PROJECT REPORT

FOR

PLASMA DONOR APPLICATION

1. INTRODUCTION

1.1 Project Overview

A plasma is a liquid portion of the blood, over 55% of human blood is plasma. Plasma is used to treat various infectious diseases and it is one of the oldest methods known as plasma therapy. Plasma therapy is a process where blood is donated by recovered patients in order to establish antibodies that fight the infection. In this project plasma donor application is being developed by using IBM Cloud. For instance, during COVID 19 crisis the requirement for plasma increased drastically as there was no vaccination found in order to treat the infected patients, with plasma therapythe recovery rates were high but the donor count was very low and in such situations it was very important to get the information about the plasma donors. Saving the donor information and notifying about the current donors would be a helping hand as it can savetime and help the users to track down the necessary information about the donors.

1.2 Purpose

As we all know, the traditional methods of finding plasma, one has to find out for oneself by looking at hospital records and contacting donors have been recovered, sometimes may not be available at home and move to other places. In this type of scenario, the health of those who are sick becomes disastrous. Therefore, it is not considered a rapid process to find plasma. The main purpose of the proposed system, the donor who wants to donate plasma can simply upload their covid19 traced certificate and can donate the plasma to the blood bank, the blood bank can apply for the donor and once the donor has accepted the request, the blood bank can add the units they need and the hospital can also send the request to the blood bank that urgently needs the plasma for the patient and can take the plasma from the blood bank.

2. LITERATURE SURVEY

2.1 Existing problem

There are many people who are willing to donate plasma and who need plasma.
But there is not any accessible way to help them to find plasma donation centers in real-time. So, the problem is not the lack of donors, but finding the right sponsor at the right time. If someone needs plasma, they seek plasma first from family members, then from hospitals and the nearest plasma bank. If they can't process plasma in these ways, it's very difficult for them to contact another for a short-term plasma draw. This is a problem that I want to solve through this application. Instead of just providing plasma to people in need with an outdated list of regular plasma donors who may or may not be available to help, This application reaches the right people the moment users find Out.

2.2 References

Several experiments have been carried out over the years by different groups of researchers. Here are some of the following groups:

[1] Denuis O'Neil (1999). "Blood component" Archived from the original on June 5, 2013. Normally, a certain amount of human body weight comes from blood. For adults, it is 4-6 liters of blood. This essential liquid plays an important role in transporting oxygen and nutrients to cells and removing carbon dioxide, ammonia and other waste products. Blood is a very common tissue composed of over 4000 different types of components.

[2] ways to keep your plasma healthy, Original Archived November 1, 2013, Accessed November 11, 2011. Plasma donation is one of the most accepted practices for saving lives,While earning a few dollars. The whole process can take some time, but it's well worth it once you experience it a few times. Accepting money in exchange for plasma is welcome. It's a move when you feel like you're not just a hero, but you're adding value to yourself. The term "healthy" does not mean only in the absence of disease. It also means that you are healthy enough.

[3] Ripathis S, Kumar V, Prabhakar A, Joshi S, Agarwal A (2015). "Microscale Passive Plasma Separation: A Review of Design Principles and Microdevices," J. Micromech Micro 25 (8): 083001; Plasma separation is of great importance in the fields of diagnosis and healthcare. Due to the lagging transition to microscale, these recent trends are a rapid shift towards shrinking complex macro processes.

[4]In this paper, the author has carried out analysis based on the opportunities presented by serverless computing. They emphasize that serverless services are a more affordable approach for many network services and it is more user friendly as a serverless approach will relieve the customers from the intricacies of deployment. These services will help to improve the new business opportunities.

[5]Author conducted a survey of existing serverless platform in this paper from source projects, industry, academia, use cases, and key characteristics and has described the challenges and the open problems associated with it. Authors work presented a hands on experience of serverless technologies using different services from different cloud provides such as Amazon, Google, IBM, Microsoft Azure.

[6]In this paper three demonstrators for IBM Bluemix OpenWhisk were presented. They exhibit event-based programming triggered by weather forecast data, speech utterances and Apple WatchOS2 application data. And also demonstrated a chatbot using IBM Bluemix OpenWhisk that calls on the IBM Watson services which include dates, weather, alarm services, news and music tutor.

[7]In this paper serverlessOS was designed. It comprises components such as 1. desegregation model that leverages desegregation for abstraction but it will enable resources to move fluidly between servers for the performance. 2. The second key component is cloud orchestration layer which helps to manage fine-grained resource placement and allocation throughout the application lifetime with the help of global and local decision making 3. And the third component is an isolation capability which enforces data and resource isolation.

[8]In this paper an efficient resource management system for serverless computing framework was proposed which aims to enhance resource with a focus on memory allocation among the containers and the design which was added on top of an open-source serverless platform, openLambda and it is based memory needs events are triggered

2.3 Problem Statement Definition

This system aims at connecting the donors & the patients by an online application. By using this application, the users can either raise a request for plasma donation or requirement. Similar to blood donors there also exist plasma donors where there exists problems like in case of emergency needs the most important life saver necessity is plasma , Plasma Banks are the main providers of plasma who receives blood from

various donors, monitors the plasma groups database of emergencies and makes them available to the hospital whenever needed. The major problem faced by the main plasma providers and the need is the availability of donors at the right time. We hereby took a step forward to build a system to create a network of people who can help each other in need. We propose an application where the plasma banks can timely update the plasma Stock availability and donor and register themselves to the donor and the user can find plasma availability nearby him/her. The urgent time of a plasma requirement, users can quickly check for plasma banks, hospitals or donors as per req irement matching a particular or related and reach out to them through the App.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

3.2 Ideation & Brainstorming

https://github.com/IBM-EPBL/IBM-Project-8732-1658928319/blob/main/Project%20Design%20and%20Planning/Ideation%20Phase/Empathy%20map.pdf

3.3 Proposed Solution

<table>
<tr>
<td>1.CUSTOMER SEGMENT(S)

Who is your customer? People who wish to donate plasma and Hospitals & Blood banks which needs plasma donors</td>
<td>5.AVAILABLE SOLUTIONS

Which solutions are available to the customers when they face the problem?
Available solutions notify about the donors, patients and the availability of plasma & need for the plasma. The notification regarding the need for plasma was not send to the donors</td>
<td>8.CHANNEL OF BEHAVIOUR
8.1 ONLINE What kind of actions do customers take online?
Registering for plasma donation and requesting for plasma will be carried out through online

8.2 OFFLINE What kind of actions do customers take offline?
Arrangements for plasma donation Awareness for more plasma donation</td>
</tr>
<tr>
<td>2. JOBS-TO-BE-DONE / PROBLEMS J&P

Which jobs-to-be-done (or problems) do you address for your customers?
Data collection should be monitored properly with the donor's data security. Unawareness about the need for plasma donation. Demand for donors.</td>
<td>6.CUSTOMER CONSTRAINTS

What constraints prevent your customers from taking action or limit their choices of solutions?
Network Bandwidth Donor Health condition Lack of knowledge about app Unavailability of plasma</td>
<td>9.PROBLEM ROOT CAUSE

What is the real reason that Does this problem exist?
What is the backstory behind the need to do this job?
Lack of unawareness about the importance of plasma donation. Inability to find the donors at the time of emergency. Decrease in donors count</td>
</tr>
<tr>
<td>3. TRIGGERS TR
What triggers customers to act?

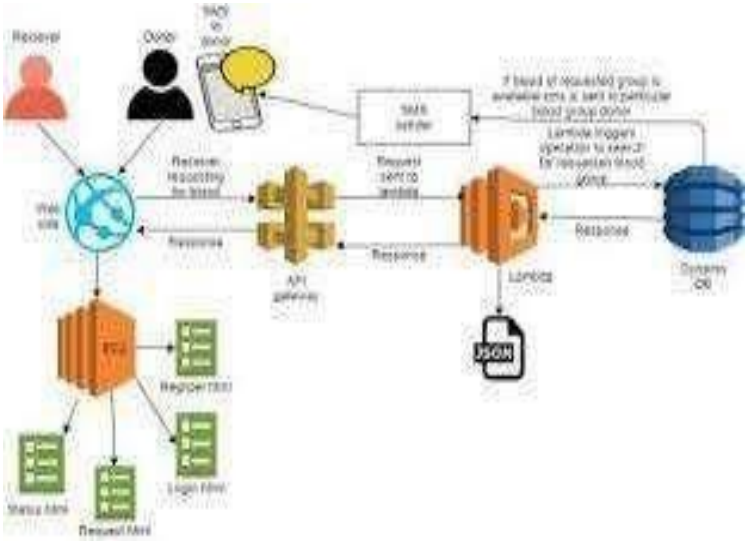
Volunteering interest and social responsibility towards society triggers the people to use this application</td>
<td rowspan="2">7. BEHAVIOUR

What does your customer do to address the problem and get the job done?
An unique ID will be provided for the donor’s, in order to maintain their personal privacy. At the same time, an unique ID will be issued to the patient and the records will be monitored. Both donor and patient can access the application at ease</td>
<td rowspan="2">10. YOUR SOLUTION

SL Donors will be searched with blood groups in our database, if needed.
The volunteers can donate the blood with their interest and become donors by registering themselves.
Stock monitoring will be done and updates happen at the same time.
An application which will act as the intermediate between the hospital and donors and bridge the gap between them.</td>
</tr>
<tr>
<td>4. EMOTIONS: BEFORE / AFTER EM
How do customers feel when they face a problem or a job and afterwards?
Before : Hard to find the donors for plasma donation at the right time.
After Satisfactory feel and relaxed feel after getting the right donor</td>
</tr>
</table>

3.4 Problem Solution fit

S.NO	**Parameter**	**Description**
1.	Problem Statement (Problem to be solved)	The main aim of this project is to help the people who need blood in an emergency and to associate some donors who are willing to donate their blood to needy people and save their lives.
2.	Idea / Solution description	The user will be able to Search donors of suitable blood groups and contact them if needed. Donate blood by registering themselves with our system and can also become donors. Will be able to see the stock of various blood groups. Send requests for blood via "contact us". Get information about all the blood campaigns.
3.	Novelty / Uniqueness	All of them have different ideas and different queries. Based on the user request and experience we will update our project based on user convenience .
4.	Social Impact / Customer Satisfaction	With the right implementation of the software you can benefit in many ways and also it makes the management very easy and error free. The software helps in tracking donors, getting Prompt and Correct Reports when required, and Centralized data storage with security. And last but not the least; the software will help in Customer Satisfaction.

5.	Business Model (Revenue Model)	Hospitals, NGOs, and private groups will profit from this donation application. Anyone with a basic understanding can use this software. This can be utilized at any time, anywhere. Working with the assistance of the government, we can create a programme to assist persons in need of plasma. 
6.	Scalability of the Solution	Instead of scouring the entire world for plasma donors, this program enables users to find donors while sitting at home. Once there is an emergency, send a plasma request to all people. The donor is prepared to be informed of the donation. Receiver may get in touch with the donor. Due to this Donors can check their eligibility on an app as well as making it simpler to find a suitable donor

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	**Access Website**	Software operator should be capable to access web- application through either an application browser or similar on the pc.

FR-2	**Software operator Registration**	The software operator should be able to register through the web-application. The donor software operator must provide user name, gender, blood/plasma group, location, contact.
FR-3	**Login/logout/update details**	The login information will be stored on the database for future use.
FR-4	**Search for donor**	Search results can be viewed in a list. Each element in the list represents a specific donor with the donor details.
FR-5	**User plasma request**	Users can request to donate plasma by filling out the request form on the page. Once the request is submitted, they will get an email.
FR-6	**View distribution details**	The plasma bank should be able to view the status of the distribution details.

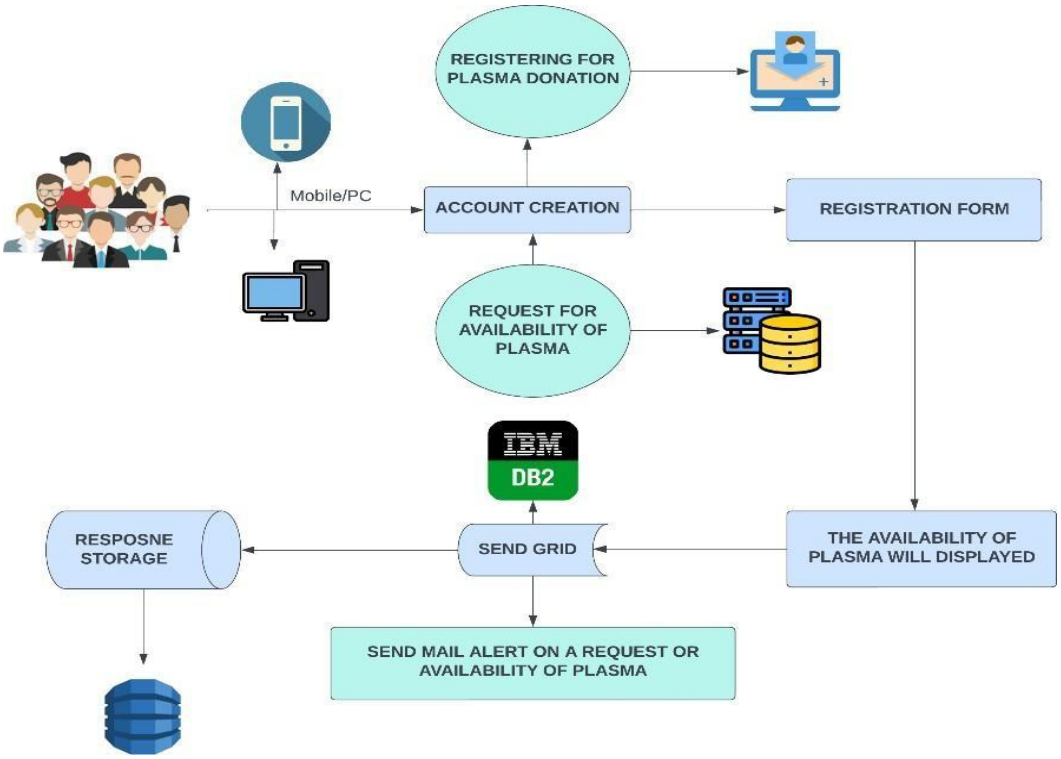
4.2 Non-Functional requirements

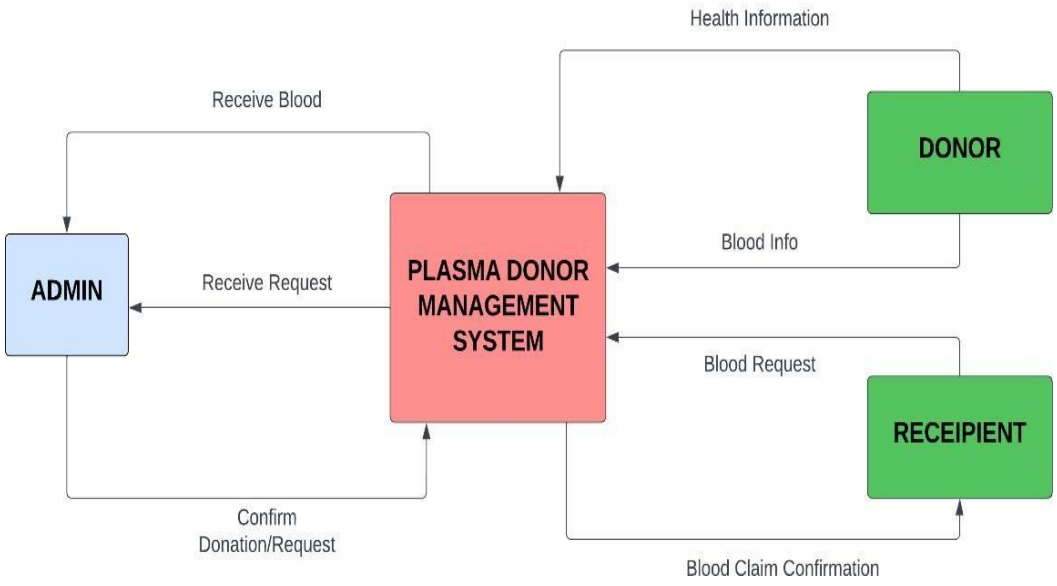
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The plasma donor application must have a good looking user friendly interface.
NFR-2	**Security**	The plasma donor application must be secured with proper username and passwords.
NFR-3	**Reliability**	The plasma donor application should work properly,even when faults occur.
NFR-4	**Performance**	The plasma donor application must perform well in different scenarios.
NFR-5	**Availability**	The plasma donor application must be available 24 hours a day with no bandwidth issues.
NFR-6	**Scalability**	The plasma donor application should able to increase or decrease in performance and cost in response to changes in application and system processing demands.

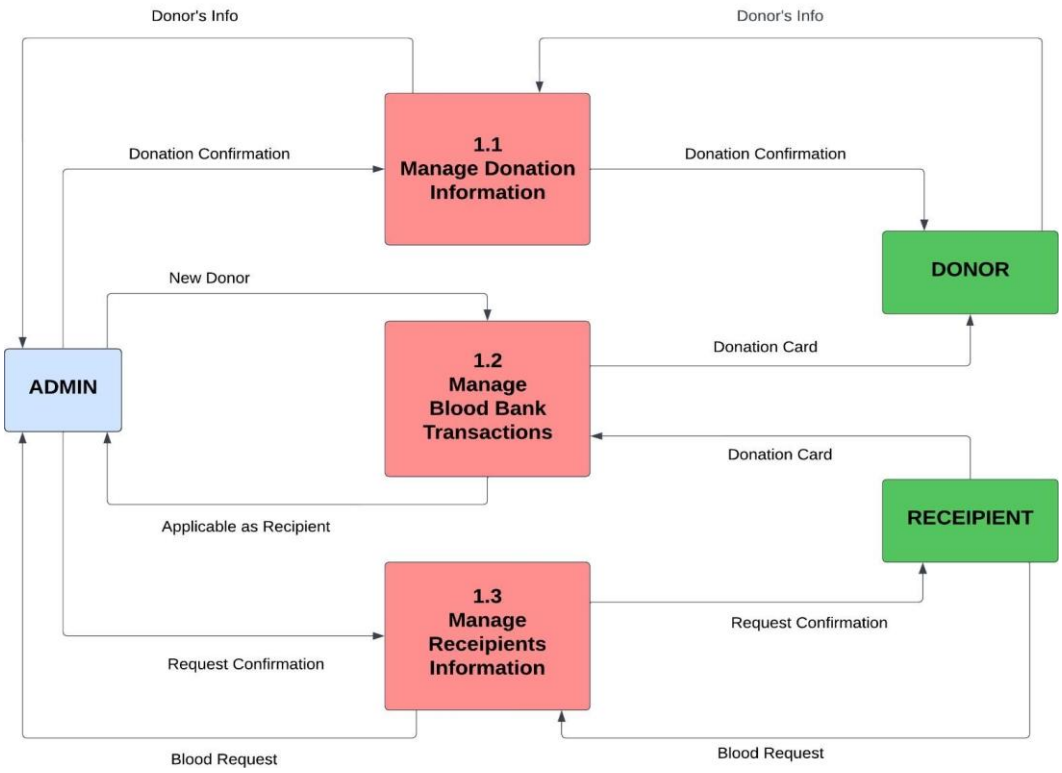
5. PROJECT DESIGN

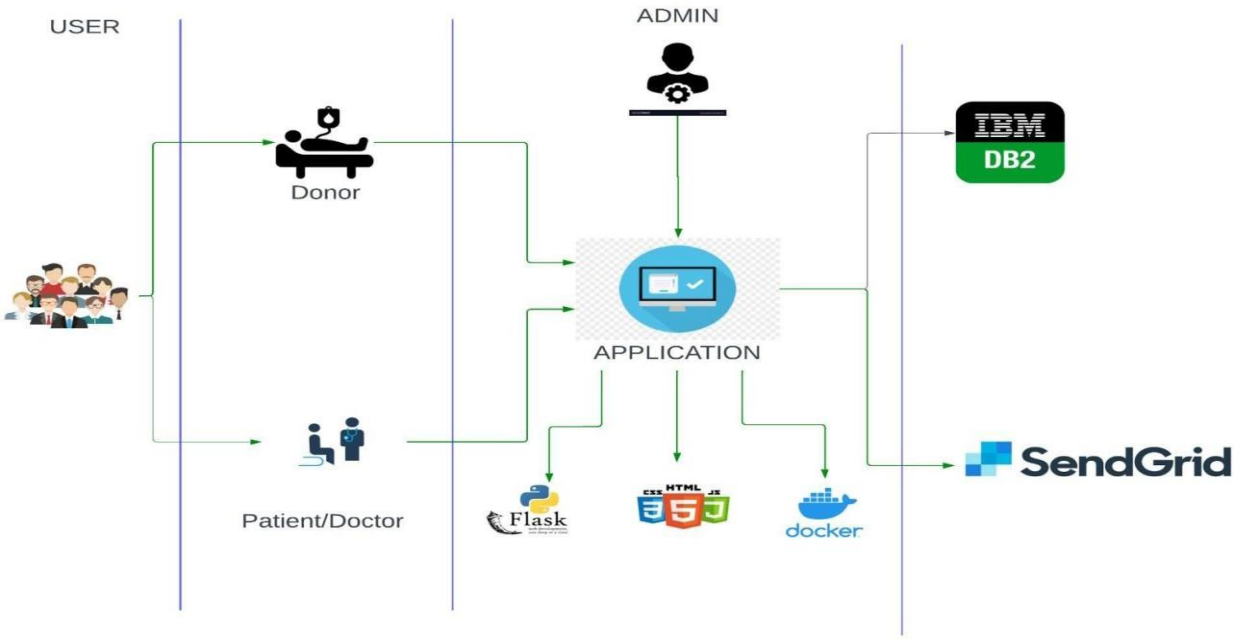
5.1 Data Flow Diagrams





DATA FLOW DIAGRAM LEVEL 1





5.2 Solution & Technical Architecture

Table-1: Components & Technologies:

SNO	Component Description	Description	Technology
1	User Interface	The interaction between th use and application e.g.,Web UI, Mobile App, Chatbot	HTML, CSS, JavaScript / Bootstrap etc.
2	Application Logic-1	Framework used for designing the application.	Python, Python - Flask
3	Application Logic-2	Accessing the cloud and storing details of the users both donors and patients.	IBM Cloud, IBM DB2
4	Application Logic-3	Docker is an open-source platform for building, deploying, and managing containerized applica	Docker
5	Database	Data Type, Configurations etc.	SQL.
6	Cloud Database	Database Service on Cloud	BM Cloud and IBM DB2
7	File Storage	File storage requirements	IBM Block Storage or NO Storage Service or Local File System

Table-2: Application Characteristics:

sno	Characteristics	Description	Technology
1	Open-Source Framework	Python – flask is an open-source framework used to develop the application.	Python – flask is an open source framework used to develop the application.
2	Security Implementation	Container registry and Kubernetes Cluster are used for encryption of data.	Container registry and Kubernetes Cluster
3	Scalable Architecture	Kubernetes Cluster allow containers to run across mu machines and environments.	Kubernetes Cluster
4	Availability	Kubernetes Cluster provides all time availability.	Kubernetes Cluster
5	Performance	Docker improves the application performance.	Docker

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1

		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can receive confirmation email click confirm	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can enter into my account	High	Sprint-1
	Dashboard	USN-6	As a user ,Display all details about plasma application	I can donate/get details about the plasma	High	Sprint-2
Customer (Web user)	Application	USN-7	As a user ,I can register, login and see details about plasma	I can access the donor details and availability of plasma	High	Sprint-3
Customer Care Executive	Update Plasma storage	USN-8	Keep track the availability of the Plasma	I can provide application for customer needs	High	Sprint-4
Administrator	Verify donor details	USN-9	To add the donor plasma details in application	I can Control the all details in this application	Medium	Sprint-3
Customer Care Executive	Verify Customer Feedback	USN-10	To design the application that meets user's desires	I can satisfy the customer expectations	Medium	Sprint-4
Customer Care Executive	Control all Plasma details	USN-11	Make sure to check the availability of plasma in application	I can alert notification through email and SMS	High	Sprint-2
Administrator	Performance of application	USN-12	To make the process more efficient	I can save time, cost by improving the Plasma management application	High	Sprint-4

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	High	Jeyanigeswar Karunakaran Jeyaprakash Mohamed Safeek
Sprint-1	Login	USN-2	As a user, I can log into the application by entering email & password	High	Jeyanigeswar Karunakaran Jeyaprakash Mohamed Safeek
Sprint-2	Dashboard	USN-3	As a user ,Display all details about plasma application	High	Jeyanigeswar Karunakaran Jeyaprakash Mohamed Safeek
Sprint-3	Application	USN-4	As a user ,I can register, login and see details about plasma	High	Jeyanigeswar Karunakaran Jeyaprakash Mohamed Safeek
Sprint-3	Verify donor details	USN-5	To add the donor plasma details in application	Medium	Jeyanigeswar Karunakaran Jeyaprakash Mohamed Safeek
Sprint-2	Control all Plasma details	USN-6	Make sure to check the availability of plasma in application	High	Jeyanigeswar Karunakaran Jeyaprakash Mohamed Safeek
Sprint-4	Verify feedback	USN-7	To design the application that meets user's desires	Medium	Jeyanigeswar Karunakaran Jeyaprakash Mohamed Safeek

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Sprint Release Date (Actual)
Sprint-1	30	6 Days	25 Oct 2022	30 Oct 2022	30 Oct 2022
Sprint-2	30	6 Days	1 Nov 2022	6 Nov 2022	6 Nov 2022

Sprint-3	30	6 Days	8 Nov 2022	13 Nov 2022	13 Nov 2022
Sprint-4	30	5 Days	14Nov 2022	18 Nov 2022	18 Nov 2022

7. CODING & SOLUTIONING

7.1 FEATURE 1

https://github.com/IBM-EPBL/IBM-Project-8732-1658928319/tree/main/Project%20Development%20Phase/Sprint1

It consists of two modules index and story

Index- It is the main webpage of our model

Story- It shows about the need for plasma donation

7.2 FEATURE 2

https://github.com/IBM-EPBL/IBM-Project-8732-1658928319/tree/main/Project%20Development%20Phase/Sprint2

Here we discussed about register module,

In this module, users can register their name as a donor. If a certain age limit is satisfied their registration process for plasma donors will be accepted.

7.3 FEATURE 3

https://github.com/IBM-EPBL/IBM-Project-8732-1658928319/tree/main/Project%20Development%20Phase/Sprint3

Here we discussed about login module,

In this module, users can login as a donor and they can update their availability status.

Chatbot also created which helps the user to know more about plasma donation.

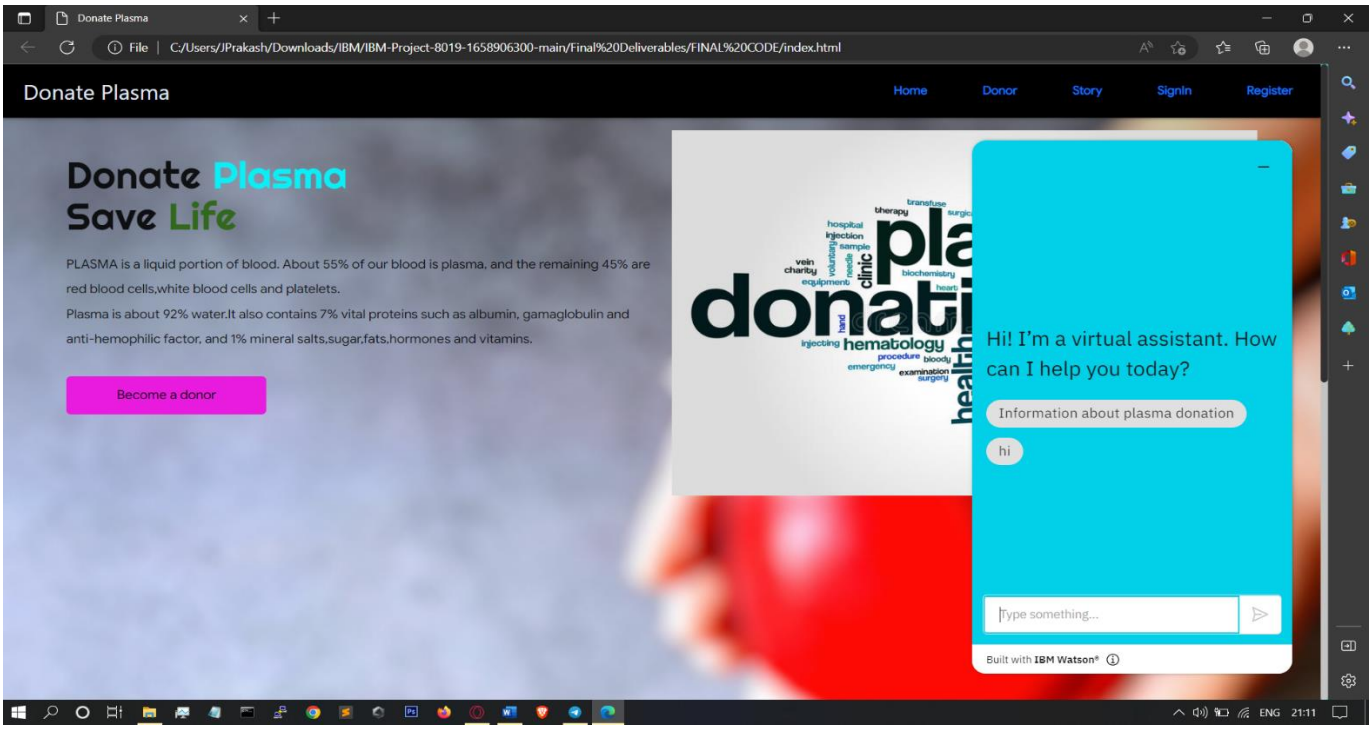
7.4 FEATURE 4

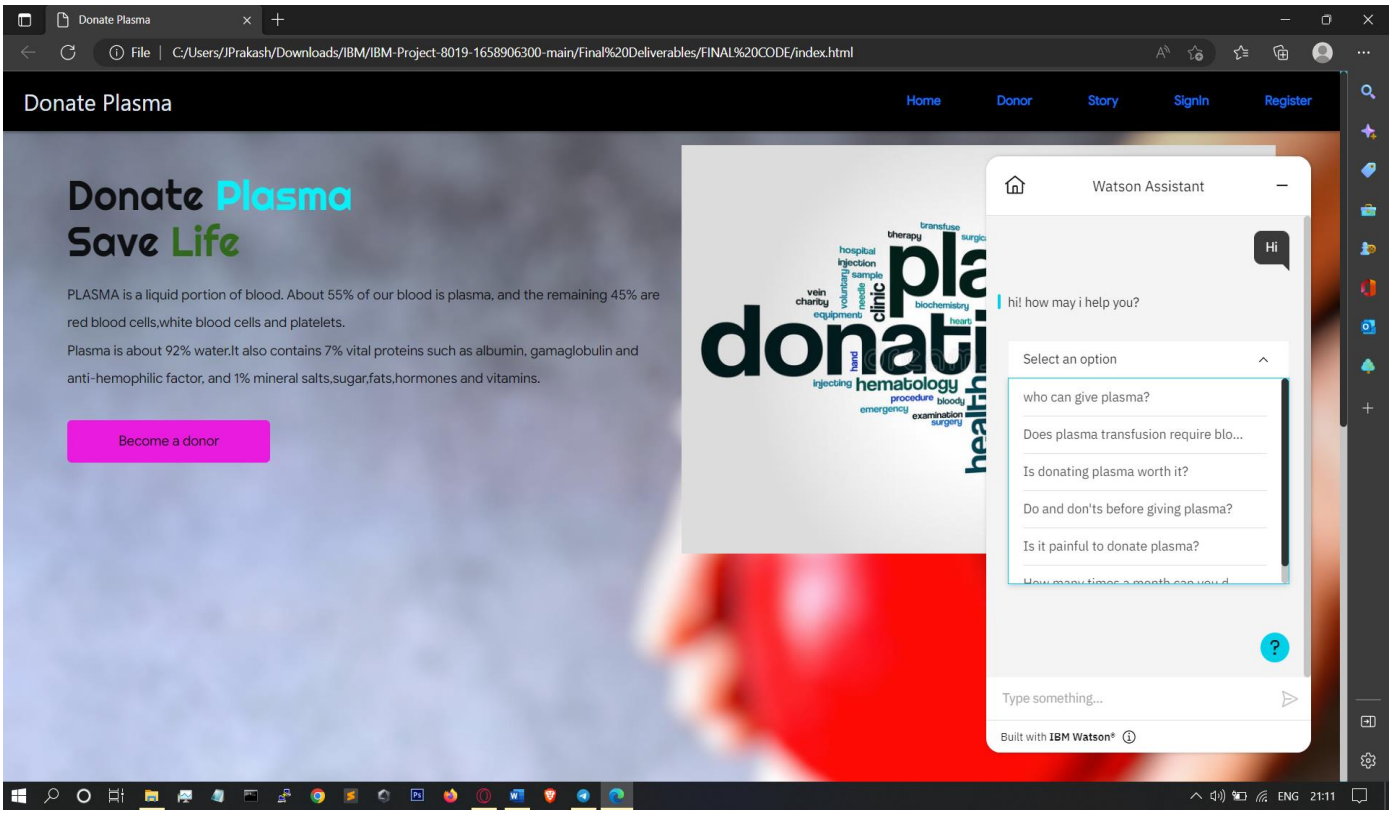
https://github.com/IBM-EPBL/IBM-Project-8732-1658928319/tree/main/Project%20Development%20Phase/Sprint4

In this process we make a database connectivity for register , login and update of donor information.

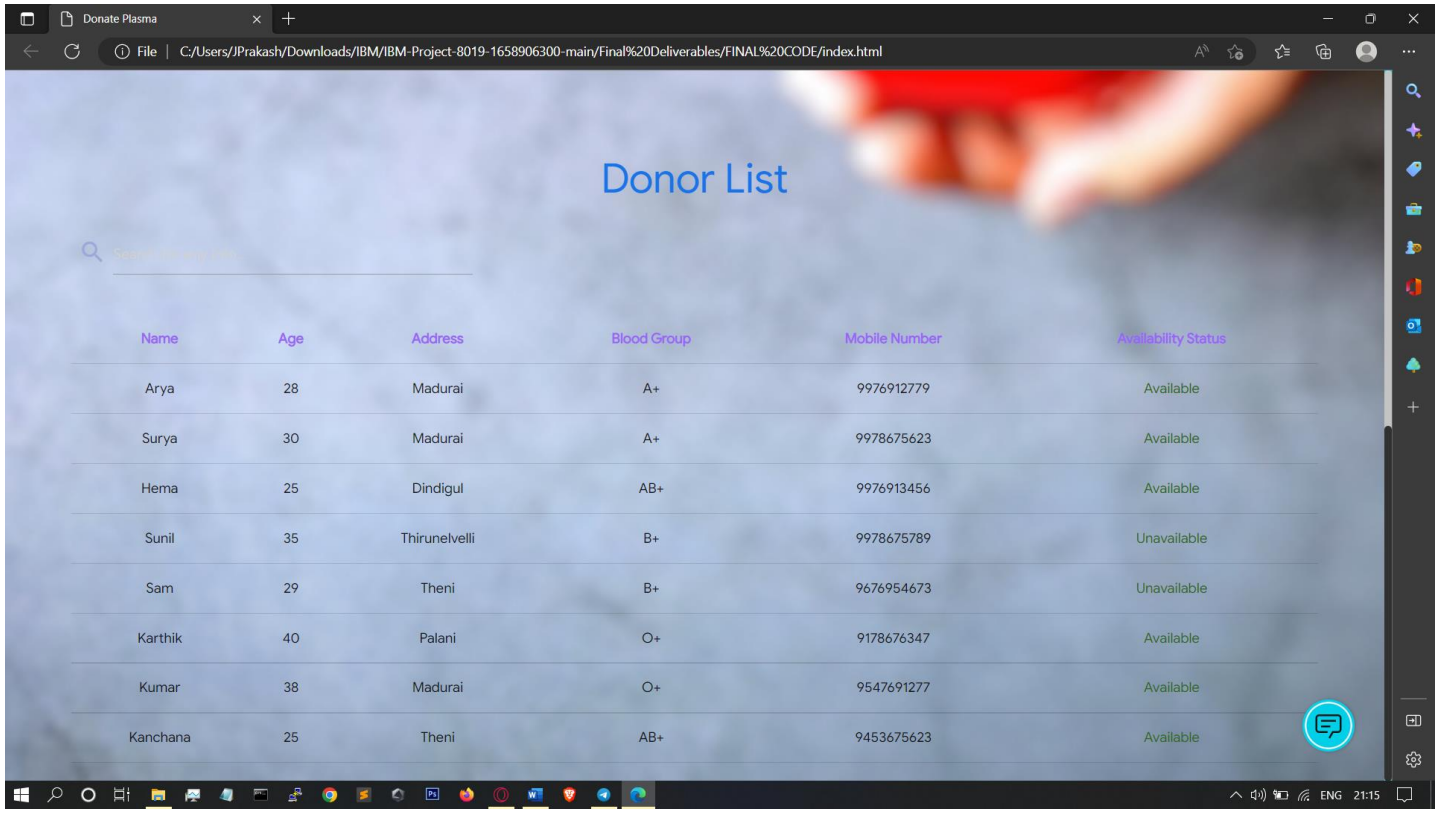
8. TEST CASES

8.1 CHATBOT WORKING

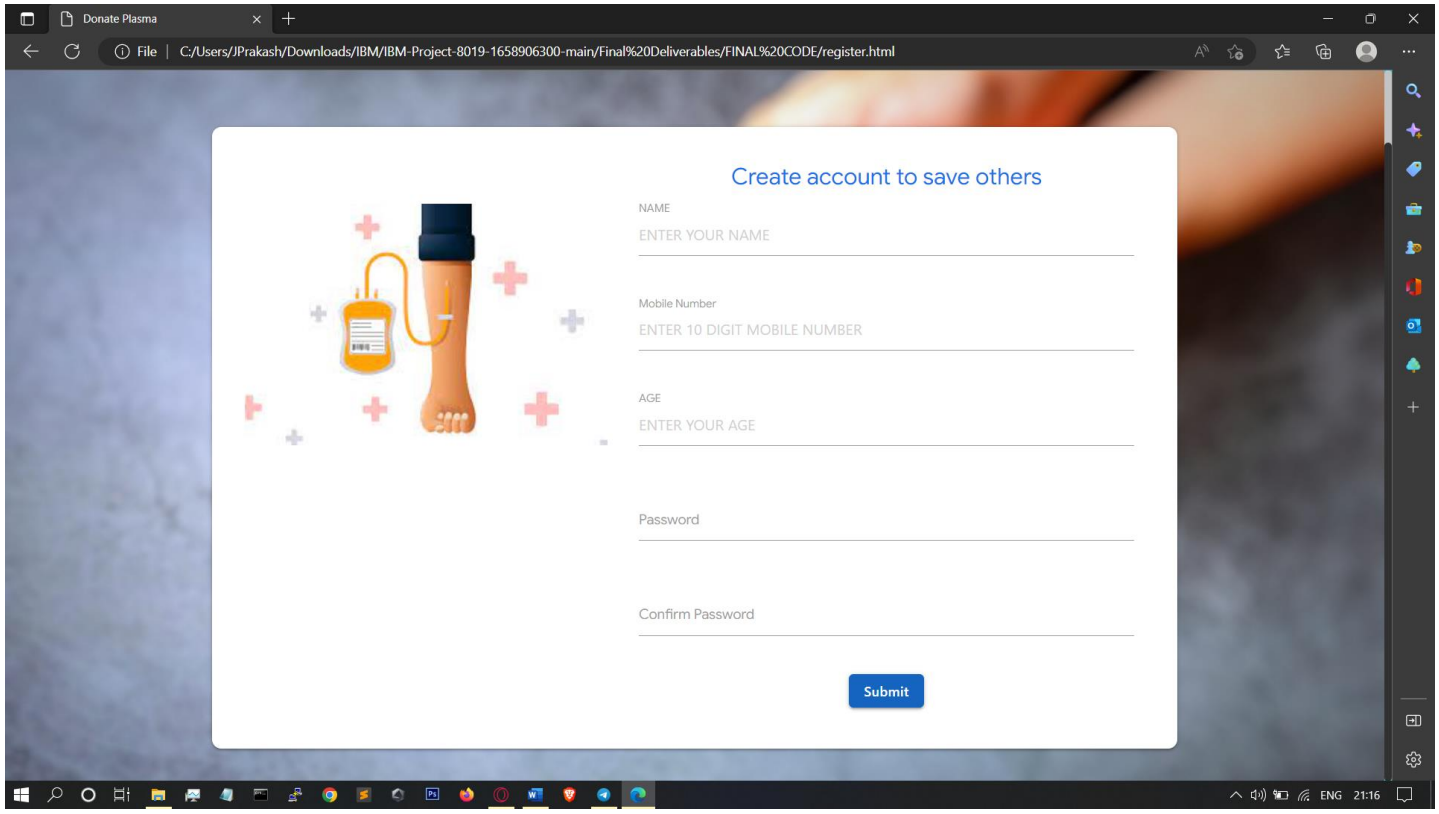




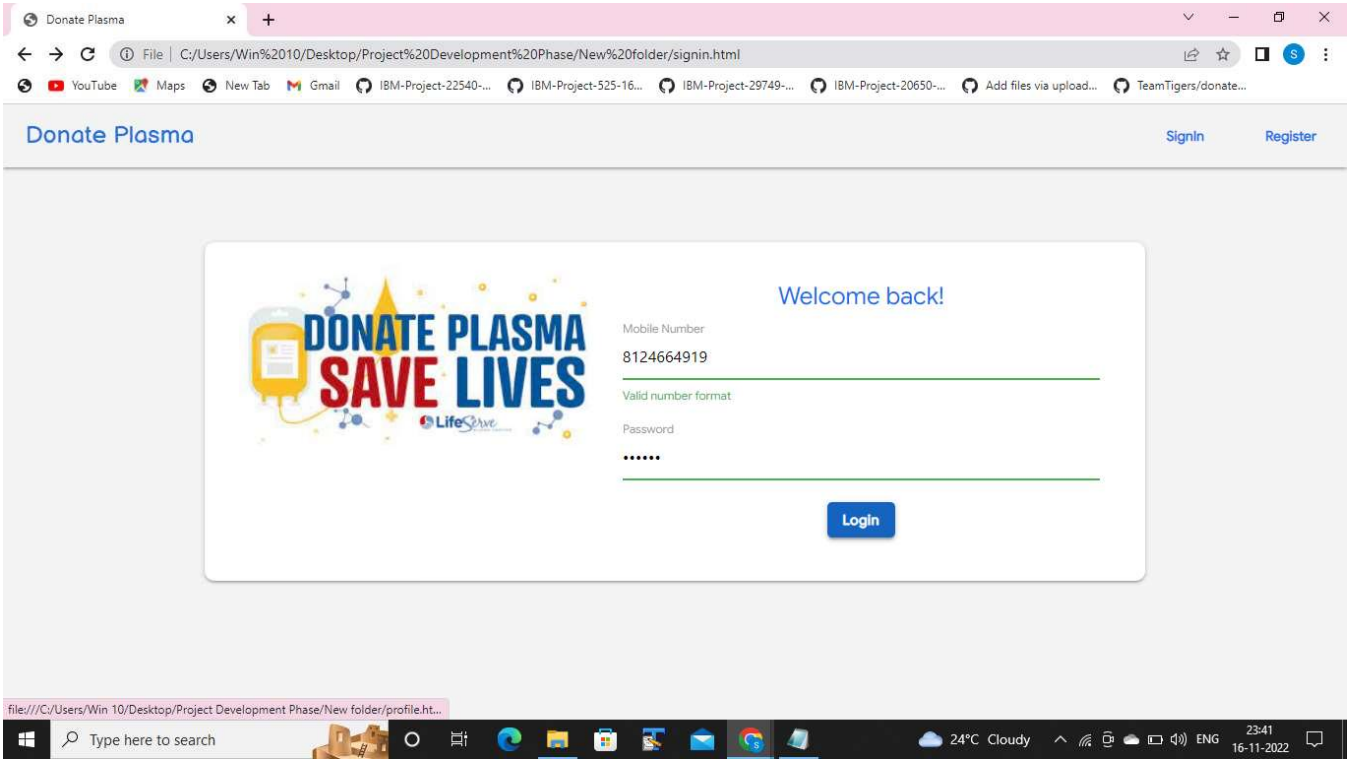
8.2 RECIPIENT SEARCHING



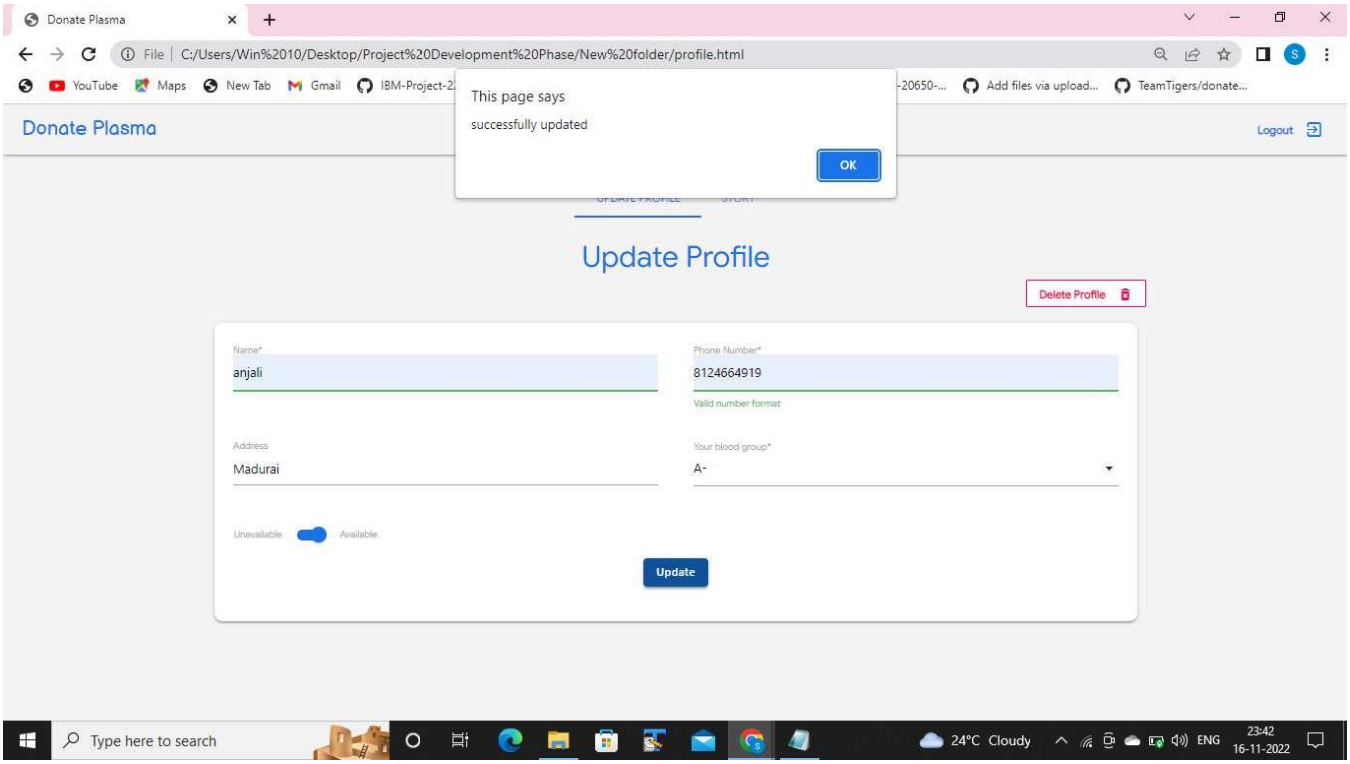
8.3 DONOR REGISTRATION



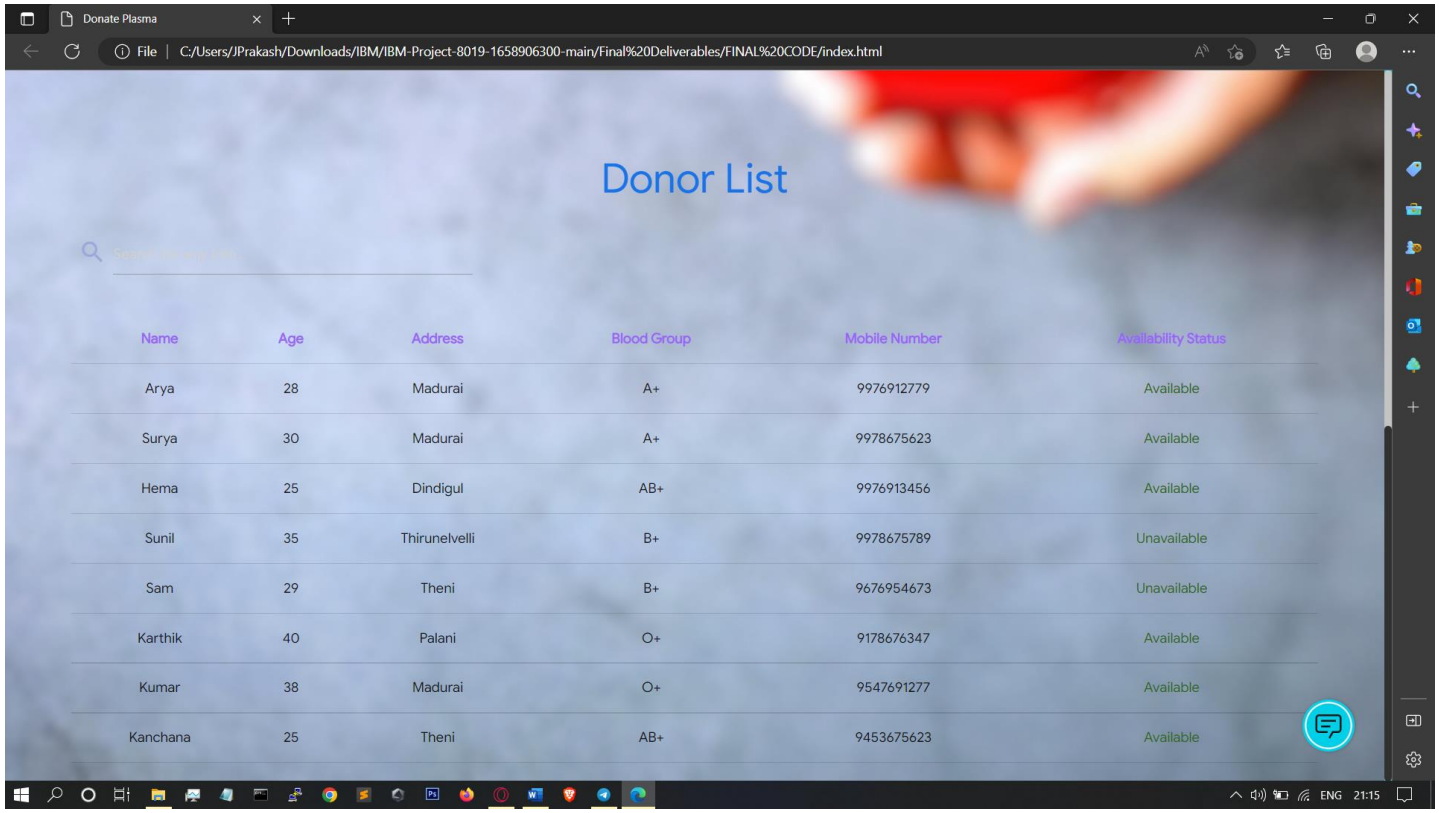
8.4 DONOR LOGIN



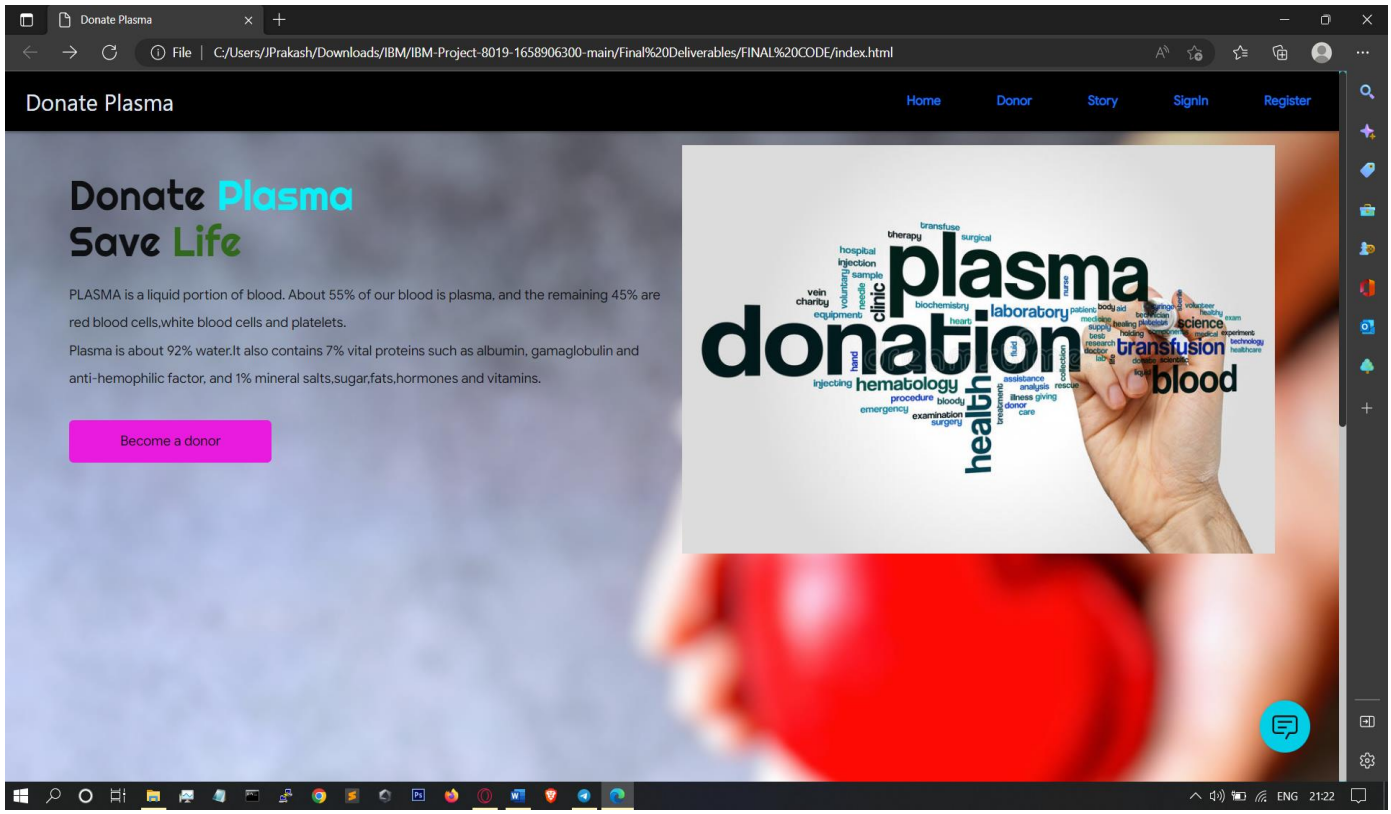
8.5 UPDATING DONOR PROFILE

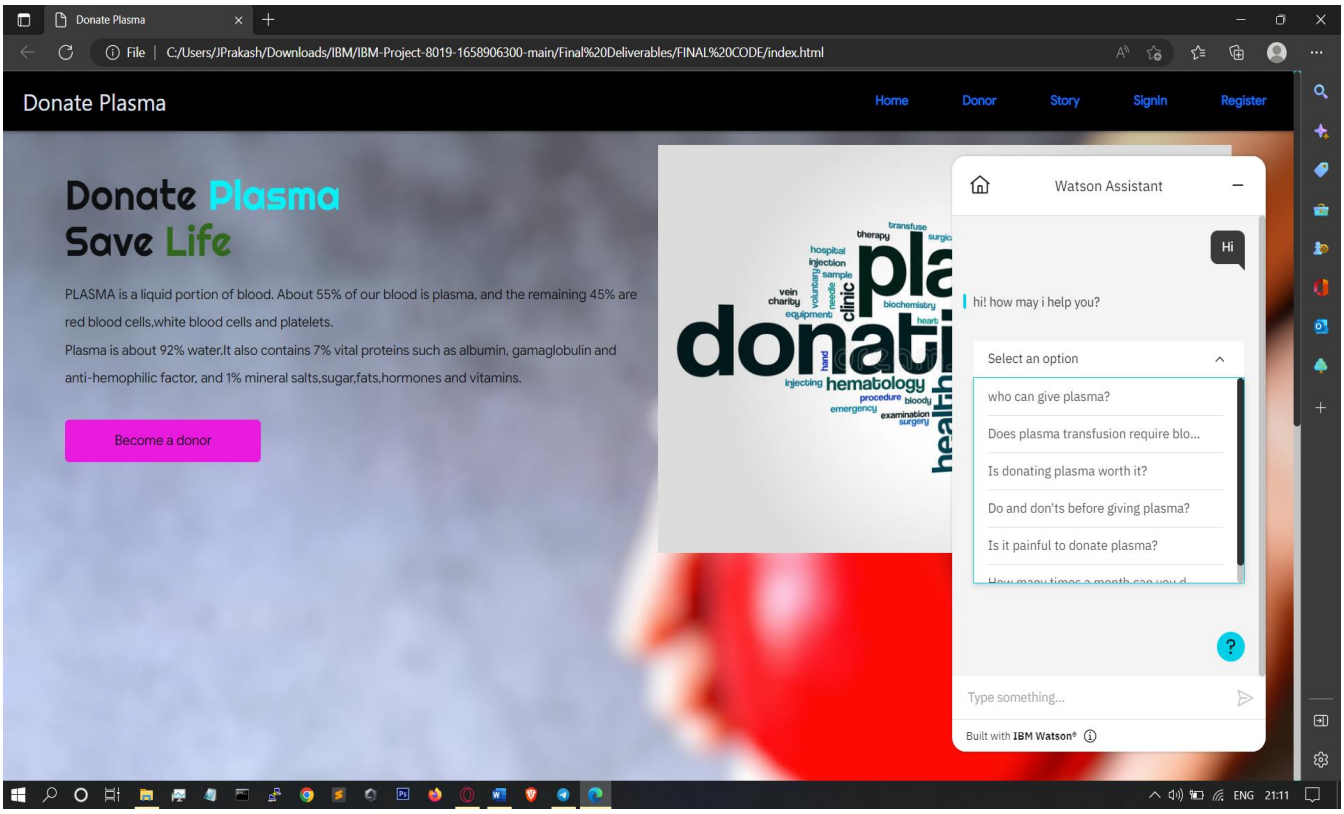


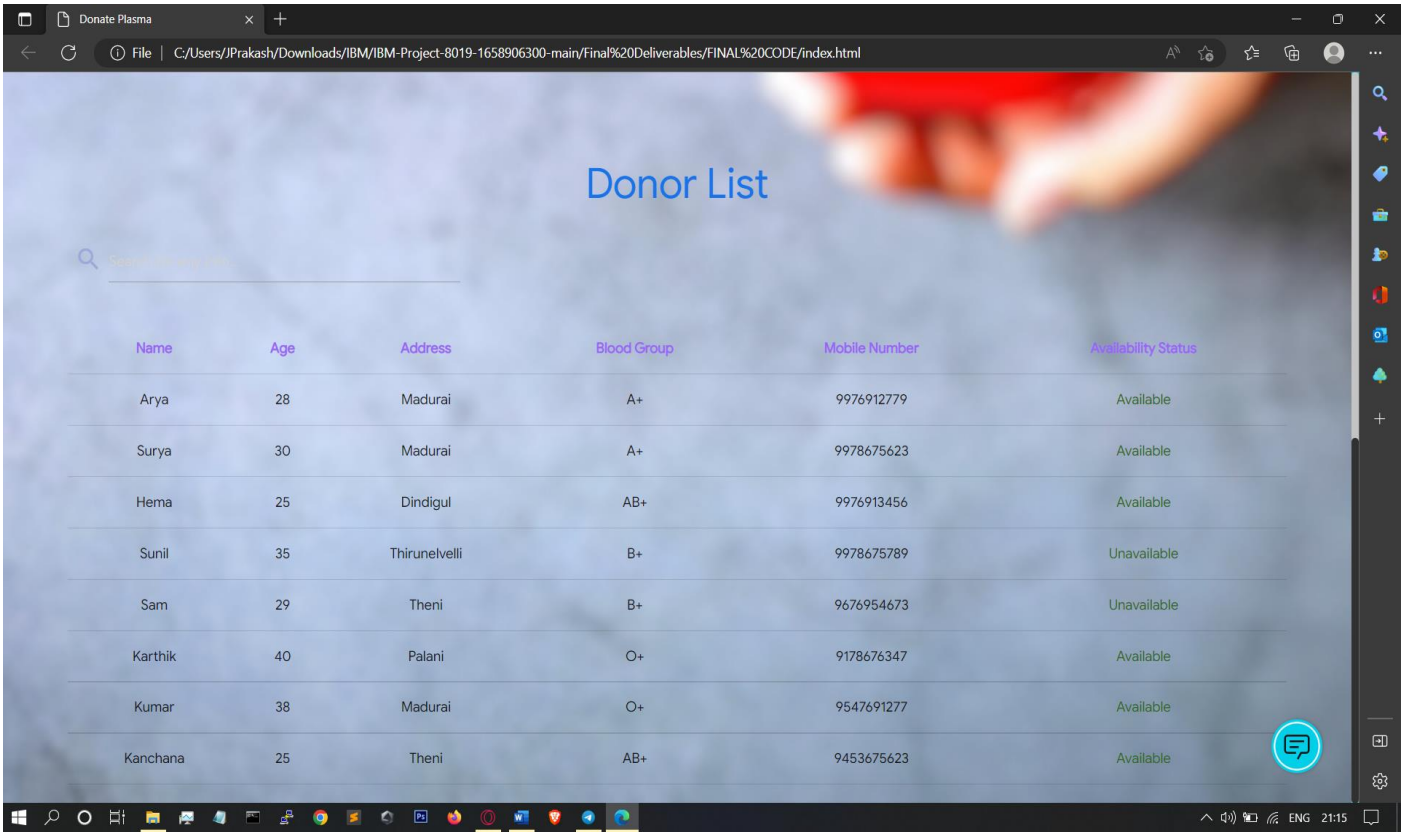
8.6 DONOR ADDED



9. RESULTS




Donate Plasma
File | C:/Users/JPrakash/Downloads/IBM/IBM-Project-8019-1658906300-main/Final%20Deliverables/FINAL%20CODE/index.html
Donate Plasma
Home
Donor
Story
SignIn
Register
Donate Plasma
Save Life
PLASMA is a liquid portion of blood. About 55% of our blood is plasma, and the remaining 45% are red blood cells,white blood cells and platelets.
Plasma is about 92% water.It also contains 7% vital proteins such as albumin, gamaglobulin and anti-hemophilic factor, and 1% mineral salts,sugar,fats,hormones and vitamins.
Become a donor
Watson Assistant
Hi
hi! how may i help you?
Select an option
who can give plasma?
Does plasma transfusion require blo...
Is donating plasma worth it?
Do and don'ts before giving plasma?
Is it painful to donate plasma?
Type something...
Built with IBM Watson®
ENG 21:11


Donate Plasma
File | C:/Users/JPrakash/Downloads/IBM/IBM-Project-8019-1658906300-main/Final%20Deliverables/FINAL%20CODE/index.html
Donor List
Name
Age
Address
Blood Group
Mobile Number
Availability Status
Arya 28 Madurai A+ 9976912779 Available
Surya 30 Madurai A+ 9978675623 Available
Hema 25 Dindigul AB+ 9976913456 Available
Sunil 35 Thirunelvelli B+ 9978675789 Unavailable
Sam 29 Theni B+ 9676954673 Unavailable
Karthik 40 Palani O+ 9178676347 Available
Kumar 38 Madurai O+ 9547691277 Available
Kanchana 25 Theni AB+ 9453675623 Available
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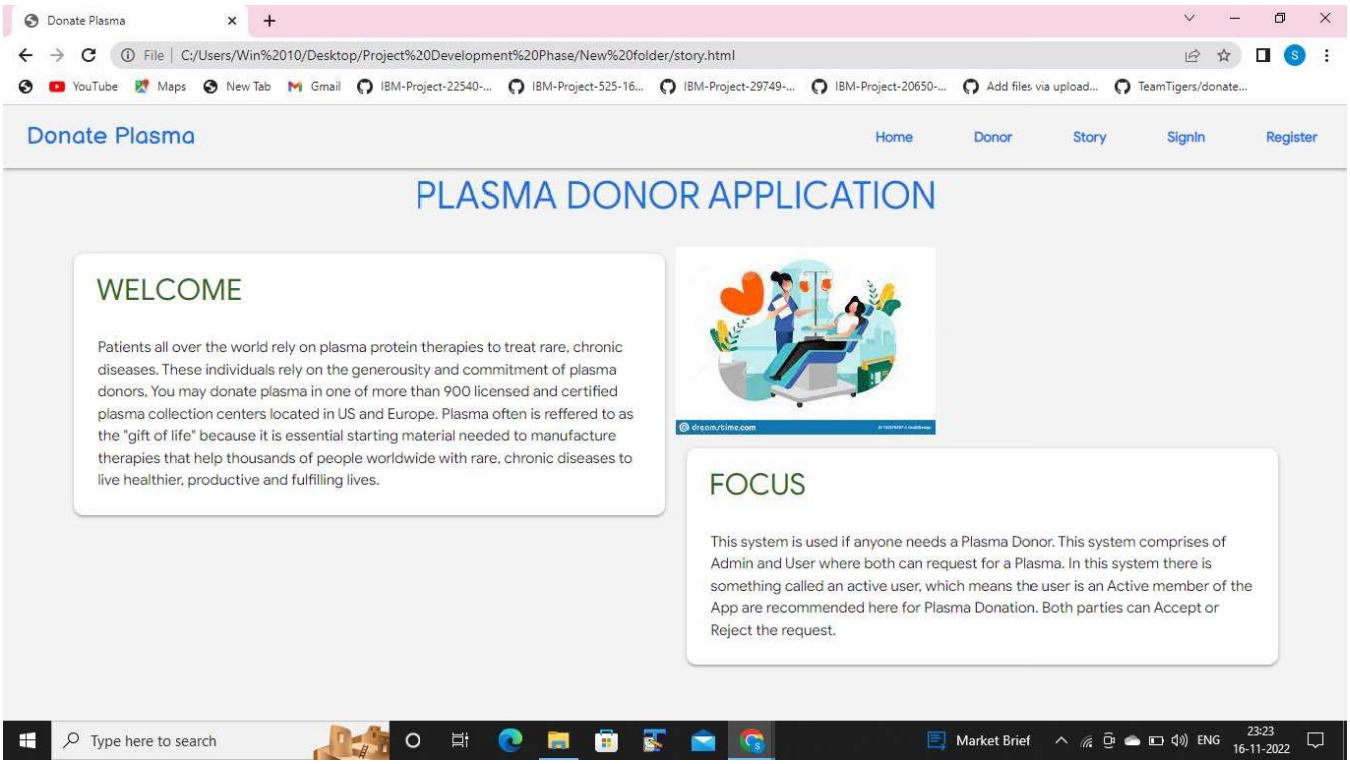
Donate Plasma
File | C:/Users/Win%2010/Desktop/Project%20Development%20Phase/New%20folder/story.html
YouTube Maps New Tab Gmail IBM-Project-22540-... IBM-Project-525-16... IBM-Project-29749-... IBM-Project-20650-... Add files via upload... TeamTigers/donate...
Donate Plasma
Home Donor Story SignIn Register
PLASMA DONOR APPLICATION
WELCOME
Patients all over the world rely on plasma protein therapies to treat rare, chronic diseases. These individuals rely on the generousity and commitment of plasma donors, You may donate plasma in one of more than 900 licensed and certified plasma collection centers located in US and Europe. Plasma often is reffered to as the "gift of life" because it is essential starting material needed to manufacture therapies that help thousands of people worldwide with rare, chronic diseases to live healthier, productive and fulfilling lives.
FOCUS
This system is used if anyone needs a Plasma Donor. This system comprises of Admin and User where both can request for a Plasma. In this system there is something called an active user, which means the user is an Active member of the App are recommended here for Plasma Donation. Both parties can Accept or Reject the request.
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Market Brief
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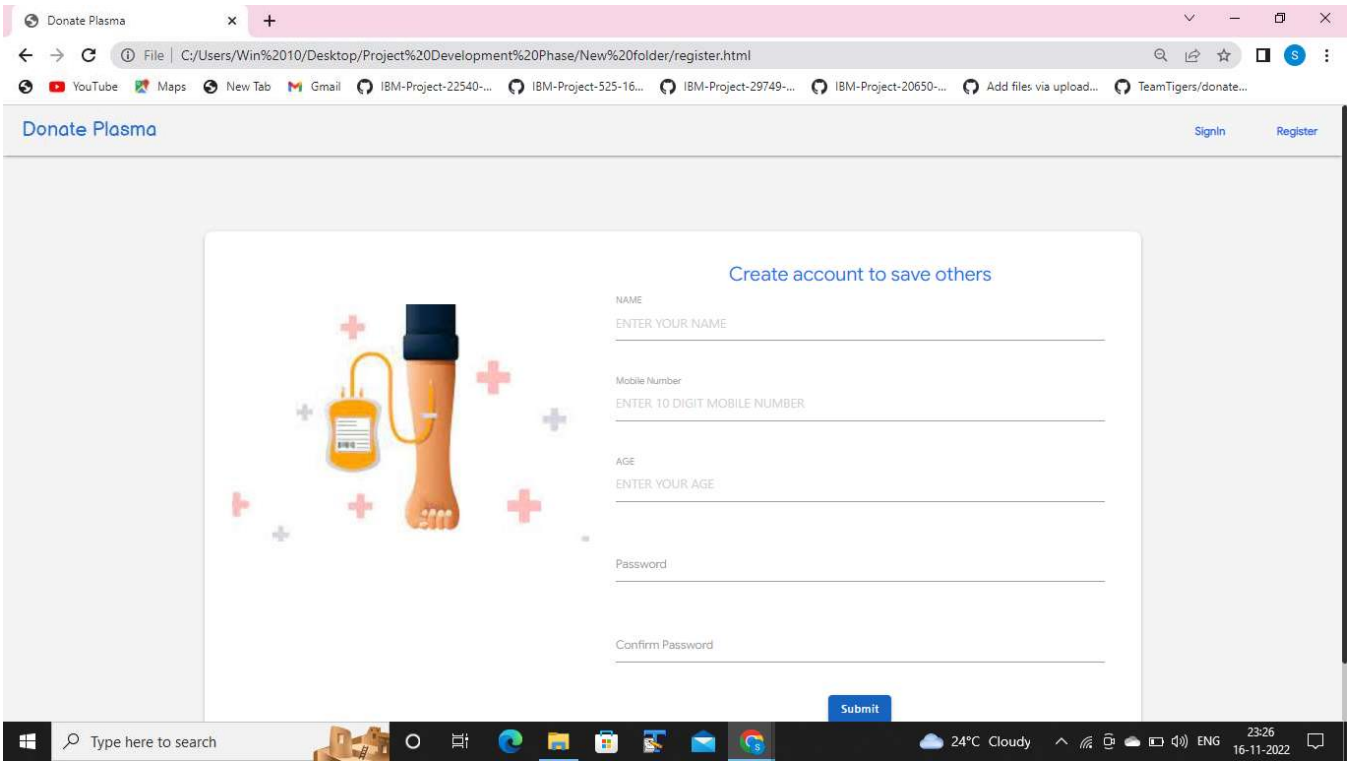
Donate Plasma
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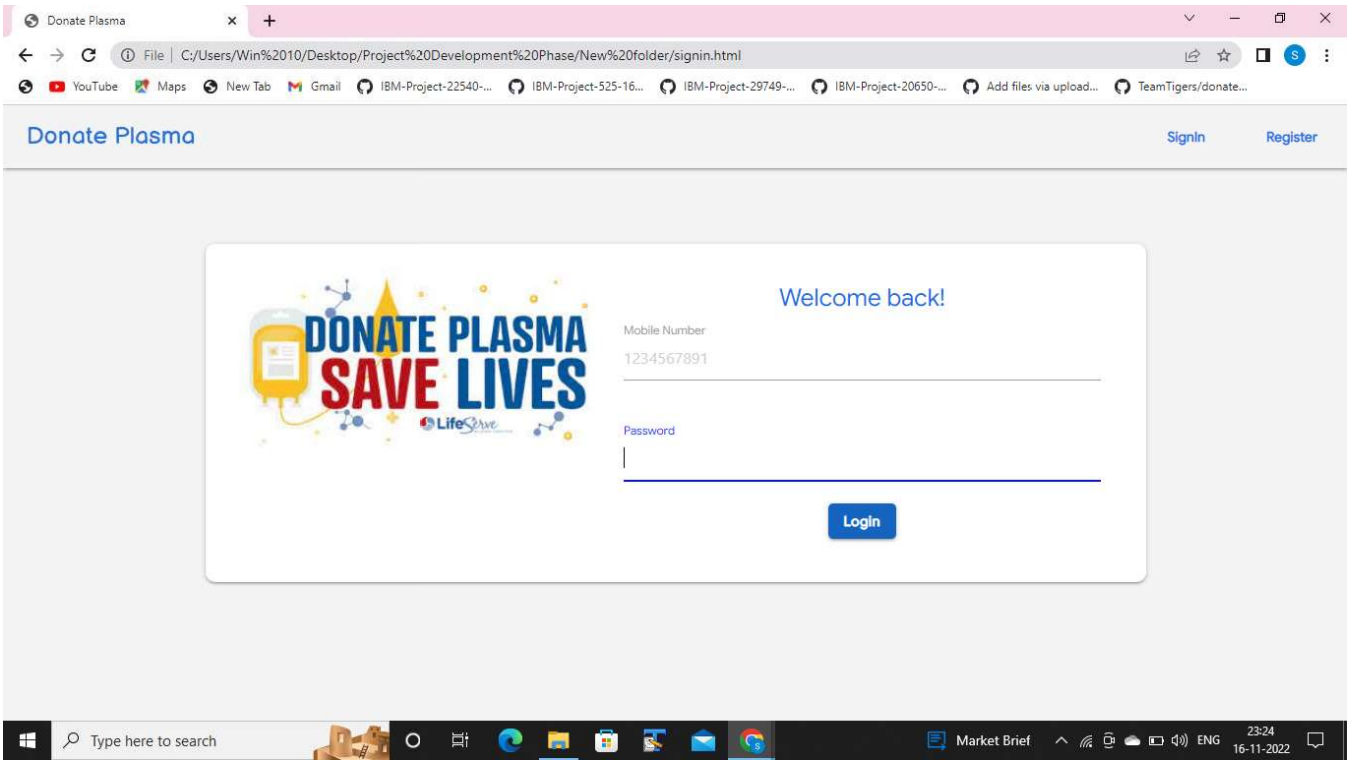

10. ADVANTAGES

1. Easy connecting donors and recipients makes plasma donation way more proficient.
2. Prime motive of the app is to solve the perpetual shortfall of plasma donors.
3. It connects plasma donors and recipients through a single and scalable platform.
4. Effortless access: Users on this platform will be able to use the app with just One-click.

11. CONCLUSION

The efficient way of finding plasma donors for the infected people is implemented using the plasma donor website that is hosted on Cloud platform. To ensure the smooth functioning of the website operations. I have hosted the website on a cloud platform to make sure the operations are running successfully to deploy the application cloud service.

12. FUTURE ENHANCEMENTS

Upgrading the UI that is more user-friendly which will help many users to access the website and also ensures that many plasma donors can be added into the community. Using elastic load balancer, it helps to handle multiple requests at the same time which will maintain the uptime of the website with negligible downtime.

13. APPENDIX

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-8732-1658928319

DEMO PROJECT VIDEO LINK:

https://youtu.be/Iaf0MqaZUUA