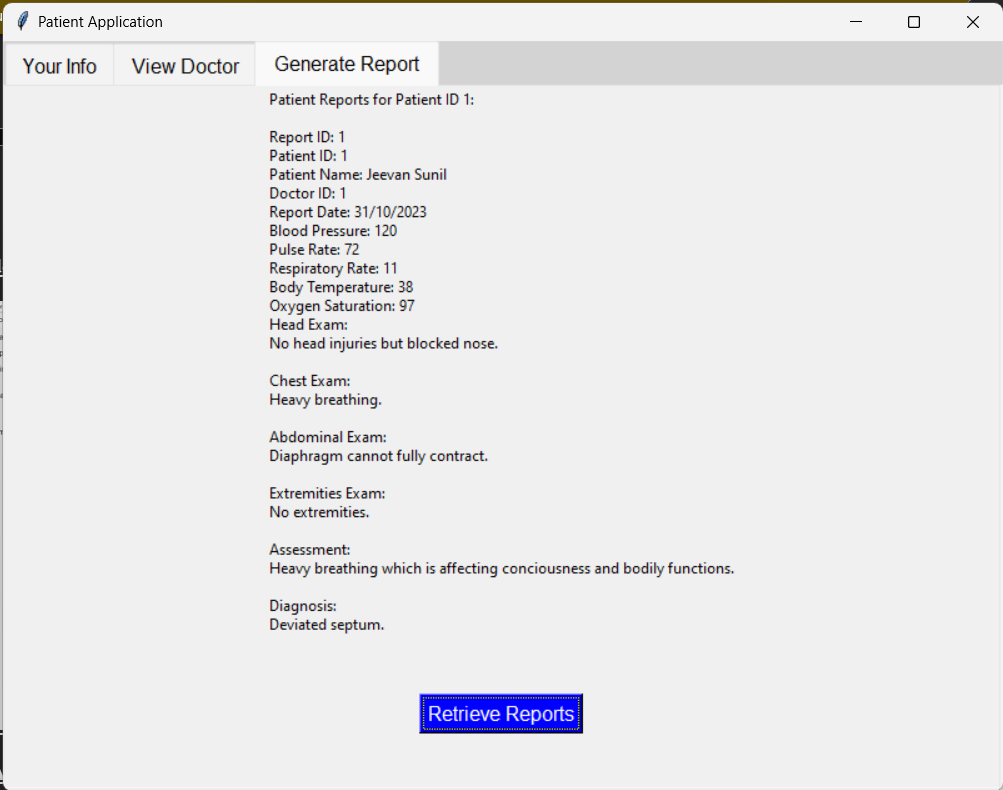
1. **Your Info:**

****

1. **View Doctors:**

****

1. **Generate Report:**

****

1. **CONCLUSION**

In this report, we presented the development of a doctor-patient management system using Python and the Tkinter library for creating a graphical user interface. The system is designed to facilitate the interactions between doctors and patients, enabling doctors to manage patient information and submit medical reports, and allowing patients to access their personal details and medical reports. The system is backed by a SQLite database, which stores the necessary data for user authentication and information retrieval.

The key features and functionalities of the system can be summarized as follows:

Doctor and Patient Login: The system supports secure login for both doctors and patients, ensuring that only authorized users can access their respective functionalities.

Doctor Features:

1. Add Patient: Doctors can add new patients to the system, providing details such as name, date of birth, gender, and their own doctor ID.
2. Search Patients: A search feature allows doctors to find patients based on name or patient ID.
3. Update Patient Information: Doctors can update patient details.
4. View Doctors: A list of doctors is available for reference.

Patient Features:

1. Personal Details: Patients can view their personal information, including name, date of birth, age, gender, and their assigned doctor.
2. View Doctors: Like doctors, patients can also access a list of doctors.
3. Generate Medical Reports: Patients can retrieve and view their medical reports, providing them with insights into their healthcare records.

This doctor-patient management system provides a foundation for efficient and organized healthcare data management. It ensures that doctors have the necessary tools to manage their patients' information and medical reports, while patients can conveniently access and review their own medical records. The use of a user-friendly graphical interface enhances the user experience and makes the system accessible to a wider audience.

The system's use of a SQLite database allows for data storage, retrieval, and management. However, it should be noted that for real-world use, additional security measures and data validation checks should be implemented to ensure the privacy and integrity of patient data.

As with any software system, there is always room for improvement and future development. In future iterations of this system, additional features such as appointment scheduling, prescription management, and integration with external systems could be considered to further enhance its functionality.

In conclusion, the doctor-patient management system presented in this report serves as a valuable tool for medical practitioners and patients, streamlining the process of managing patient information and healthcare records. It is a testament to the power of Python and the Tkinter library in creating user-friendly and efficient graphical user interfaces for healthcare applications.