

AI-Powered Patient Data Management System

Packages

```
import os
import base64
import io
from flask import Flask, render_template, Response, redirect, request, session, abort,
url_for
import mysql.connector
import hashlib
from datetime import datetime
from random import randint
from urllib.request import urlopen
import webbrowser
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
import urllib.request
import urllib.parse
import pulp
```

Database Connection

```
mydb = mysql.connector.connect(
host="localhost",
user="root",
```

```

password="",
charset="utf8",
database="appointment_scheduling"
Login
def login():
msg=""
ff=open("static/title.txt","r")
title=ff.read()
ff.close()
if request.method=='POST':
uname=request.form['uname']
pwd=request.form['pass']
cursor = mydb.cursor()
cursor.execute('SELECT * FROM ho_user WHERE uname = %s AND pass = %s',
(uname, pwd))
account = cursor.fetchone()
if account:
session['username'] = uname
return redirect(url_for('userhome'))
else:
msg = 'Incorrect username/password!'
Patient Registration
def register():
msg=""
mess=""
email=""
ff=open("static/title.txt","r")
title=ff.read()
ff.close()

```

```

mycursor = mydb.cursor()
mycursor.execute("SELECT max(id)+1 FROM ho_user")
maxid = mycursor.fetchone()[0]
if maxid is None:
    maxid=1
patid="PT"+str(maxid)
now = datetime.datetime.now()
rdate=now.strftime("%d-%m-%Y")
if request.method=='POST':
    name=request.form['name']
    gender=request.form['gender']
    dob=request.form['dob']
    mobile=request.form['mobile']
    email=request.form['email']
    address=request.form['address']
    parent_mobile=request.form['parent_mobile']
    aadhar=request.form['aadhar']
    pass1=request.form['pass']
    mycursor.execute('SELECT count(*) FROM ho_user WHERE aadhar=%s',
(aadhar,))
    cnt = mycursor.fetchone()[0]
    if cnt==0:
        mycursor.execute("SELECT max(id)+1 FROM ho_user")
        maxid = mycursor.fetchone()[0]
        if maxid is None:
            maxid=1
        sql = "INSERT INTO
ho_user(id,name,gender,dob,mobile,email,address,parent_mobile,aadhar,blood_grp,u
name,pass,rdate,stype) VALUES (%s,%s, %s, %s, %s, %s, %s, %s,%s, %s, %s, %s,

```

```

%s, %s)"
val =
(maxid,name,gender,dob,mobile,email,address,parent_mobile,aadhar,",patid,pass1,rd
ate,'register'mycursor.execute(sql, val)
mydb.commit()
msg="success"
else:
mycursor.execute('SELECT * FROM ho_user WHERE aadhar=%s', (aadhar,))
dd = mycursor.fetchone()
patid=dd[10]
mycursor.execute("update ho_user set
name=%s,gender=%s,dob=%s,mobile=%s,email=%s,address=%s,parent_mobile=%s
,pass=%s,stype='register' where
aadhar=%s",(name,gender,dob,mobile,email,address,parent_mobile,pass1,aadhar))
mydb.commit()
msg='success'
Add Doctor
def add_doctor():
msg=""
act=request.args.get("act")
if 'username' in session:
uname = session['username']
mycursor = mydb.cursor()
mycursor.execute('SELECT * FROM ho_hospital')
hdata = mycursor.fetchall()
now = datetime.datetime.now()
rdate=now.strftime("%d-%m-%Y")
mycursor.execute("SELECT max(id)+1 FROM ho_doctor")
maxid = mycursor.fetchone()[0]

```

```

if maxid is None:
    maxid=1
    docid="D"+str(maxid)
    if request.method=='POST':
        name=request.form['name']
        hospital=request.form['hospital']
        speciality=request.form['speciality']
        av_time=request.form['av_time']
        mobile=request.form['mobile']
        email=request.form['email']
        uname=request.form['uname']
        pass1=request.form['pass']
        mycursor.execute("SELECT count(*) FROM ho_doctor where
        uname=%s",(uname,))
        cnt = mycursor.fetchone()[0]
        if cnt==0:
            sql = "INSERT INTO
            ho_doctor(id,name,hospital,speciality,mobile,email,av_time,uname,pass,rdate,status)
            VALUES (%s, %s, %s, %s, %s, %s, %s, %s,%s,%s,%s)"
            val = (maxid,name,hospital,speciality,mobile,email,av_time,uname,pass1,rdate,'1')
            mycursor.execute(sql, val)
            mydb.commit()
            mess="Hospital ID: "+hospital+", Doctor:"+name+", Dotor ID:"+uname+",
            Password:"+pass1
            msg="success"
        else:
            msg='fail'
Booking Doctor Appointment
def appoint():

```

```
msg=""
ff=open("static/title.txt","r")
title=ff.read()
ff.close()
hid=request.args.get("hid")
did=request.args.get("did")
if 'username' in session:
    uname = session['username']
    st=""
    mycursor = mydb.cursor()
    mycursor.execute('SELECT * FROM ho_user WHERE uname = %s', (uname, ))
    data = mycursor.fetchone()
    name=data[1]
    mobile=str(data[4])
    mycursor.execute('SELECT * FROM ho_hospital where id=%s',(hid,))
    hdata = mycursor.fetchone()
    hos=hdata[9]
    mycursor.execute('SELECT * FROM ho_doctor where id=%s',(did,))
    ddata = mycursor.fetchone()
    doc=ddata[7]
    dname=ddata[1]
    import datetime
    now1 = datetime.datetime.now()
    edate=now1.strftime("%Y-%m-%d")
    rtime=now1.strftime("%H:%M")
    print(edate)
    if request.method=='POST':
        rdate1=request.form['ap_date']
        reason=request.form['reason']
```

```

rd=rdate1.split("-")
rdate=rd[2]+"-"+rd[1]+"-"+rd[0]
month=rd[1]
year=rd[0]
mycursor.execute('SELECT count(*) FROM ho_entry WHERE hospital = %s &&
docid=%s && rdate=%s', (hos,doc,rdate))
cnt = mycursor.fetchone()[0]
token_no=cnt+1
mycursor.execute("SELECT max(id)+1 FROM ho_entry")
maxid = mycursor.fetchone()[0]
if maxid is None:
maxid=1
sql = "INSERT INTO
ho_entry(id,patient_id,hospital,docid,doctor,token_no,reason,rdate,rtime,month,year,
staff_id,entry_type) VALUES (%s,%s,%s, %s, %s, %s, %s, %s,%s,%s,%s,%s,%s)"
val =
(maxid,uname,hos,doc,dname,token_no,reason,rdate,rtime,month,year,"','booked')
mycursor.execute(sql, val)
mydb.commit()
mess="Patient ID: "+uname+", Name:"+name+", Token No."+str(token_no)
msg="success"
Update Patient Status
def nur_edit():
msg=""
pid=request.args.get("pid")
if 'username' in session:
uname = session['username']
mycursor = mydb.cursor()
mycursor.execute('SELECT * FROM ho_nurse WHERE uname = %s', (uname, ))

```

```

data = mycursor.fetchone()
hospital=data[2]
if request.method=='POST':
temp=request.form['temp']
pulse=request.form['pulse']
bp=request.form['bp']
height=request.form['height']
weight=request.form['weight']
mycursor.execute("update ho_entry set
temp=%s,pulse=%s,bp=%s,height=%s,weight=%s where patient_id=%s &&
id=%s",(temp,pulse,bp,height,weight,pid,rid))
mydb.commit()
msg="ok"

```

#ILP-Based Priority Scheduling

```

def ILP_priority():
# Parameters
priority= {'P1': 3, 'P2': 5, 'P3': 1} # Higher = more urgent
# Doctor availability (1 if available at that time)
availability = {
('D1', 0): 1, ('D1', 1): 1, ('D1', 2): 0,
('D2', 0): 1, ('D2', 1): 0, ('D2', 2): 1,
# Max 1 patient per doctor per time slot
max_patients = 1
model = pulp.LpProblem("Doctor_Appointment_Scheduling", pulp.LpMaximize)
# Decision variables
x = pulp.LpVariable.dicts("x", [(i, j, t) for i in patients for j in doctors for t in times],
cat='Binary')

```



```

# Objective: Maximize weighted priorities (earlier time = better)
model += pulp.lpSum(priority[i] * (len(times) - t) * x[(i, j, t)]
for i in patients for j in doctors for t in times)

# Constraint 1: Each patient gets at most one appointment
for i in patients:
    model += pulp.lpSum(x[(i, j, t)] for j in doctors for t in times) <= 1

# Constraint 2: Doctor can only see 1 patient per time
for j in doctors:
    for t in times:
        model += pulp.lpSum(x[(i, j, t)] for i in patients) <= max_patients *
availability.get((j, t), 0)

# Constraint 3: Respect doctor availability
for i in patients:
    for j in doctors:
        for t in times:
            model += x[(i, j, t)] <= availability.get((j, t), 0)

# Solve the model
model.solve()

print("Scheduled Appointments:")
for i, j, t in x:
    if pulp.value(x[(i, j, t)]) == 1:
        print(f"Patient {i} -> Doctor {j} at Time Slot {t}")

DoctorConsultation
def doc_consult():
    msg=""
    st=""
    act=request.args.get("act")
    pid=request.args.get("pid")
    adata=[]

```

```

mdata=[]
ff=open("static/title.txt","r")
title=ff.read()
ff.close()
if 'username' in session:
    uname = session['username']
    mycursor = mydb.cursor()
    mycursor.execute('SELECT * FROM ho_doctor WHERE uname = %s', (uname, ))
    data = mycursor.fetchone()
    import datetime
    now1 = datetime.datetime.now()
    rdate=now1.strftime("%d-%m-%Y")
    edate1=now1.strftime("%Y-%m-%d")
    rtime=now1.strftime("%H:%M")
    mycursor.execute('SELECT * FROM ho_entry WHERE docid = %s && rdate=%s
    && patient_id=%s', (uname, rdate,pid))
    d1 = mycursor.fetchall()
    i=1
    for d11 in d1:
        dt=[]
        dt.append(d11[0])
        dt.append(d11[1])
        mycursor.execute('SELECT * FROM ho_user WHERE uname = %s', (d11[1], ))
        d2 = mycursor.fetchone()
        dt.append(d2[1])
        dt.append(d2[6])
    i+=1
    if request.method=='POST':
        medicine=request.form['medicine']

```

```

details=request.form['details']

mycursor.execute("SELECT max(id)+1 FROM ho_medicine")
maxid = mycursor.fetchone()[0]
if maxid is None:
    maxid=1
sql = "INSERT INTO ho_medicine(id,docid,patient_id,medicine,details,rdate)
VALUES (%s,%s,%s,%s,%s,%s)"
val = (maxid,uname,pid,medicine,details,rdate)
mycursor.execute(sql, val)
mydb.commit()
msg="ok"
mycursor.execute('SELECT count(*) FROM ho_medicine WHERE patient_id = %s
&& rdate=%s', (pid,rdate ))
mcnt = mycursor.fetchone()[0]
if mcnt>0:
    st="1"
mycursor.execute('SELECT * FROM ho_medicine WHERE patient_id = %s &&
rdate=%s', (pid,rdate ))
mdata = mycursor.fetchall()
if act=="complete":
mycursor.execute("update ho_entry set status=2 where status=1 && patient_id = %s
&& rdate=%s", (pid,rdate ))
mydb.commit()
msg="done"

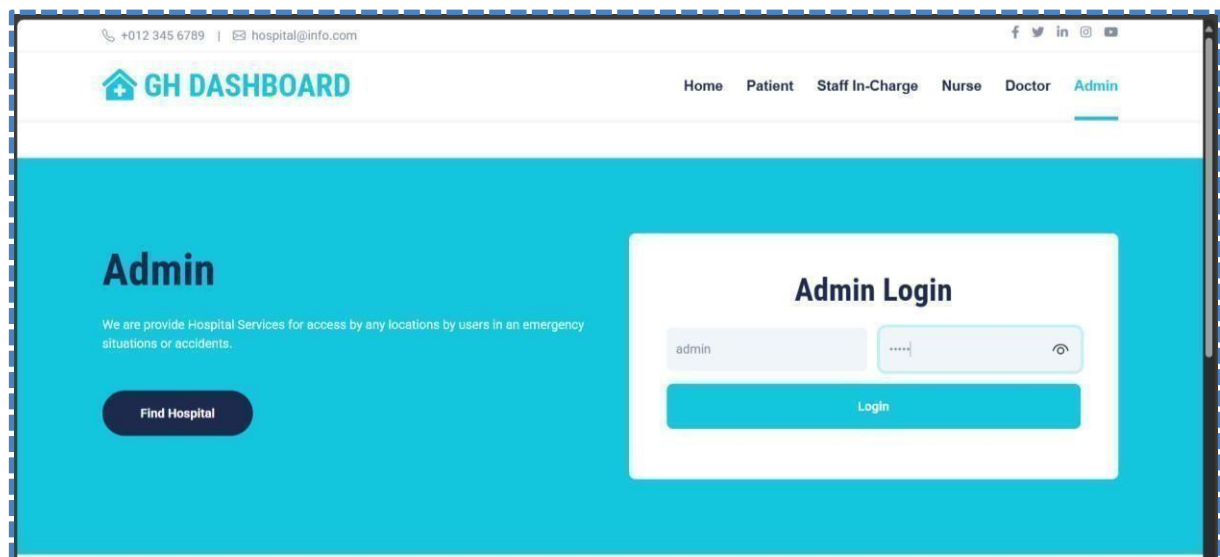
```

8.1. SCREENSHOT


Home page



ADMIN LOGIN PAGE



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Home ▾

Doctor

Staff In-charge


Nurse

Report


Logout

ADMIN


Hospital Information




GH-Ghandhi Hospital (GH001)
Location: Woraiyur, Trichy
Contact: 9723015655, gh001try@gmail.com




GH-Periyar Hospital (GH002)
Location: Old Bus Stand, Thanjavur
Contact: 7995945456, gh002tnj@gmail.com



GH-Rajaji Hospital (GH003)
Location: Alwarpuram, Madurai
Contact: 6321544545, gh003mdi@gmail.com





Home ▾ Doctor Staff In-charge Nurse Report Logout

Add Doctor Information

GH-Ghandhi Hospital [GH001]

Dr. S. Divahar M.S

General Physician


10am to 5pm

8956564121

divahar121@gmail.com

D1


.....



Add

+012 345 6789 | hospital@info.com

f t in @ y



Home ▾DoctorStaff In-chargeNurseReportLogout

Add Staff Information

GH-Ghandhi Hospital [GH001]

Sudha

8956741455


sudha@gmail.com

S1

Add


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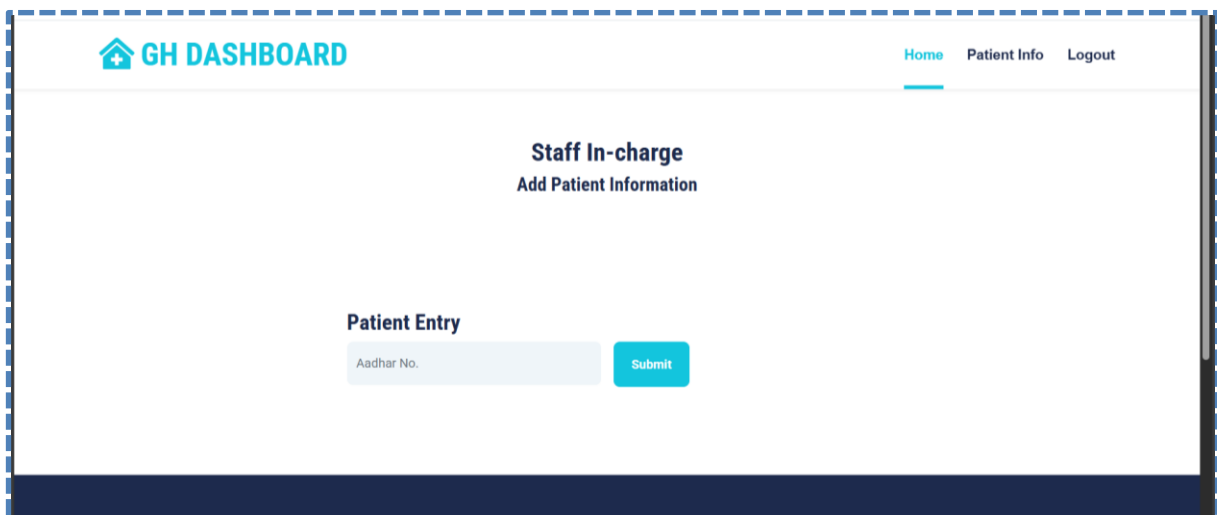
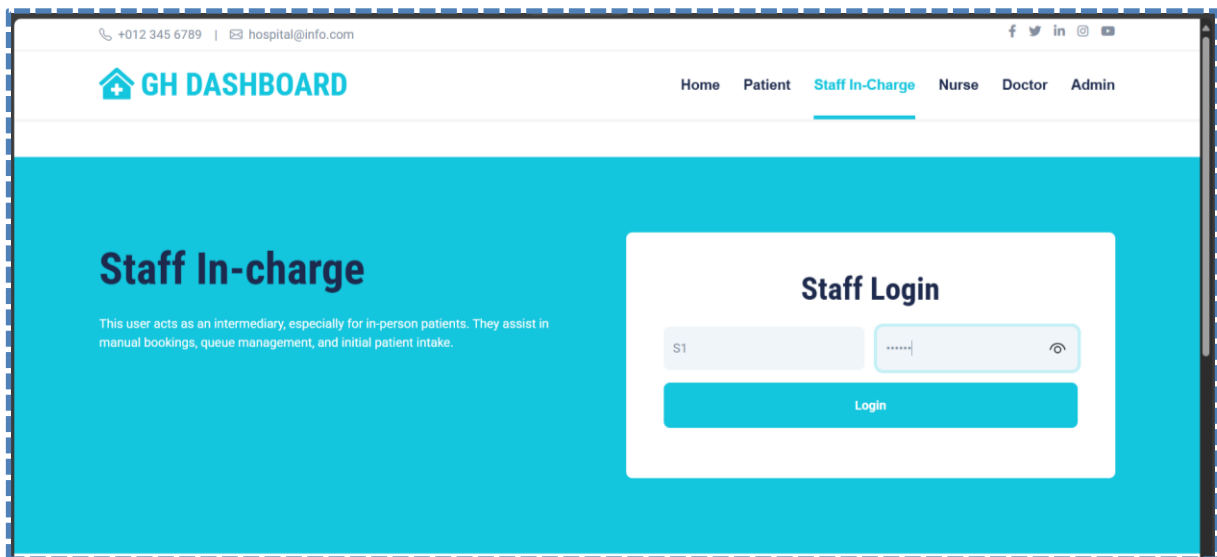
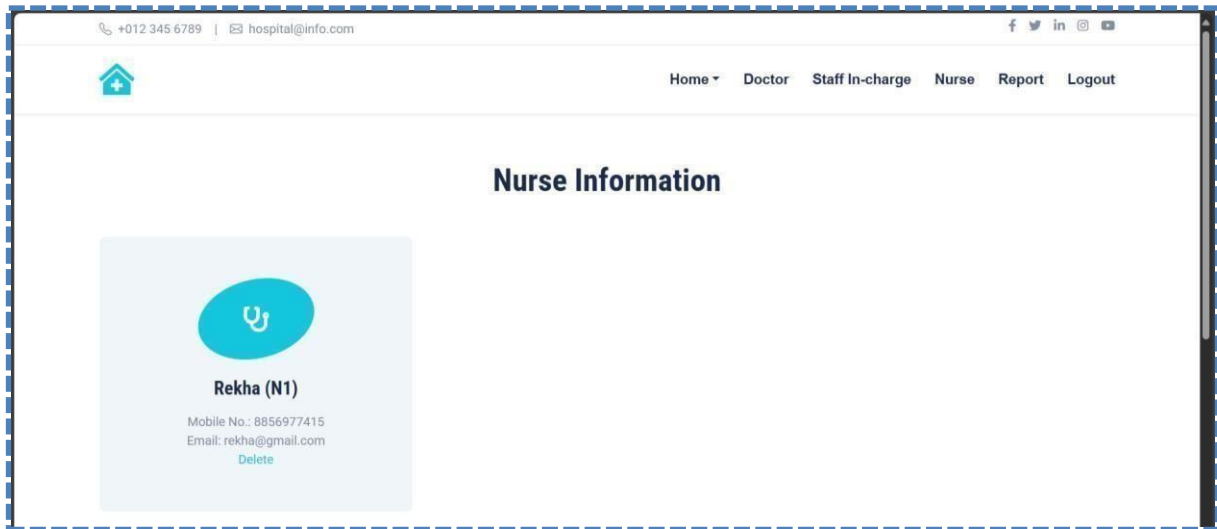



Home ▾DoctorStaff In-chargeNurseReportLogout

Staff In-charge



Sudha (S1)
Mobile No.: 8956741455
Email: sudha@gmail.com
[Delete](#)





HomePatient InfoLogout

Staff In-charge

Add Patient Information

Usha

Female

05-08-1975

7586512121


usha@gmail.com

Parent / Guardian Mobile No.

25,SM Colony

Add

+012 345 6789 | hospital@info.com



HomePatient InfoLogout

Staff In-charge


Add Patient Information

Patient Entry

D1-Dr. S. Divahar M.S

Reason for the Visit

Submit



[Home](#) [Patient](#) [Staff In-Charge](#) [Nurse](#) [Doctor](#) [Admin](#)

NEW PATIENT

Registration

Vijay

Male

04-05-1995

9654254885

vijay@gmail.com


Parent / Guardian Mobile No.

44,FG Nagar

315484545454

Register

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[Home](#) [Patient](#) [Staff In-Charge](#) [Nurse](#) [Doctor](#) [Admin](#)

User

We are provide Hospital Services for access by any locations by users in an emergency situations or accidents.

Register New User

Patient Login

PT2

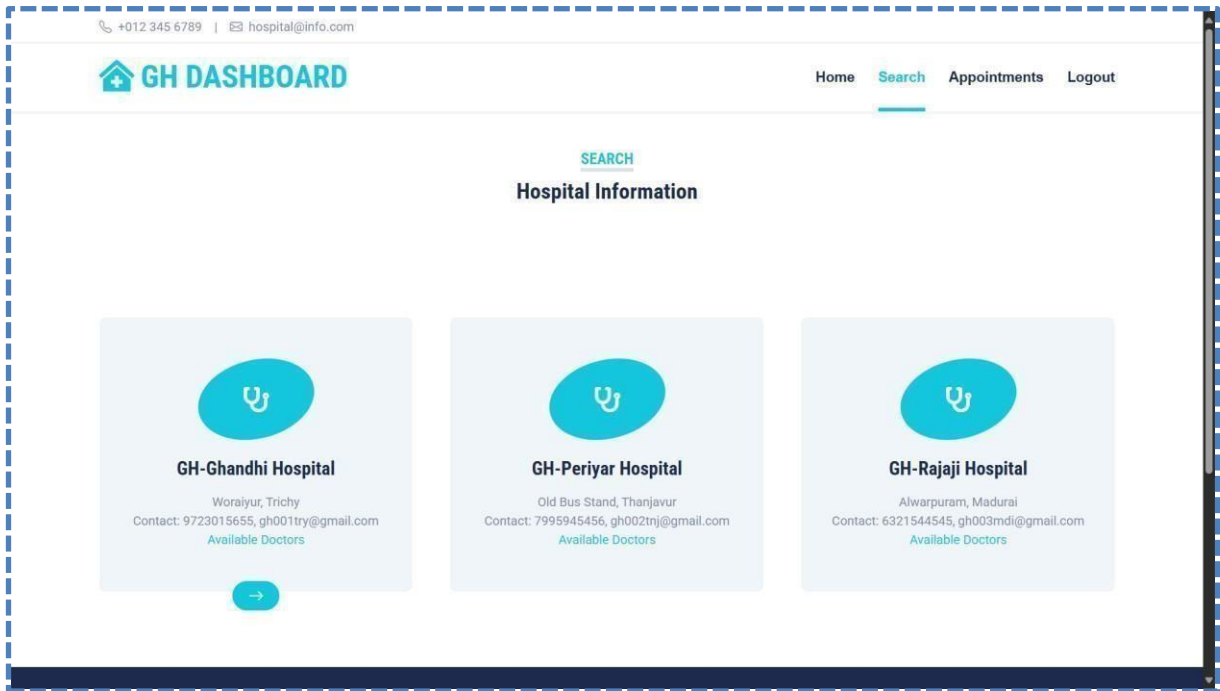
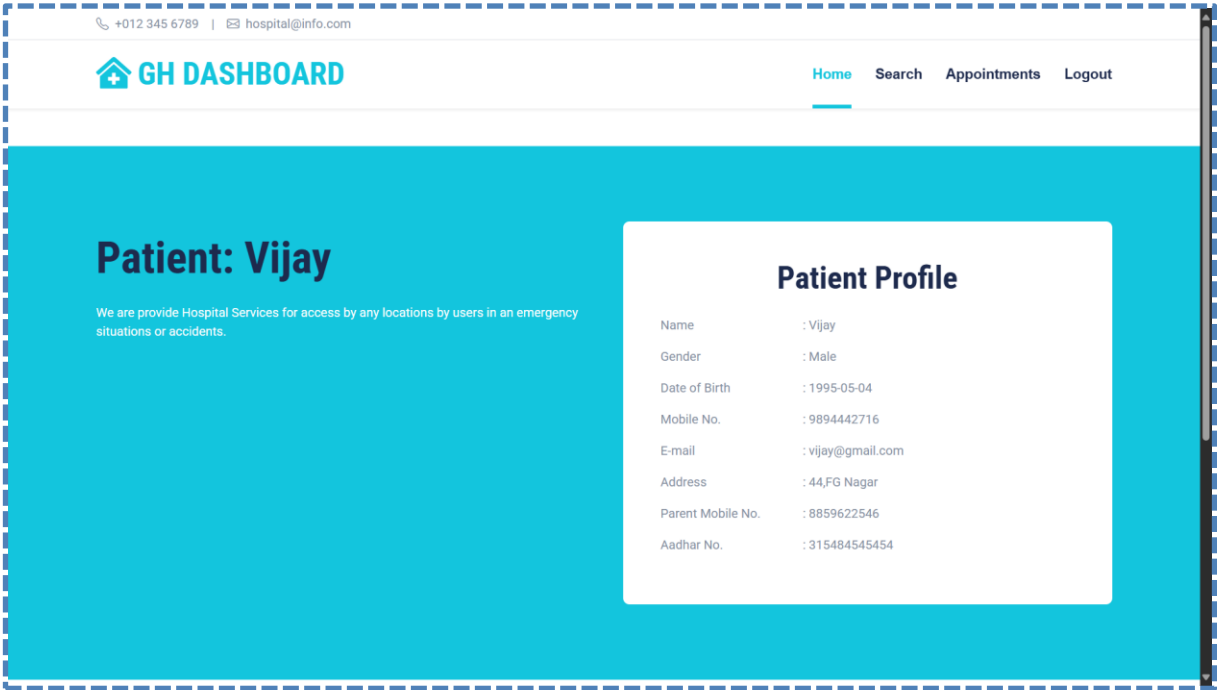
Login

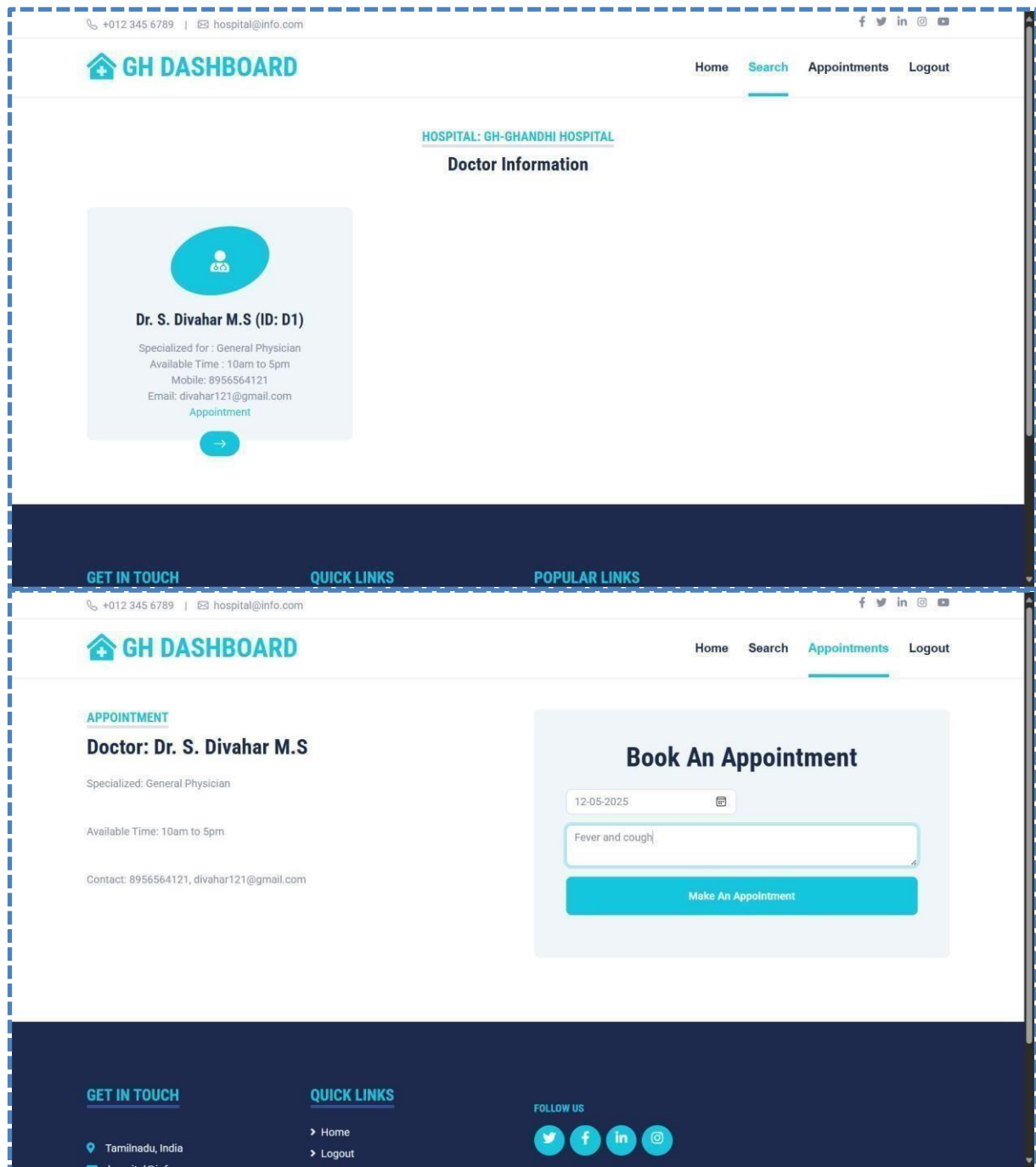
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GH DASHBOARD

HomePatientStaff In-ChargeNurseDoctorAdmin

Nurse

Nurses use the system to access appointment schedules, assist doctors, and update vital stats or medical records before consultation.

Nurse Login

N1

Login

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GH DASHBOARD

HomeLogout

Update Status

Temperature (97 °F - 99 °F)

99

Pulse (Heart Rate) (60 - 100 bpm)

70

BP (systolic/diastolic) (120/80 mmHg)

125/85


Height (cm)

172

Weight (kg)

76

Submit


 GH DASHBOARD

HomeLogout

Nurse

Update Patient Status

#	Patient	Status	Update
1	Usha [ID: PT3]	Temperature: 99.0 Pulse: 70 BP: 125/85 Height: 172.0 (cm) Weight: 76.0 (kg)	Update
2	Vijay [ID: PT2]	Temperature: 98.0 Pulse: 68 BP: 123/84 Height: 171.0 (cm) Weight: 75.0 (kg)	Update
3	Gokul [ID: PT4]	Temperature: 98.0 Pulse: 75 BP: 129/89 Height: 164.0 (cm) Weight: 80.0 (kg)	Update
4	Nimala [ID: PT5]	Temperature: 97.0 Pulse: 71 BP: 121/81 Height: 165.0 (cm) Weight: 78.0 (kg)	Update
5	Vetri [ID: PT6]	Temperature: 97.0 Pulse: 79 BP: 121/81	Update




HomePatientStaff In-ChargeNurseDoctorAdmin

Doctor

We are provide Hospital Services for access by any locations by users in an emergency situations or accidents.

Doctor Login

D1

*****

Login

GH DASHBOARD

HomeReportLogout



Token: 1

Patint: Usha [ID: PT3]

Appointment on: 12-05-2025 09:02

Reason: health checkup

Gender: Female

D.O.B: 1975-08-05

Address: 25,SM Colony

Mobile No.: 7586512121

Email: usha@gmail.com

(Entry by Staff)

Consultation



Token: 2

Patint: Vijay [ID: PT2]

Appointment on: 12-05-2025 09:09

Reason: Fever and cough

Gender: Male

D.O.B: 1995-05-04

Address: 44,FG Nagar

Mobile No.: 9894442716

Email: vijay@gmail.com

(Booked Online)

Waiting



Token: 3

Patint: Gokul [ID: PT4]

Appointment on: 12-05-2025 09:11

Reason: Fever

Gender: Male

D.O.B: 1999-08-04

Address: 43,RR Nagar

Mobile No.: 7852455256

Email: gokul@gmail.com

(Entry by Staff)

Waiting



Token: 4

Patint: Nimala [ID: PT5]

Appointment on: 12-05-2025 09:13

Reason: Skin Allergy

Gender: Female

D.O.B: 1980-08-07

Address: 11,NS Nagar

Mobile No.: 8545421565

Email: nirmala@gmail.com



Token: 5

Patint: Vetri [ID: PT6]

Appointment on: 12-05-2025 09:14

Reason: Back pain

Gender: Male

D.O.B: 1978-04-11

Address: 12,SS Road

Mobile No.: 7345485522

Email: vetri@gmail.com



Token: 6

Patint: Kumar [ID: PT1]

Appointment on: 12-05-2025 09:15

Reason: Fever


Gender: Male

D.O.B: 1980-05-04

Address: 56,BS Nagar, Salem

Mobile No.: 9894442716

Email: kumar@gmail.com

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HomePatient InfoLogout

Patient Entry Details

12-05-2025

Go

#	Patient	Date/Time	Reason for Visit	Doctor	Status
1	Token No.: 1 Name: Usha Patient ID: PT3 Gender: Female D.O.B: 1975-08-05	12-05-2025 09:02	health checkup (Entry by Staff)	D1 - Dr. S. Divahar M.S	Consulting Now
2	Token No.: 2 Name: Vijay Patient ID: PT2 Gender: Male D.O.B: 1995-05-04	12-05-2025 09:09	Fever and cough (Booked Online)	D1 - Dr. S. Divahar M.S	Waiting
3	Token No.: 3 Name: Gokul Patient ID: PT4 Gender: Male D.O.B: 1999-08-04	12-05-2025 09:11	Fever (Entry by Staff)	D1 - Dr. S. Divahar M.S	Waiting
4	Token No.: 4 Name: Nimala Patient ID: PT5 Gender: Female D.O.B: 1980-08-07	12-05-2025 09:13	Skin Allergy (Entry by Staff)	D1 - Dr. S. Divahar M.S	Waiting
5	Token No.: 5 Name: Vetri Patient ID: PT6 Gender: Male D.O.B: 1978-04-11	12-05-2025 09:14	Back pain (Entry by Staff)	D1 - Dr. S. Divahar M.S	Waiting
6	Token No.: 6 Name: Kumar Patient ID: PT1 Gender: Male	12-05-2025 09:15	Fever (Booked Online)	D1 - Dr. S. Divahar M.S	Waiting

GH DASHBOARD

HomeReportLogout

DOCTOR: DR. S. DIVAHAR M.S

Appointments

Patient PT2:Vijay next for Doctor Consultation..

Token: 1

Patint: Usha [ID: PT3]

Appointment on: 12-05-2025 09:02
Reason: health checkup
Gender: Female
D.O.B: 1975-08-05
Address: 25,SM Colony
Mobile No.: 7586512121
Email: usha@gmail.com
(Entry by Staff)
Consultation

Token: 2

Patint: Vijay [ID: PT2]

Appointment on: 12-05-2025 09:09
Reason: Fever and cough
Gender: Male
D.O.B: 1995-05-04
Address: 44,FG Nagar
Mobile No.: 9894442716
Email: vijay@gmail.com
(Booked Online)
Waiting

Token: 3

Patint: Gokul [ID: PT4]

Appointment on: 12-05-2025 09:11
Reason: Fever
Gender: Male
D.O.B: 1999-08-04
Address: 43,RR Nagar
Mobile No.: 7852455256
Email: gokul@gmail.com
(Entry by Staff)
Waiting

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HomeLogout

DOCTOR: DR. S. DIVAHAR M.S


Patient: Usha [ID: PT3]

Patient Status

Temperature: 99.0°F
Pulse: 70
BP: 125/85
Height: 172.0 cm
Weight: 76.0 kg

Prescription

Medicine
Description
Acetaminophen
250mg, Morning, Night
Add
Complete Consultation

GH DASHBOARD

HomeLogout

Patient Status

Temperature: 99.0°F
Pulse: 70
BP: 125/85
Height: 172.0 cm
Weight: 76.0 kg

Prescription

Medicine
Description
Add

#	Medicine
1	Acetaminophen 250mg, Morning, Night
2	Paracetamol 500mg, Morning, Night

Complete Consultation

GH DASHBOARD

Home

Report

Logout

DOCTOR: DR. S. DIVAHAR M.S

Patient Information

dd-mm-yyyy

Go

#	Patient	Date/Time	Reason for Visit	Status	Prescription
1	Name: Usha Patient ID: PT3 Gender: Female D.O.B: 1975-08-05	12-05-2025 09:02	health checkup (Entry by Staff)	Temperature: 99.0 Pulse: 70 BP: 125/85 Height: 172.0 Weight: 76.0	Acetaminophen 250mg, Morning, Night Paracetamol 500mg, Morning, Night
2	Name: Gokul Patient ID: PT4 Gender: Male D.O.B: 1999-08-04	12-05-2025 09:11	Fever (Entry by Staff)	Temperature: 98.0 Pulse: 75 BP: 129/89 Height: 164.0 Weight: 80.0	
3	Name: Nimala Patient ID: PT5 Gender: Female D.O.B: 1980-08-07	12-05-2025 09:13	Skin Allergy (Entry by Staff)	Temperature: 97.0 Pulse: 71 BP: 121/81 Height: 165.0 Weight: 78.0	
4	Name: Vetri Patient ID: PT6 Gender: Male D.O.B: 1978-04-11	12-05-2025 09:14	Back pain (Entry by Staff)	Temperature: 97.0 Pulse: 79 BP: 121/81 Height: 169.0 Weight: 78.0	
5	Name: Kumar Patient ID: PT1 Gender: Male	12-05-2025 09:15	Fever (Booked Online)	Temperature: 98.0 Pulse: 82 BP: 122/81	

GH DASHBOARD

Home

Doctor

Staff In-charge

Nurse

Report

Logout

Report

GH001-GH-Ghandhi Hospital

12-05-2025

Go

#	Patient	Date/Time	Reason for Visit	Doctor	Status
1	Name: Usha Patient ID: PT3 Gender: Female D.O.B: 1975-08-05	12-05-2025 09:02	health checkup (Entry by Staff)	D1 - Dr. S. Divahar M.S	Consulted
2	Name: Vijay Patient ID: PT2 Gender: Male D.O.B: 1995-05-04	12-05-2025 09:09	Fever and cough (Booked Online)	D1 - Dr. S. Divahar M.S	Cancelled
3	Name: Gokul Patient ID: PT4 Gender: Male D.O.B: 1999-08-04	12-05-2025 09:11	Fever (Entry by Staff)	D1 - Dr. S. Divahar M.S	Consulting Now
4	Name: Nimala Patient ID: PT5 Gender: Female D.O.B: 1980-08-07	12-05-2025 09:13	Skin Allergy (Entry by Staff)	D1 - Dr. S. Divahar M.S	Waiting
5	Name: Vetri Patient ID: PT6 Gender: Male D.O.B: 1978-04-11	12-05-2025 09:14	Back pain (Entry by Staff)	D1 - Dr. S. Divahar M.S	Waiting
6	Name: Kumar Patient ID: PT1 Gender: Male D.O.B: 1980-05-04	12-05-2025 09:15	Fever (Booked Online)	D1 - Dr. S. Divahar M.S	Waiting

