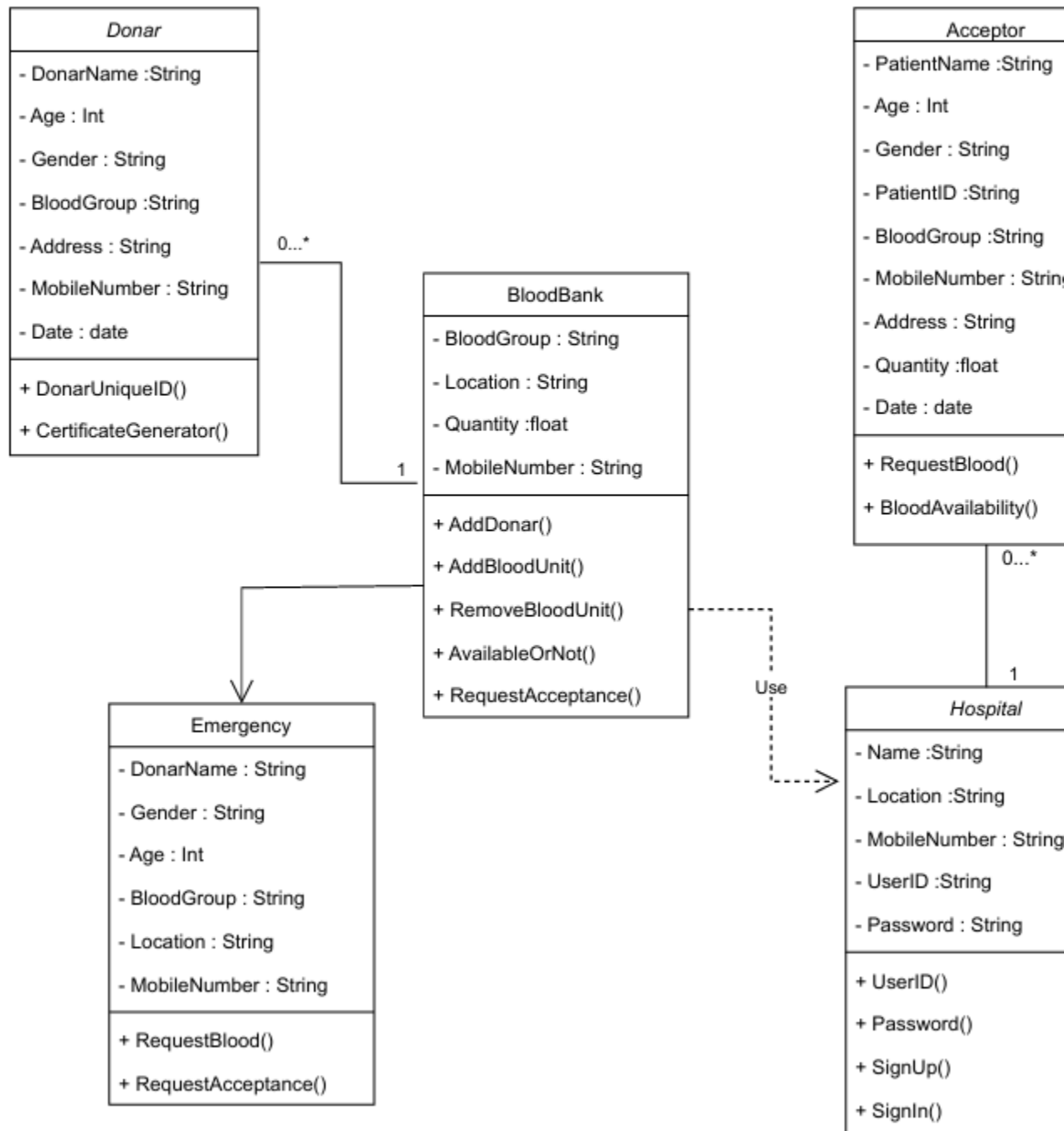


Blood Banking System

Class Diagram For Blood Banking System



SQL Code

Creating DataBase

```
Create DATABASE Blood_Banking_System;
```

#we have many databases among them we have to select or to mention the database name to create table(understanding to the System)

```
use Blood_Banking_System;
```

Creating Donor table

```
CREATE TABLE Donor (  
    DonorID INT PRIMARY KEY,  
    DonorName VARCHAR(50) NOT NULL,  
    Age INT (5),  
    Gender VARCHAR(10),  
    MobileNumber VARCHAR(15) UNIQUE,  
    BloodGroup VARCHAR(5),  
    Address VARCHAR(100),  
    DonationDate DATE  
);
```

#insert Data into Donor

```
INSERT INTO Donor (DonorName, Age, Gender, MobileNumber, BloodGroup, Address,  
DonationDate)  
VALUES ('Divya', 22, 'Female', '9123456780', 'O-', 'Bangalore, Karnataka', '2025-09-06'),  
('Sri Devi', 42, 'Female', '9876001234', 'A+', 'Chennai, Tamil Nadu', '2025-09-05'),  
('Sowmya', 19, 'Female', '9988776655', 'O+', 'Guntur, Andhra Pradesh', '2025-09-06'),  
('Anjaneyulu', 48, 'Male', '9123004567', 'B-', 'Mumbai, Maharashtra', '2025-09-06');  
('Vijay Kumar', 22, 'Male', '9876543210', 'O+', 'Hyderabad, Telangana', '2025-09-06');
```

Display Data

```
Select * from Donor;
```

#create Acceptor Table

```
use Blood_Banking_System;;  
CREATE TABLE Acceptor (  
    AcceptorID INT PRIMARY KEY AUTO_INCREMENT,
```

```
    AcceptorName VARCHAR(50) NOT NULL,  
    Age INT (5),  
    Gender VARCHAR(10),  
    MobileNumber VARCHAR(15) UNIQUE,  
    BloodGroup VARCHAR(5),  
    Address VARCHAR(100),  
    Quantity INT (5),  
    AcceptDate DATE  
);
```

#insert Data into Acceptor

```
INSERT INTO Acceptor (AcceptorName, Age, Gender, MobileNumber, BloodGroup, Address,  
Quantity, AcceptDate)  
VALUES  
( 'Sahithi', 24, 'Female', '9012345678', 'A+', 'Hyderabad, Telangana', 2, '2025-09-06'),  
( 'Rama', 35, 'Male', '9023456789', 'O-', 'Vijayawada, Andhra Pradesh', 1, '2025-09-06'),  
( 'Sita', 30, 'Female', '9034567890', 'B+', 'Chennai, Tamil Nadu', 3, '2025-09-05'),  
( 'Lakshmana', 28, 'Male', '9045678901', 'AB+', 'Bangalore, Karnataka', 2, '2025-09-04'),  
( 'Krishna', 40, 'Male', '9056789012', 'O+', 'Delhi', 1, '2025-09-06');
```

Display Data

```
Select * from Acceptor;
```

#create table for Blood bank

```
CREATE TABLE BloodBank (  
    BloodBankID INT PRIMARY KEY AUTO_INCREMENT,  
    BloodGroup VARCHAR(5) NOT NULL,  
    Location VARCHAR(100) NOT NULL,  
    UnitsQuantity INT (5),  
    MobileNumber VARCHAR(15) UNIQUE  
);
```

#inserting Data

```
INSERT INTO BloodBank (BloodGroup, Location, UnitsQuantity, MobileNumber)  
VALUES  
( 'A+', 'Hyderabad', 20, '9876543210'),  
( 'B-', 'Chennai', 15, '9123456780'),  
( 'O+', 'Bangalore', 30, '9988776655'),  
( 'AB+', 'Delhi', 10, '9123004567'),  
( 'O-', 'Mumbai', 25, '9090909090');
```

Display Data

```
Select * from BloodBank;
```

#create Table for Hospital

```
CREATE TABLE Hospital (  
    HospitalID INT PRIMARY KEY AUTO_INCREMENT,  
    HospitalName VARCHAR(100) NOT NULL,  
    Location VARCHAR(100) NOT NULL,  
    MobileNumber VARCHAR(15) UNIQUE NOT NULL,  
    Password VARCHAR(50) NOT NULL  
);
```

#insert data into Hospital Table

```
INSERT INTO Hospital (HospitalName, Location, MobileNumber, Password)  
VALUES  
( 'Apollo Hospitals', 'Hyderabad', '9876543210', 'apollo@123'),  
( 'Yashoda Hospitals', 'Secunderabad', '9123456780', 'yashoda@123'),  
( 'SaiRam Hospital', 'Bangalore', '9988776655', 'fortis@123'),  
( 'AIIMS', 'Delhi', '9123004567', 'aiims@123'),  
( 'Care Hospitals', 'Visakhapatnam', '9090909090', 'care@123');
```

Display Data

```
Select * from Hospital;
```

#create table for Emergency

```
CREATE TABLE Emergency (  
    EmergencyID INT PRIMARY KEY AUTO_INCREMENT,  
    DonarName VARCHAR(100) NOT NULL,  
    DonarID INT NOT NULL,  
    Gender VARCHAR(10),  
    Age INT (5),  
    BloodGroup VARCHAR(5) NOT NULL,  
    Location VARCHAR(100) NOT NULL,  
    MobileNumber VARCHAR(15),  
    RecentDonatedDate DATE NOT NULL  
);
```

#insert data into Emergency

```
INSERT INTO Emergency (DonarName, DonarID, Gender, Age, BloodGroup, Location,
MobileNumber, RecentDonatedDate)
VALUES
('Divya', 1, 'Female', 26, 'O-', 'Hyderabad', '9876543210', '2025-09-06'),
('Sri Devi', 2, 'Female', 30, 'A+', 'Chennai', '9123456780', '2025-09-06'),
('Sowmya', 3, 'Female', 24, 'O+', 'Bangalore', '9988776655', '2025-09-06'),
('Anjaneyulu', 4, 'Male', 35, 'B-', 'Delhi', '9123004567', '2025-09-06'),
('Vijay Kumar', 5, 'Male', 32, 'O+', 'Mumbai', '9090909090', '2025-09-06');
```

Display Data

```
Select * from Emergency;
```

Joins

#innerJoin

```
use Blood_Banking_System;
SELECT d.DonorName, d.BloodGroup, e.Location, e.RecentDonatedDate
FROM Donor d
INNER JOIN Emergency e ON d.DonorID = e.DonarID;
```

DonorName	BloodGroup	Location	RecentDonatedDate
Divya	O-	Hyderabad	2025-09-06
Sri Devi	A+	Chennai	2025-09-06
Sowmya	O+	Bangalore	2025-09-06
Anjaneyulu	B-	Delhi	2025-09-06
Vijay Kumar	O+	Mumbai	2025-09-06

#LeftJoin

```
SELECT d.DonorName, d.BloodGroup, a.AcceptorName, a.UnitsQuantity
FROM Donor d
LEFT JOIN Acceptor a ON d.BloodGroup = a.BloodGroup;
```

DonorName	BloodGroup	AcceptorName	UnitsQuantity
Sri Devi	A+	Sahithi	2
Divya	O-	Rama	1
Vijay Kumar	O+	Krishna	1
Sowmya	O+	Krishna	1
Anjaneyulu	B-		

#RightJoin

```
SELECT h.HospitalName, h.Location, a.AcceptorName, a.BloodGroup
FROM Donor d
RIGHT JOIN Hospital h ON h.Location LIKE '%Hyderabad%'
RIGHT JOIN Acceptor a ON a.Address LIKE '%Hyderabad%';
```

HospitalName	Location	AcceptorName	BloodGroup
Apollo Hospitals	Hyderabad	Sahithi	A+
Apollo Hospitals	Hyderabad	Sahithi	A+
Apollo Hospitals	Hyderabad	Sahithi	A+
Apollo Hospitals	Hyderabad	Sahithi	A+
Apollo Hospitals	Hyderabad	Sahithi	A+
Yashoda Hospitals	Secunderabad	Sahithi	A+
SaiRam Hospital	Bangalore	Sahithi	A+
AIIMS	Delhi	Sahithi	A+
Care Hospitals	Visakhapatnam	Sahithi	A+
		Rama	O-
		Sita	B+
		Lakshmana	AB+
		Krishna	O+

#FullOuterJoin

```
use Blood_Banking_System;
SELECT d.DonorName, d.BloodGroup, a.AcceptorName, a.BloodGroup
FROM Donor d
LEFT JOIN Acceptor a ON d.BloodGroup = a.BloodGroup
UNION
SELECT d.DonorName, d.BloodGroup, a.AcceptorName, a.BloodGroup
FROM Donor d
RIGHT JOIN Acceptor a ON d.BloodGroup = a.BloodGroup;
```

DonorName	BloodGroup	AcceptorName	BloodGroup_1
Anjaneyulu	B-		
Sri Devi	A+	Sahithi	A+
Vijay Kumar	O+	Krishna	O+
		Lakshmana	AB+
Divya	O-	Rama	O-
Sowmya	O+	Krishna	O+
		Sita	B+

#CrossJoin

```
use Blood_Banking_System;
SELECT h.HospitalName, b.BloodGroup, b.UnitsQuantity
FROM Hospital h
CROSS JOIN BloodBank b;
```

HospitalName	BloodGroup	UnitsQuantity
Apollo Hospitals	O-	25
Apollo Hospitals	AB+	10
Apollo Hospitals	O+	30
Apollo Hospitals	B-	15
Apollo Hospitals	A+	20
Yashoda Hospitals	O-	25
Yashoda Hospitals	AB+	10
Yashoda Hospitals	O+	30
Yashoda Hospitals	B-	15
Yashoda Hospitals	A+	20
SaiRam Hospital	O-	25
SaiRam Hospital	AB+	10
SaiRam Hospital	O+	30
SaiRam Hospital	B-	15
SaiRam Hospital	A+	20

AIIMS	O-	25
AIIMS	AB+	10
AIIMS	O+	30
AIIMS	B-	15
AIIMS	A+	20
Care Hospitals	O-	25
Care Hospitals	AB+	10
Care Hospitals	O+	30
Care Hospitals	B-	15
Care Hospitals	A+	20

#Donors with Hospitals in the same City (INNER JOIN on Location)

```
SELECT d.DonorName, d.BloodGroup, h.HospitalName, h.Location
FROM Donor d
INNER JOIN Hospital h ON d.Address LIKE CONCAT('%', h.Location, '%');
```

DonorName	BloodGroup	HospitalName	Location
Vijay Kumar	O+	Apollo Hospitals	Hyderabad
Divya	O-	SaiRam Hospital	Bangalore

#Acceptor and Donor Matching by BloodGroup (INNER JOIN)

```
use Blood_Banking_System;
SELECT a.AcceptorName, a.BloodGroup, d.DonorName, d.DonationDate
FROM Acceptor a
INNER JOIN Donor d ON a.BloodGroup = d.BloodGroup;
```

AcceptorName	BloodGroup	DonorName	DonationDate
Rama	O-	Divya	2025-09-06
Sahithi	A+	Sri Devi	2025-09-05
Krishna	O+	Sowmya	2025-09-06
Krishna	O+	Vijay Kumar	2025-09-06

Aggregate Functions

Count total donors

```
use Blood_Banking_System;  
SELECT COUNT(*) AS TotalDonors  
FROM Donor;
```

TotalDonors

5

Find average age of donors

```
SELECT AVG(Age) AS AverageDonorAge  
FROM Donor;
```

AverageDonorAge

30.6000

Count donors by blood group

```
SELECT BloodGroup, COUNT(*) AS DonorCount  
FROM Donor  
GROUP BY BloodGroup;
```

BloodGroup	DonorCount
O-	1
A+	1
O+	2
B-	1

Maximum units available in BloodBank

```
SELECT MAX(UnitsQuantity) AS MaxUnits  
FROM BloodBank;
```

MaxUnits

30

Total units of blood available by group

```
SELECT BloodGroup, SUM(UnitsQuantity) AS TotalUnits
FROM BloodBank
GROUP BY BloodGroup;
```

BloodGroup	TotalUnits
O+	30
A+	20
B-	15
AB+	10
O-	25

Average age of emergency donors

```
SELECT AVG(Age) AS AvgEmergencyDonorAge
FROM Emergency;
```

AvgEmergencyDonorAge
29.4000

Number of acceptors per city

```
SELECT Address, COUNT(*) AS AcceptorCount
FROM Acceptor
GROUP BY Address;
```

Address	AcceptorCount
Vijayawada, Andhra Pradesh	1
Bangalore, Karnataka	1
Hyderabad, Telangana	1
Chennai, Tamil Nadu	1
Delhi	1

Donors with minimum and maximum age

```
SELECT MIN(Age) AS YoungestDonor, MAX(Age) AS OldestDonor
FROM Donor;
```

YoungestDonor	OldestDonor
19	48

Hospitals count by location

```
SELECT Location, COUNT(*) AS HospitalCount
FROM Hospital
GROUP BY Location;
```

Location	HospitalCount
Secunderabad	1
Bangalore	1
Hyderabad	1
Delhi	1
Visakhapatnam	1

Acceptor blood units required (sum by blood group)

```
SELECT BloodGroup, SUM(UnitsQuntity) AS TotalUnitsRequired
FROM Acceptor
GROUP BY BloodGroup
HAVING SUM(UnitsQuntity) > 1;
```

BloodGroup	TotalUnitsRequired
AB+	2
A+	2
B+	3

Sub Queries

Donors who donated most recently (based on DonationDate)

```
use Blood_Banking_System;
SELECT DonorName, DonationDate
FROM Donor
WHERE DonationDate = (SELECT MAX(DonationDate) FROM Donor);
```

DonorName	DonationDate
Divya	2025-09-06
Sowmya	2025-09-06
Anjaneyulu	2025-09-06
Vijay Kumar	2025-09-06

Donors with blood groups required by acceptors

```
SELECT DonorName, BloodGroup
FROM Donor
WHERE BloodGroup IN (SELECT BloodGroup FROM Acceptor);
```

DonorName	BloodGroup
Divya	O-
Sri Devi	A+
Sowmya	O+
Vijay Kumar	O+

Hospitals in the same city where donors live

```
SELECT HospitalName, Location
FROM Hospital
WHERE Location IN (SELECT Address FROM Donor);
```

✔ Query OK.

empty set

Blood groups available in BloodBank but not yet requested by acceptors

```
SELECT BloodGroup
FROM BloodBank
```

WHERE BloodGroup NOT IN (SELECT BloodGroup FROM Acceptor);

BloodGroup

B-

Emergency donors matching the youngest donor's age

```
SELECT DonarName, Age
FROM Emergency
WHERE Age = (SELECT MIN(Age) FROM Donor);
```

✔ Query OK.

empty set