BLOOD BANK MANAGEMENT SYSTEM

A mini project report submitted by

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in partial fulfillment for the award of the degree
of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

under the supervision of

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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(Declared as Deemed-to-be-under Sec-3 of the UGC Act, 1956)
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that the project report entitled, "**Blood Bank Management System**" is a bonafide record of Mini Project work done during the even semester of the academic year 2020-2021 by

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Submitted for the Viva Voce held on ________________

Project Coordinator **Signature of the Guide**

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ABSTRACT

Blood Bank Management System (BBMS) is a browser-based system that is designed to store, process, retrieve and analyze information concerned with the administrative and inventory management within a blood bank. This project aims at maintaining all the information related to blood donors, different blood groups available in each blood bank and help them manage in a better way. The main objective is to provide transparency in this field, make the process of obtaining blood from a blood bank corruption free and make the system of blood bank management effective. This gives attention in stocking blood donors information. The donors who are interested in donating blood has to register in the database. The software is fully integrated with CRM (customer relationship management) as well as CMS (content management system) solution. The requirement of the blood has to be requested and the information of the donor are supplied. The donors can update their status whether they are available or not. After the implementation of the project, the blood searching process is expected to be faster, easier, and reliable. Admin will view the donor side and view the available blood requested by the users.

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INTRODUCTION

1.1 INTRODUCTION

Every year our nation requires about 4 Crore units of blood, out of which only 5 Lakh units of blood are available. It is not that, people do not want to donate blood. Often they are unaware of the need and also they do not have a proper facility to enquire about it. As a result, needy people end up going through a lot of pain. India has many blood banks, all-functioning in a decentralized fashion. In the current system, individual hospitals have their own blood banks and there is no interaction between blood banks.

Donors cannot access blood from blood banks other than the bank where they have donated blood. In present system all the blood banks are attached to hospitals and there is no stand-alone blood bank. Some hospital has its own systems and limitations. Because of low number of donors and more number of blood banks, the efficiency and quality of blood banks are low, resulting in wastage of blood and blood components.

The operation of the blood bank still now is maintained in the manual system. It is tedious, time-consuming and space consuming. It ends up with errors as the data is entered manually by the people and is not accurate and precise. It includes the risk of documents being lost over years and the maintenance of the records is difficult.

This project software is designed to handle the daily transactions of the blood bank and search the details when required. It also helps to register the details of the donors, blood collection details as well as blood issued reports. It also suits the necessities of all the blood bank requirements in the future.

1.2 PROBLEM STATEMENT

The following problems arise when using the blood bank’s existing system:

- Personal profile accessibility: The donor’s information can only be updated by the administrators of the blood bank. A donor can update their information by calling, faxing, e-mailing, but not by themselves. This is a waste of time just for updating a piece of information and it may be difficult for some donors.
- Lost or damaged card: A typical membership card can easily get damaged if it is exposed to the sunlight or weather and this causes to ruin the card’s barcode which is significantly important for retrieving records. If the card gets lost or stolen, the donor has to make a replacement card to keep their membership at the blood bank.
- Donation record accessibility: The donor ID card is the only evidence that contains the donor’s recent donation records, if the card gets lost, donors may find it difficult to schedule their next appointment since they are not able to see the last record of donation.
- Blood result notifications: After the process of blood donation, the donor will receive a card that only contains their name and blood type. They will not be notified of their blood result unless they request that information from the blood bank.
- Blood stock management: Blood banks are required to maintain account of blood bags in the inventory. This increases with each blood donation recorded in our system, and decreases as they are checked out upon hospital requests. Our system will need to keep the information up-to-date to ensure correctness of the inventory.
- Mailing by postal system: Blood banks will only mail donors when the donated blood is disqualified, however, this mail is sent through the postal system to the donor’s given address. If the donor’s address is recorded incorrectly, the mail will be sent to the wrong address and the donor will never be notified that their blood is rejected and given the reason for that.

1.3 OBJECTIVES

The main goal of this project is to develop a Blood Bank Management software to make all the procedures automated so that it can be more fast and accurate. The main objectives of this website development can be defined as follows:

1. To develop a system that provides functions to support donors to view and manage their information conveniently.
2. To find out the availability of the required blood groups in the blood banks.
3. To maintain records of blood donors, blood donation information and blood stocks in a centralized database system.
4. To inform donors of their blood result after their donation.
5. To support searching, matching and requesting for blood, convenient for administrators.

1.4 MOTIVATION AND IDEA BEHIND THE PROJECT

MOTIVATION:

Even in this day and age we get text messages and people use such primitive methods to obtain blood during the case of a life-threatening emergencies. There are existing systems in place but the bureaucracy makes the process highly inefficient even in the case of a life and death emergency. Human life is invaluable and regardless of whoever it is life must be protected and saved at all costs. We also wanted to build a tool so that hospital has scheduled access of blood when they need it for surgeries and various other medical procedures. So to do our part in saving human life we decided to build a tool that would help patients and hospitals to get access to blood in case of an emergency or for scheduled medical procedures.

IDEA BEHIND THE PROJECT

When a person or hospital needs blood they can get access to it by using our application. The app also aims to provide information about donation camps and the type of blood needed at the donation camps. There are also features to test the eligibility of a donor and the donor can become a member to volunteer at donation camps. Hospitals can get scheduled access for blood on the day of a medical procedure by submitting the necessary documents. This app mainly aims at coming up with an algorithm to sort the priority of access to blood according to the parameters of quantity, availability and time constraints.

WORK IMPLEMENTED IN THE PROJECT

MODULE 1: Availability of blood types and quantity
Input: Blood Type/Group
Output: Available Units

MODULE 2: Blood donation camps
Input: Serial no of camp.
Output: Camp date, Timing, Location, Organiser

MODULE 3: Application
Input: Patient details, Hospital details, No. of units required, Priority
Output: Applications sorted on basis of priority

MODULE 4: Required blood group
Input: Blood groups with low availability
Output: Intimate low stock to camps

MODULE 5: Testing for donors
Input: Personal details, Blood type, Compatibility
Output: Eligible to donate blood or Not

MODULE 6: Members
Input: Personal details, Previous donation history
Output: No of members of blood group available, Member details

Additional features:

Binary search for members:

[1] Using member-ID
OUTPUT: Member Info

[2] Using blood group
OUTPUT: No of donor(s) available.

ANALYSIS AND DESIGN

2.1 ANALYSIS OF THE EXISTING SYSTEM

There are two types of process in the existing system: the blood donation process by donors, and the blood request process by hospitals. In both processes, an administrator is in charge of managing the blood inventory in the blood bank.

Blood Donation Process by Donors:

When a new donor comes to donate blood, they are required to fill out their personal information during the registration process before making a donation. After the donation, the donor is given a donor identification card with their name, blood type and a barcode to be used as a reference for future donations. The barcode is used to retrieve the donor's record containing their personal information, medical history and donation information, including blood results. Only blood bank administrators have the authority to access the donor's records, since the system is only available for their use within the organization. This makes it difficult for donors to make changes to their personal information within the system. That is, for donors to update their personal information, such as their phone number, mailing address, or e-mail, they cannot update the information by themselves, but have to contact the blood bank center to update their information. At the back the card is a table that contains number of donations, date, location, and the blood collector's signature. Existing donors can submit their donor ID cards to retrieve their personal information and donation records and start the blood donation process, and they will be given a new card after they have donated blood for a total of eight times. Having a donor ID card may be a tangible reminder to people that they are helping lives as a blood donor; however, possessing a physical card comes with drawbacks such as loss or damage. To ensure donors can still identify themselves with the system, other credentials, such as username and password, can be used as a safeguard if their donor ID card is lost or damaged. If the donated blood is disqualified, the donor will be notified through postal mail that their blood component is reactive to viruses, meaning that there is a positive result of the blood being infected, and the organization will also inform the donor to perform another blood test at the blood bank to confirm the result of blood. If the blood is qualified, the administrator then will deposit the blood into the inventory for future requests.

Blood Request Process by Hospitals:

Hospitals can request for blood by calling in or e-mailing the blood bank the type of blood and the quantity that is in need. The administrator is responsible in 15 checking the availability of the blood type according to the request. If the requested blood type is available, the administrator will withdraw the blood from the inventory and transfer it to the hospital. However, if the requested blood is unavailable, the administrator will send an e-mail to inform the hospital.

2.2 REQUIREMENT ANALYSIS

1. Registration of donor: Requires an interface for the registering the details of the donor.
2. Donor:

To be able to view their donation records, including where and when they made donations, and the blood results for each, to learn of their donated blood quality and schedule their next donations. To be able to view and update their personal information, including name, contact address, and phone number, to keep their donor’s information record up-to-date with the blood bank. To be notified of the blood results of their previous donation by e-mail, to know the success of their donation.

3. Health Information: Attributes- Body Weight, Pulse Rate, Haemoglobin, Weight of Bag, Blood pressure, Temperature.
4. Donation Details: Attributes- Blood group, Number of bags, Donation date.
5. Blood Bank: Requires an interface to display the details of the blood bank. Attributes- Name, Address, Contacts, Hospitals linked.
6. Administrator:

To be able to create, update, delete, and query donor’s records in order to manage donor information. To be able to create, update, delete, and retrieve donation records to manage information about donations made. To be able to deposit donated blood into inventory when donations are made. To be able to withdraw blood from the inventory and keep a record of blood stocks to always keep count of the blood bags. To be able to create, update, delete, and retrieve request records from hospitals to manage hospital requests for blood. To be able to create, update, delete, and query hospital’s records in order to manage hospital information. To be able to send e-mails to donors for their user account and blood results through the system. To be able to send e-mail responding to hospitals for their blood requests through the system.

2.3 BENEFIT ANALYSIS

1. Users do not have to contact the hospital to know the results of their blood donation. They can view their results through the website by logging-in with their username and password.
2. The reports and information are kept in electronic form and can be easily maintained by the administrators, and donors may access their donation records whenever they want to.
3. The reports of donations are kept in electronic files so that they may last longer and have less chance of being lost or damaged.
4. Administrators of the system can easily manage blood stock and blood withdrawals that have been requested by the hospitals.

2.4 METHODOLOGY

1. Project Identification and Selection

In this project, we aimed to develop an online blood bank system which will focus mainly on managing the donor's blood information. Anyone who is interested in blood donation can donate the blood at the hospital or blood donation centers.

2. Project Initiation and Planning

To begin the project, we have gather user requirement of this system and prepare the scope and objective. The results from this phase are scope and limitation, objectives, cost and benefits, feature of the proposed system and user interface design.

3. Analyzing System needs

We have studied and identified problems of existing system, then we develop data flow diagram for the existing system. We also develop data flow diagram (DFD) and entity relation diagram (E-R diagram) for the proposed system.

4. Designing the Proposed System

Based on the analysis phase, we converted E-R diagram into relational database model and created data dictionary and DFD and user interface are designed in this process.

5. Development of the Proposed System

In this phase, we are going to convert the design of proposed system to computer software, which includes computer programming using phpMyAdmin as a software tool written in PHP, which is intended to handle the administration of MySQL, and translating the design specifications into the computer code.

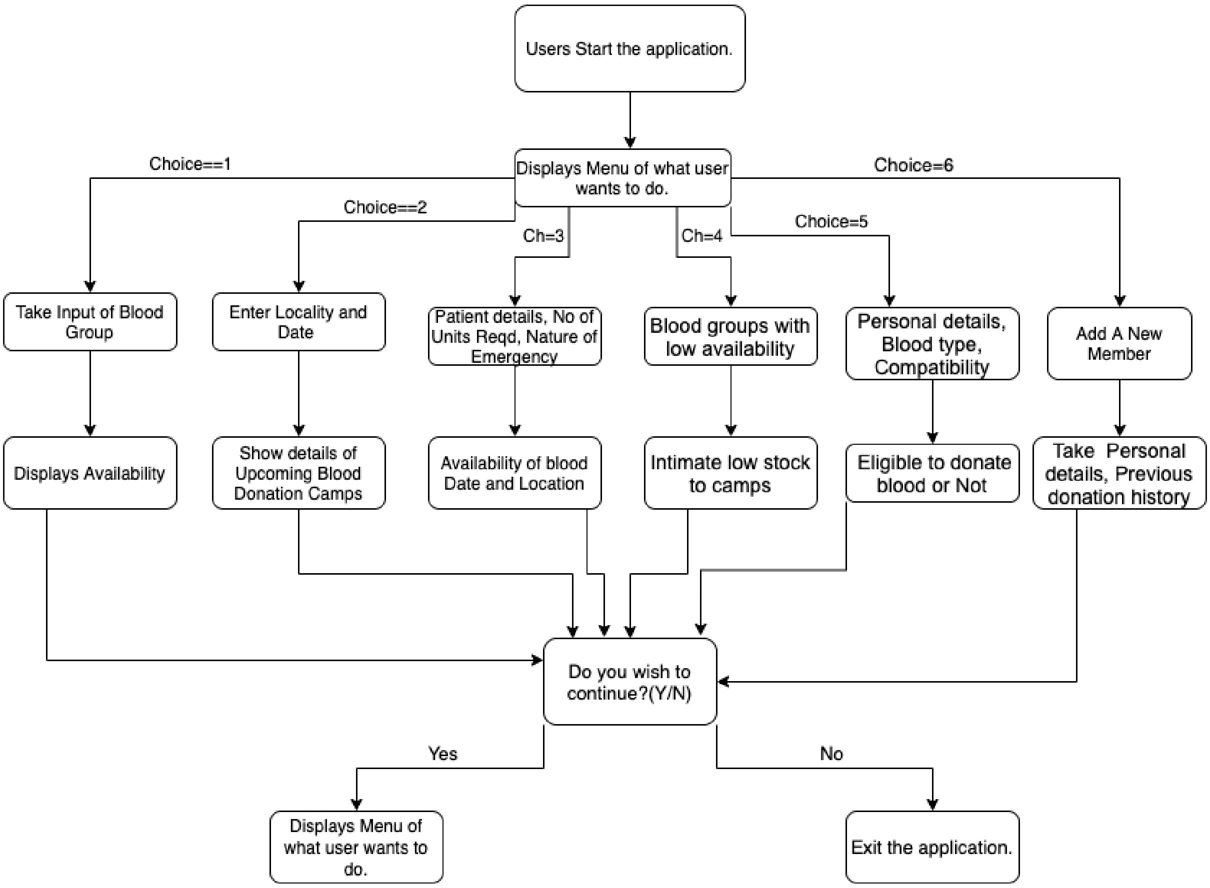
6. Testing the Proposed System

This step is the process of testing whether the programming code will work correctly with the conditions in our system or not. In this phase, we will fix bugs in order to produce a system with maximum performance.

7. Implementing the Proposed System

We wish to launch this system on the internet, so that donors are able to view their blood donation records online and administrators can create, update, delete, and query records conveniently.

2.5 FLOW DIAGRAM



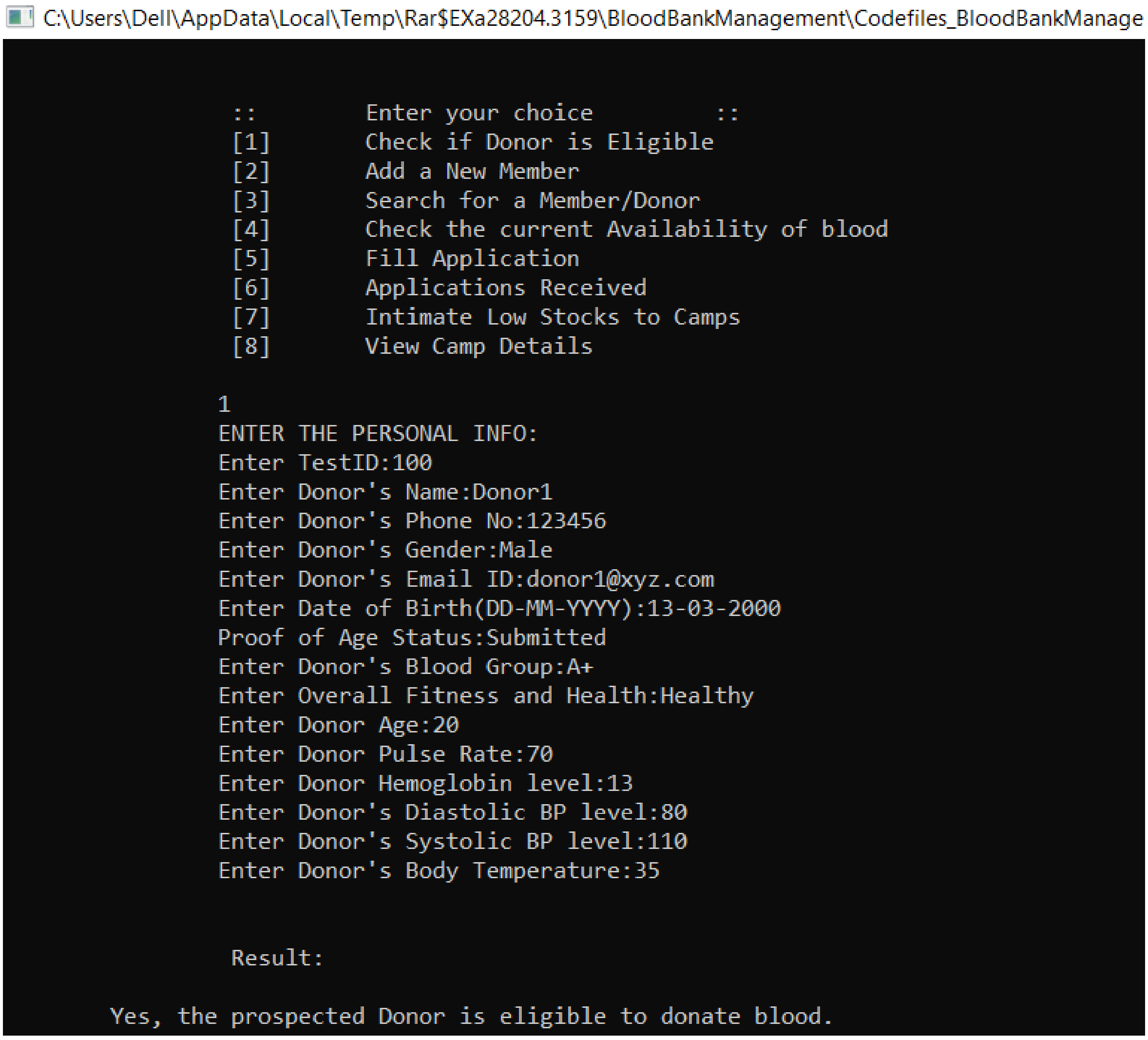
TEST RESULTS

4.1 SAMPLE TEST CASES OF THE FEATURES

C:\Users\Dell\AppData\Local\Temp\Rar$EXa28204.792\BloodBankManagement\Codefiles_BloodBankManagement\main.exe

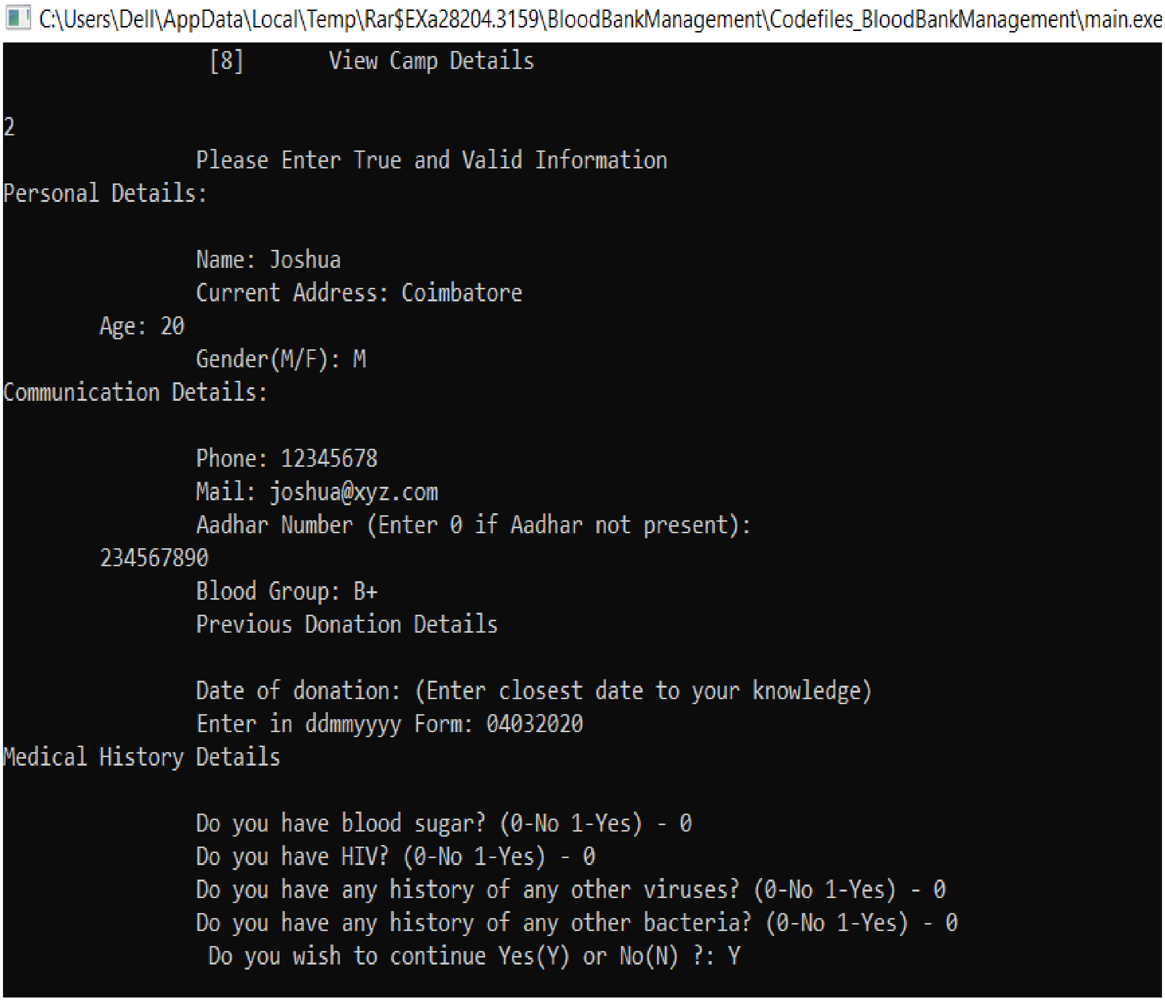
```
-----------------------------------------------------
|     WELCOME TO BLOOD BANK MANAGEMENT SYSTEM       |
-----------------------------------------------------



::      Enter your choice        ::
[1]     Check if Donor is Eligible
[2]     Add a New Member
[3]     Search for a Member/Donor
[4]     Check the current Availability of blood
[5]     Fill Application
[6]     Applications Received
[7]     Intimate Low Stocks to Camps
[8]     View Camp Details
```

Fig 1: Welcome page



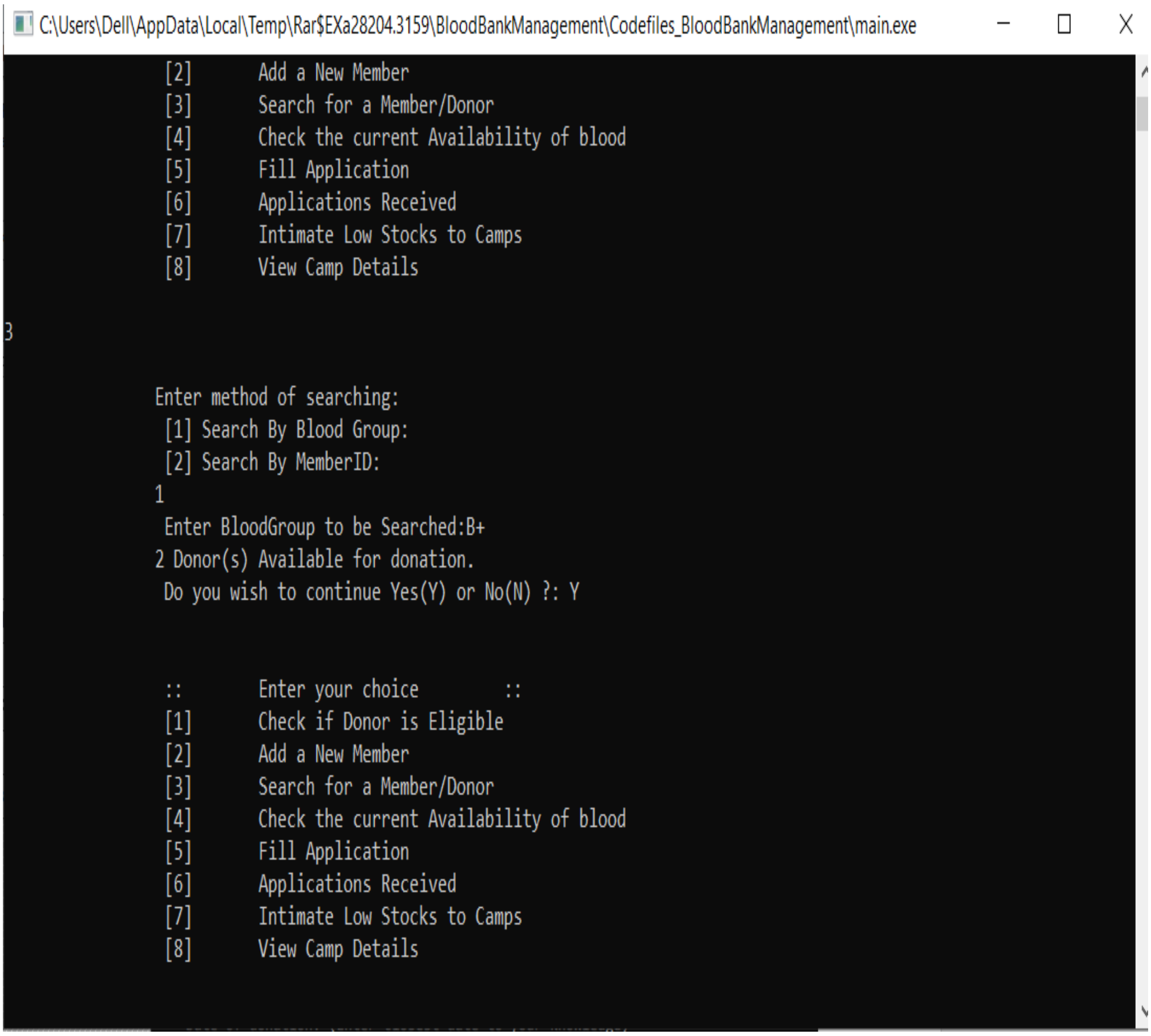
```
C:\Users\Dell\AppData\Local\Temp\Rar$EXa28204.3159\BloodBankManagement\Codefiles_BloodBankManage

         ::        Enter your choice         ::
         [1]       Check if Donor is Eligible
         [2]       Add a New Member
         [3]       Search for a Member/Donor
         [4]       Check the current Availability of blood
         [5]       Fill Application
         [6]       Applications Received
         [7]       Intimate Low Stocks to Camps
         [8]       View Camp Details

        1
        ENTER THE PERSONAL INFO:
        Enter TestID:100
        Enter Donor's Name:Donor1
        Enter Donor's Phone No:123456
        Enter Donor's Gender:Male
        Enter Donor's Email ID:donor1@xyz.com
        Enter Date of Birth(DD-MM-YYYY):13-03-2000
        Proof of Age Status:Submitted
        Enter Donor's Blood Group:A+
        Enter Overall Fitness and Health:Healthy
        Enter Donor Age:20
        Enter Donor Pulse Rate:70
        Enter Donor Hemoglobin level:13
        Enter Donor's Diastolic BP level:80
        Enter Donor's Systolic BP level:110
        Enter Donor's Body Temperature:35


         Result:

    Yes, the prospected Donor is eligible to donate blood.
```

Fig 2: Eligibility to donate blood or not


C:\Users\Dell\AppData\Local\Temp\Rar$EXa28204.3159\BloodBankManagement\Codefiles_BloodBankManagement\main.exe

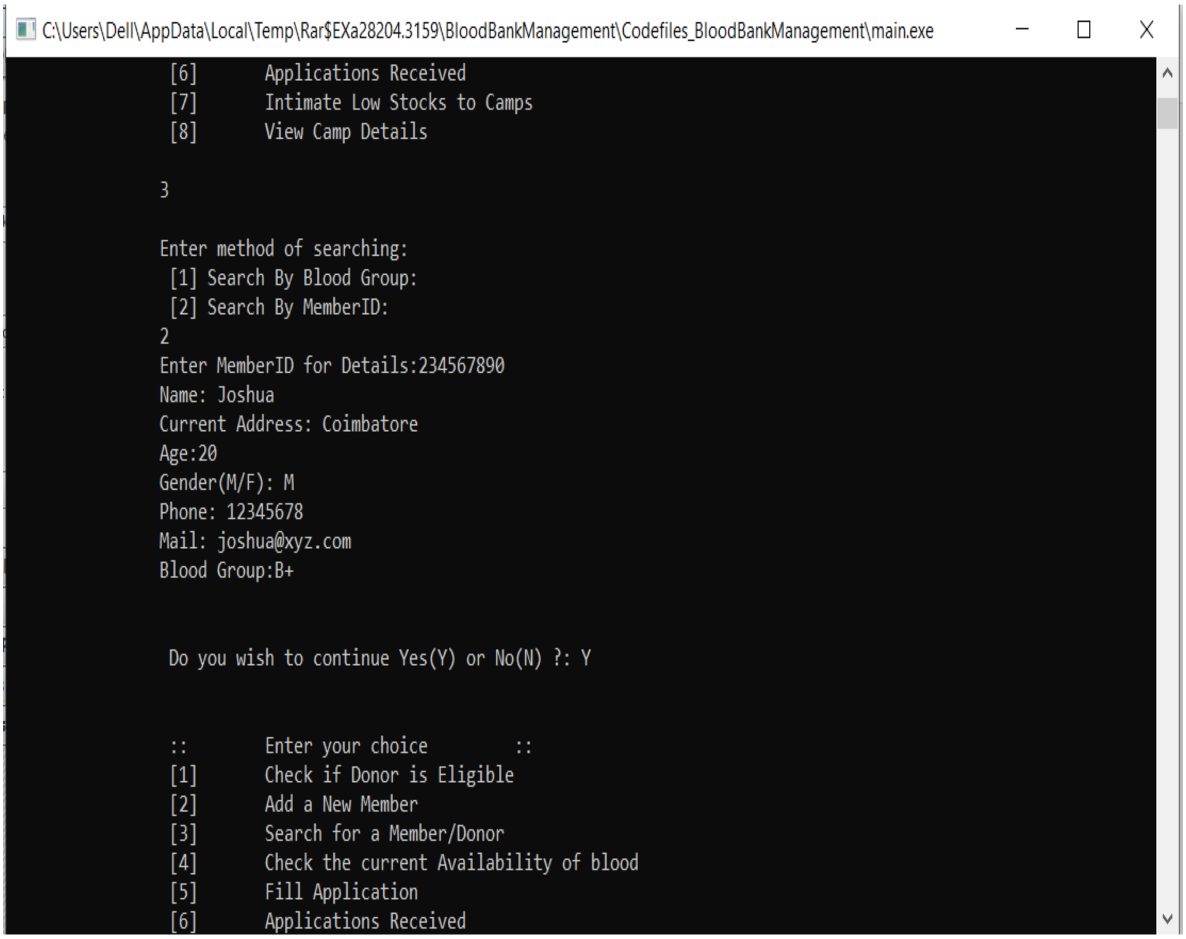
```
                 [8]       View Camp Details


2
                Please Enter True and Valid Information
Personal Details:

                Name: Joshua
                Current Address: Coimbatore
        Age: 20
                Gender(M/F): M
Communication Details:

                Phone: 12345678
                Mail: joshua@xyz.com
                Aadhar Number (Enter 0 if Aadhar not present):
        234567890
                Blood Group: B+
                Previous Donation Details

                Date of donation: (Enter closest date to your knowledge)
                Enter in ddmmyyyy Form: 04032020
Medical History Details

                Do you have blood sugar? (0-No 1-Yes) - 0
                Do you have HIV? (0-No 1-Yes) - 0
                Do you have any history of any other viruses? (0-No 1-Yes) - 0
                Do you have any history of any other bacteria? (0-No 1-Yes) - 0
                 Do you wish to continue Yes(Y) or No(N) ?: Y
```

Fig 3: Add a new member



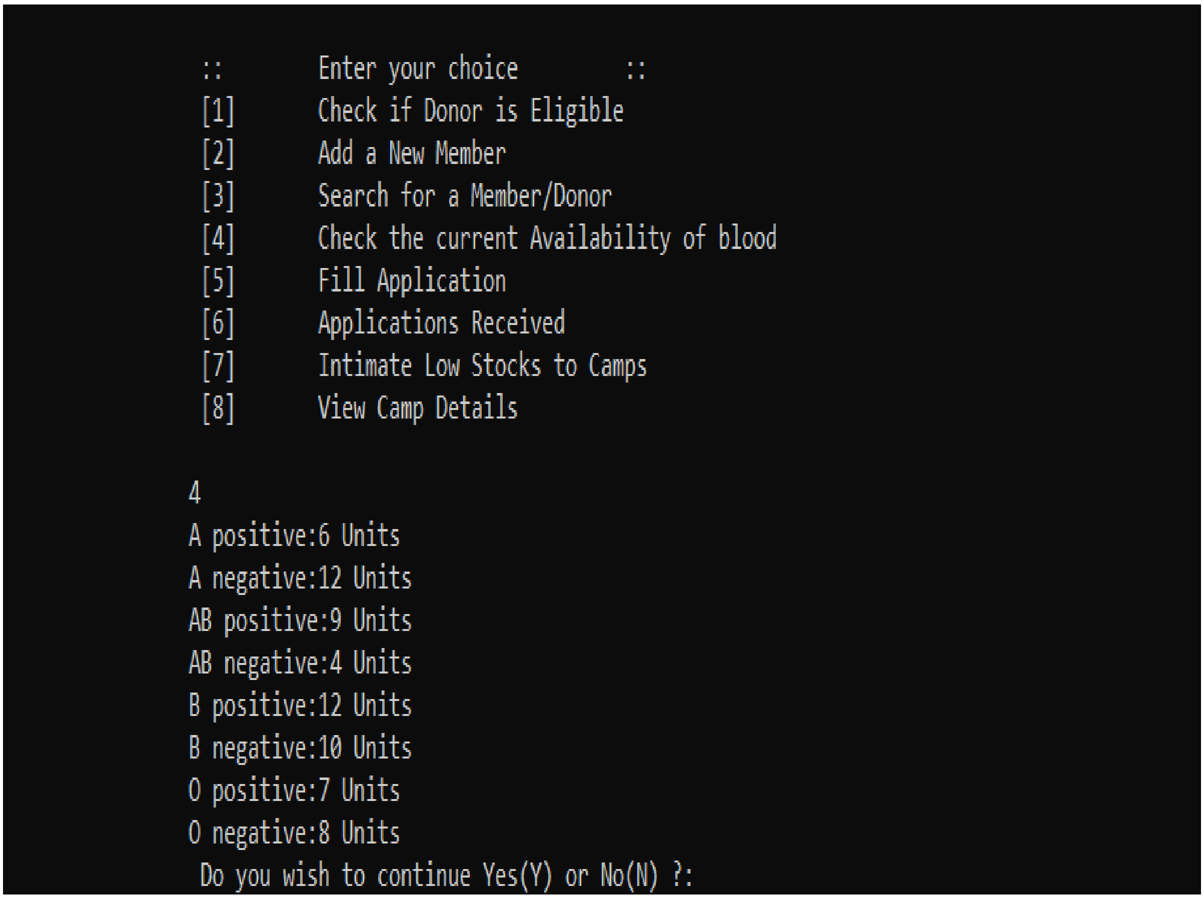
```
C:\Users\Dell\AppData\Local\Temp\Rar$EXa28204.3159\BloodBankManagement\Codefiles_BloodBankManagement\main.exe
                [2]       Add a New Member
                [3]       Search for a Member/Donor
                [4]       Check the current Availability of blood
                [5]       Fill Application
                [6]       Applications Received
                [7]       Intimate Low Stocks to Camps
                [8]       View Camp Details


3



               Enter method of searching:
                [1] Search By Blood Group:
                [2] Search By MemberID:
               1
                Enter BloodGroup to be Searched:B+
               2 Donor(s) Available for donation.
                Do you wish to continue Yes(Y) or No(N) ?: Y


                ::        Enter your choice        ::
                [1]       Check if Donor is Eligible
                [2]       Add a New Member
                [3]       Search for a Member/Donor
                [4]       Check the current Availability of blood
                [5]       Fill Application
                [6]       Applications Received
                [7]       Intimate Low Stocks to Camps
                [8]       View Camp Details
```

Fig 4: Searching for available members using blood group



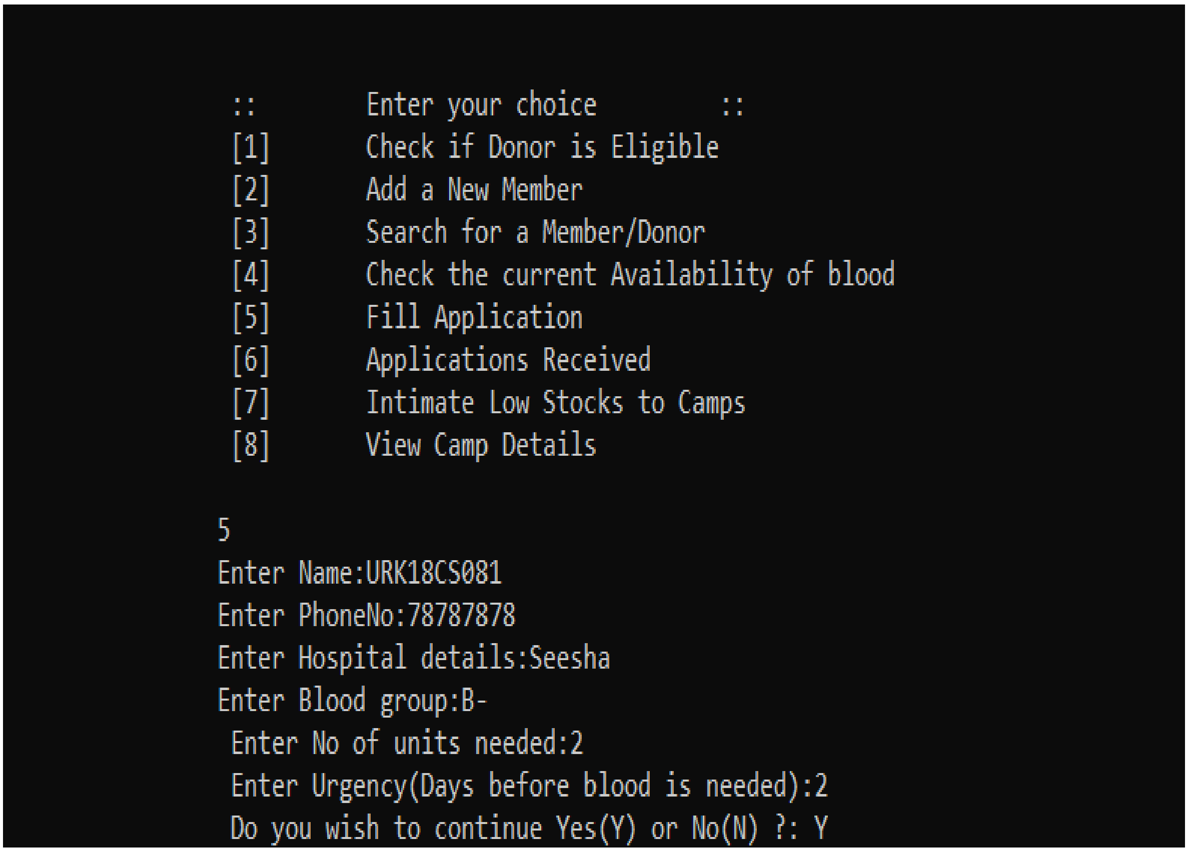
```
                 [6]      Applications Received
                 [7]      Intimate Low Stocks to Camps
                 [8]      View Camp Details

                3

                Enter method of searching:
                 [1] Search By Blood Group:
                 [2] Search By MemberID:
                2
                Enter MemberID for Details:234567890
                Name: Joshua
                Current Address: Coimbatore
                Age:20
                Gender(M/F): M
                Phone: 12345678
                Mail: joshua@xyz.com
                Blood Group:B+


                 Do you wish to continue Yes(Y) or No(N) ?: Y


                 ::       Enter your choice       ::
                 [1]      Check if Donor is Eligible
                 [2]      Add a New Member
                 [3]      Search for a Member/Donor
                 [4]      Check the current Availability of blood
                 [5]      Fill Application
                 [6]      Applications Received
```

Fig 5: Searching for available members using Member ID



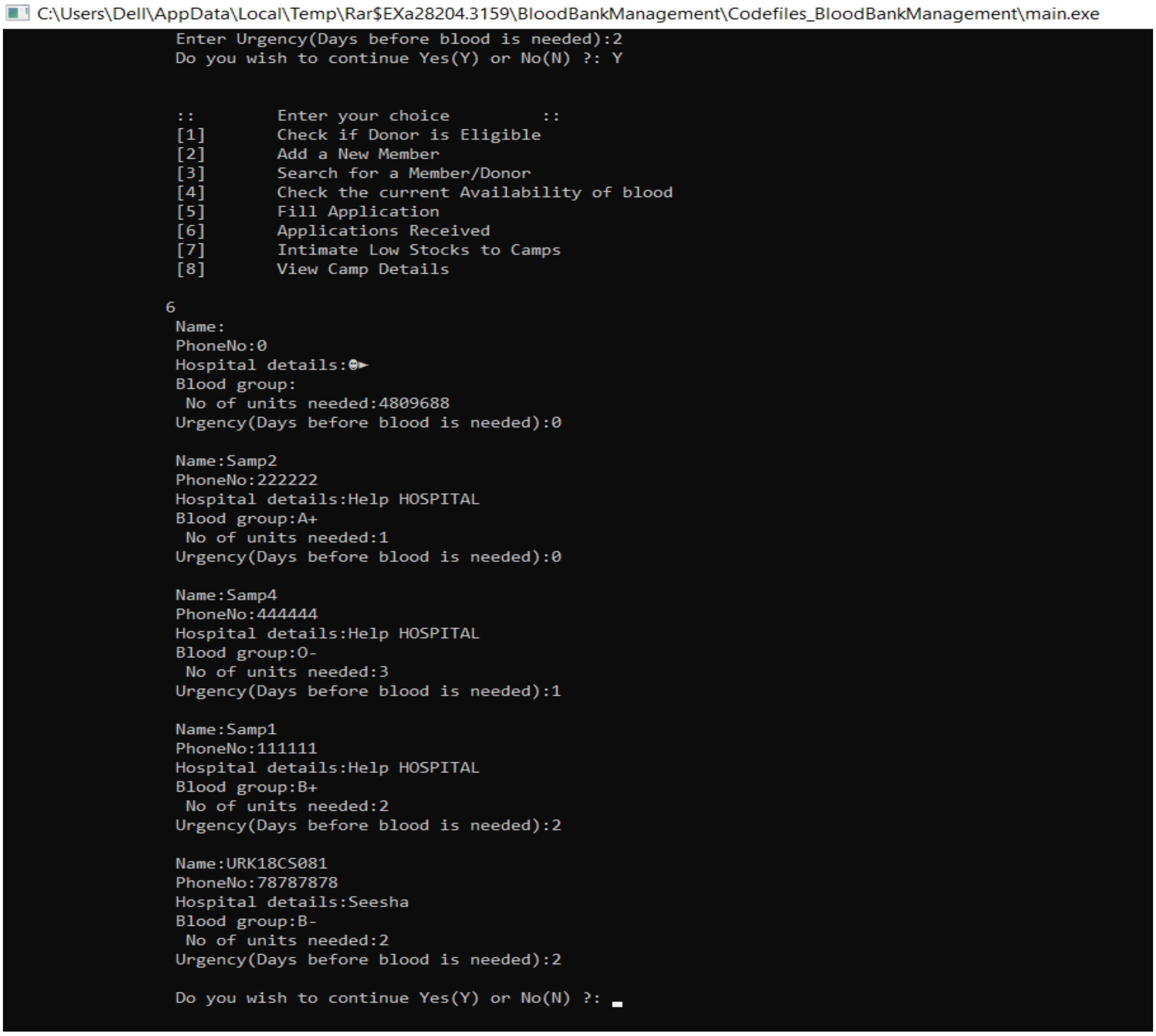
```
 ::       Enter your choice        ::
 [1]      Check if Donor is Eligible
 [2]      Add a New Member
 [3]      Search for a Member/Donor
 [4]      Check the current Availability of blood
 [5]      Fill Application
 [6]      Applications Received
 [7]      Intimate Low Stocks to Camps
 [8]      View Camp Details

4
A positive:6 Units
A negative:12 Units
AB positive:9 Units
AB negative:4 Units
B positive:12 Units
B negative:10 Units
O positive:7 Units
O negative:8 Units
 Do you wish to continue Yes(Y) or No(N) ?:
```

Fig 6: Check the current availability of blood



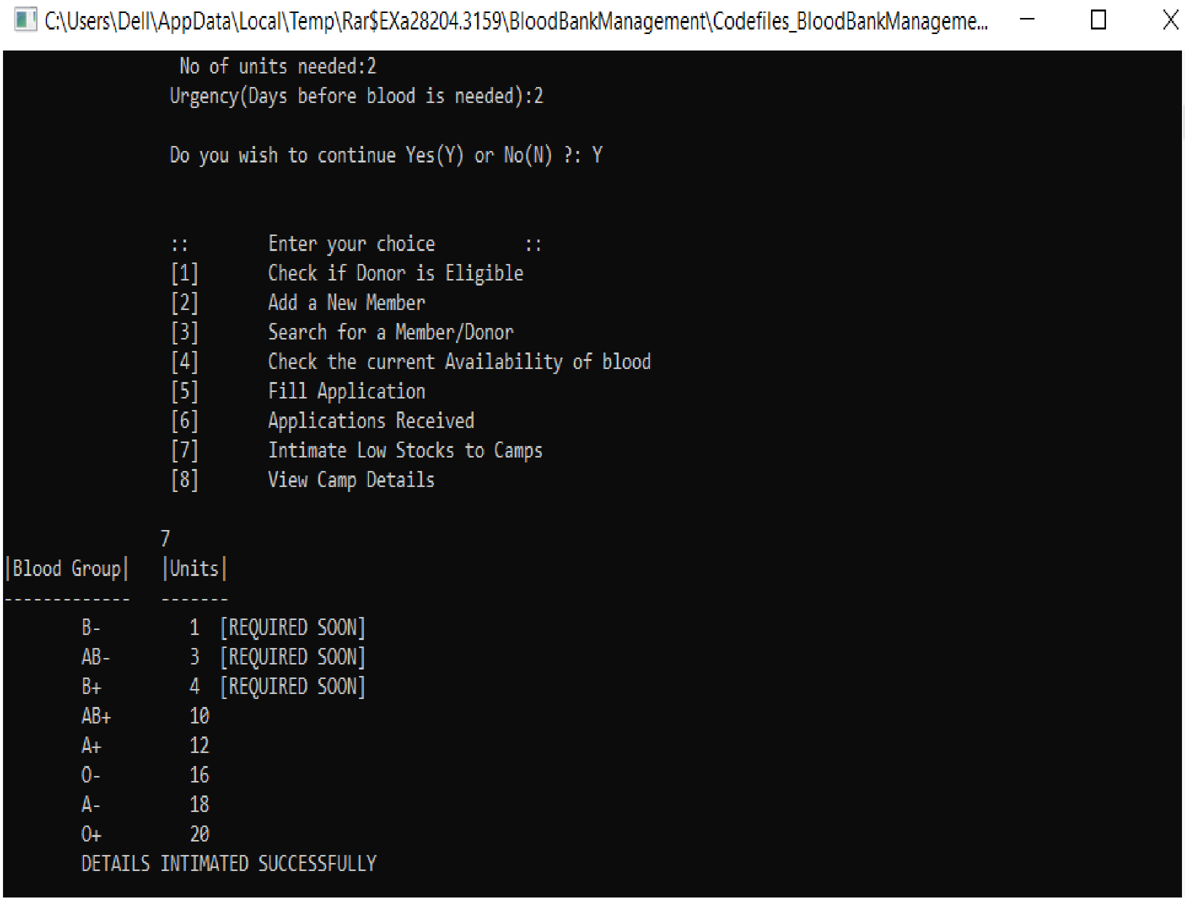
```
 ::        Enter your choice         ::
 [1]       Check if Donor is Eligible
 [2]       Add a New Member
 [3]       Search for a Member/Donor
 [4]       Check the current Availability of blood
 [5]       Fill Application
 [6]       Applications Received
 [7]       Intimate Low Stocks to Camps
 [8]       View Camp Details

5
Enter Name:URK18CS081
Enter PhoneNo:78787878
Enter Hospital details:Seesha
Enter Blood group:B-
 Enter No of units needed:2
 Enter Urgency(Days before blood is needed):2
 Do you wish to continue Yes(Y) or No(N) ?: Y
```

Fig 7: Filling an application



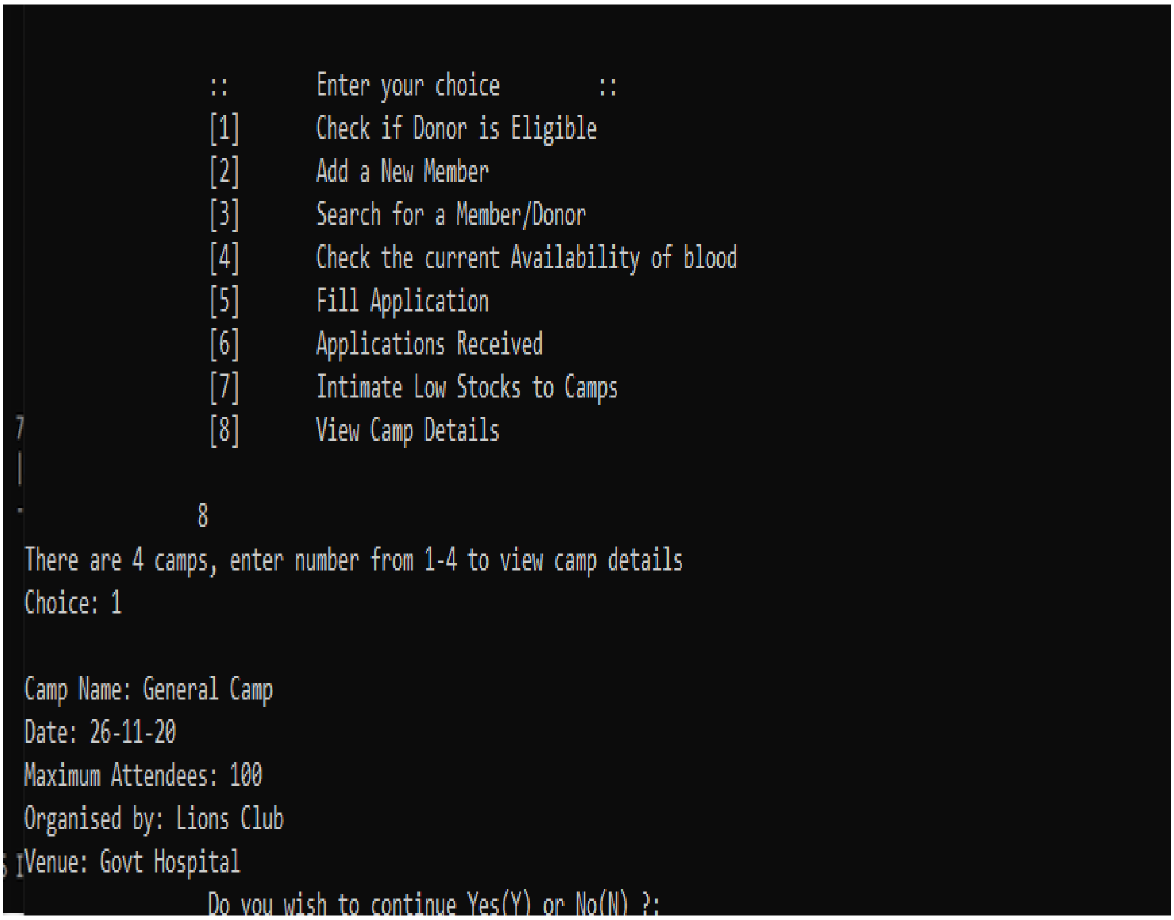
```
C:\Users\Dell\AppData\Local\Temp\Rar$EXa28204.3159\BloodBankManagement\Codefiles_BloodBankManagement\main.exe
 Enter Urgency(Days before blood is needed):2
 Do you wish to continue Yes(Y) or No(N) ?: Y


 ::        Enter your choice         ::
 [1]       Check if Donor is Eligible
 [2]       Add a New Member
 [3]       Search for a Member/Donor
 [4]       Check the current Availability of blood
 [5]       Fill Application
 [6]       Applications Received
 [7]       Intimate Low Stocks to Camps
 [8]       View Camp Details

6
 Name:
 PhoneNo:0
 Hospital details:☻►
 Blood group:
  No of units needed:4809688
 Urgency(Days before blood is needed):0

 Name:Samp2
 PhoneNo:222222
 Hospital details:Help HOSPITAL
 Blood group:A+
  No of units needed:1
 Urgency(Days before blood is needed):0

 Name:Samp4
 PhoneNo:444444
 Hospital details:Help HOSPITAL
 Blood group:O-
  No of units needed:3
 Urgency(Days before blood is needed):1

 Name:Samp1
 PhoneNo:111111
 Hospital details:Help HOSPITAL
 Blood group:B+
  No of units needed:2
 Urgency(Days before blood is needed):2

 Name:URK18CS081
 PhoneNo:78787878
 Hospital details:Seesha
 Blood group:B-
  No of units needed:2
 Urgency(Days before blood is needed):2

 Do you wish to continue Yes(Y) or No(N) ?: _
```

Fig 8: Applications sorted on the basis of priority(urgency)



```
                  No of units needed:2
                 Urgency(Days before blood is needed):2

                 Do you wish to continue Yes(Y) or No(N) ?: Y


                 ::        Enter your choice         ::
                 [1]       Check if Donor is Eligible
                 [2]       Add a New Member
                 [3]       Search for a Member/Donor
                 [4]       Check the current Availability of blood
                 [5]       Fill Application
                 [6]       Applications Received
                 [7]       Intimate Low Stocks to Camps
                 [8]       View Camp Details

                7
|Blood Group|   |Units|
-------------   -------
        B-         1  [REQUIRED SOON]
        AB-        3  [REQUIRED SOON]
        B+         4  [REQUIRED SOON]
        AB+       10
        A+        12
        O-        16
        A-        18
        O+        20
        DETAILS INTIMATED SUCCESSFULLY
```

Fig 9: Low stock details



```
                ::        Enter your choice        ::
                [1]       Check if Donor is Eligible
                [2]       Add a New Member
                [3]       Search for a Member/Donor
                [4]       Check the current Availability of blood
                [5]       Fill Application
                [6]       Applications Received
                [7]       Intimate Low Stocks to Camps
                [8]       View Camp Details

               8
There are 4 camps, enter number from 1-4 to view camp details
Choice: 1

Camp Name: General Camp
Date: 26-11-20
Maximum Attendees: 100
Organised by: Lions Club
Venue: Govt Hospital
                Do you wish to continue Yes(Y) or No(N) ?:
```

Fig 10: View camp details

CONCLUSION AND FUTURE SCOPE

Conclusion:

Based on results, this study concluded that online blood bank management system is much better than the manual system. The findings showed that users prefer to use online blood bank management system rather than the manual system because it offers many advantages and benefits that lead to its effectiveness, and efficiency. Because of the increased confidence on the users on the system, it can be concluded that the online blood bank management system enhances blood transfusion safety since it provides better ways of handling the various processes in blood bank.

Future scope:

In view of the findings, the researchers recommend that implementation of online blood bank management system. Further, the researchers recommend that further studies on how online blood bank management system enhances blood transfusion safety can be undertaken to strengthen this project’s findings. Lastly, this project recommends that the system can be expanded by allowing donors to register online and be a system user, and these donors will be informed about the planned blood donation activities through the online system.

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