MIT-WPU

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MIT WORLD PEACE UNIVERSITY | PUNE
TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS

Faculty: Engineering

School of Computer Engineering & Technology

Programme: BTech Computer Sc. & Engineering

Course: SEM V –Full Stack Web Development

TYCSE 2023-24 SEM V

FSD Mini Project Report

BLOOD BANK INVENTORY MANAGEMENT SYSTEM

Group Members:

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PG-04 Riya Gupta 1032210724

PG-01 Sadhika Jain 1032210508

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Introduction

- **Purpose of the project:** The Online Blood Bank project aims to create a platform for managing and tracking blood donations, connecting donors with recipients, creating & managing blood donation camps and providing real-time information on blood shortages and needs.

- **Objectives:** The primary objectives of the project are to increase the efficiency and accessibility of the blood donation process, improve the matching of donors and recipients, and provide real-time information on blood shortages and needs with a clean UI and experience.

- **Scope of the project:** The scope of the project includes the development of a web-based platform for managing and tracking blood donations, connecting donors with recipients, and providing real-time information on blood shortages and needs. The platform will include both a user-facing interface and an blood bank's interface for managing the data.

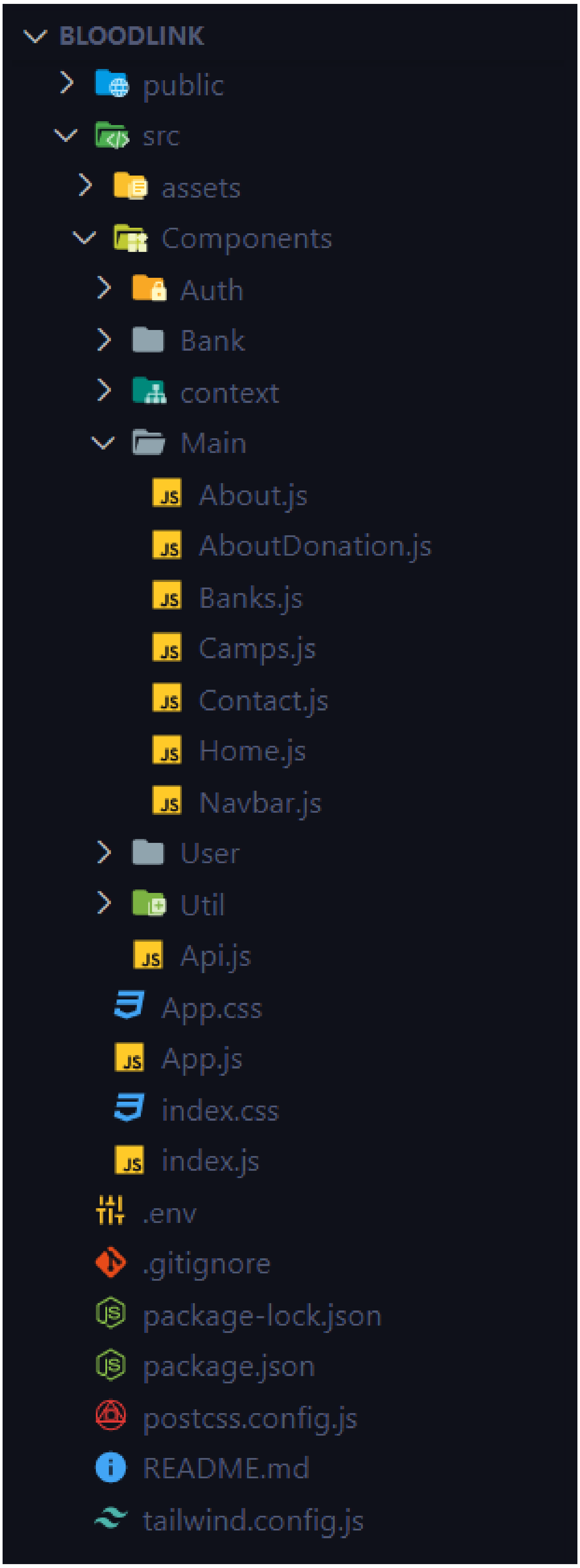
Project Description

- BloodLink will work as a platform for users to register as blood to either request/donate blood and blood banks to manage their stocks by managing the pending donations and request along with scheduling blood camps and managing them. The system will authenticate the user/bank using their username(mobile) and password to further perform other actions.

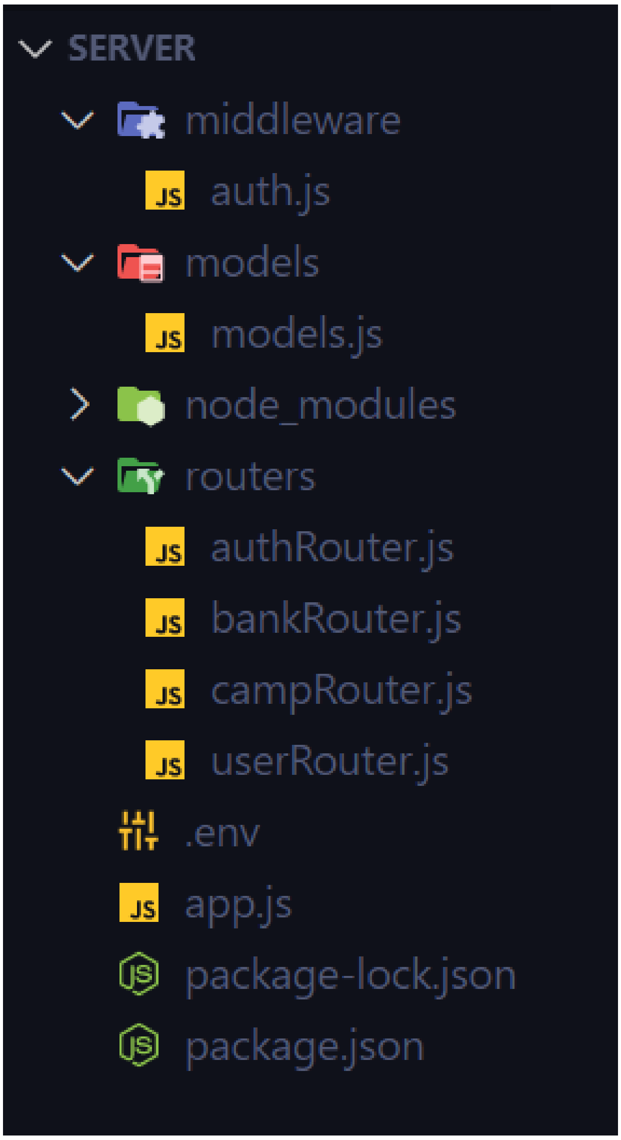
  - The milestones for the project include completing the database design, completing the user interface design, completing the back-end functionality, and completing testing.

➢ Project structure & Architecture:

Frontend **Backend**



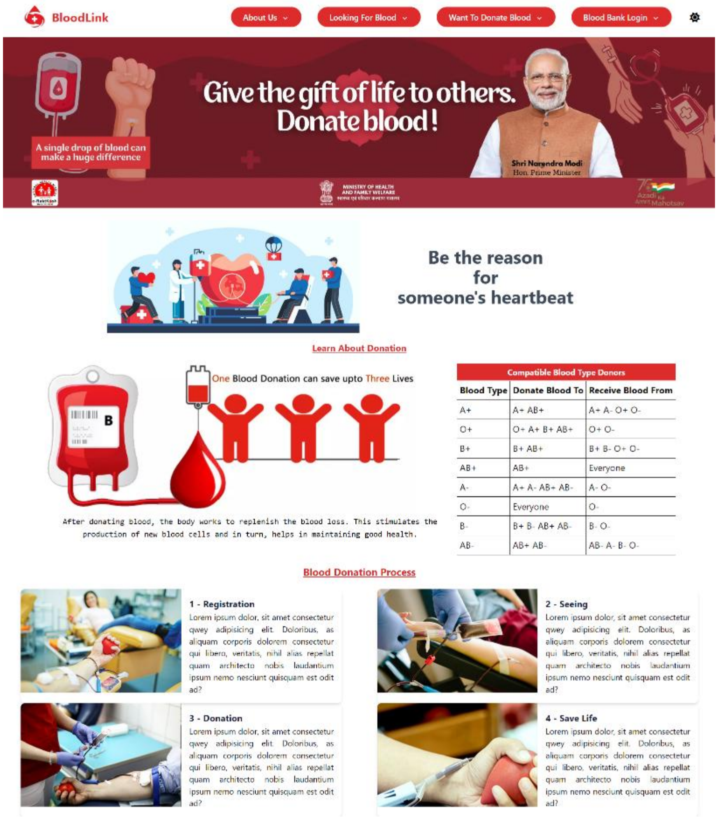
```
⌄ BLOODLINK
  › public
  ⌄ src
    › assets
    ⌄ Components
      › Auth
      › Bank
      › context
      ⌄ Main
          About.js
          AboutDonation.js
          Banks.js
          Camps.js
          Contact.js
          Home.js
          Navbar.js
      › User
      › Util
        Api.js
      App.css
      App.js
      index.css
      index.js
    .env
    .gitignore
    package-lock.json
    package.json
    postcss.config.js
    README.md
    tailwind.config.js
```



```
⌄ SERVER
  ⌄ middleware
      auth.js
  ⌄ models
      models.js
  › node_modules
  ⌄ routers
      authRouter.js
      bankRouter.js
      campRouter.js
      userRouter.js
    .env
    app.js
    package-lock.json
    package.json
```

- **Home:**

  The home page of the website displays the navbar with position fixed at the top of the webpage with options available for the user to navigate across other pages with option available to switch between dark and light theme.



BloodLink

About Us ⌄ | Looking For Blood ⌄ | Want To Donate Blood ⌄ | Blood Bank Login ⌄

Give the gift of life to others. Donate blood!

A single drop of blood can make a huge difference

Shri Narendra Modi
Hon. Prime Minister

MINISTRY OF HEALTH AND FAMILY WELFARE

Azadi Ka Amrit Mahotsav

Be the reason for someone's heartbeat

Learn About Donation

One Blood Donation can save upto Three Lives

After donating blood, the body works to replenish the blood loss. This stimulates the production of new blood cells and in turn, helps in maintaining good health.

Compatible Blood Type Donors

Blood Type	Donate Blood To	Receive Blood From
A+	A+ AB+	A+ A- O+ O-
O+	O+ A+ B+ AB+	O+ O-
B+	B+ AB+	B+ B- O+ O-
AB+	AB+	Everyone
A-	A+ A- AB+ AB-	A- O-
O-	Everyone	O-
B-	B+ B- AB+ AB-	B- O-
AB-	AB+ AB-	AB- A- B- O-

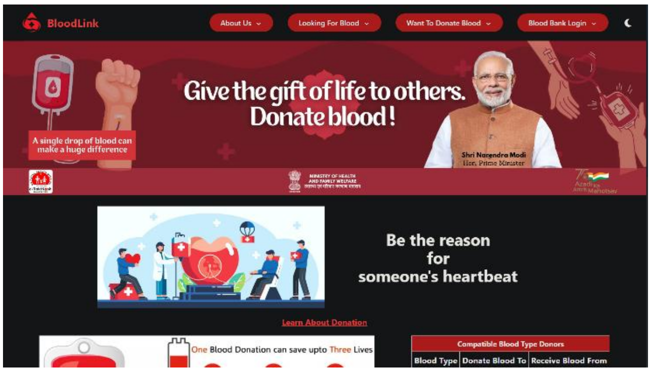
Blood Donation Process

1 - Registration
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?

2 - Seeing
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?

3 - Donation
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?

4 - Save Life
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?



BloodLink

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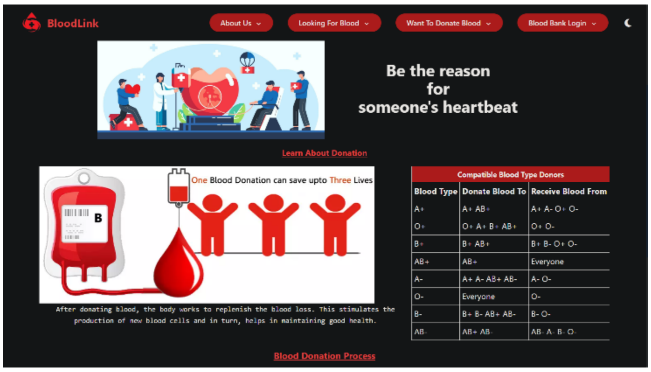
Compatible Blood Type Donors

Blood Type | Donate Blood To | Receive Blood From



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Be the reason for someone's heartbeat

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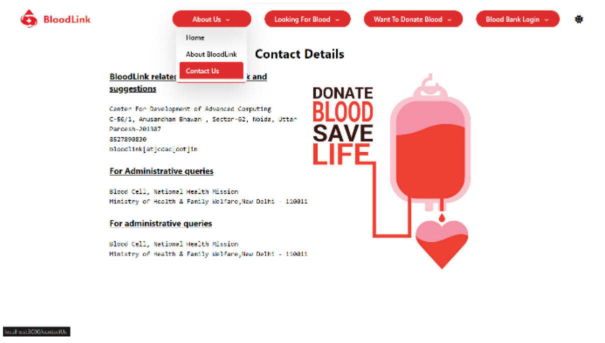
Compatible Blood Type Donors

Blood Type	Donate Blood To	Receive Blood From
A+	A+ AB+	A+ A- O+ O-
O+	O+ A+ B+ AB+	O+ O-
B+	B+ AB+	B+ B- O+ O-
AB+	AB+	Everyone
A-	A+ A- AB+ AB-	A- O-
O-	Everyone	O-
B-	B+ B- AB+ AB-	B- O-
AB-	AB+ AB-	AB- A- B- O-

Blood Donation Process

- **About, Contact, About Blood Donation, Blood Bank Directory & Blood Donation Camps:**

  These are the options in the submenu of the navbar for user to know about us, the system, the process of blood donation and to get access to the list of the blood donation camps scheduled by different blood banks that can be filtered by either state, district and the date scheduled. The Blood Bank Directory option lets the user to see the list of all the blood banks registered and the details on the system.



Contact Details

BloodLink relate[...]k and suggestions

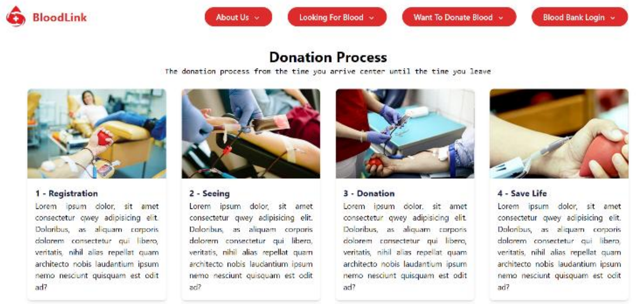
Center For Development of Advanced Computing
C-56/1, Anusandhan Bhawan , Sector-62, Noida, Uttar Pardesh-201307
8527898830
bloodlink[at]cdac[dot]in

For Administrative queries

Blood Cell, National Health Mission
Ministry of Health & Family Welfare,New Delhi - 110011

For administrative queries

Blood Cell, National Health Mission
Ministry of Health & Family Welfare,New Delhi - 110011



Donation Process

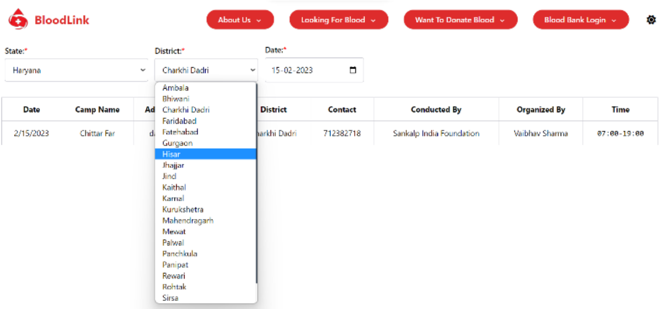
The donation process from the time you arrive center until the time you leave

1 - Registration
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?

2 - Seeing
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?

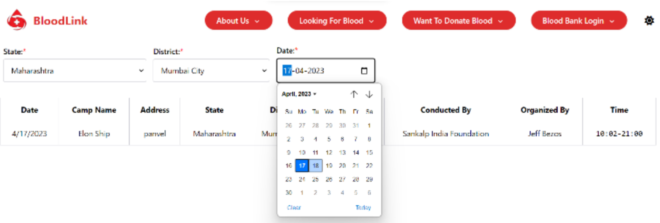
3 - Donation
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?

4 - Save Life
Lorem ipsum dolor, sit amet consectetur qwey adipisicing elit. Doloribus, as aliquam corporis dolorem consectetur qui libero, veritatis, nihil alias repellat quam architecto nobis laudantium ipsum nemo nesciunt quisquam est odit ad?



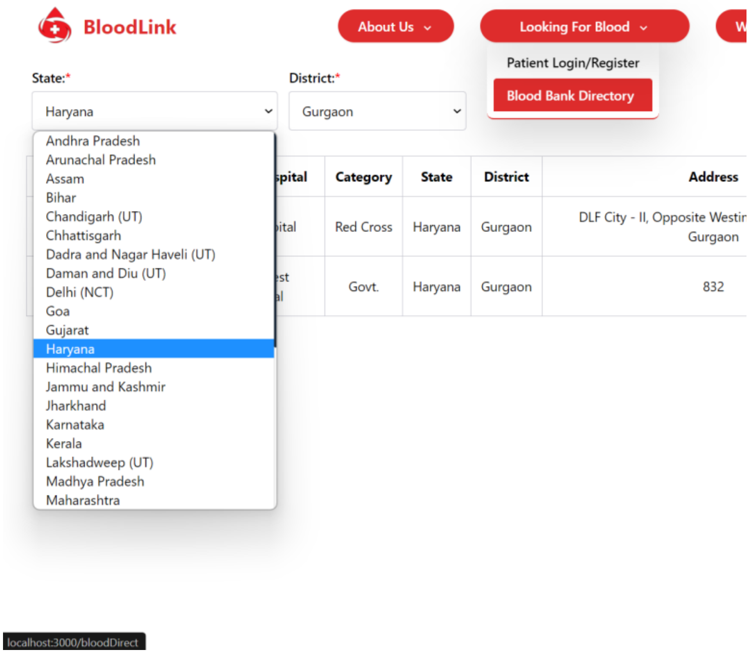
State:* Haryana
District:* Charkhi Dadri
Date:* 15-02-2023

Date	Camp Name	Ad	District	Contact	Conducted By	Organized By	Time
2/15/2023	Chittar Far	d	arkhi Dadri	712382718	Sankalp India Foundation	Vaibhav Sharma	07:00-19:00



State:* Maharashtra
District:* Mumbai City
Date:* 17-04-2023

Date	Camp Name	Address	State	Di	Conducted By	Organized By	Time
4/17/2023	Elon Ship	panvel	Maharashtra	Mur	Sankalp India Foundation	Jeff Bezos	10:02-21:00

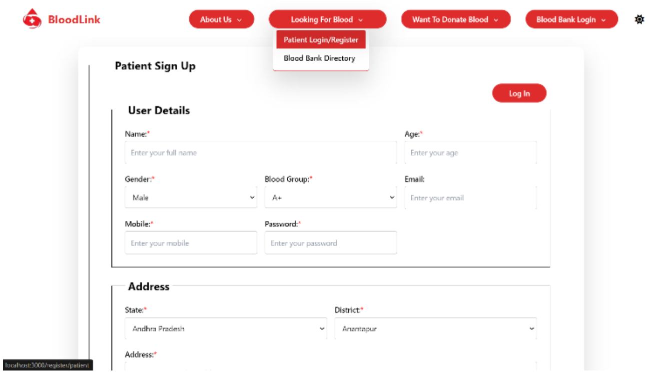


State:* Haryana
District:* Gurgaon

spital	Category	State	District	Address
pital	Red Cross	Haryana	Gurgaon	DLF City - II, Opposite Westir Gurgaon
st al	Govt.	Haryana	Gurgaon	832

- **Patient/Donor Registration & Login:**

  Either donor or the one who is requesting for blood can register as a user using the Donor or Patient Sign-Up/Login page available by entering all the essential details like Name, Age, Gender, Blood Group, Email, Mobile, Password & Address Details.



BloodLink

About Us ⌄ | Looking For Blood ⌄ | Want To Donate Blood ⌄ | Blood Bank Login ⌄

Patient Login/Register
Blood Bank Directory

Patient Sign Up

Log In

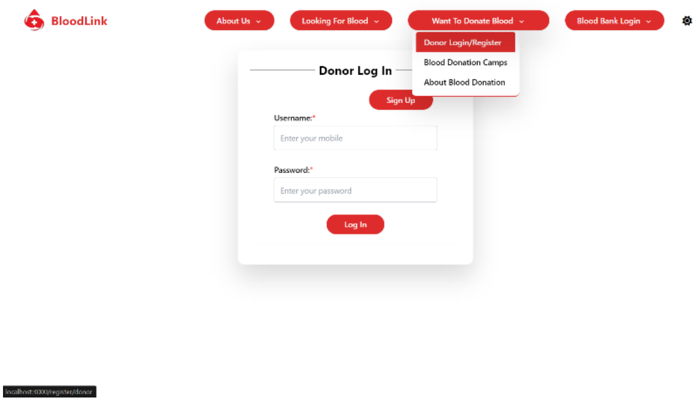
User Details

Name:* Enter your full name
Age:* Enter your age
Gender:* Male
Blood Group:* A+
Email: Enter your email
Mobile:* Enter your mobile
Password:* Enter your password

Address

State:* Andhra Pradesh
District:* Anantapur
Address:*

localhost:3000/register/patient



BloodLink

About Us ⌄ | Looking For Blood ⌄ | Want To Donate Blood ⌄ | Blood Bank Login ⌄

Donor Login/Register
Blood Donation Camps
About Blood Donation

Donor Log In

Sign Up

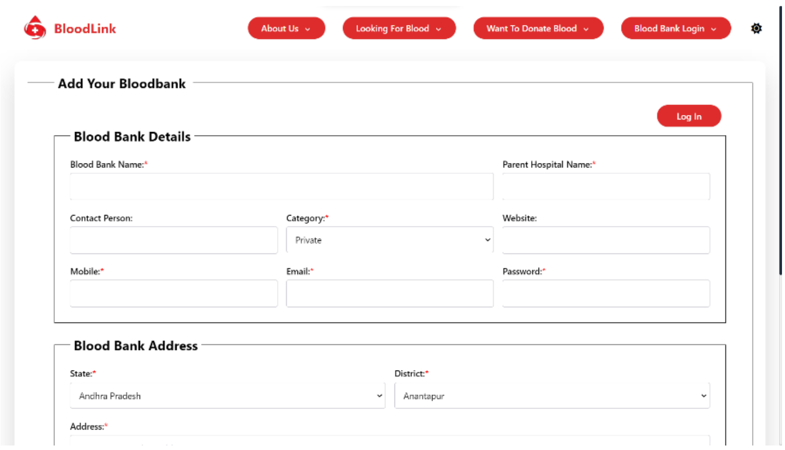
Username:* Enter your mobile
Password:* Enter your password

Log In

localhost:3000/register/donor

- **Blood Bank Registration & Login:-**

  New Blood Banks can register on the portal using `Add your Bloodbank` option available under `Blood Bank Login` in Navbar and the already registered can login using `Login` available under the same.
  Blood Banks can register by entering the essential info including BloodBank Name, Parent Hospital Name, Contact Person, Category, Website, Mobile, Email, Password & Address details. Here, the address will include the state, district and complete address including the geographic location co-ordinates of the bank which can be fetched at that time using `Fetch Geocode` option available.



BloodLink

About Us ⌄ | Looking For Blood ⌄ | Want To Donate Blood ⌄ | Blood Bank Login ⌄

Add Your Bloodbank

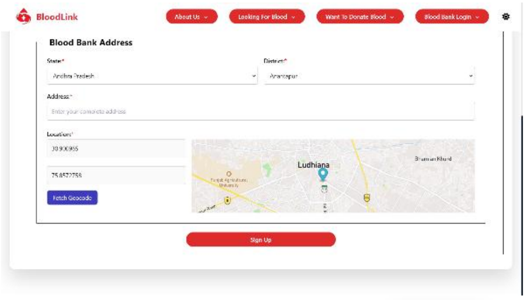
Log In

Blood Bank Details

Blood Bank Name:*
Parent Hospital Name:*
Contact Person:
Category:* Private
Website:
Mobile:*
Email:*
Password:*

Blood Bank Address

State:* Andhra Pradesh
District:* Anantapur
Address:*



BloodLink

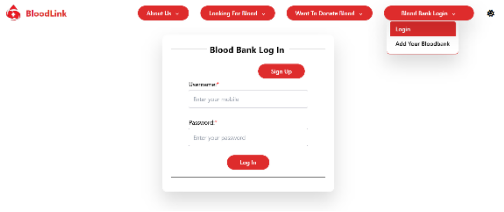
About Us ⌄ | Looking For Blood ⌄ | Want To Donate Blood ⌄ | Blood Bank Login ⌄

Blood Bank Address

State:* Andhra Pradesh
District:* Anantapur
Address:* Enter your complete address
Location:* 30.900965
75.8572758

Fetch Geocode

Sign Up



BloodLink

About Us ⌄ | Looking For Blood ⌄ | Want To Donate Blood ⌄ | Blood Bank Login ⌄

Login
Add Your Bloodbank

Blood Bank Log In

Sign Up

Username:* Enter your mobile
Password:* Enter your password

Log In

- ## Authentication:

- The authentication of the users during registration and logging in has been done using JWTs (Json Web Tokens), a JWT will be signed everytime any user/bank registers or logs into the website which will be stored as the cookie in the user's browser with a max expiration age scheduled after which user will need to log in again.
- This JWT token will be a random string of characters which will get verified at the backend and authenticate the user. To check the authenticity of the user logged in, a request will be sent to the backend using a api route which will return a Boolean value after verifying the JWT token of the user basis on which the logged in bank/user will be able to access all services.

- ## Security:

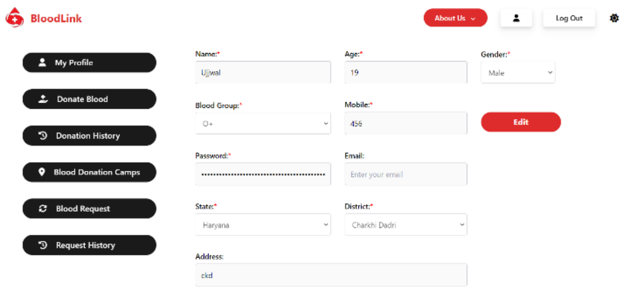
- For security purpose, the password saved at the server will be a encrypted hash value generated after the user's registration which will neither be known to database administrators nor the system managers and the backend. The middle-ware will match the hash value of the entered password by user on logging in with the hash value stored in the database to authenticate the user.
- Further, complete authentication has been done on the system with securing all routes which shouldn't be accessible to the user who is not logged in.

User Side

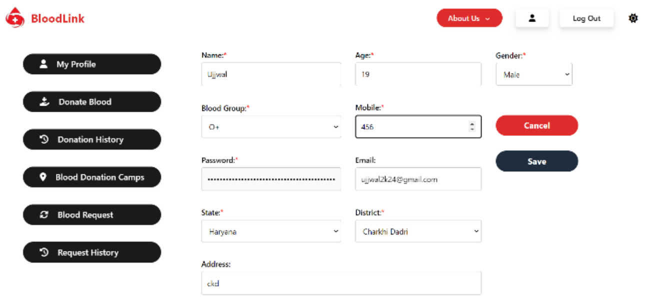
➢ ### Main:

- The user logged in will have an access to different options for editing his/her profile, donate blood, request for blood, see donation/requests history and to register for a blood donation camp.

- The navbar will be changed for the logged-in user for navigating to the about, contact us, my profile page and to logout.



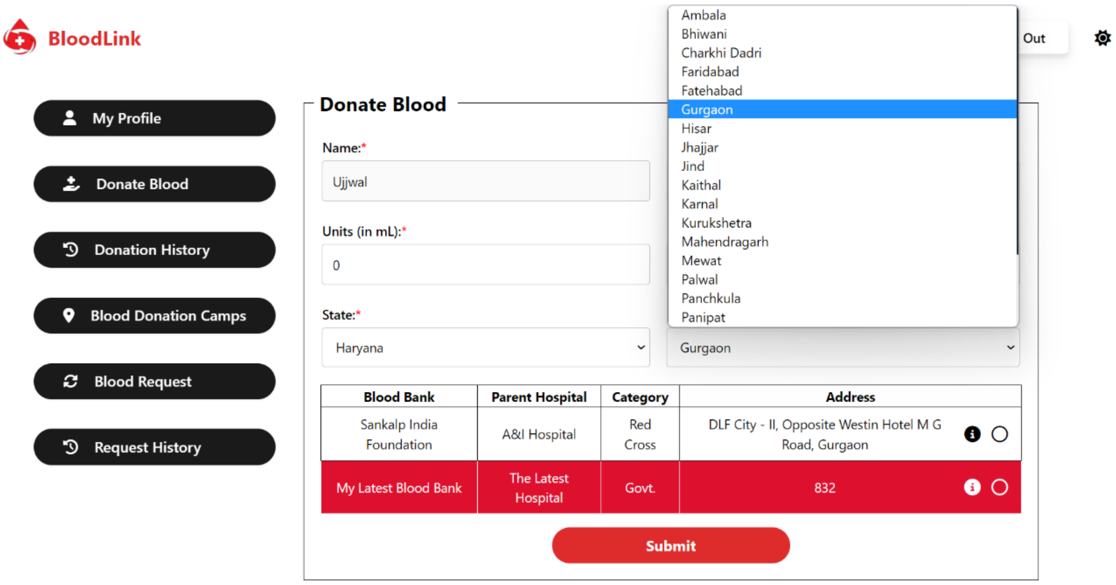
Name:* Ujjwal
Age:* 19
Gender:* Male
Blood Group:* O+
Mobile:* 456
Password:* ••
Email: Enter your email
State:* Haryana
District:* Charkhi Dadri
Address: ckd



Name:* Ujjwal
Age:* 19
Gender:* Male
Blood Group:* O+
Mobile:* 456
Password:* ••
Email: ujjwal2k24@gmail.com
State:* Haryana
District:* Charkhi Dadri
Address: ckd

- ## Donate Blood:

  - The logged-in user can donate blood by entering the units they want to donate and any disease if they have and can choose blood bank by state and district where they want to donate. Name & age will get auto-filled as per the details of the current logged-in user.



Donate Blood

Name:* Ujjwal

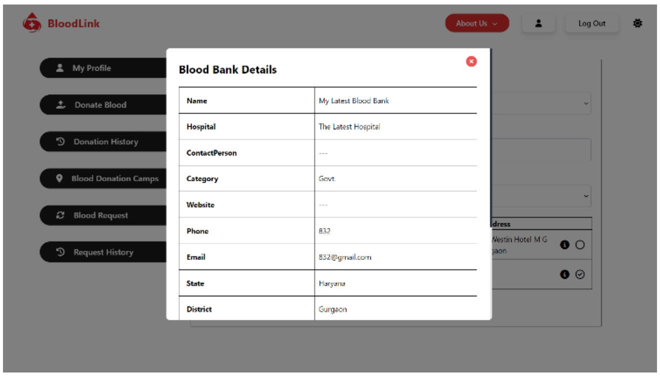
Units (in mL):* 0

State:* Haryana

Gurgaon

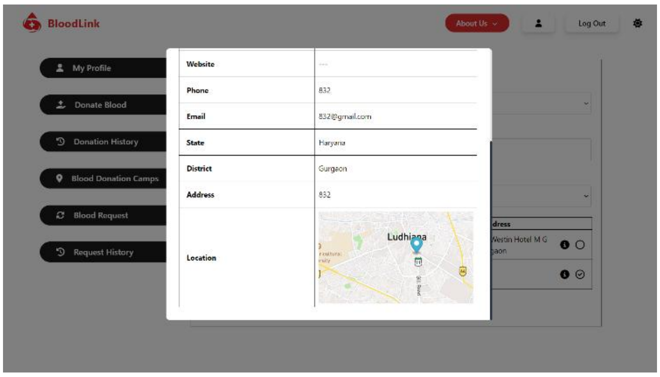
Blood Bank	Parent Hospital	Category	Address
Sankalp India Foundation	A&I Hospital	Red Cross	DLF City - II, Opposite Westin Hotel M G Road, Gurgaon
My Latest Blood Bank	The Latest Hospital	Govt.	832

- There will be an extra option also available for the user to see the complete details of the blood bank.



Blood Bank Details

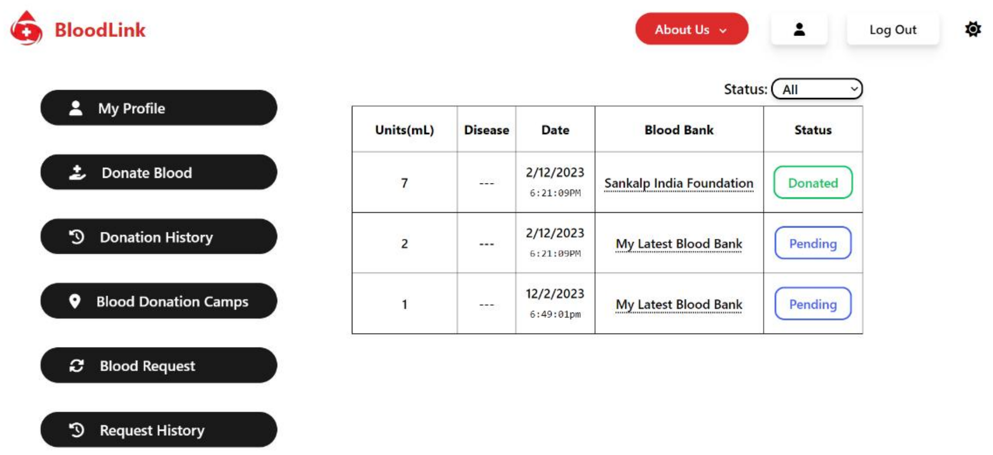
Name	My Latest Blood Bank
Hospital	The Latest Hospital
ContactPerson	---
Category	Govt.
Website	---
Phone	832
Email	832@gmail.com
State	Haryana
District	Gurgaon



Website	---
Phone	832
Email	832@gmail.com
State	Haryana
District	Gurgaon
Address	832
Location	

➢ Donation History:

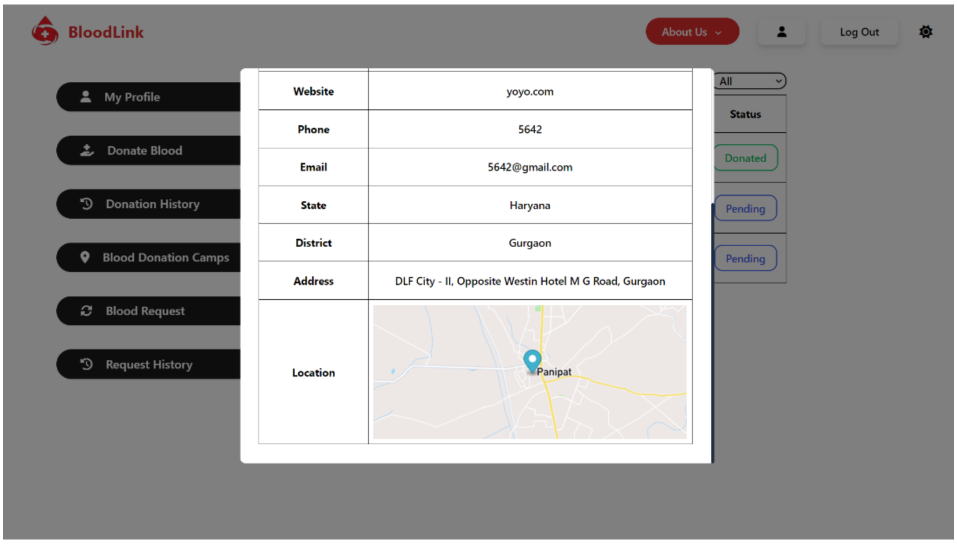
- The user will have an access to see his past donation history and their status (Pending/Approved/Donated/Denied)



Status: All

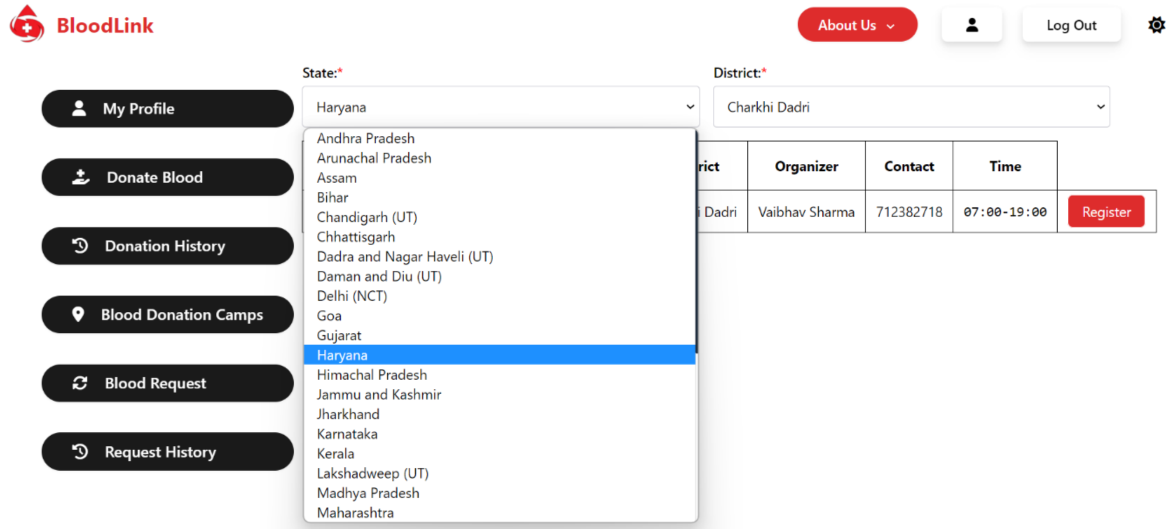
Units(mL)	Disease	Date	Blood Bank	Status
7	---	2/12/2023 6:21:09PM	Sankalp India Foundation	Donated
2	---	2/12/2023 6:21:09PM	My Latest Blood Bank	Pending
1	---	12/2/2023 6:49:01pm	My Latest Blood Bank	Pending

- ➢ The user can click on the bank name to see the complete bank details also.



Website	yoyo.com
Phone	5642
Email	5642@gmail.com
State	Haryana
District	Gurgaon
Address	DLF City - II, Opposite Westin Hotel M G Road, Gurgaon
Location	

- ➢ **<u>Blood Donation Camps:</u>**
- ➢ User can register for the blood donation camps scheduled by different blood banks and can also filter them by the state & district.

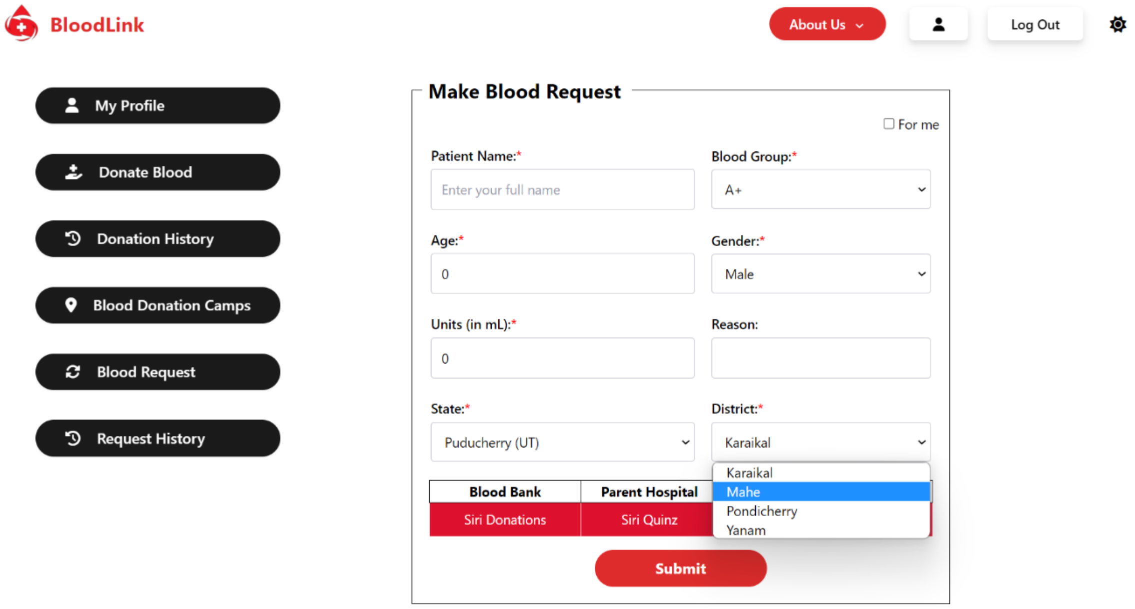


State:* Haryana

District:* Charkhi Dadri

rict	Organizer	Contact	Time	
i Dadri	Vaibhav Sharma	712382718	07:00-19:00	Register

- **Blood Request:**
- Users can request blood either for himself or any other person, if he will be requesting blood for himself, the name, age, blood group & gender values will get auto-filled accordingly and the users will need to enter the units required, reason and selecting the bank by filtering them all by state and districts.
- The user can see the complete bank details using the `i` button again same as on the donate blood panel.



Make Blood Request

☐ For me

Patient Name:* Enter your full name

Blood Group:* A+

Age:* 0

Gender:* Male

Units (in mL):* 0

Reason:

State:* Puducherry (UT)

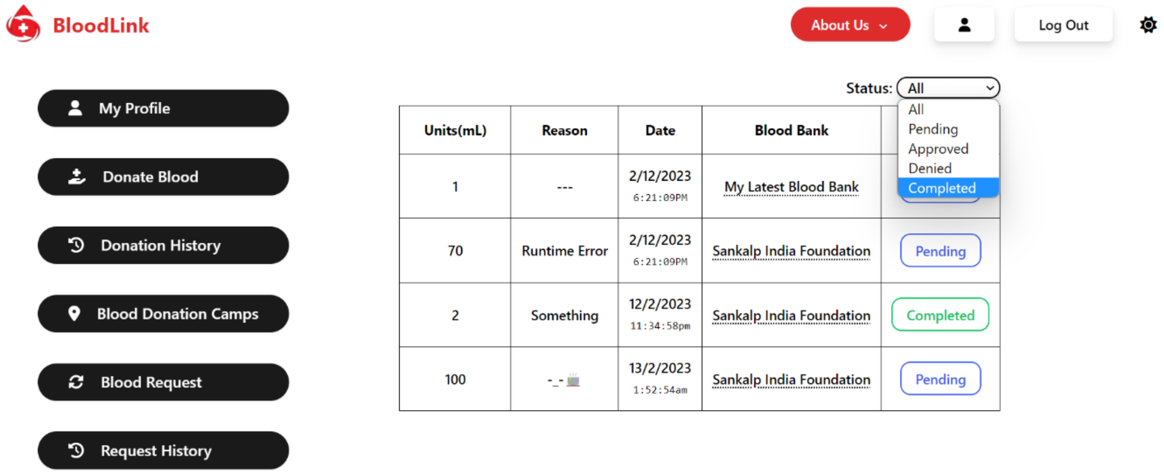
District:* Karaikal

Karaikal
Mahe
Pondicherry
Yanam

Blood Bank	Parent Hospital
Siri Donations	Siri Quinz

Submit

- **Request History:**
- The user will have an access to see his past requests history and their status (Pending/Approved/Completed /Denied)
- The option to see the complete details of the bank by click on bank will be available here also.



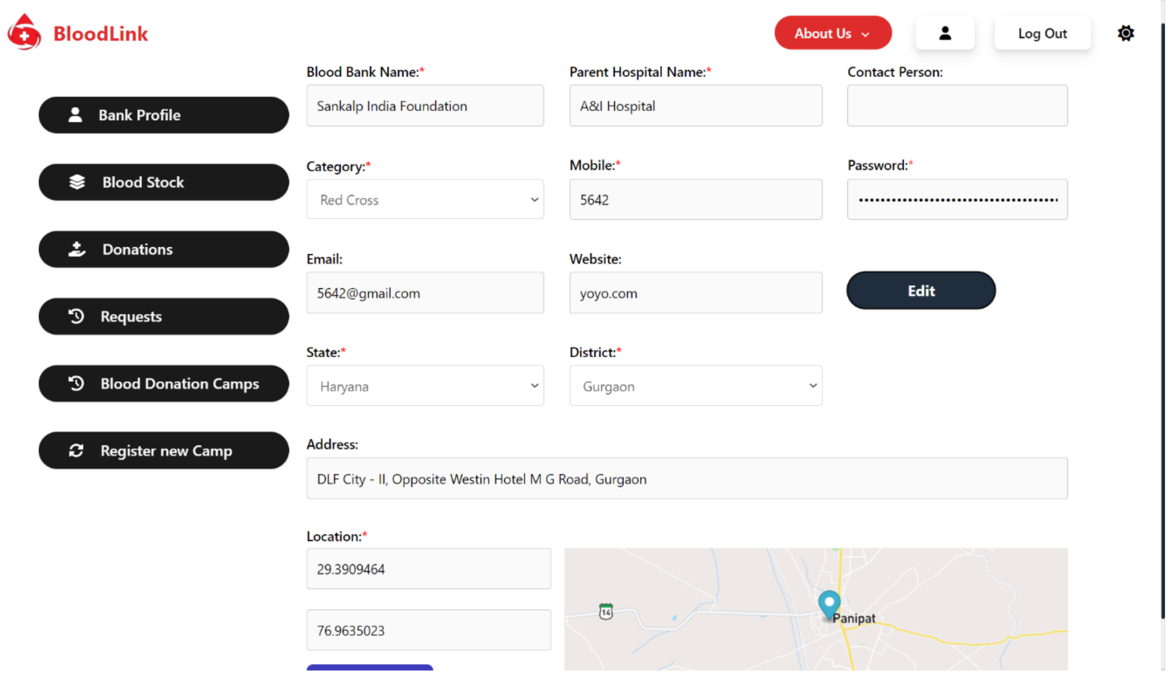
Status: All

All
Pending
Approved
Denied
Completed

Units(mL)	Reason	Date	Blood Bank	
1	---	2/12/2023 6:21:09PM	My Latest Blood Bank	
70	Runtime Error	2/12/2023 6:21:09PM	Sankalp India Foundation	Pending
2	Something	12/2/2023 11:34:58pm	Sankalp India Foundation	Completed
100	-_-	13/2/2023 1:52:54am	Sankalp India Foundation	Pending

Blood Bank Side

- **Main:**
- The blood-bank logged in will have an access to different options for its profile, see blood stock, donations, requests, blood donation camps and can register a new blood donation camp.
- The navbar will be changed for the logged-in bank for navigating to the about, contact us, my profile page and to logout.



Blood Bank Name:* Sankalp India Foundation

Parent Hospital Name:* A&I Hospital

Contact Person:

Category:* Red Cross

Mobile:* 5642

Password:* ••

Email: 5642@gmail.com

Website: yoyo.com

State:* Haryana

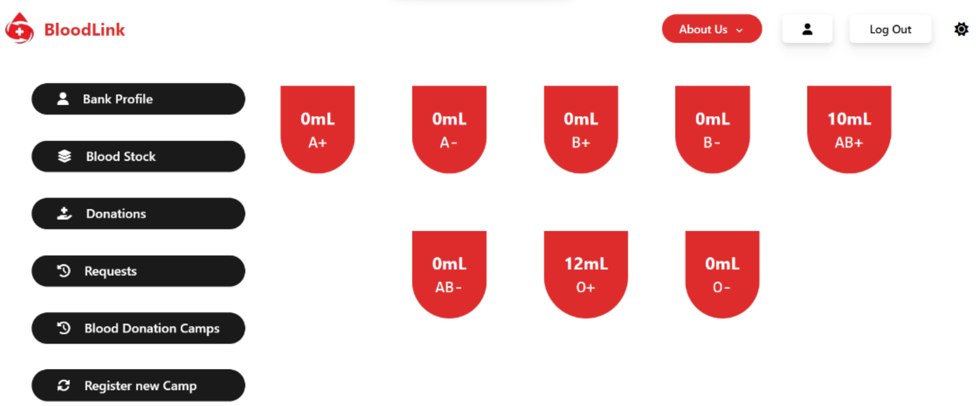
District:* Gurgaon

Address: DLF City - II, Opposite Westin Hotel M G Road, Gurgaon

Location:* 29.3909464

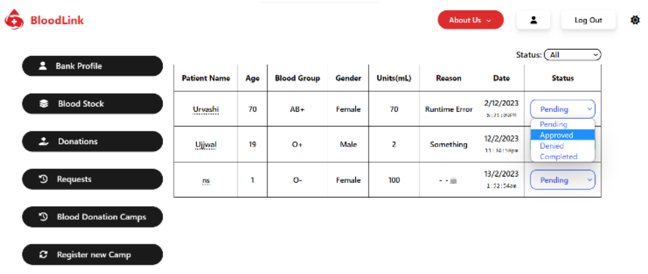
76.9635023

- **Blood Stock:**
- `Blood stock` will show the current available blood stock at the current logged-int blood bank.

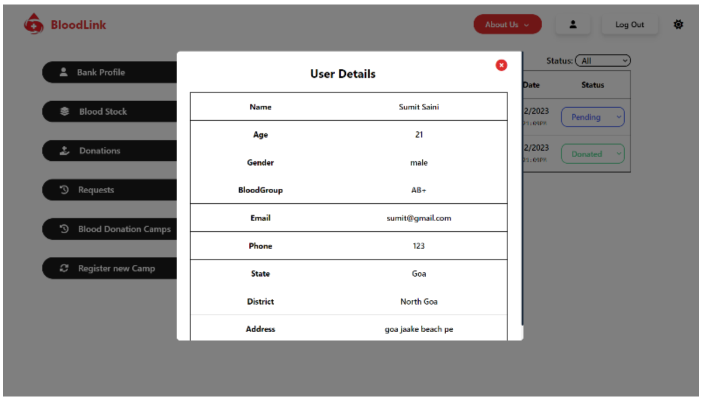


0mL A+	0mL A-	0mL B+	0mL B-	10mL AB+
	0mL AB-	12mL O+	0mL O-	

- **Donations/Requests:**
- These options will let the logged-in blood bank to see and manage the blood donation requests and the requests for blood by updating their status accordingly by the user details.
- The complete details of the user can be seen here by clicking on the user's name underlined.



Patient Name	Age	Blood Group	Gender	Units(mL)	Reason	Date	Status
Urvashi	70	AB+	Female	70	Runtime Error	2/12/2023 5:21:09PM	Pending
Ujjwal	19	O+	Male	2	Something	12/2/2023 11:14:58pm	
ns	1	O-	Female	100	- -	13/2/2023 1:52:54am	Pending

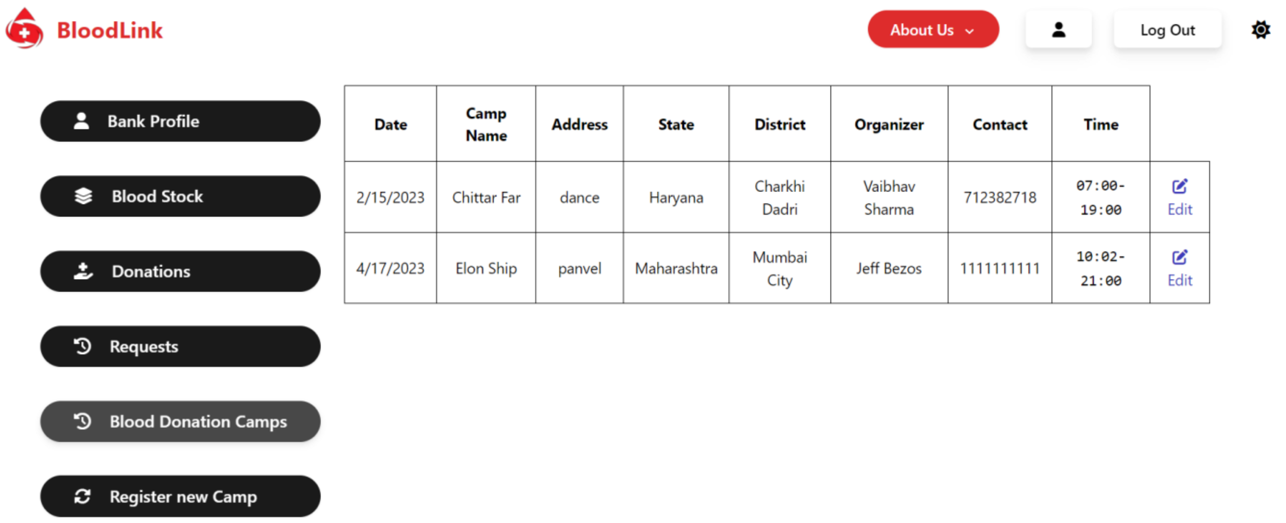


User Details

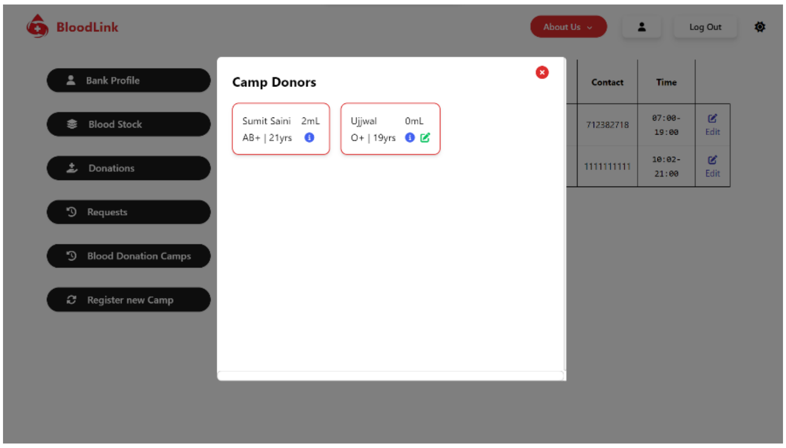
Name	Sumit Saini
Age	21
Gender	male
BloodGroup	AB+
Email	sumit@gmail.com
Phone	123
State	Goa
District	North Goa
Address	goa jaake beach pe

- The option to update the status of the request will get automatically disabled after the status gets updated to "Donated" for donations and "Completed" for the requests.

- **Blood Donation Camps:**
- Bank currently logged-in can see all of his registered blood donation camps and can edit using the "Edit" button provided.
- On clicking the "Edit" button, a new window will be popped-up showing all the camp donors registered for the camp. Further clicking on the "i" button mentioned under every donor will open another pop-window and will show the complete details of the donor.
- Bank can here update the donation value after the donation completion at the blood camp by the donor, any new user at the camp can register for the same by signing up directly from the options mentioned previously.



Date	Camp Name	Address	State	District	Organizer	Contact	Time	
2/15/2023	Chittar Far	dance	Haryana	Charkhi Dadri	Vaibhav Sharma	712382718	07:00-19:00	Edit
4/17/2023	Elon Ship	panvel	Maharashtra	Mumbai City	Jeff Bezos	1111111111	10:02-21:00	Edit

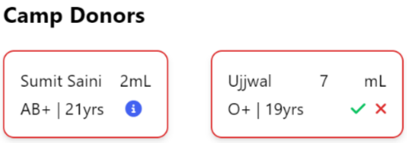


Camp Donors

Sumit Saini 2mL
AB+ | 21yrs

Ujjwal 0mL
O+ | 19yrs

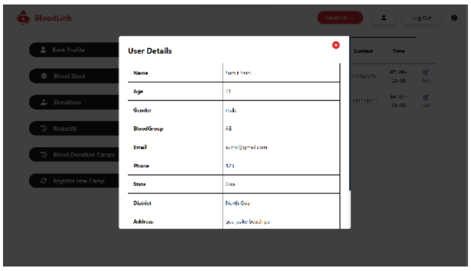
Contact	Time	
712382718	07:00-19:00	Edit
1111111111	10:02-21:00	Edit



Camp Donors

Sumit Saini 2mL
AB+ | 21yrs

Ujjwal 7 mL
O+ | 19yrs ✓ ✕



User Details

Name	Sumit Saini
Age	21
Gender	male
BloodGroup	AB
Email	sumit@gmail.com
Phone	123
State	Goa
District	North Goa
Address	goa, [illegible] beach [illegible]

➢

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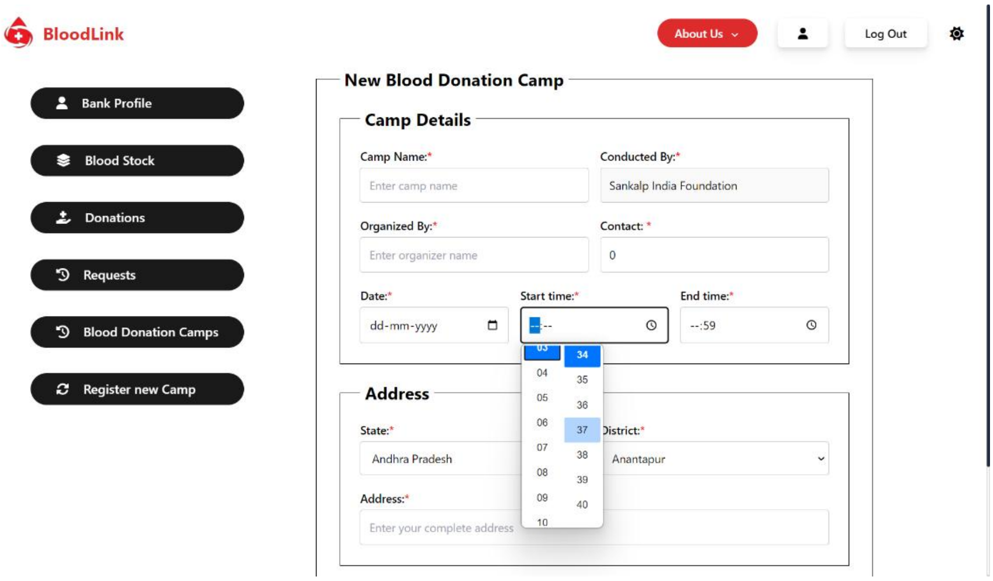
i

ster new camp:

Bank can create/register a new blood donation camp by `Register new Camp` option available by specifying all details with the date & time duration of the camp.



New Blood Donation Camp

Camp Details

Camp Name:* Enter camp name

Conducted By:* Sankalp India Foundation

Organized By:* Enter organizer name

Contact: * 0

Date:* dd-mm-yyyy

Start time:* --:--

End time:* --:59

Address

State:* Andhra Pradesh

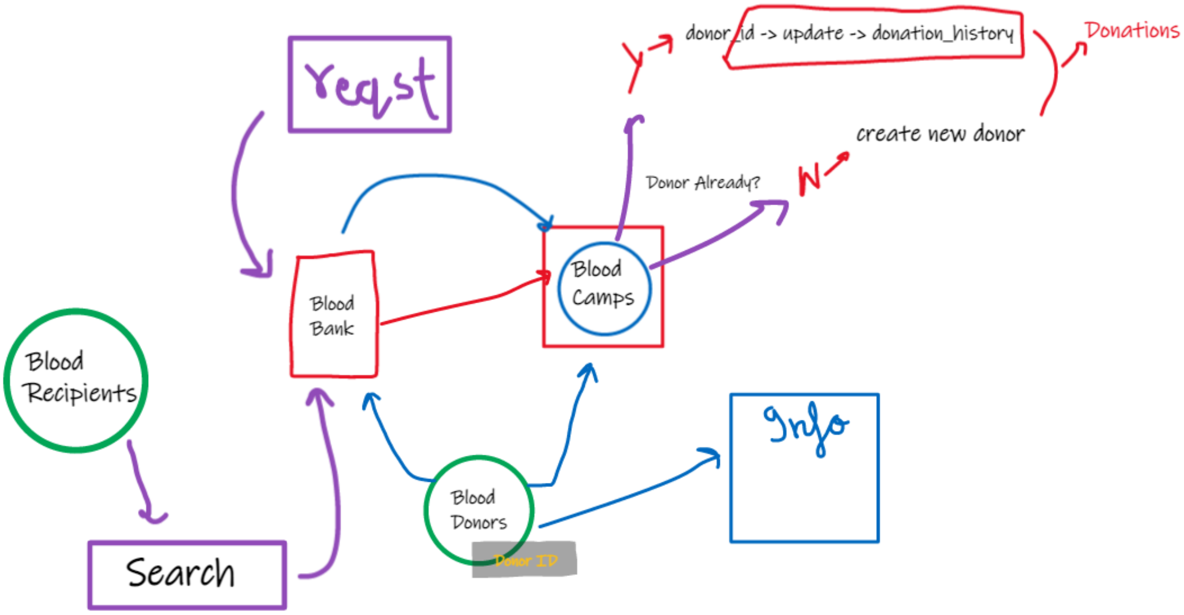
District:* Anantapur

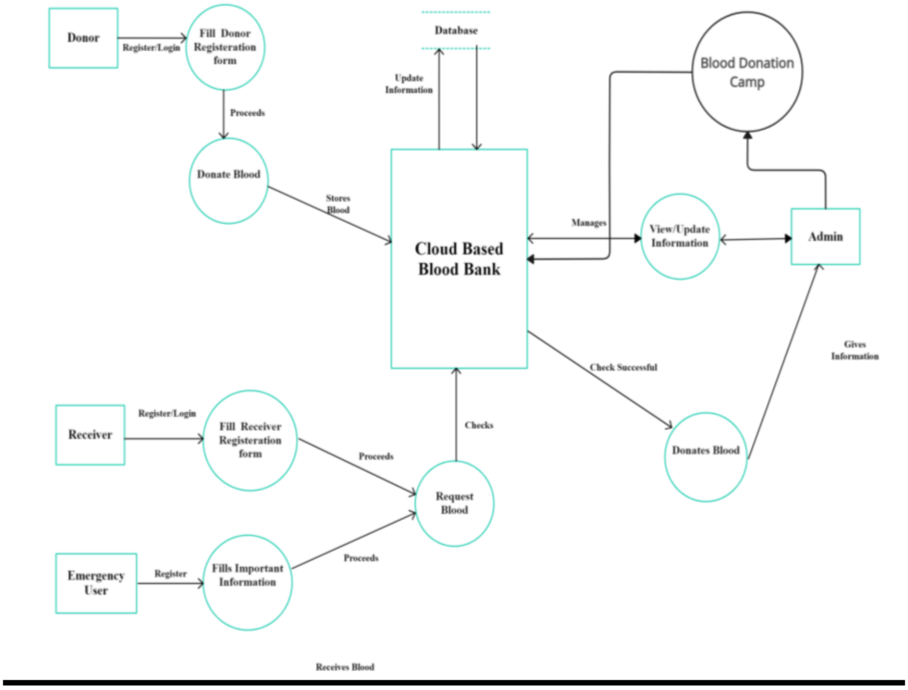
Address:* Enter your complete address

Technical Specification

- ➢ **Front-end:** React.js
- ➢ **Back-end:** Node.js, Express.js
- ➢ **Database:** MongoDB

Database Design & Schema

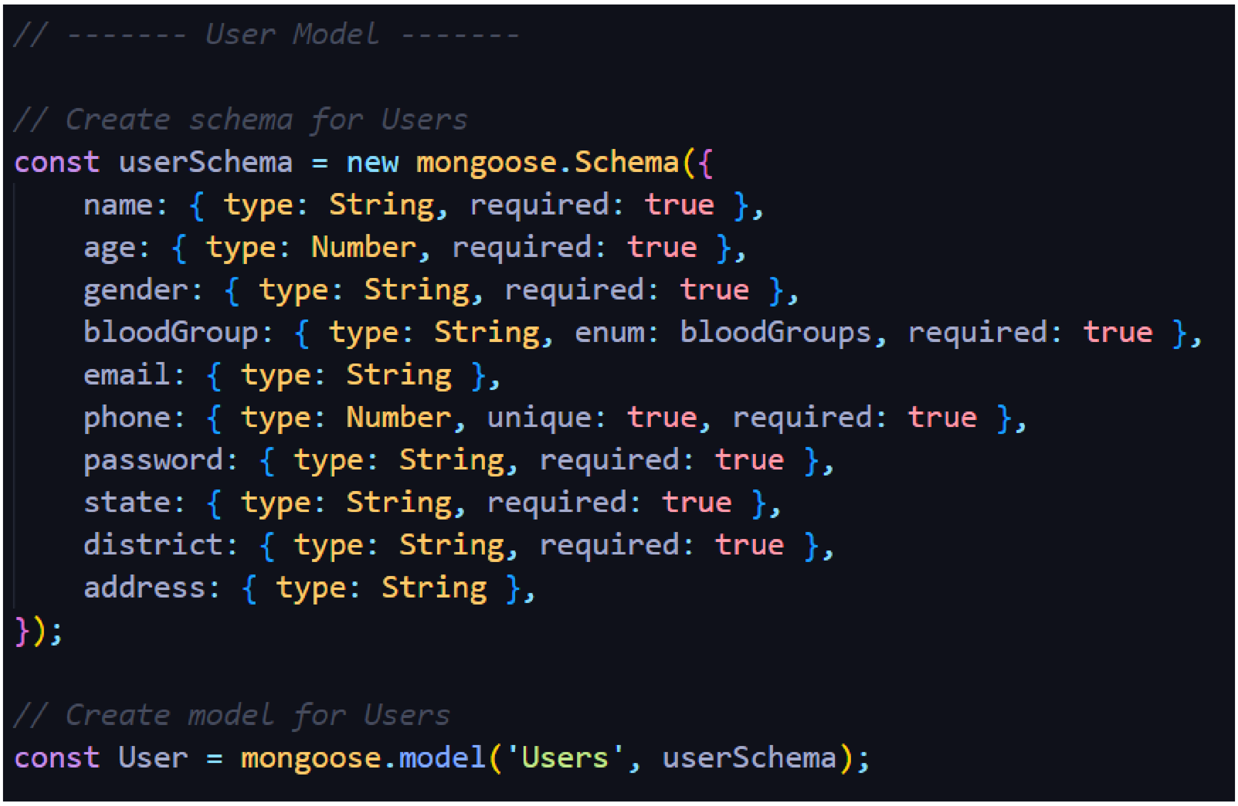




- The database used for the BloodLink project is MongoDB, a NoSQL database.
- The following collections are being used to store and organize the data for the project:

Users, BloodBanks, Donations, Requests, Camps

➢ **Users:**

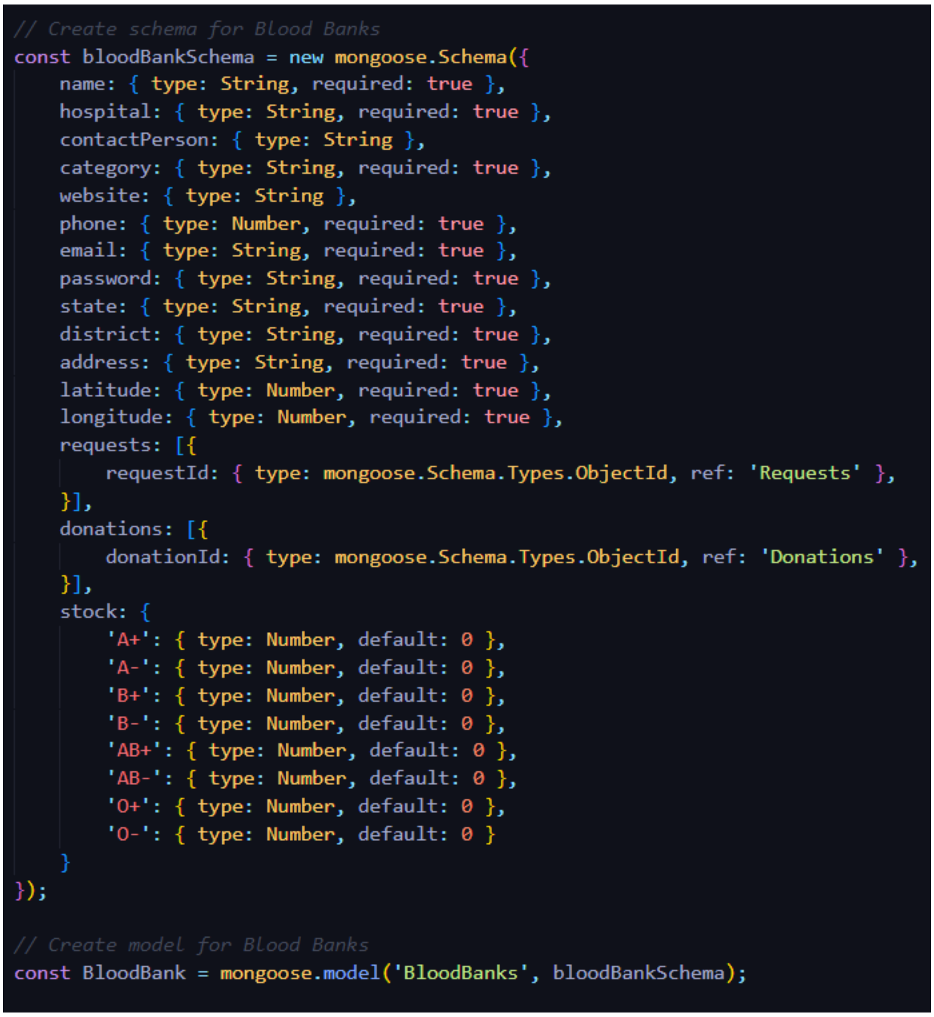


```
// ------- User Model -------

// Create schema for Users
const userSchema = new mongoose.Schema({
    name: { type: String, required: true },
    age: { type: Number, required: true },
    gender: { type: String, required: true },
    bloodGroup: { type: String, enum: bloodGroups, required: true },
    email: { type: String },
    phone: { type: Number, unique: true, required: true },
    password: { type: String, required: true },
    state: { type: String, required: true },
    district: { type: String, required: true },
    address: { type: String },
});

// Create model for Users
const User = mongoose.model('Users', userSchema);
```

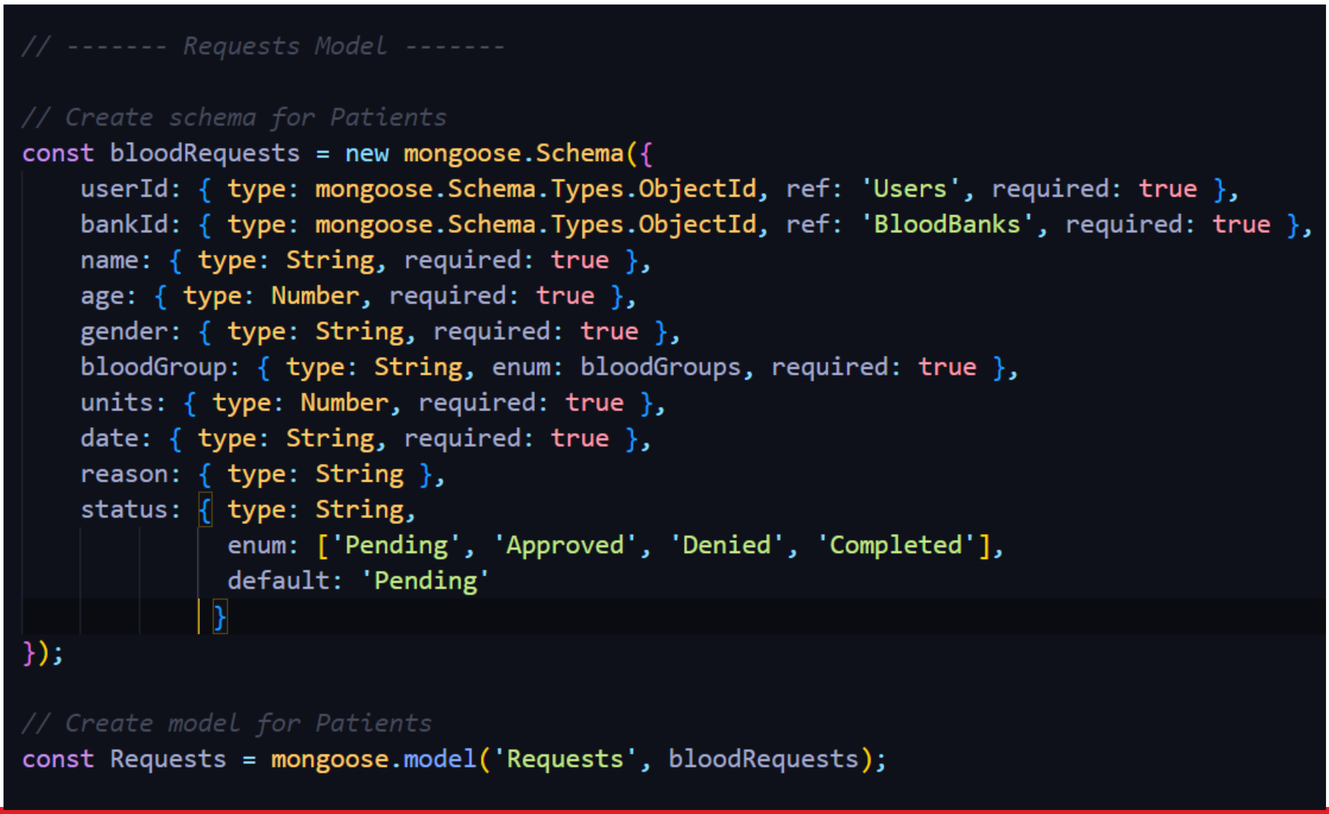
BloodBanks:



```
// Create schema for Blood Banks
const bloodBankSchema = new mongoose.Schema({
    name: { type: String, required: true },
    hospital: { type: String, required: true },
    contactPerson: { type: String },
    category: { type: String, required: true },
    website: { type: String },
    phone: { type: Number, required: true },
    email: { type: String, required: true },
    password: { type: String, required: true },
    state: { type: String, required: true },
    district: { type: String, required: true },
    address: { type: String, required: true },
    latitude: { type: Number, required: true },
    longitude: { type: Number, required: true },
    requests: [{
        requestId: { type: mongoose.Schema.Types.ObjectId, ref: 'Requests' },
    }],
    donations: [{
        donationId: { type: mongoose.Schema.Types.ObjectId, ref: 'Donations' },
    }],
    stock: {
        'A+': { type: Number, default: 0 },
        'A-': { type: Number, default: 0 },
        'B+': { type: Number, default: 0 },
        'B-': { type: Number, default: 0 },
        'AB+': { type: Number, default: 0 },
        'AB-': { type: Number, default: 0 },
        'O+': { type: Number, default: 0 },
        'O-': { type: Number, default: 0 }
    }
});

// Create model for Blood Banks
const BloodBank = mongoose.model('BloodBanks', bloodBankSchema);
```

Requests:

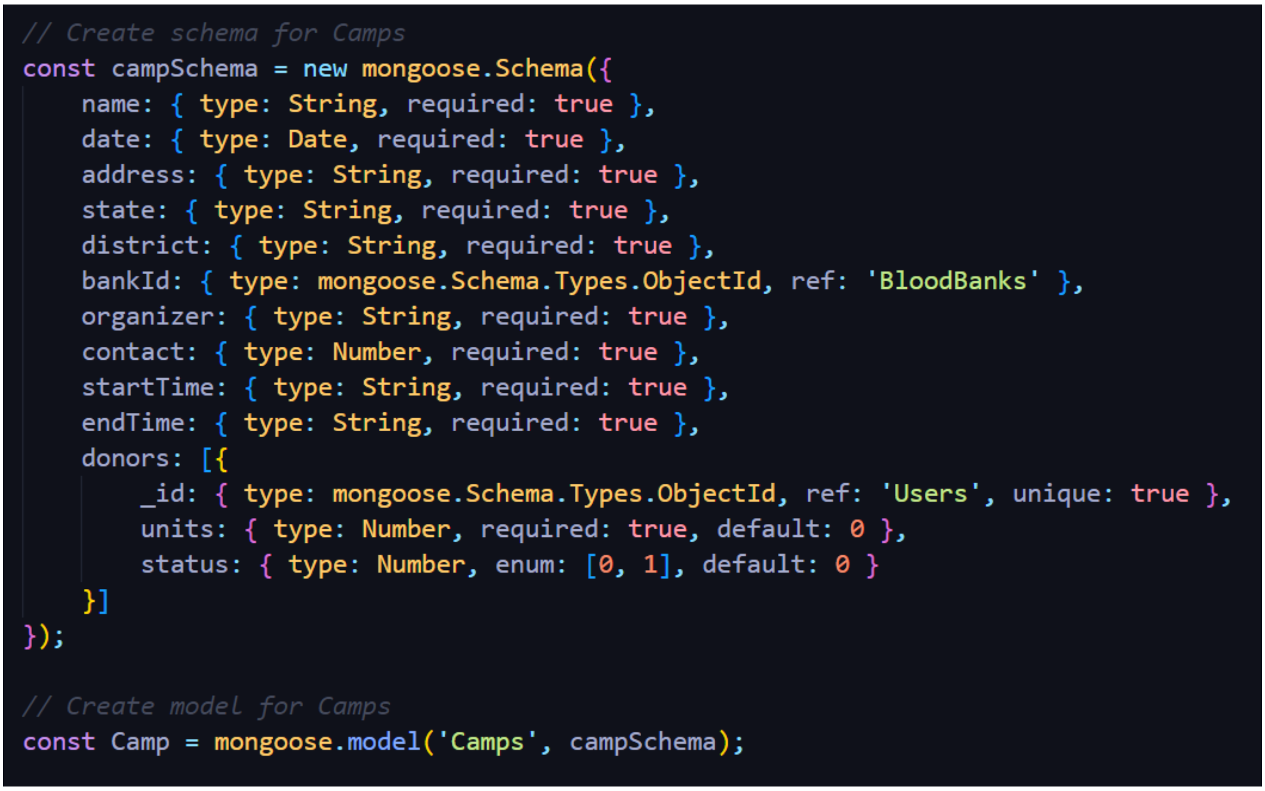


```
// ------- Requests Model -------

// Create schema for Patients
const bloodRequests = new mongoose.Schema({
    userId: { type: mongoose.Schema.Types.ObjectId, ref: 'Users', required: true },
    bankId: { type: mongoose.Schema.Types.ObjectId, ref: 'BloodBanks', required: true },
    name: { type: String, required: true },
    age: { type: Number, required: true },
    gender: { type: String, required: true },
    bloodGroup: { type: String, enum: bloodGroups, required: true },
    units: { type: Number, required: true },
    date: { type: String, required: true },
    reason: { type: String },
    status: { type: String,
              enum: ['Pending', 'Approved', 'Denied', 'Completed'],
              default: 'Pending'
            }
});

// Create model for Patients
const Requests = mongoose.model('Requests', bloodRequests);
```

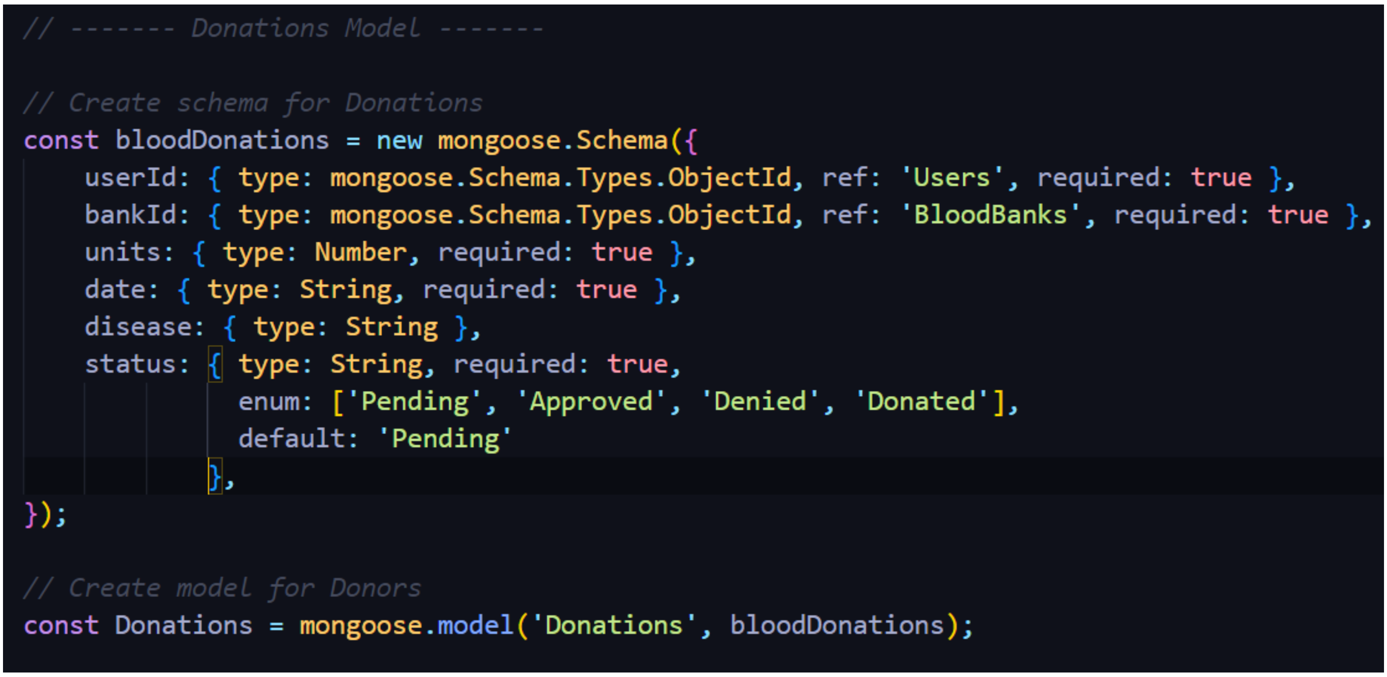
➢ Camps:



```
// Create schema for Camps
const campSchema = new mongoose.Schema({
    name: { type: String, required: true },
    date: { type: Date, required: true },
    address: { type: String, required: true },
    state: { type: String, required: true },
    district: { type: String, required: true },
    bankId: { type: mongoose.Schema.Types.ObjectId, ref: 'BloodBanks' },
    organizer: { type: String, required: true },
    contact: { type: Number, required: true },
    startTime: { type: String, required: true },
    endTime: { type: String, required: true },
    donors: [{
        _id: { type: mongoose.Schema.Types.ObjectId, ref: 'Users', unique: true },
        units: { type: Number, required: true, default: 0 },
        status: { type: Number, enum: [0, 1], default: 0 }
    }]
});

// Create model for Camps
const Camp = mongoose.model('Camps', campSchema);
```

Donation:



```
// ------- Donations Model -------

// Create schema for Donations
const bloodDonations = new mongoose.Schema({
    userId: { type: mongoose.Schema.Types.ObjectId, ref: 'Users', required: true },
    bankId: { type: mongoose.Schema.Types.ObjectId, ref: 'BloodBanks', required: true },
    units: { type: Number, required: true },
    date: { type: String, required: true },
    disease: { type: String },
    status: { type: String, required: true,
              enum: ['Pending', 'Approved', 'Denied', 'Donated'],
              default: 'Pending'
            },
});

// Create model for Donors
const Donations = mongoose.model('Donations', bloodDonations);
```

Description:

- The `Users` collection stores complete details of any registered user.
- `BloodBanks` collection stores complete details of the registered blood banks,
    - The `requests` field here is an array of objects having requestID referring to the `Requests` collection.
    - The `donations ` field here is an array of objects having donationID referring to the `Donations` collection.
    - The `stock` field is an object with all the blood groups as keys and value of the units of the stock of each blood group available.
- `Donations` collections stores every donation request made by the user, with userId referring to the `Users` collection and bankId referring to the `BloodBanks` collection with the status of the request,units to be donated.
- `Requests` collections stores every request made for blood by the user, with userId referring to the `Users` collection and bankId referring to the `BloodBanks` collection with the status of the request, units requested,.
- `Camps` schema stores the details of any camp scheduled by any blood bank where bankId is referring to `BloodBanks` collection and donors field is an array of objects with _id referring the `Users` collection, the units donated and the status.
- All the fields referring to other collections will get populated using the populate() in mongoose accordingly to get the complete data.

Conclusion

In conclusion, the MERN (MongoDB, Express.js, React, Node.js) stack-based Blood Inventory Management System represents a comprehensive and powerful solution for efficiently managing and optimizing blood donation processes. The seamless integration of these technologies brings together the strengths of each component, offering a robust and scalable platform to address the critical needs of blood banks, donors, and patients.

The use of MongoDB as the database allows for flexible and dynamic storage of data in a BSON format, accommodating varying document structures and providing efficient query capabilities. Express.js, with its middleware support, simplifies the development of a robust backend, facilitating user authentication, data validation, and the creation of RESTful APIs for smooth communication between the server and the client.

React, on the client side, provides a modern and responsive user interface, enhancing the user experience for donors, blood bank personnel, and patients. Its component-based architecture enables the creation of dynamic and interactive interfaces, seamlessly integrated with the backend services.

Node.js, as the server-side runtime, ensures the efficient handling of asynchronous operations and facilitates the creation of scalable and performant applications. The event-driven, non-blocking I/O model of Node.js contributes to the overall responsiveness and speed of the Blood Inventory Management System.

This MERN stack-based solution goes beyond traditional blood bank management by incorporating features such as user and blood bank registration, real-time inventory management, donor facilitation, and patient blood request capabilities. The system's emphasis on accessibility, data security, and community impact positions it as a valuable tool in supporting healthcare organizations, promoting blood donation drives, and ultimately contributing to saving lives.