

A Course Based Project Report on
BLOOD BANK MANAGEMENT SYSTEM

Submitted to the

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING- (CYS, DS) AND AI&DS

in partial fulfilment of the requirements for the completion of course
DATABASE MANAGEMENT SYSTEM PROGRAMMING
LABORATORY(A19PC2CS01)

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

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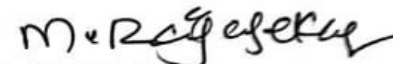
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CERTIFICATE

This is to certify that the project report entitled "**Blood Bank Management System**" is a bonafide work done under our supervision and is being submitted by team **Miss. Nandini(21071A67A5), Mr. Raghavendra(21071A67B1), Mr. Lokesh (21071A67B2), Mr. Sandeep (22075A6708)** in partial fulfilment for the award of the degree of **Bachelor of Technology** in Computer Science and Engineering Data Science, of the VNRVJIET, Hyderabad during the academic year 2022-2023.


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DECLARATION

We declare that the course based project work entitled “**Blood Bank Management System**” submitted in the Department of Information Technology, Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology, Hyderabad, in partial fulfilment of the requirement for the award of the degree of **Bachelor of Technology in Computer Science and Engineering Data Science** is a bonafide record of our own work carried out under the supervision of **Mrs. N. Sunanda, Assistant Professor, Department of CSE- (CYS, DS) and AI&DS, VNRVJIET.** Also, we declare that the matter embodied in this thesis has not been submitted by us in full or in any part thereof for the award of any degree/diploma of any other institution or university previously.

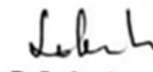
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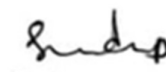
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We express our deep sense of gratitude to our beloved President, Sri. D. Suresh Babu, VNR Vignana Jyothi Institute of Engineering & Technology for the valuable guidance and for permitting us to carry out this project.

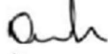



With immense pleasure, we record our deep sense of gratitude to our beloved Principal, Dr. C.D Naidu, for permitting us to carry out this project.

We express our deep sense of gratitude to our beloved Professor Dr. M. RAJA SEKAR, Professor and Head, Department of Computer Science & Engineering- (CYS, DS) and AI&DS, VNR Vignana Jyothi Institute of Engineering & Technology, Hyderabad- 500090 for the valuable guidance and suggestions, keen interest and through encouragement extended throughout the period of project work.

We take immense pleasure to express our deep sense of gratitude to our beloved Guide, **Mrs. N. Sunanda**, Assistant Professor in CSE- (CYS, DS) and AI&DS, VNR Vignana Jyothi Institute of Engineering & Technology, Hyderabad, for his/her valuable suggestions and rare insights, for constant source of encouragement and inspiration throughout my project work.

We express our thanks to all those who contributed for the successful completion of our project work.

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ABSTRACT

This project aims to develop a Blood Bank Management System.

A Blood Bank Management System can be used in any clinic, hospital, labs or any emergency situation which requires blood units for survival. Our system can be used to find required type of blood in emergency situations from either blood bank or even blood donors.

Current system uses a grapevine communication for finding blood in cases of emergency, may it be by a donor or blood bank. The intentions of proposing such a system is to abolish the panic caused during an emergency due to unavailability of blood.

This project contains entity relationship model diagram introduction to relation model .There is also design of the database of the blood bank system based on relation model. Example of some SQL queries to retrieves data from blood bank management database.

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INTRODUCTION

Blood banks collect, store and provide collected blood to the patients who are in need of blood. The people who donate blood are called 'donors'. The banks then group the blood which they receive according to the blood groups. They make sure that the blood is not contaminated. The main mission of the blood bank is to provide the blood to the hospitals and health care systems which saves the patient's life. No hospital can maintain the health care system without pure and adequate blood.

The major concern each blood bank has is to monitor the quality of the blood and monitor the people who donate the blood, that is 'donors'. But this is a tough job. The existing system will not satisfy the need of maintaining quality blood and keep track of donors. To overcome all these limitations we introduced a new system called 'Blood Donation Management System'.

The 'Blood Bank Management System' allows us to keep track of quality of blood and also keeps track of available blood when requested by the acceptor. The existing systems are Manual systems which are time consuming and not so effective.

'Blood Bank Management system' automates the distribution of blood. This database consists of thousands of records of each blood bank.

By using this system searching the available blood becomes easy and saves lot of time than the manual system. It will hoard, operate, recover and analyse information concerned with the administrative and inventory management within a blood bank. This system is developed in a manner that it is manageable, time effective, cost effective, flexible and much man power is not required.

SCHEMA

Patient Table -

id INT PRIMARY KEY,
name VARCHAR(50),
blood_type VARCHAR(3),
last_transfusion_date DATE

Column name	Datatype	width	Constraint
id	INT	10	Primary Key
name	VARCHAR	50	NOT NULL
blood_type	VARCHAR	3	NOT NULL
last_transfusion_date	DATE	7	NOT NULL

Blood_bank Table-

blood_bank_id INT PRIMARY KEY,
name VARCHAR(50),
address VARCHAR(100)

Col Name	datatype	Width	Constraint
blood_bank_id	INT	10	Primary Key
name	VARCHAR	50	NOT NULL
address	VARCHAR	100	NOT NULL

Donor Table –

id INT PRIMARY KEY,
name VARCHAR(50),
age INT,
blood_type VARCHAR(3),
is_eligible BOOLEAN,
phone_number VARCHAR(15),
donation_count INT

Column Name	Datatype	Width	Constraint
id	INT	10	Primary Key
name	VARCHAR	50	NOT NULL
age	INT	10	NOT NULL
blood_type	VARCHAR	3	NOT NULL
phone_number	VARCHAR	15	NOT NULL
is_eligible	BOOLEAN	1	NOT NULL
donation_count	INT	10	NOT NULL

Donation Table

id INT PRIMARY KEY,
donor_id INT,
blood_bank_id INT,
date DATE

Col Name	Datatype	Width	Constraint
id	INT	10	Primary Key
donor_id	INT	10	Foreign key
blood_bank_id	INT	10	Foreign key
date	DATE	7	NOT NULL

Transfusion Table

id INT PRIMARY KEY,
patient_id INT,
donation_id INT,
date DATE

Col Name	Datatype	Width	Constraint
id	INT	10	Primary Key
patient_id	INT	10	Foreign key
donation_id	INT	10	Foreign key
date	DATE	7	NOT NULL

DATA

Patient Table:

id	name	blood_type	last_transfusion_date
1	Alice	A+	2022-12-01
2	Bob	B+	2023-01-15
3	Charlie	AB-	2022-11-23
4	Dave	O-	2023-02-18
5	Emily	A-	2022-12-30

Blood bank TABLE :

Blood_bank_id	name	address
1	Blood Bank A	123 Main St, Anytown
2	Blood Bank B	456 Maple Ave, Otherville
3	Blood Bank C	789 Oak Rd, Smalltown

Donor TABLE :

id	name	age	blood_type	is_eligible	donation_count	phone_number
1	Frank	23	A+	1	3	555-1234
2	Gina	30	O+	1	8	555-5678
3	Henry	42	B+	1	2	555-1111
4	Irene	29	AB-	0	5	555-2222
5	Jack	37	O-	1	6	555-3333

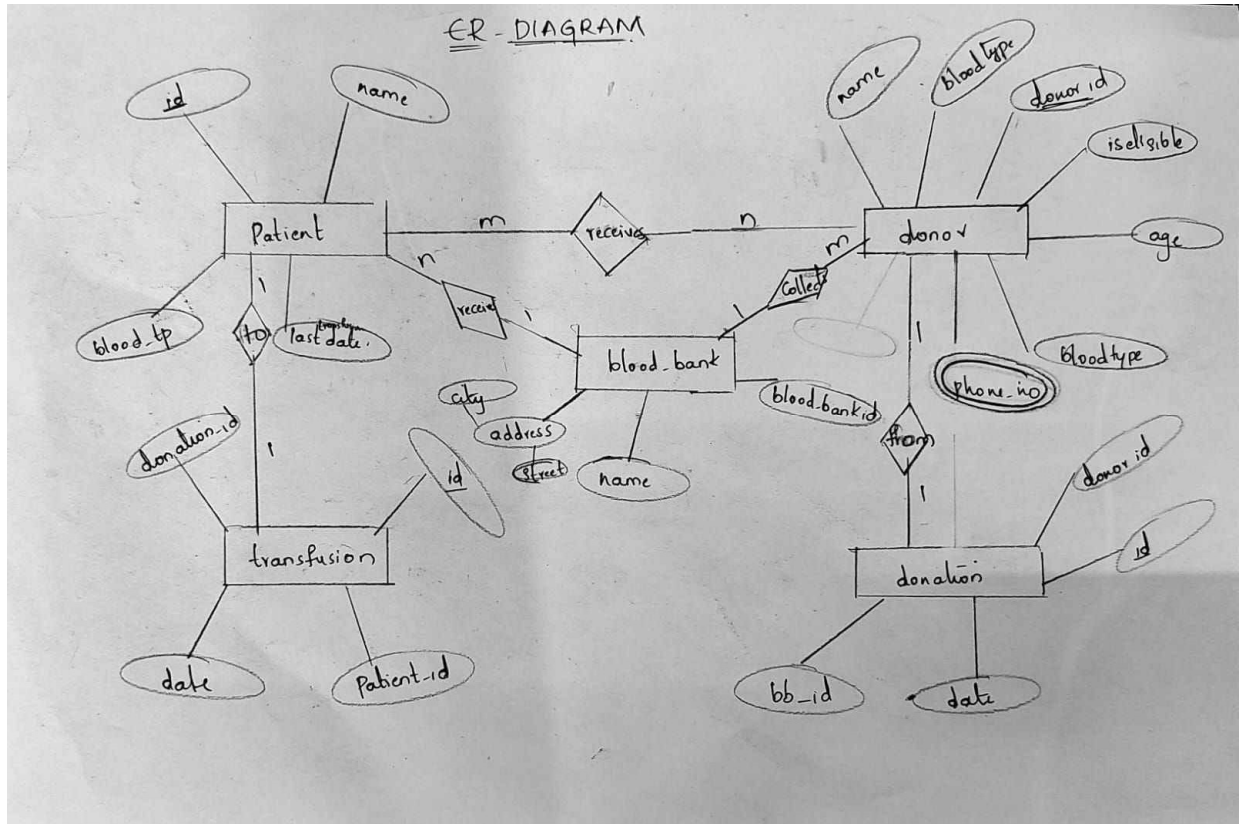
Donation TABLE :

id	donor_id	blood_bank_id	date
1	1	1	2022-11-01
2	2	1	2023-01-01
3	3	2	2022-12-01'
4	4	3	2023-02-01
5	5	2	2022-10-01
1	1	3	2022-11-15
2	2	3	2023-01-15
3	3	1	2022-12-15
4	4	2	2023-02-15
5	5	1	2022-10-15

Transfusion Table:

id	patient_id	donation_id	transfusion_date
1	1	2	2023-01-16
2	2	1	2022-11-16
3	3	3	2022-12-16
4	4	4	2023-02-16
5	5	5	2022-10-16

ER DIAGRAM



DDL & DML COMMANDS SCREENSHOTS

Patients Table:

DDL-

```
1 CREATE TABLE patient (  
2     id INT PRIMARY KEY,  
3     name VARCHAR(50),  
4     age INT,  
5     blood_type VARCHAR(5),  
6     last_transfusion_date DATE  
7 );
```

Table created.

DML-

-- Insert sample data into patient table

```
INSERT INTO patient (name, blood_type, last_transfusion_date) VALUES  
( 'Alice', 'A+', '2022-12-01'),  
( 'Bob', 'B+', '2023-01-15'),  
( 'Charlie', 'AB-', '2022-11-23'),  
( 'Dave', 'O-', '2023-02-18'),  
( 'Emily', 'A-', '2022-12-30');
```

row created.

Donor Table:

DDL-

```
CREATE TABLE donor (  
    id INT PRIMARY KEY,  
    name VARCHAR(50),  
    age INT,  
    blood_type VARCHAR(5),  
    is_eligible BOOLEAN,  
    donation_count INT,  
    phone_number VARCHAR(15)  
);
```

Table created.

DML-

-- Insert sample data into donor table

```
INSERT INTO donor (name, age, blood_type, is_eligible, phone_number, donation_count) VALUES  
( 'Frank', 23, 'A+', true, '555-1234', 3),  
( 'Gina', 30, 'O+', true, '555-5678', 8),  
( 'Henry', 42, 'B+', true, '555-1111', 2),  
( 'Irene', 29, 'AB-', false, '555-2222', 5),  
( 'Jack', 37, 'O-', true, '555-3333', 6);
```

row created.

Blood bank Table-

DDL-

```
CREATE TABLE blood_bank (  
    id INT PRIMARY KEY,  
    name VARCHAR(50),  
    address VARCHAR(100)  
);
```

Table created.

DML-

```
INSERT INTO blood_bank (name, address) VALUES  
( 'Blood Bank A', '123 Main St, Anytown'),  
( 'Blood Bank B', '456 Maple Ave, Otherville'),  
( 'Blood Bank C', '789 Oak Rd, Smalltown');
```

row created.

Donations Table-

DDL-

```
CREATE TABLE donation (  
    id INT PRIMARY KEY,  
    donor_id INT,  
    blood_bank_id INT,  
    date DATE,  
    FOREIGN KEY (donor_id) REFERENCES donor(id),  
    FOREIGN KEY (blood_bank_id) REFERENCES blood_bank(id)  
);
```

Table created.

DML-

```
INSERT INTO donation (donor_id, blood_bank_id, date) VALUES  
(1, 1, '2022-11-01'),  
(2, 1, '2023-01-01'),  
(3, 2, '2022-12-01'),  
(4, 3, '2023-02-01'),  
(5, 2, '2022-10-01'),  
(1, 3, '2022-11-15'),  
(2, 3, '2023-01-15'),  
(3, 1, '2022-12-15'),  
(4, 2, '2023-02-15'),  
(5, 1, '2022-10-15');
```

row created.

Transfusion Table-

DDL-

```
CREATE TABLE transfusion (  
    id INT PRIMARY KEY,  
    patient_id INT,  
    donation_id INT,  
    transfusion_date DATE,  
    FOREIGN KEY (patient_id) REFERENCES patient(id),  
    FOREIGN KEY (donation_id) REFERENCES donation(id)  
);
```

Table created.

DML-

```
INSERT INTO transfusion (patient_id, donation_id,transfusion_date) VALUES  
(1, 2, '2023-01-16'),  
(2, 1, '2022-11-16'),  
(3, 3, '2022-12-16'),  
(4, 4, '2023-02-16'),  
(5, 5, '2022-10-16');
```

row created.

QUERIES AND SCREENSHOTS

1. Retrieve the names of all patients along with their blood types.

```
SELECT patient.name, patient.blood_type FROM patient;
```

Output

```
Alice|A+  
Bob|B+  
Charlie|AB-  
Dave|O-  
Emily|A-
```

2. Retrieve the names and phone numbers of all donors who have A+ blood type.

```
SELECT donor.name, donor.phone_number FROM donor WHERE donor.blood_type = 'A+';
```

Output

```
Frank|555-1234
```

3. Retrieve the names of all donors who have donated blood more than 5 times.

```
SELECT donor.name FROM donor WHERE donor.donation_count > 5;
```

Output

```
Gina  
Jack
```

4. Retrieve the names and blood types of all donors who are eligible to donate blood.

```
SELECT donor.name, donor.blood_type FROM donor WHERE donor.is_eligible = 1;
```

Output

```
Frank|A+  
Gina|O+  
Henry|B+  
Jack|O-
```

5. Retrieve the names and addresses of all blood banks.

```
SELECT blood_bank.name, blood_bank.address FROM blood_bank;
```

Output

```
Blood Bank A|123 Main St, Anytown  
Blood Bank B|456 Maple Ave, Otherville  
Blood Bank C|789 Oak Rd, Smalltown
```

6. Retrieve the names and phone numbers of all donors who have donated blood to a specific blood bank.

```
SELECT donor.name, donor.phone_number FROM donor JOIN  
donation ON donor.id = donation.donor_id JOIN blood_bank  
ON donation.blood_bank_id = blood_bank.id WHERE blood_bank.name = 'Blood Bank B';
```

Output

```
Gina|555-5678
```

```
Jack|555-3333
```

7. Retrieve the total number of donations made by each donor.

```
SELECT donor_id, COUNT(*) as num_donations  
FROM donation  
GROUP BY donor_id;
```

Output

```
1|2  
2|2  
3|2  
4|2  
5|2
```

8. Retrieve the total number of transfusions received by each patient.

```
SELECT patient_id, COUNT(*) as num_transfusions
FROM transfusion
GROUP BY patient_id;
```

Output

```
1|1
2|1
3|1
4|1
5|1
```

9. Retrieve all donations made on a specific date of day 15.

```
SELECT * FROM donation WHERE date like '%15';
```

Output

```
|1|3|2022-11-15
|2|3|2023-01-15
|3|1|2022-12-15
|4|2|2023-02-15
|5|1|2022-10-15
```

10. Show the total number of donations made by each donor, sorted in descending order.

```
SELECT distinct name, COUNT(donation.donor_id) AS total_donations
FROM donor
JOIN donation ON donor_id = donation.donor_id
GROUP BY donor_id
ORDER BY total_donations DESC;
```

Output

```
Frank|10
```

```
[Execution complete with exit code 0]
```

CHAPTER-6

6.0 CONCLUSION

Prior to this project, a general study of blood bank management system was conducted from recent researches of various authors and facts were gathered in which helped to uncover the misfits that the system was facing. After proper analyzation of these problems, a solution was then developed in order to meet up the needs of a more advanced system. This system is known as the centralized blood bank repository which helped in eliminating all the problems that the previous systems were facing. With this system, Blood banks/ Centers, Hospitals, Patients and Blood donors will be brought together to enjoy a large number of functionalities and access a vast amount of information, thereby making blood donation and reception a lot easier and faster.

Before implementing the database, in the design phase, We have explored various features, operations of a blood bank to figure out required entities, attributes and the relationship among entities to make an efficient Entity Relationship Diagram(ERD). After analyzing all the requirements, we have created our ERD and then converted the ERD to relational model and normalized the tables.

In our project Blood bank management system we have stored all the information about the donors, patients, blood banks etc. This data base is helpful for the applications which facilitate users to check the details of different blood groups available and their donors from their place itself it avoids inconvenience of going to blood banks for each and every query they get.

We had considered the most important requirements only, many more features and details can be added to our project in order to obtain even more user friendly applications. These applications are already in progress and in future they can be upgraded and may become part of amazing technology.

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