A Practical activity Report submitted

for Database Management System (UNC502) by

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**INDIA**

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# TABLE OF CONTENT

Contents

[TABLE OF CONTENT 2](#_Toc166323598)

[OBJECTIVE: BLOOD BANK MANAGEMENT SYSTEM 3](#_Toc166323599)

[ABSTRACT 3](#_Toc166323600)

[Intro 3](#_Toc166323601)

[INFORMATION OF ENTITIES 4](#_Toc166323602)

[1. Donor: 4](#_Toc166323603)

[3. Manager: 4](#_Toc166323604)

[4. Recording Staff: 4](#_Toc166323605)

[5. BloodSpecimen: 4](#_Toc166323606)

[6. DiseaseFinder: 4](#_Toc166323607)

[7. Hospital\_Info: 4](#_Toc166323608)

[8. City: 5](#_Toc166323609)

[9. Disease: 5](#_Toc166323610)

[ER-DIAGRAM 6](#_Toc166323611)

[RELATIONSHIP BETWEEN ENTITES: 7](#_Toc166323612)

[ER TO TABLES 8](#_Toc166323613)

[BEFORE NORMALIZATION: 8](#_Toc166323614)

[AFTER NORMALIZATION 9](#_Toc166323615)

[NORMALIZATION OF DONOR TABLE 9](#_Toc166323616)

[NORMALIZATION OF HOSPITAL\_INFO 10](#_Toc166323617)

[NORMALIZATION OF DISEASE 11](#_Toc166323618)

[RELATIONAL SCHEMAS AFTER NORMALIZATION: 11](#_Toc166323619)

[QUERIES: 19](#_Toc166323620)

[USING JOINS: 19](#_Toc166323621)

[USING GROUP BY 21](#_Toc166323622)

[USING SUBQUERIES 22](#_Toc166323623)

[CONCLUSION 25](#_Toc166323624)

# OBJECTIVE: BLOOD BANK MANAGEMENT SYSTEM

## ABSTRACT

Blood donation safety is a relevant and important public health issue. This database project allows hospitals to make inventories of their blood online, subsequently allowing each hospital to check the availability of blood anytime possible. With this project threats on improper blood donor documentation or misplaced records will be totally removed. Our system aims in providing desired blood in emergency from either blood bank or direct donors.

# Intro

PROJECT OVERVIEW

Blood Bank Management System is a database system to link between the donors and blood banks and act as an interface for the patient to find his/her desired blood in a fast and efficient way. Transfusion of blood is a complex organization requiring careful management and design. Essential requirements can be stated as Donor requirement, blood collection, testing of donor blood, component preparation and supply.

Blood Banks collect, store and provide collected blood to the patients from donors. The banks then group the blood which they receive according to their blood groups. Along with grouping, they need to check contamination of blood.

This database automates the distribution of blood. The entire project has been developed keeping in view of the distributed client server architecture with centralized storage of database in mind.

Using the constructs of MySQL Server database has been designed, normalized for better results.

BACKGROUND OF STUDY

For hospitals, a blood bank known as blood collection center, also is an area in which collected blood bags are stored and preserved for future use in blood transfusion services. Most blood banks are still running manual system in its processes. As such, there is a lack of efficiency because it is still paper-based in collecting information about donors, inventories of blood bags, and blood transfusion services. The lack of proper documentation may endanger patients due to possibility of having contaminate blood bags.

Hence, a web-based blood bank management system is in high need.

# INFORMATION OF ENTITIES

PROJECT ENTITIES:

### Donor:

(Attributes: bd\_ID, bd\_name, bd\_age, bd\_sex, bd\_Bgroup, bd\_reg\_date, bd\_phNo)

Donor is the person who donates blood, on donation a donor id(bd\_ID) is generated and used as primary key to identify the donor information. Name, age, sex, phone number and registration dates will be stored in database under Donor entity.

1. **Recipient**:

(Attributes- reci\_ID, reci\_name, reci\_age, reci\_Bgrp, reci\_Bqnty, reci\_sex, reci\_reg\_date, reci\_phNo) Recipient is the person who receives blood from blood bank, when blood ig given recipient ID(reci\_ID) is generated which is used as primary key for the recipient entity to identify blood recipients information.

### Manager:

(Attributes: M\_id, mName, m\_phNo)

Manager takes care of the available blood samples in the blood bank, also responsible for handling blood requests from recipients and hospitals. Blood Manager has a unique identification number (M\_id) used as a primary key along with name and number of managers stored under Manager entity.

### Recording Staff:

(Attributes: reco\_ID, reco\_Name, reco\_phNo)

The recording staff is a person who registers the blood donor and recipients and the Recording Staff entity has reco\_ID which is primary key along with recorder’s name along with phone number stored under this entity.

### BloodSpecimen:

(Attributes- specimen\_number, b\_group, status)

Under this entity, we will store the information of blood samples which are available in the blood bank. Here, specimen\_number and b\_group together will be primary key along with status attribute which shows whether blood is contaminated or not.

### DiseaseFinder:

(Attributes- dfind\_ID, dfind\_name,dfind\_PhNo)

Under this entity, we will store the information of the doctor who checks the blood foor any kind of contaminations. We have a unique identification number(dfind\_ID) as primary key along with other attributes.

### Hospital\_Info:

(Attributes- hosp\_ID, hosp\_name, hosp\_needed\_Bgrp, hosp\_needed\_Bqnty)

Here, under this entity we will store the information of hospitals. In this hosp\_ID and hosp\_needed\_Bgrp together makes the primary key.

### City:

(Attributes- city\_ID, city\_name)

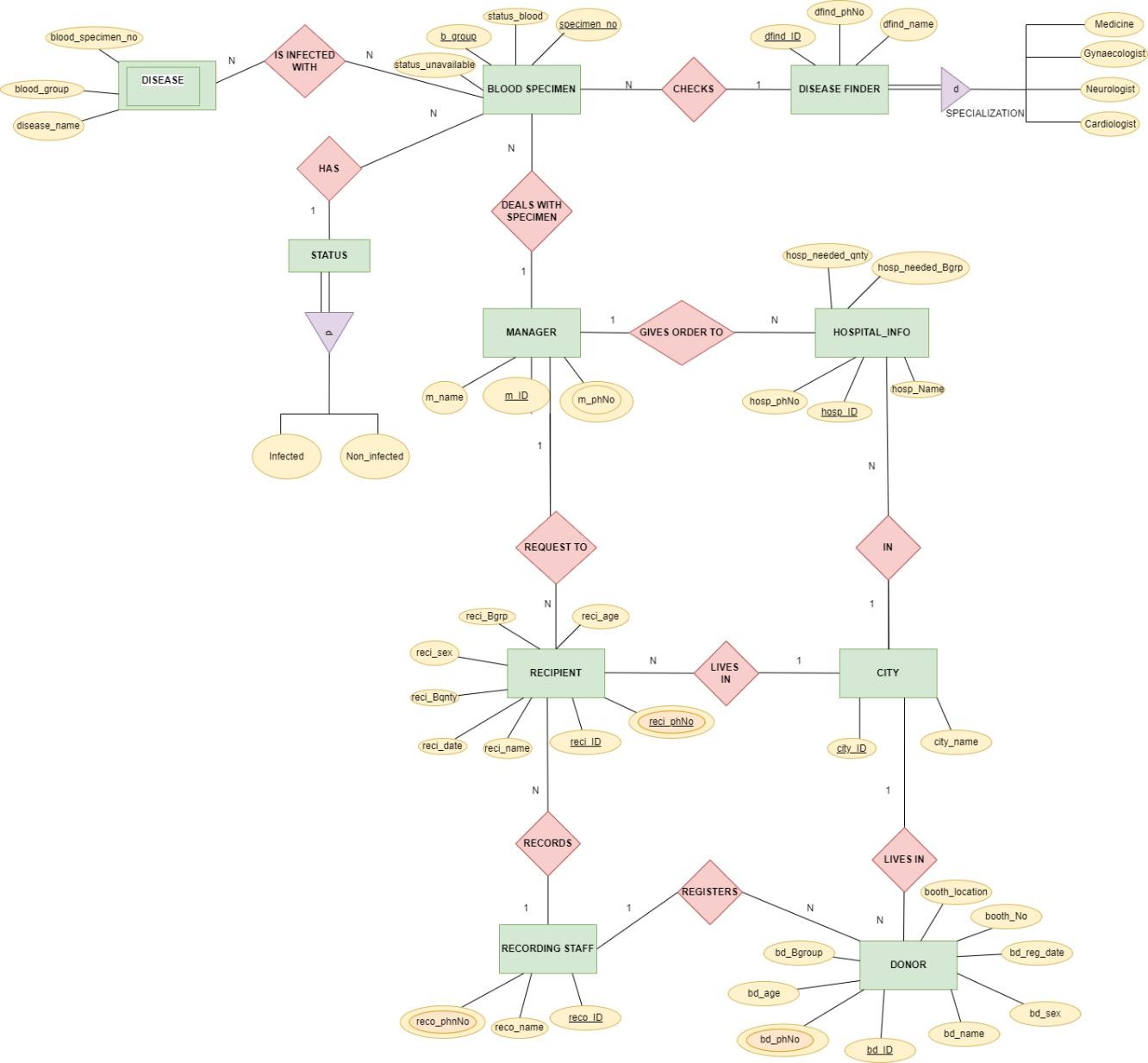
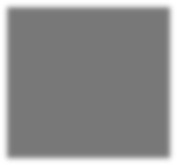
This entity stores the information where donors, recipients and hospitals are present. City\_id is used as primary key to identify the information about the city.

### Disease:

(Attributes: blood\_specimen, bgroup,disease\_name)

This entity shows the disease present in a blood specimen.

# ER-DIAGRAM



# RELATIONSHIP BETWEEN ENTITES:

1. City and Hospital\_Info: Relationship = “in” Type: 1 to Many
2. City and Donor: Relationship = “lives in” Type: 1 to Many
3. City and Recipient Relationship = ”lives in” Type: 1 to Many
4. Recording\_Staff and Donor: Relationship=”registers” Type: 1 to Many
5. Recording\_Staff and Recipient: Relationship=”records”

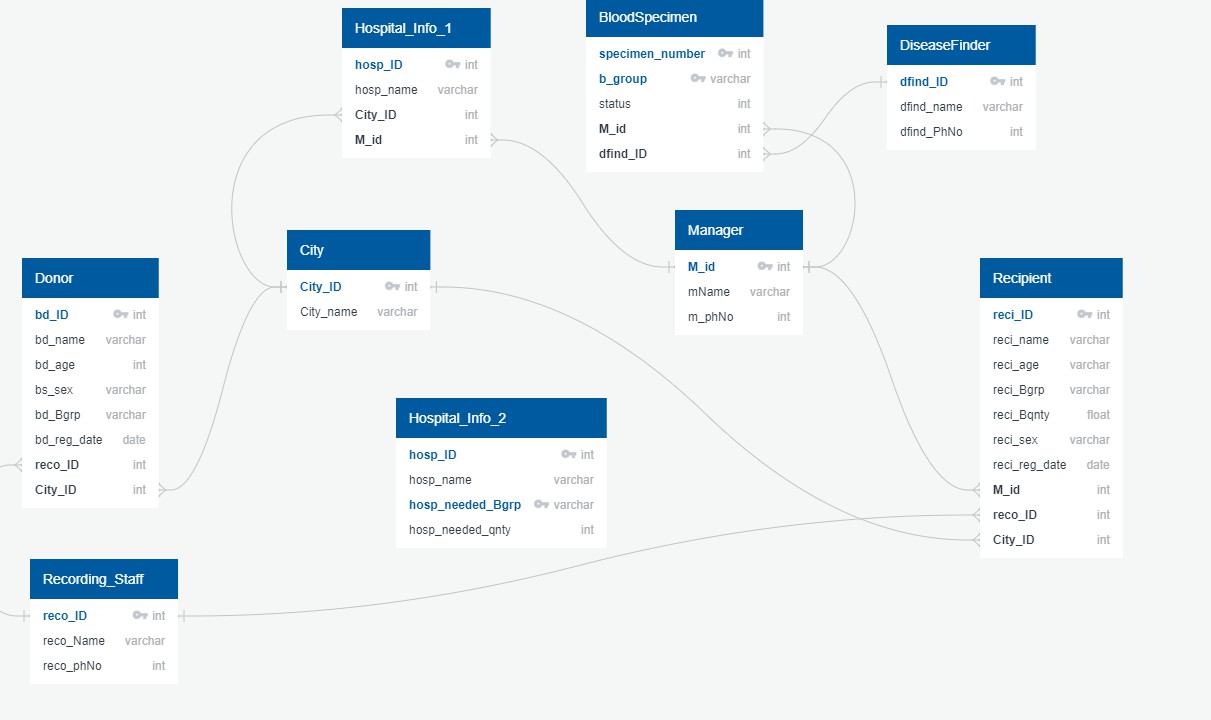
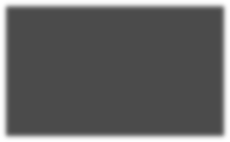
Type: 1 to Many

1. Hospital\_Info and Manager Relationship=”gives order to” Type: 1 to Many
2. Manager and BloodSpecimen Relationship=”deals with specimen” Type: 1 to Many
3. Recipient and Manager Relationship=”requests to” Type: 1 to Many
4. DiseaseFinder and BloodSpecimen

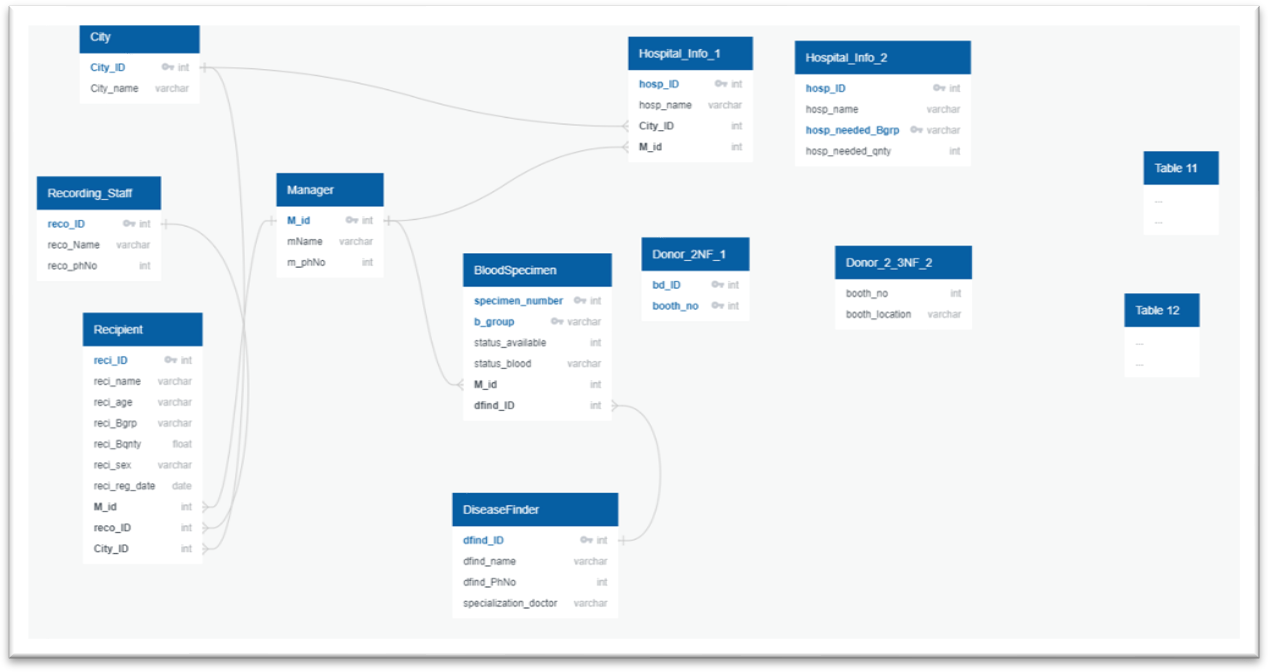
Relationship=”checks” Type: 1 to Many

# ER TO TABLES

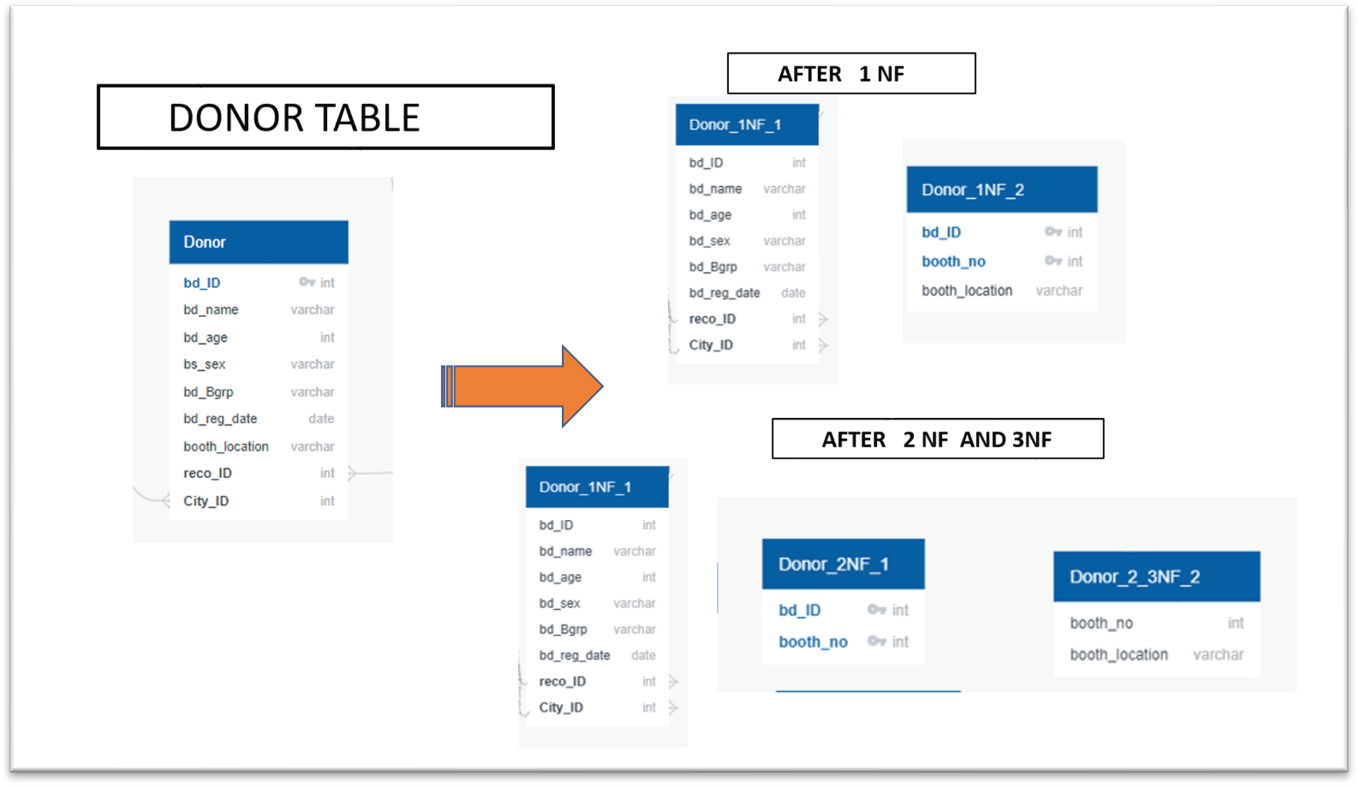
### BEFORE NORMALIZATION:



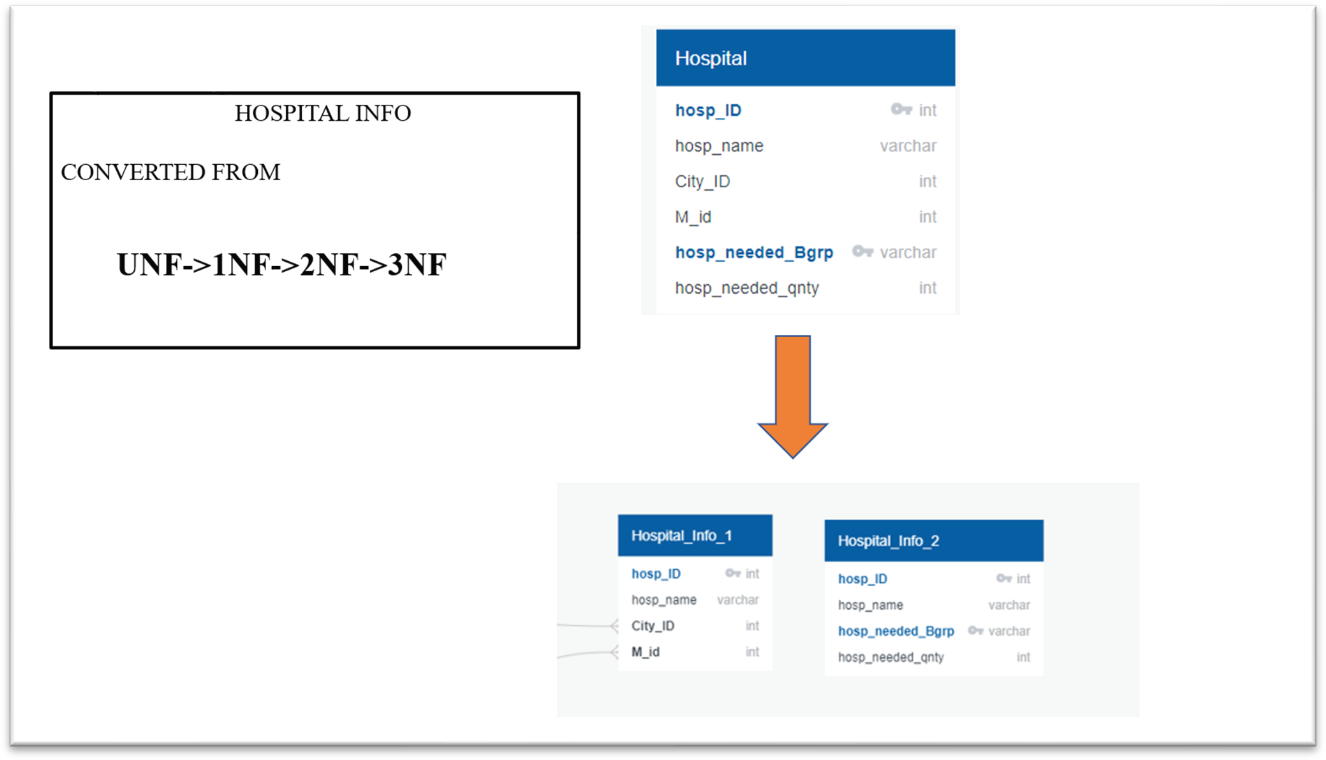
### AFTER NORMALIZATION



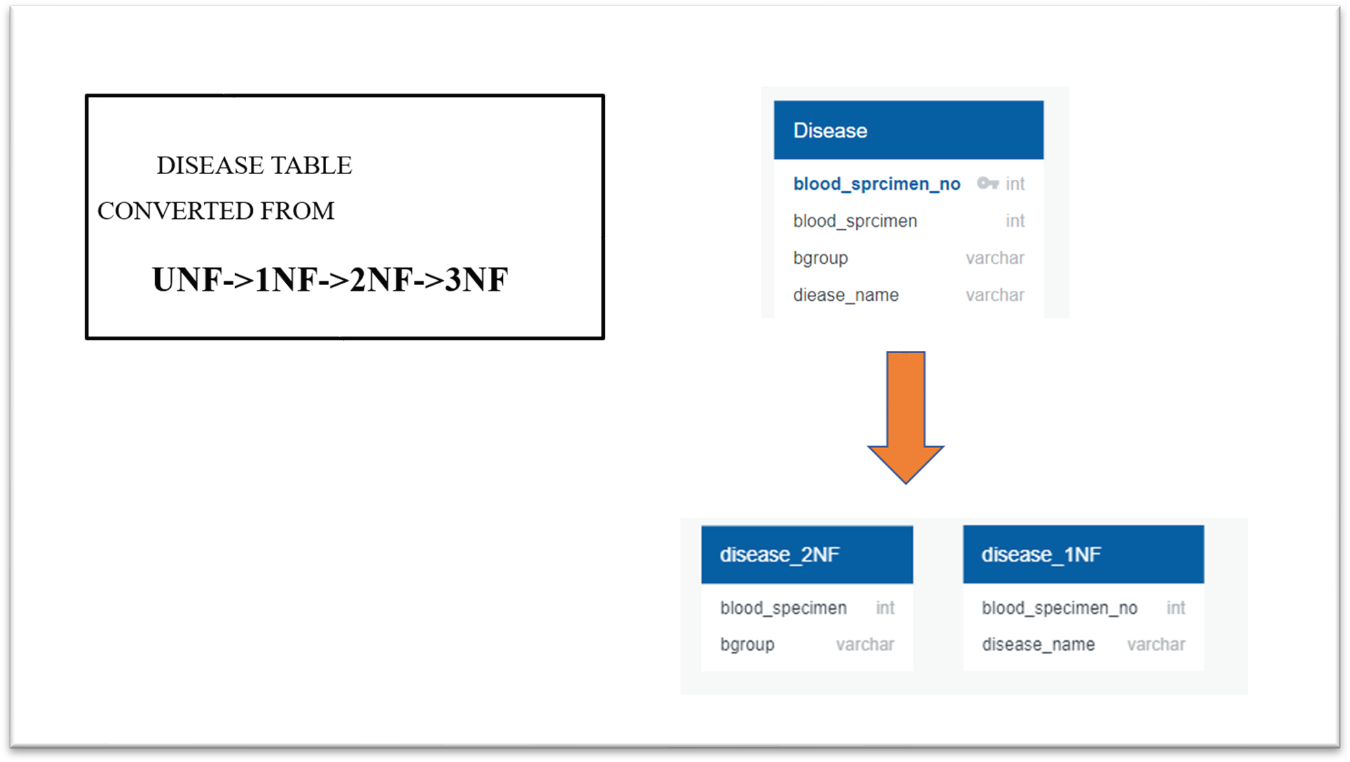
### NORMALIZATION OF DONOR TABLE



### NORMALIZATION OF HOSPITAL\_INFO

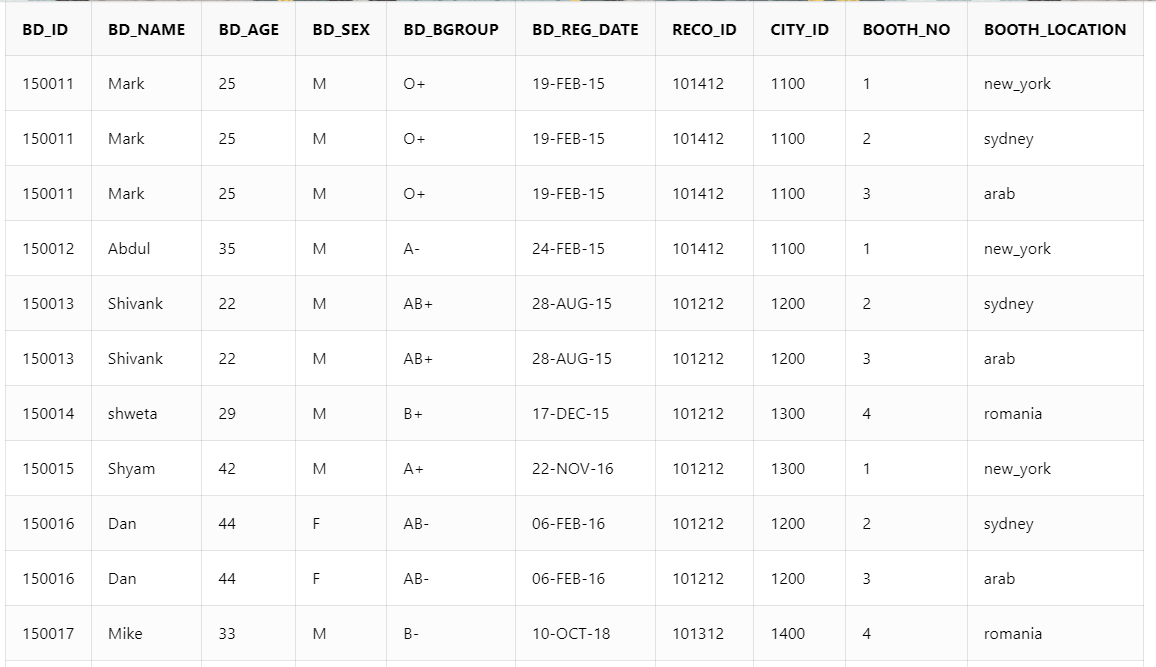


### NORMALIZATION OF DISEASE

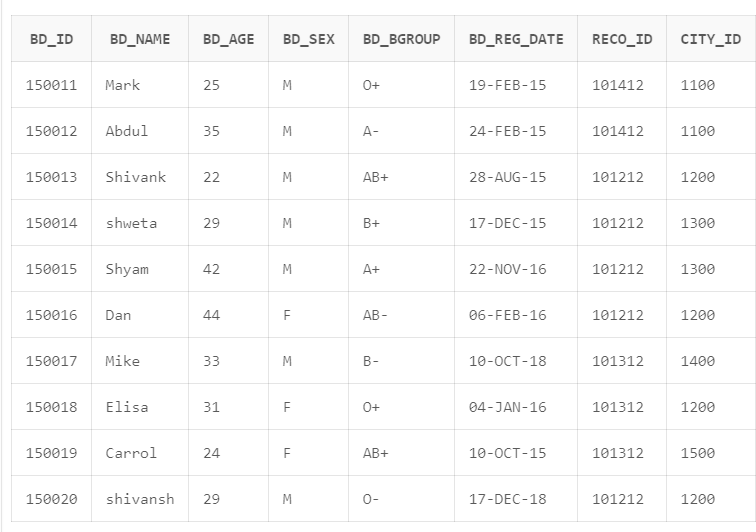


# RELATIONAL SCHEMAS AFTER NORMALIZATION:

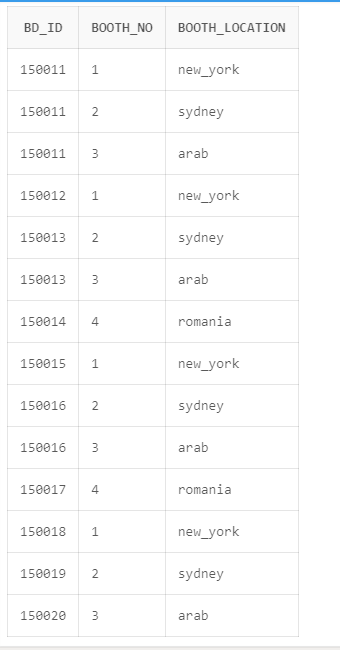
DONOR



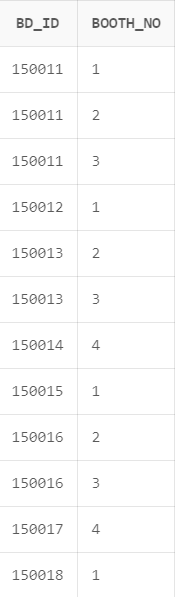
DONOR\_1NF\_1 TABLE:



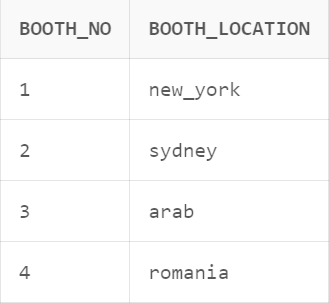
DONOR\_1NF\_2 TABLE:



DONOR\_2NF\_1



DONOR\_2NF\_2:



MANAGER TABLE:



RECORDING STAFF TABLE:



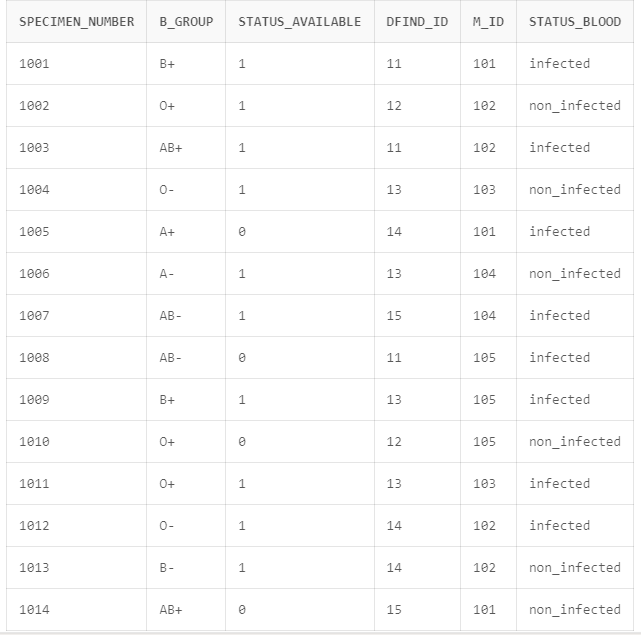
CITY TABLE:

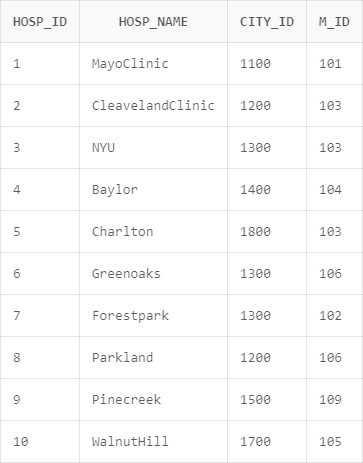


DISEASE FINDER:

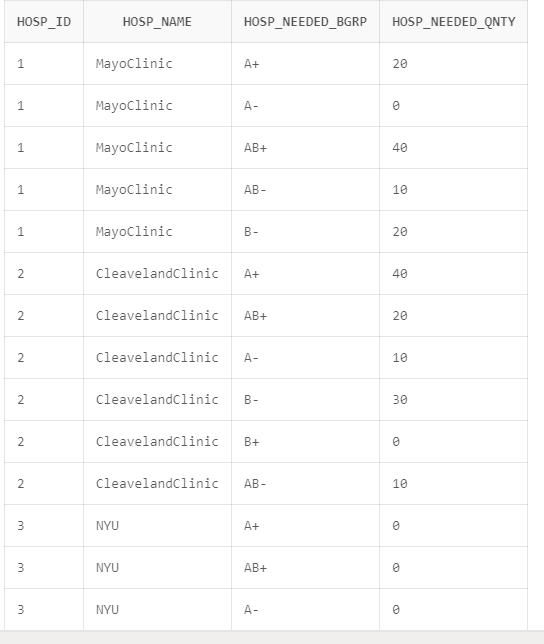


BLOOD SPECIMEN:



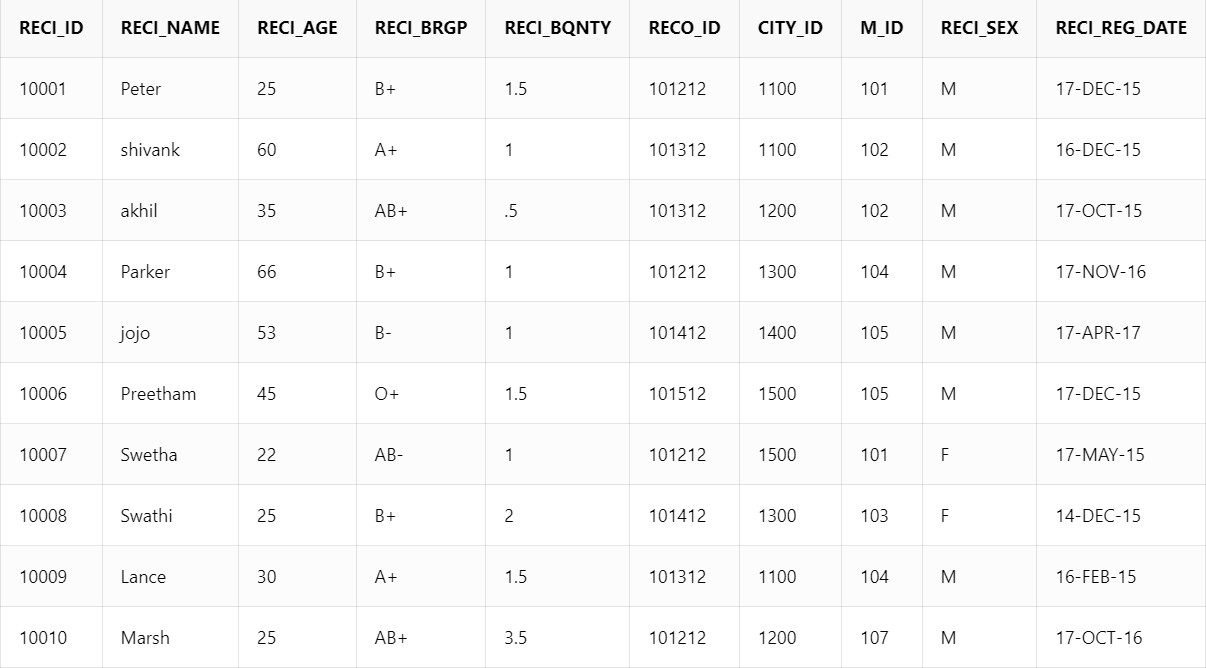
HOSPITAL\_INFO\_1

### 

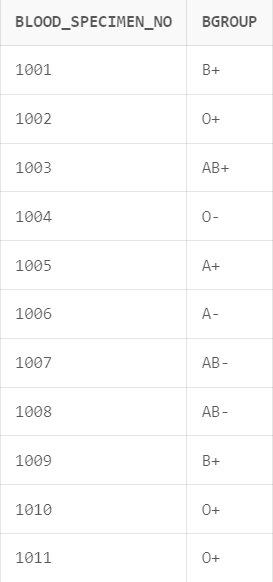
HOSPITAL\_INFO\_2:

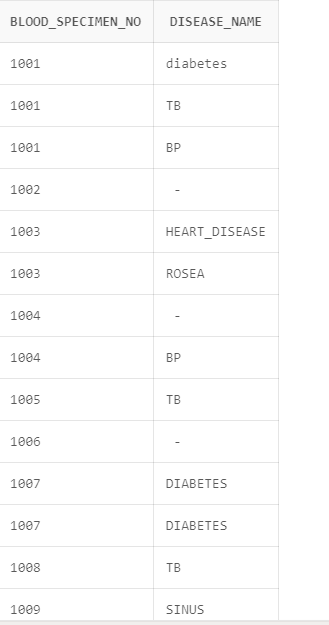
### 

RECIPIENT:

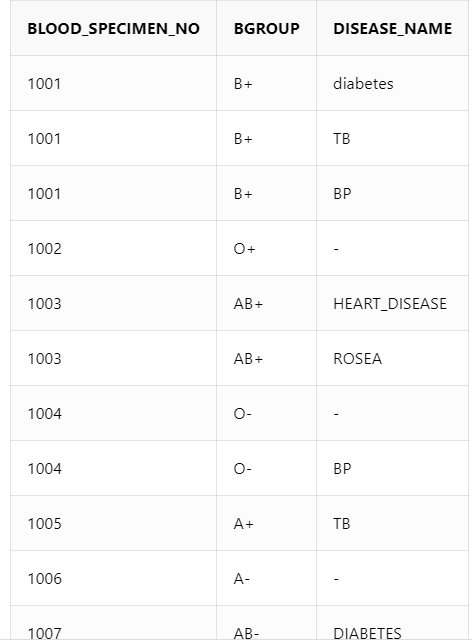


disease\_1NF TABLE:



disease\_2NF TABLE:

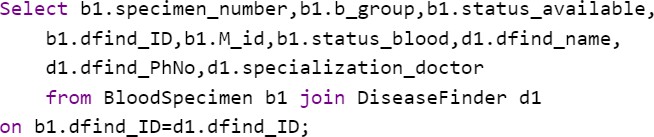
Disease TABLE:

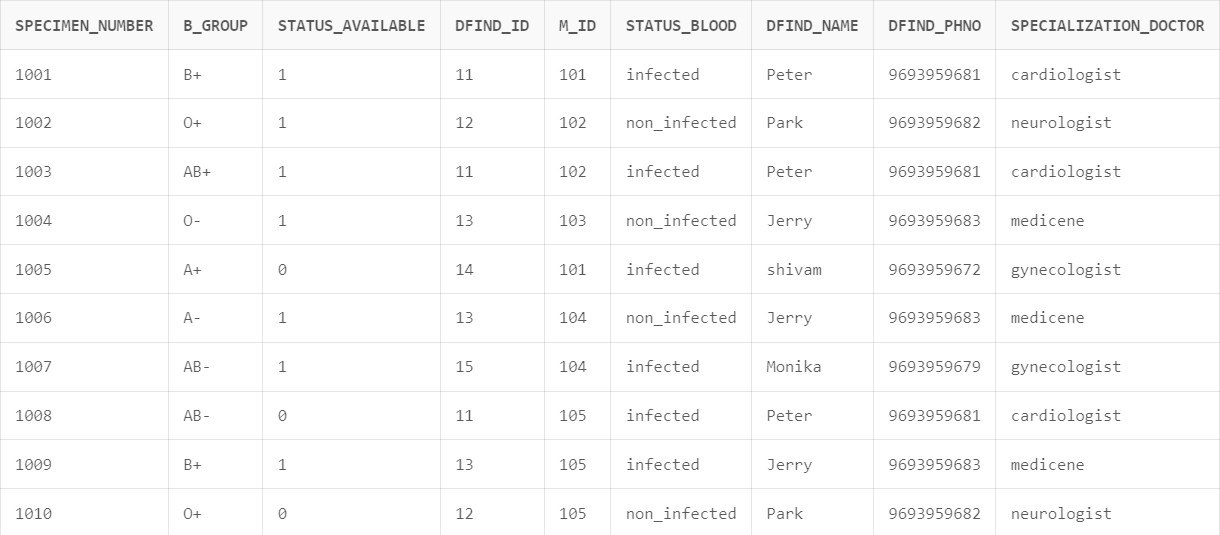


# QUERIES:

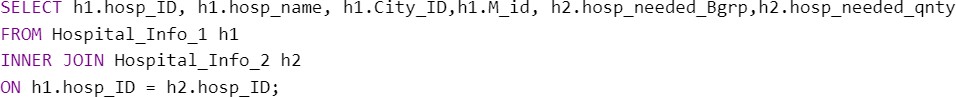
### USING JOINS:

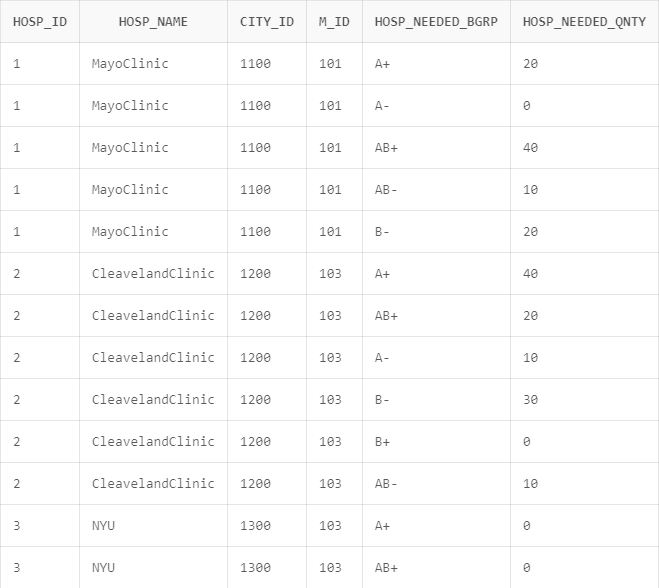
1. Retrieves the specimen number, blood group, availability status, ID, blood status, name, phone

number, and specialization of doctors who have specimens available, along with their corresponding disease finder information?"

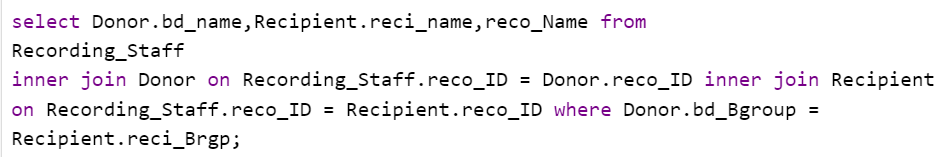


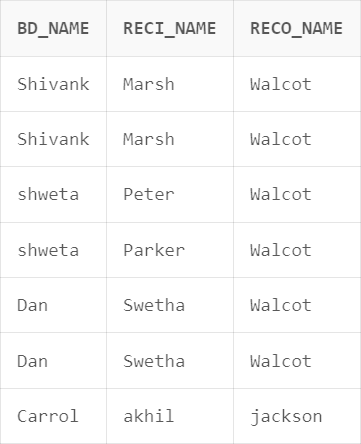
2. Retrieve hospital information along with the corresponding blood group needs and quantities from two different tables?"





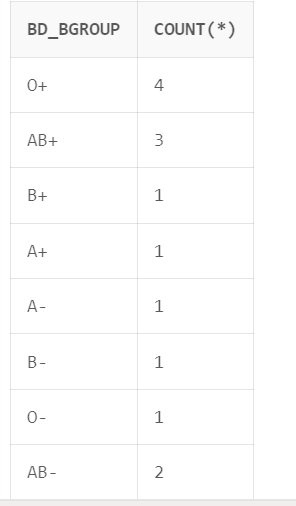
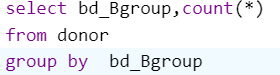
3. Retrieves the names of blood donors (bd\_name), recipients (reci\_name), and recordings (reco\_Name) made by staff members, where the blood group of the donor matches the blood group of the recipient?



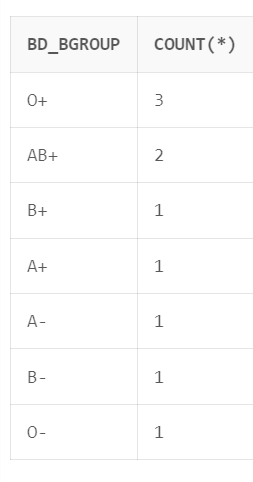
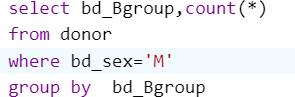


4.

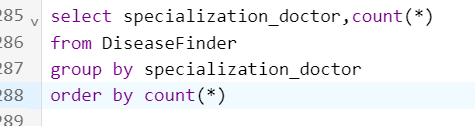
### USING GROUP BY

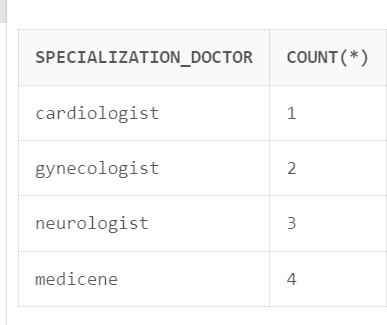
1.

2.

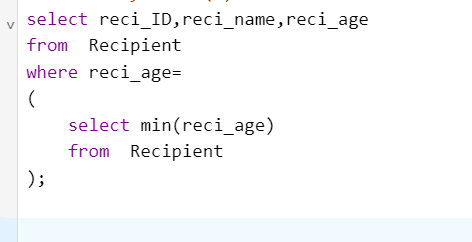


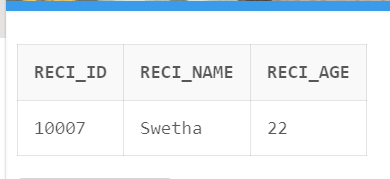
3.



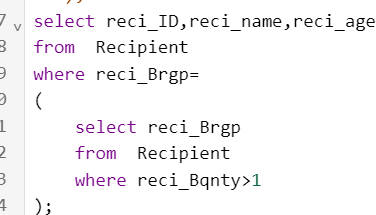


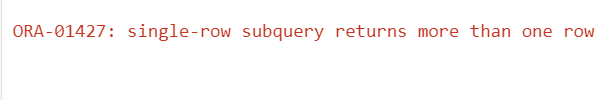
### USING SUBQUERIES

SINGLE ROW SUBQUERY 1.



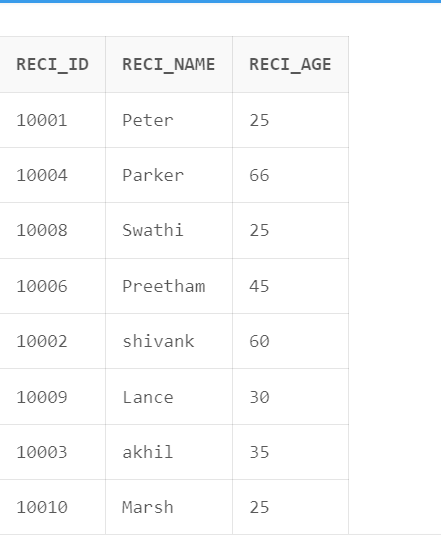
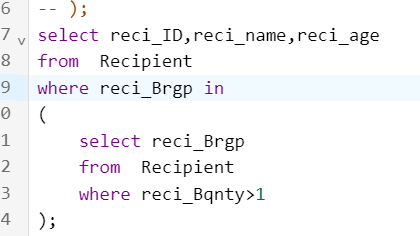
MULTIROW SUBQUERY 1.



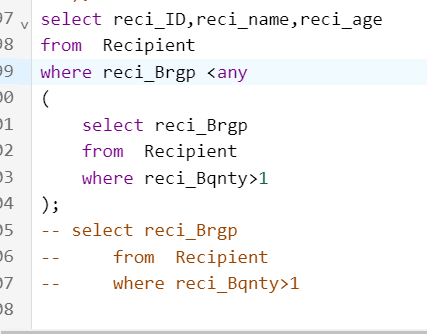


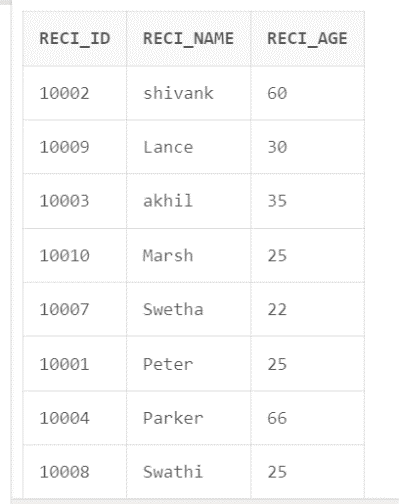
|  |  |  |  |
| --- | --- | --- | --- |
|  | OPERATOR | MEANING |  |
|  | IN | Equals to any member in the list |  |
|  | ANY | Compare value to each value returned by the subquery |  |
|  | ALL | Compare value to every value returned by the subquery |  |

2.

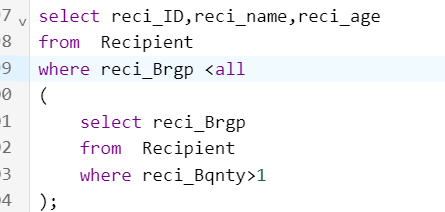


3.





4.



# CONCLUSION

Our project well addressed the limitations of the existing system. We designed well organized database management system which is a challenging job in this era. We have built a database for a Blood Bank using Microsoft SQL Server. 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. We have created the tables for our database and inserted some sample values in the tables. Finally, we have executed sample queries on our database to check its performance to retrieve useful information accurately and speedily.

We have combined all concepts including **Generalization**, **Specialization**, **Subqueries, Joins, Procedures.**

**REFERNCES**

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3. TOOL for ER to Tables: [QuickDBD (quickdatabasediagrams.com)](https://app.quickdatabasediagrams.com/%23/)
4. Notes from Prof. Hakki C Cankaya, University of Texas at Dallas, Dallas, Texas
5. Blood Donation Management: Recent trends – Sunil K Joseph, Johnson Michael, Prem Jose Vazhacharickal