

Blood Bank Management System

Java Based Desktop Application

Abstract

Our project is based on blood bank management system. It will help in keeping and tracking records for blood samples collected from donor at a medical and store the blood in blood bank. Conventional Model of keeping physical directory in blood bank suffers from several issues such as human effort, human errors, access time, and less reliability. For overcoming the hassles related to conventional blood bank directory, our proposed system aims to solve these problems for minimizing the manual work for Blood Bank by providing better record management efficiency with ever increasing records. In the current pandemic situation, we are focusing on segregating the data of Blood Donors based on their Covid History which will help the patients to get their samples according to the priority and convenience.

1.0 Introduction

The main challenges for any blood bank system is to maintain the records for every blood group donor, receiver to update the stocks according to need of the hour. Here we overcome the conventional methods of keeping records by putting everything at one place and monitoring all the donor details and their availability using a desktop application. During the current pandemic scenario, the tracking of accurate blood samples becomes relevant when it comes to perform blood transfusion of accurate blood samples for the required patients. Here we will look on some functional and non-functional requirements aspects which will help us to build scalable, reliable and efficient desktop application which can benefit the concerned stakeholders.

1.1 Aim and Objectives

In this project of “Blood Bank Management System”, our main aim is to manage the relevant details required by the concerned stakeholders. Given below provides a brief look into our project objectives:

- The main goal of the Blood Bank and Donor Management System project is to monitor Blood Bank data, Blood cells, Blood stock, Donor List.
- Provides interface in which hospital admin can have overview of the management system anytime.
- The system provides easy overview to look for blood availability depending upon location, blood group, covid status.
- The donor details keep every information about the donor including covid -19 history which can help to prioritize record based on requirements.
- Provides centralized system for blood bank management which is accessible from various geographic areas.
- The project is entirely administrative and therefore access is guaranteed only to the administrator.

1.2 Motivation

Usually existing solutions rely on a physical directory in blood bank which suffers from several issues such as human effort, human errors, access time, and less reliability. For overcoming the hassles related to conventional blood bank directory, our proposed system aims to solve these problems for minimize the manual work for Blood Bank by providing better record management efficiency with ever increasing records. These problems can be addressed by the implementation of centralized System.

1.3 Features

Building a light-weight centralized blood bank system which enables the admin-

- To view, add, update and delete donor details
- Find donors based on their location, blood group and covid history
- Tracking the donor records based on the date of donation and covid status
- Provide consolidated details to the hospitals whenever required.

2.0 System Requirements

Proposed System is a windows application which is developed using Java, Swing at the Front-end and the Database used is MySQL.

2.1 Hardware Requirements

- **Processor:** Minimum 1.2 GHz; Recommended 2.4 GHz or more
- **Hard Drive:** Minimum 20 GB; Recommended 32GB or more
- **Memory (RAM):** Minimum 1 GB; Recommended 2 GB or above

2.2 Software Requirements

Recommended Operating Systems:

Windows XP or newer

Recommended Compiler:

Netbeans 8.2 or newer, Eclipse 4.4 or newer, IntelliJ Idea Version 13 or newer.

3.0 User Requirements Analysis

3.1 Sample requirements list

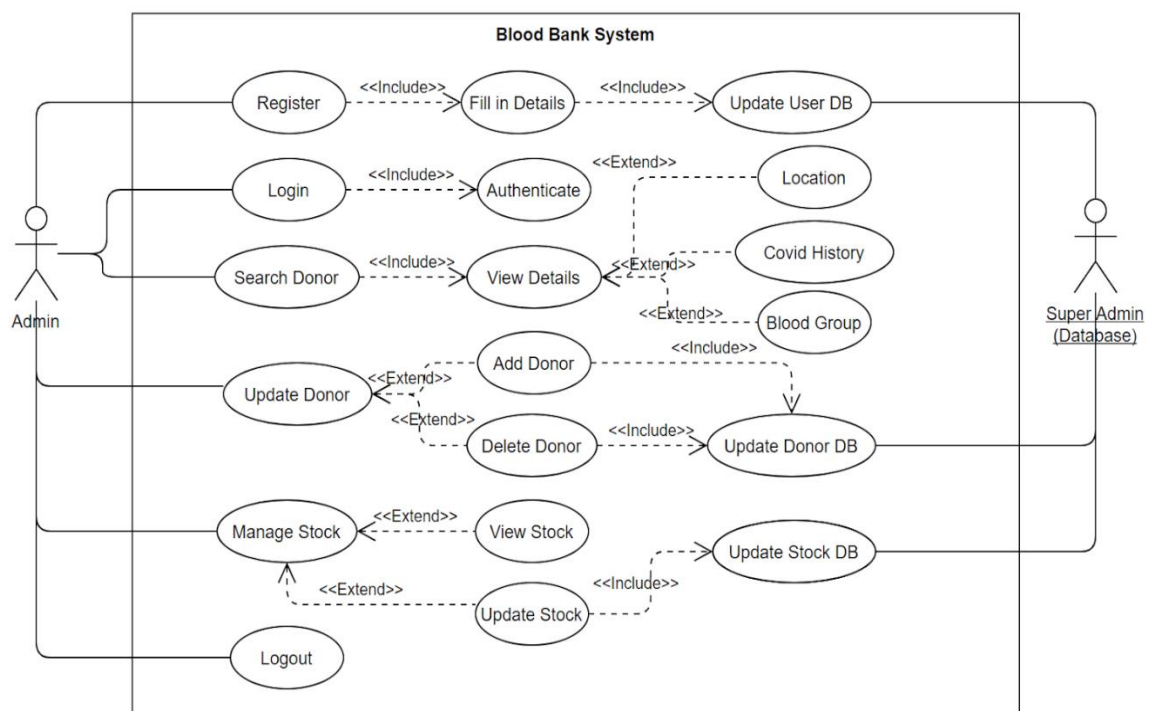
SN.	Requirement	Use case(s)
1	To access blood bank management system using correct credentials.	Login
2	To search donor based on location, blood group, covid history.	Search Donor
3	To add, modify or delete existing details of the previous donor.	Update Donor
4	To view & update records and units of existing blood groups in the blood bank.	Manage Stock

3.2 Use Case Description

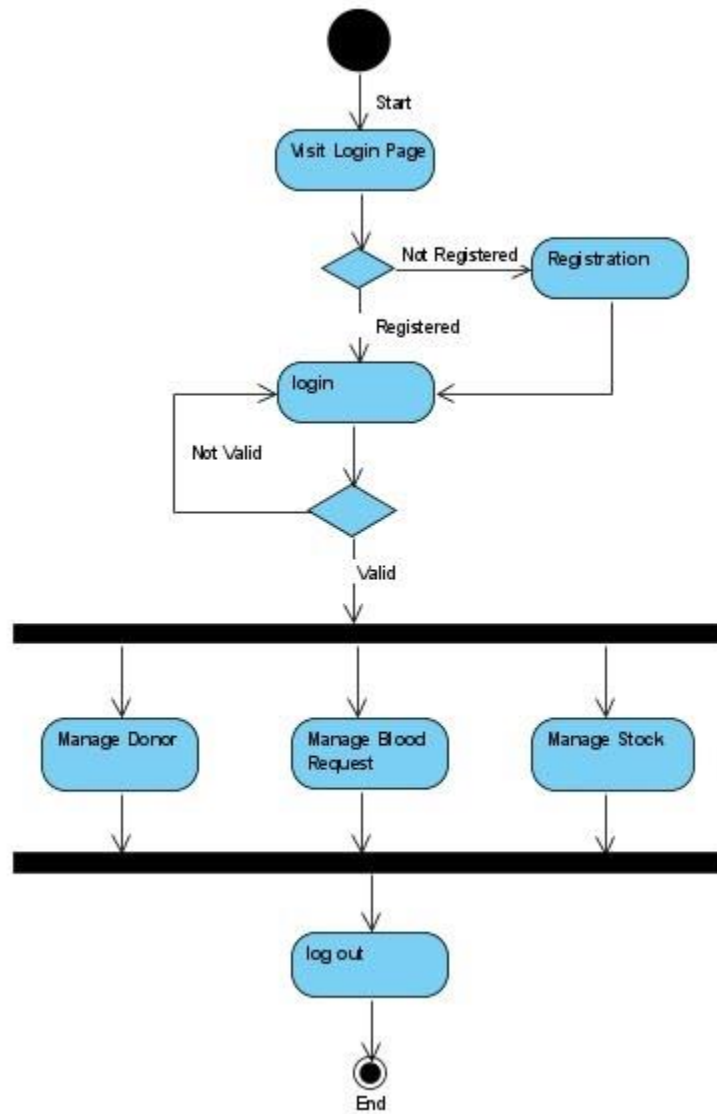
Use Case Section	Comment
Use Case Name	Search Donor
Scope	Blood Bank Management System
Level	User Goal
Primary Actor	Admin
Stakeholders & Interests	Blood Bank Admin - Wants to accurately record all Donor details and facilitate smooth Donor search at the time of emergency. Employee - Wants accurate, fast record entry & search Blood Seeker - Wants urgent action on his requirements Donor - Needs to correctly submit his personal details
Preconditions	User has selected Donor's page
Success Guarantee (Post Conditions)	Donor found successfully, display the details of Donor
Main Success Scenario	The Admin searches for the donor based on the requirements. The search is successful, and the Donor Details are displayed
Extensions	If internet connection isn't available, "Search Failed" tab is displayed If no donor exists based on the search specifications, then "Donor does not Exist" tab is displayed
Special Requirements	-
Tech & Data Variations List	-
Frequency of Occurrence	Non continuous
Miscellaneous	How reliable is the Convalescent Plasma Transfusion ? Are there any more reliable parameters to distinguish COVID and non COVID samples ?

Use Case Section	Comment
Use Case Name	Manage Stock
Scope	Blood Bank Management System
Level	User Goal
Primary Actor	Admin
Stakeholders & Interests	Blood Bank Admin - Wants to accurately view & update all Stock details and facilitate smooth Donor search at the time of emergency. Employee - Wants accurate, fast record view & updates Blood Seeker - Wants urgent action on his requirements Donor - Needs to correctly submit his personal details
Preconditions	User has selected Manage Stock tab
Success Guarantee (Post Conditions)	View / Update successful, Display the Stock details
Main Success Scenario	The Admin views the current Stock details / updates the Stock Details as per his requirements. The updated Stock Details are displayed
Extensions	If internet connection isn't available, "View / Update Failed" tab is displayed
Special Requirements	-
Tech & Data Variations List	
Frequency of Occurrence	Non continuous
Miscellaneous	How reliable is the Convalescent Plasma Transfusion ? Are there any more reliable parameters to distinguish COVID and non COVID samples ?

3.3 Use Case Diagram

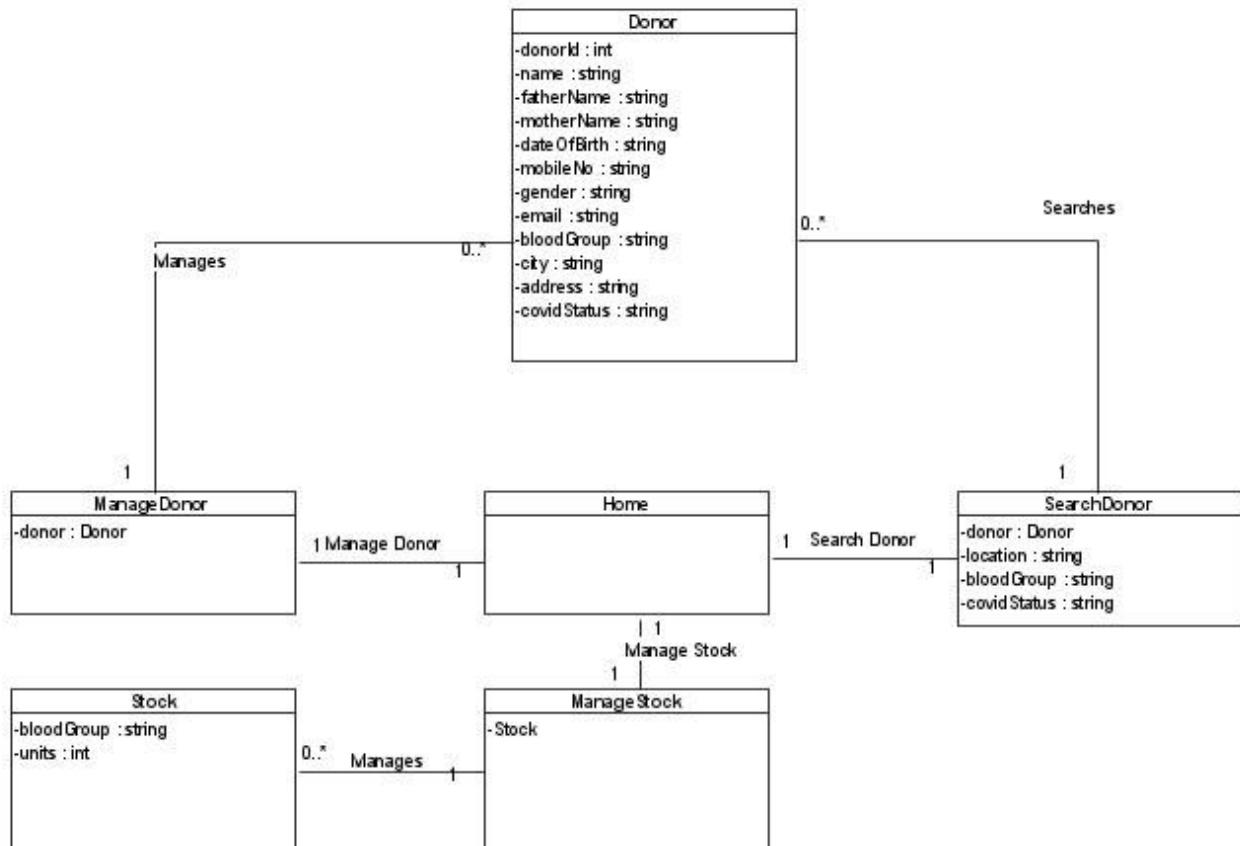


3.4 Activity Diagram

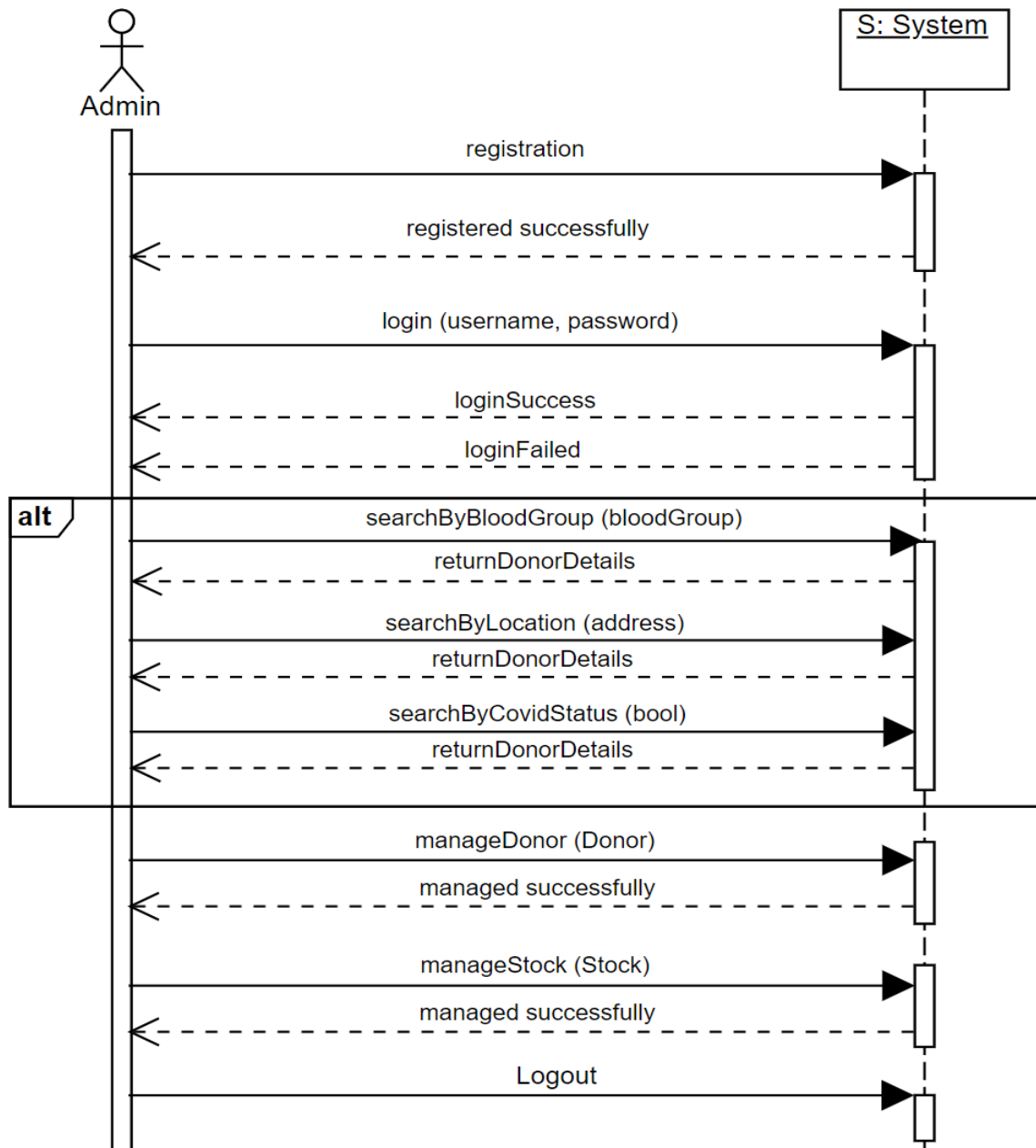


4.0 Business Processes

4.1 Domain Model



4.2 System Sequence Diagram



4.3 System Contracts

Contract: AddDonor

Operation:	AddDonor (donor:Donor)
Cross Reference:	Use Case: Add Donor
Pre-conditions:	new donor is available.
Post-conditions:	<ul style="list-style-type: none">• A donor instance donor was created (instance creation).• donor was associated with ManageDonor (association formed).• donor.id was assigned (attribute modification)• all donor details were added to database.

Contract: IncreaseStock

Operation:	IncreaseStock (bloodType:String,units:Integer)
Cross Reference:	Use Case: Manage Stock
Pre-conditions:	new blood units based on their blood type are available.
Post-condition:	<ul style="list-style-type: none">• A Stock instance stock was created (instance creation)• stock was associated with ManageStock (association formed)• stock.bloodType became bloodType• stock.units updated by units

Contract: SearchByLocation

Operation:	SearchByLocation (address:String)
Cross References:	Use Case: Search Donor
Pre-conditions:	There is a requirement of donor.
Post-conditions:	<ul style="list-style-type: none">• A Donor instance donor was created (instance creation).• donor was associated with SearchDonor and Home. (association formed)• donor was associated with Home to show the list of donor based on address.

Contract: SearchByCovidStatus

Operation:	SearchByCovidStatus (status:Boolean)
Cross References:	Use Case: Search Donor
Pre-conditions:	There is a requirement of donor.
Post-conditions:	<ul style="list-style-type: none">• A Donor instance donor was created (instance creation).• donor was associated with SearchDonor and Home. (association formed)• donor was associated with Home to show the list of donor based on covid status.

5.0 Interaction Diagrams

5.1 CRC Cards

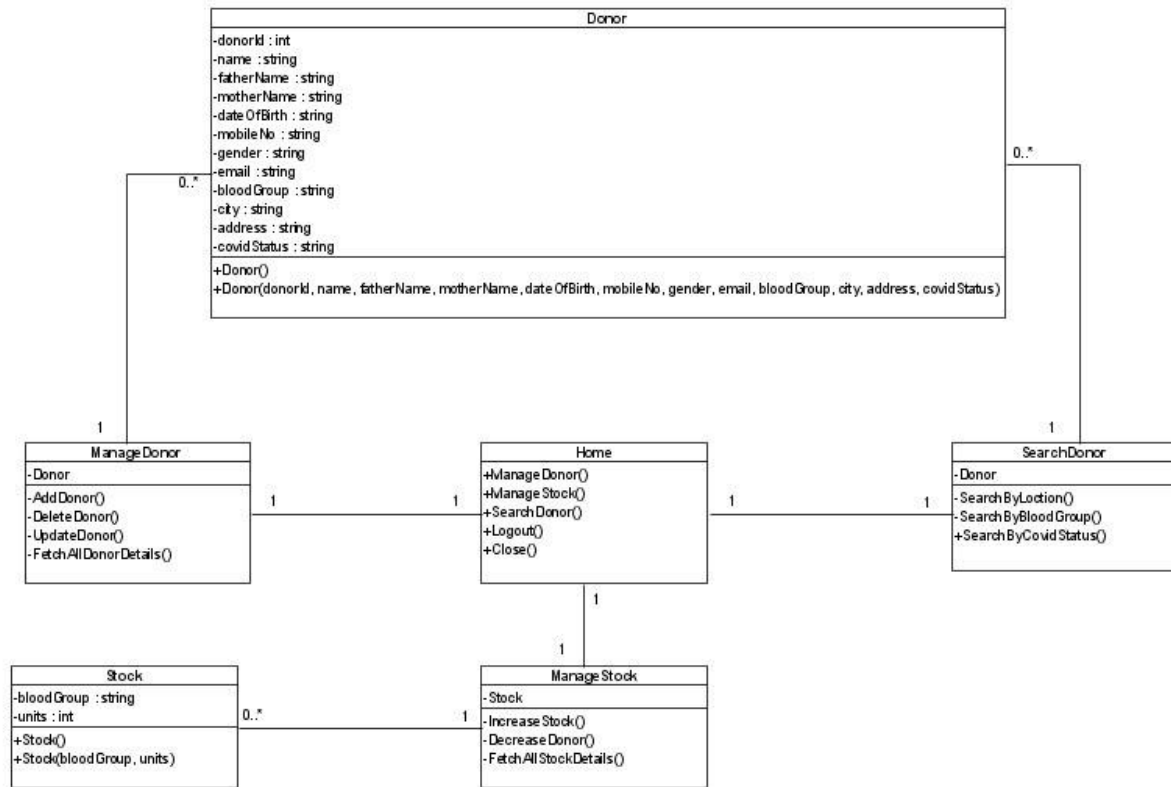
Manage Stock	
Responsibilities	Collaborator
Stock Increase	Stock
Stock Decrease	Stock
Fetch All Stock Details	Stock

Manage Donor	
Responsibilities	Collaborator
Search Donor	Donor
Add Donor	Donor
Delete Donor	Donor
Update Donor	Donor
Fetch All Donor Details	Donor

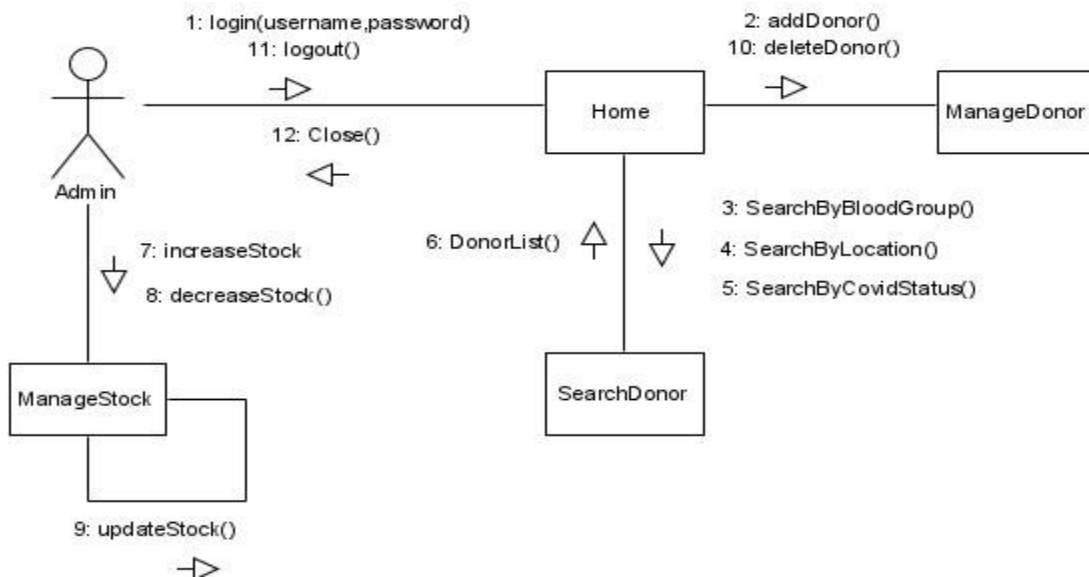
Search Donor	
Responsibilities	Collaborator
Search by Location	Donor
Search by Blood Group	Donor
Search by Covid Status	Donor

Home	
Responsibilities	Collaborator
Add new Donor	Manage Donor
Delete Donor	Manage Donor
Update Donor Details	Manage Donor
All Donor Details	Manage Donor
Stock Increase	Manage Stock
Stock Decrease	Manage Stock
All Stock Details	Manage Stock
Search Donor by Location	Search Donor
Search Donor by Blood Group	Search Donor
Search Donor by Covid Status	Search Donor
Logout	
Close	

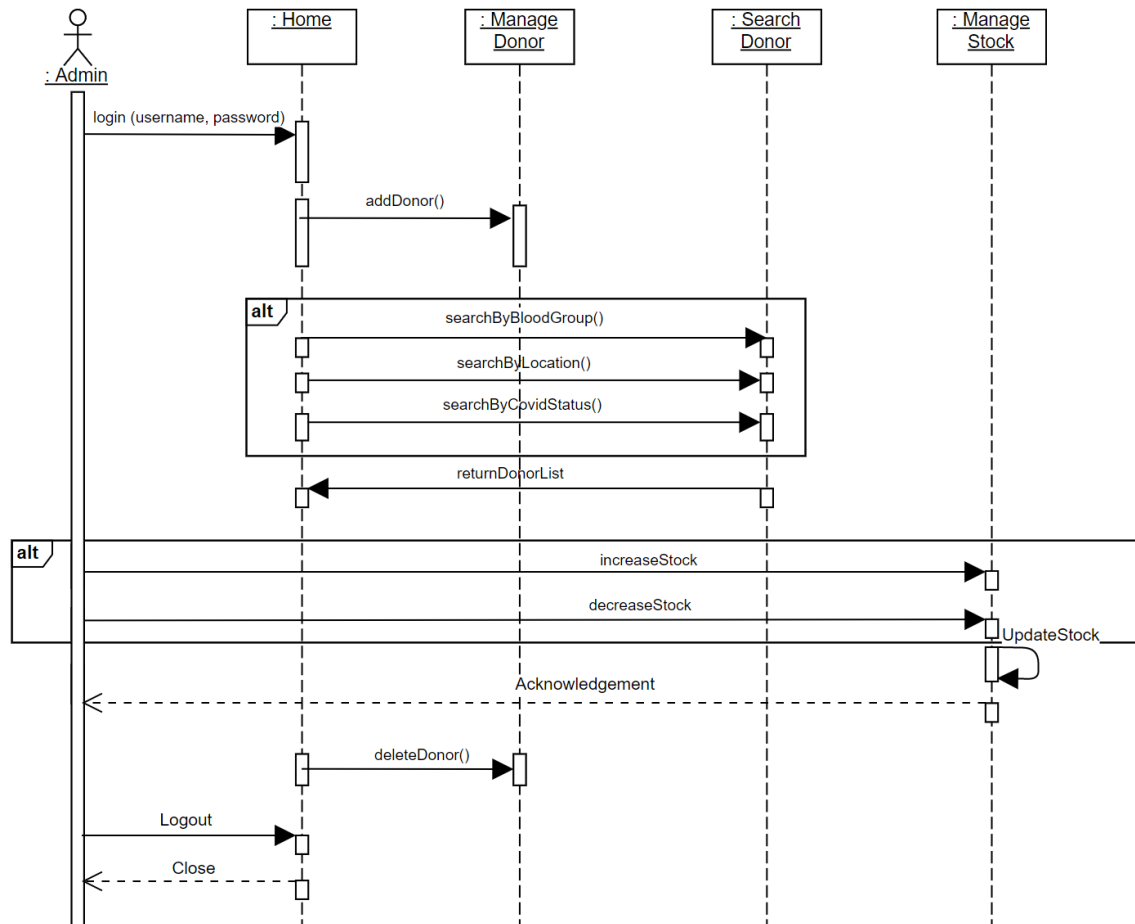
5.2 Class Diagram



5.3 Collaboration Diagram



5.4 Sequence Diagram



6.0 Testing Module

Login Module				
Test Serial	Test Condition	Expected Result	Actual Output	Status
Test 1	Click on submit button without username and password	System does not allow user to login	System displays message and resume to the same page	PASS
Test 2	Click on submit button with invalid username or password	Message “Incorrect Username or Password”	As expected	PASS
Test 3	Click on submit button with correct username and password	System allow user to login	System allow user to login and opens the home page	PASS

Donor Module				
Test Serial	Test Condition	Expected Result	Actual Output	Status
Test 1	Click on update button with non-existing Donor ID	System does not allow admin to update data with Invalid Donor ID	Message “Donor ID doesn’t exist”	PASS
Test 2	Click on All Donor Menu Item to show donor details	Print Donor details with Covid Status “No” should come on top	As expected	PASS
Test 3	Click on delete button with non-existing Donor ID	System does not allow admin to delete data with Invalid Donor ID	Message “Donor ID doesn’t exist”	PASS

Search Module				
Test Serial	Test Condition	Expected Result	Actual Output	Status
Test 1	Search Donor by Blood Group ‘B-’	Print Donor details having Blood Group ‘B-’	All Donor details having Blood Group ‘B-’	PASS
Test 2	Search Donor by Address starting with ‘bo’	Print Donor details having address starting with ‘bo’	All Donor details having address starting with ‘bo’	PASS
Test 3	Search Donor by Covid Status “Yes”	Print Donor details having Covid Status “Yes”	All Donor details having Covid Status “Yes”	PASS