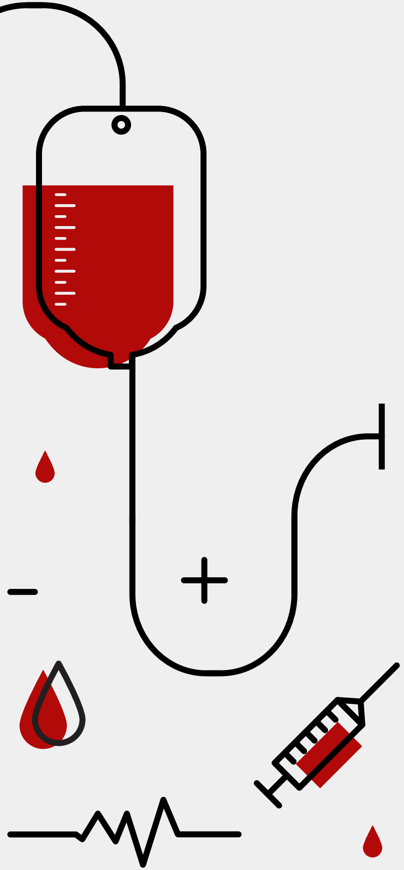


Blood Bank Management System

CHHAVI TRIPATHI 22BRS1096
VANSHIKA GARODIA 22BAI1198

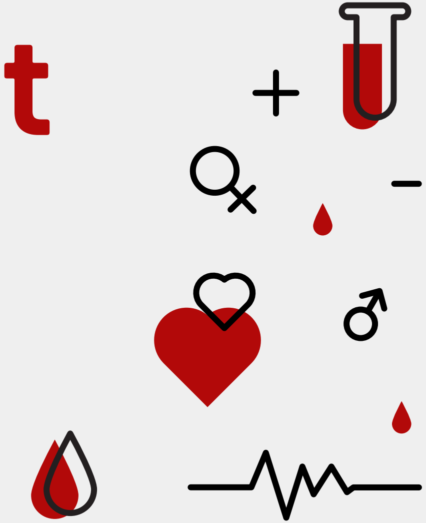


Table of contents

INTRODUCTION

Blood banks play a crucial role in collecting, storing, and supplying blood to individuals in need. Those who generously contribute blood are known as 'donors.' The collected blood is meticulously categorized based on blood groups to ensure efficient distribution, with a focus on preventing contamination. The primary objective of blood banks is to furnish hospitals and healthcare systems with the vital resource needed to save patients' lives.

Monitoring the quality of blood and keeping track of donors pose significant challenges for blood banks. The existing systems fall short in meeting the requirements for maintaining high-quality blood and effectively managing donor information. In response to these limitations, we have introduced a novel solution known as the 'Blood Donation Management System.'

The 'Blood Bank Management System' offers a comprehensive approach to monitoring blood quality and tracking available blood when requested by recipients. Manual systems, currently in use, are time-consuming and lack effectiveness. The 'Blood Bank Management System' automates blood distribution, streamlining the process. The system's database encompasses thousands of records for each blood bank, facilitating efficient searching of available blood and saving considerable time compared to the manual system.

LITERATURE WORK

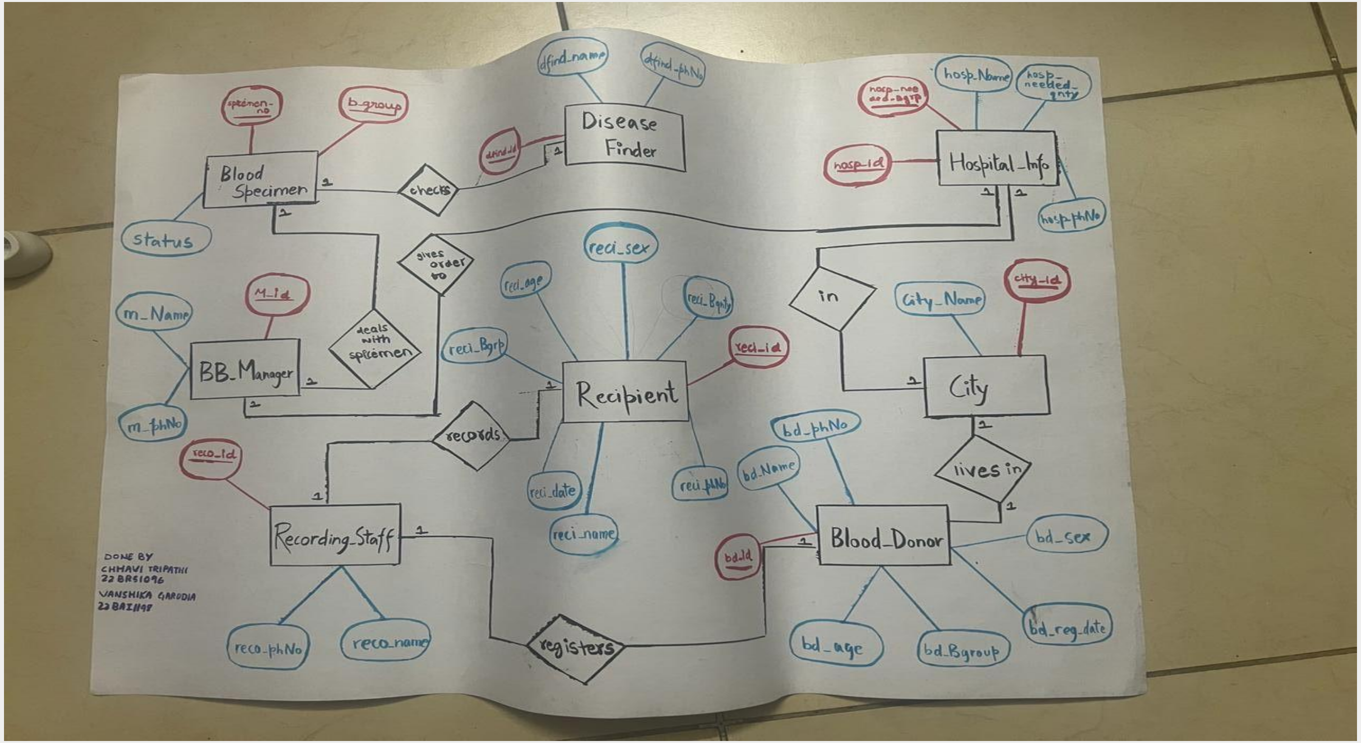
1. "Handbook of Blood Banking and Transfusion Medicine" by Christopher D. Hillyer, MD, Beth H. Shaz, MD, and James C. Zimring, MD, PhD

   This handbook serves as a comprehensive resource for healthcare professionals involved in blood banking and transfusion medicine. It covers essential topics such as blood collection, processing, storage, compatibility testing, transfusion reactions, and quality assurance in transfusion therapy. The book provides practical guidance on best practices in managing blood products and ensuring patient safety during transfusions.

2. "Transfusion Medicine and Hemostasis: Clinical and Laboratory Aspects" by Christopher D. Hillyer, MD, Leslie E. Silberstein, MD, Paul M. Ness, MD, and Kenneth C. Anderson, MD

   This work delves into the clinical and laboratory aspects of transfusion medicine and hemostasis, offering in-depth insights into blood component therapy, transfusion reactions, coagulation disorders, and management of patients requiring transfusion support. It provides a comprehensive overview of the scientific principles underlying transfusion medicine and hemostasis, making it a valuable resource for healthcare professionals involved in patient care and blood product administration.

ER DIAGRAM


dfind_name
dfind_phNo
specimen_no
b_group
dfind_id
Disease Finder
1
hosp_needed_Bgrp
hosp_Name
hosp_needed_qnty
hosp_id
Hospital_Info
1
1
hosp_phNo
Blood Specimen
1
checks
1
status
gives order to
reci_sex
reci_age
reci_Bqnty
M_Id
m_Name
deals with specimen
in
City_Name
city_id
reci_Bgrp
reci_id
BB_Manager
1
1
Recipient
1
City
1
m_phNo
records
bd_phNo
reco_Id
bd_Name
lives in
1
reci_date
reci_phNo
1
Recording_Staff
1
reci_name
bd_id
1
Blood_Donor
bd_sex
DONE BY
CHHAVI TRIPATHI
22BRS1096
VANSHIKA GARODIA
22BAI1198
reco_phNo
reco_name
registers
bd_age
bd_Bgroup
bd_reg_date

INFORMATION OF ENTITIES

In total we have eight entities and information of each entity is mentioned below:-

1. Blood_Donor: (Attributes – bd_ID, bd_name, bd_sex, bd_age, bd_Bgroup, bd_reg_date, bd_phNo) The 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.

2. Recipient: (Attributes – reci_ID, reci_name, reci_age, reci_Bgrp, reci_Bqnty , reci_sex, reci_reg_date, reci_phNo) The Recipient is the person who recivies blood from blood bank, when blood is given to a recipient a rericipient ID (reci_ID) is generated and used as primary key for the recipient entity to indentify blood recipients information.

3. BB_Manager: (Attributes – m_ID, m_Name, m_phNo) The blood bank manager is the person who takes care of the avaible blood samples in the blood bank, he is also resposible for handaling blood requests from recipients and hospitals.

4. 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 enitity has reco_ID which is primary key along with recoder's name and recodrer's phone number will also be stored in the data base under Recording_Staff entity.

5. BloodSpecimen : (Attributes – specimen_number, b_group , status) In data base, under BloodSpecimen entity we will store the information of blood samples which are available in the blood bank.

6. DiseaseFinder : (Attributes - dfind_ID, dfind_name, dfind_PhNo) In data base , under DiseaseFinder entity we will store the information of the doctor who checks the blood for any kind of contaminations.

7. Hospital_Info : (Attributes – hosp_ID, hosp_name, hosp_needed_Bgrp, hosp_needed_Bqnty) P a g e | 7 In the data base, under Hospital_Info entity we will store the information of hospitals.

8. city: (Attributes- city_ID, city_name) This entity will store the information of cities where donors, recipients and hospitals are present.

RELATIONSHIP BETWEEN ENTITIES

1. City and Hospital_Info:
Relationship = “in”
Type of relation = 1 to many

2.City and Blood_Donor:
Relationship = “lives in”
Type of relation = 1 to many

3. City and Recipient:
Relationship = “lives in”
Type of relation = 1 to many

4. Recording_Staff and Donor:
Relationship = “registers”
Type of relation = 1 to many

5. Recording_Staff and Recipient:
Relationship = “records”
Type of relation = 1 to many

6. Hospital_Info and BB_Manager:
Relationship = “gives order to”
Type of relation = 1 to many

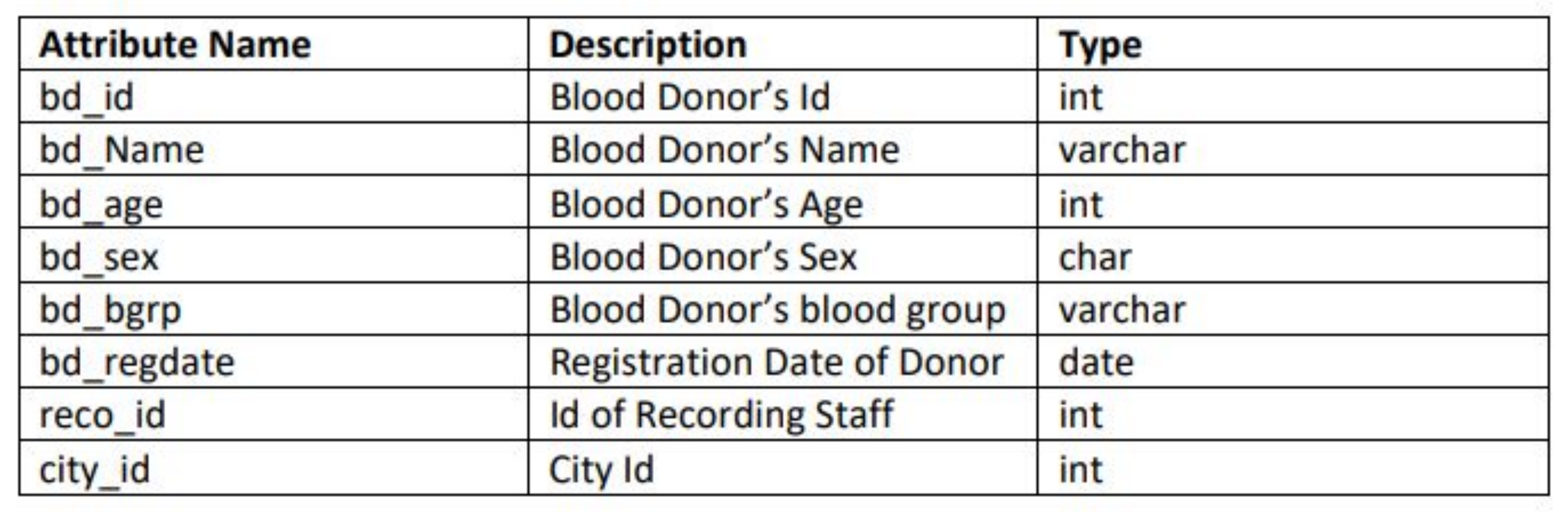
7. BB_Manager and Blood Specimen:
Relationship = “deales with specimen”
Type of relation = 1 to many

8. Recipient and BB_Manager:
Relationship = “requests to”
Type of relation = 1 to many

9. Disease_finder and Blood Specimen:
Relationship = “checks”
Type of relation = 1 to many

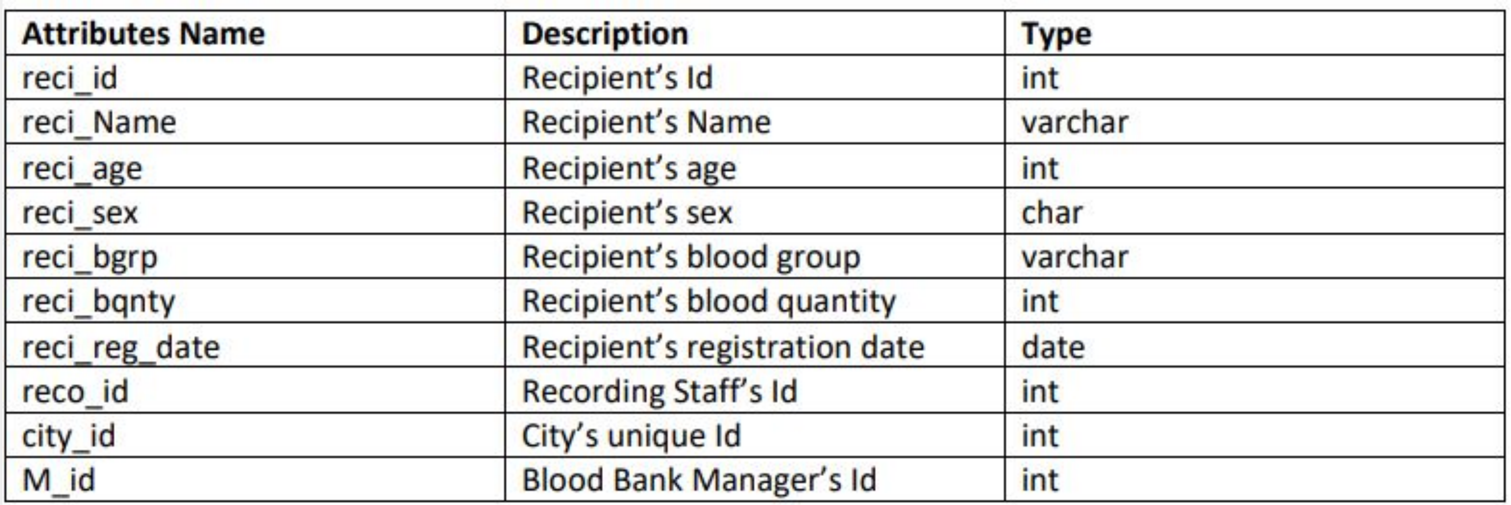
RELATIONAL SCHEMAS

DONOR TABLE



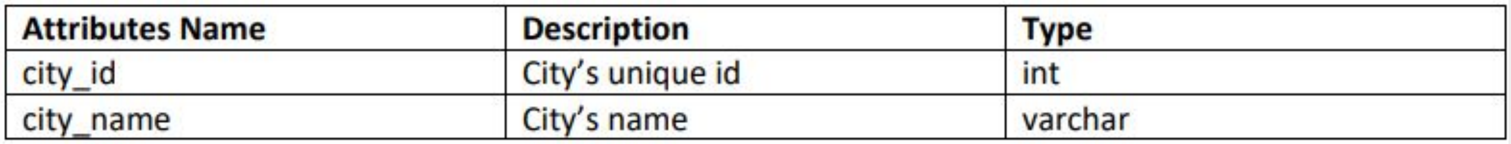
Attribute Name	Description	Type
bd_id	Blood Donor's Id	int
bd_Name	Blood Donor's Name	varchar
bd_age	Blood Donor's Age	int
bd_sex	Blood Donor's Sex	char
bd_bgrp	Blood Donor's blood group	varchar
bd_regdate	Registration Date of Donor	date
reco_id	Id of Recording Staff	int
city_id	City Id	int

RECIPIENT TABLE



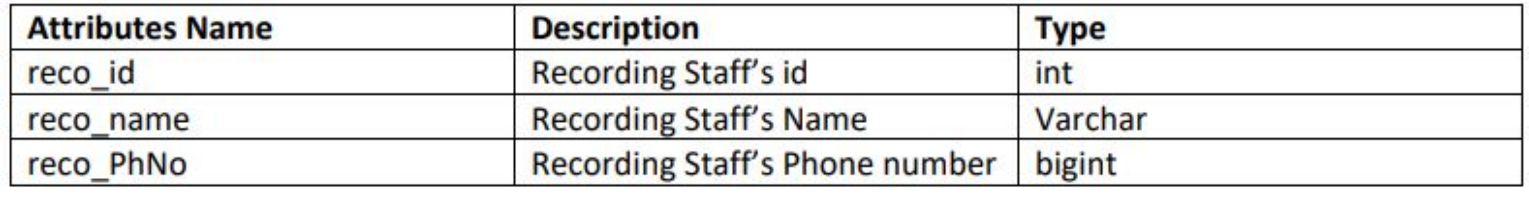
Attributes Name	Description	Type
reci_id	Recipient’s Id	int
reci_Name	Recipient’s Name	varchar
reci_age	Recipient’s age	int
reci_sex	Recipient’s sex	char
reci_bgrp	Recipient’s blood group	varchar
reci_bqnty	Recipient’s blood quantity	int
reci_reg_date	Recipient’s registration date	date
reco_id	Recording Staff’s Id	int
city_id	City’s unique Id	int
M_id	Blood Bank Manager’s Id	int

CITY TABLE



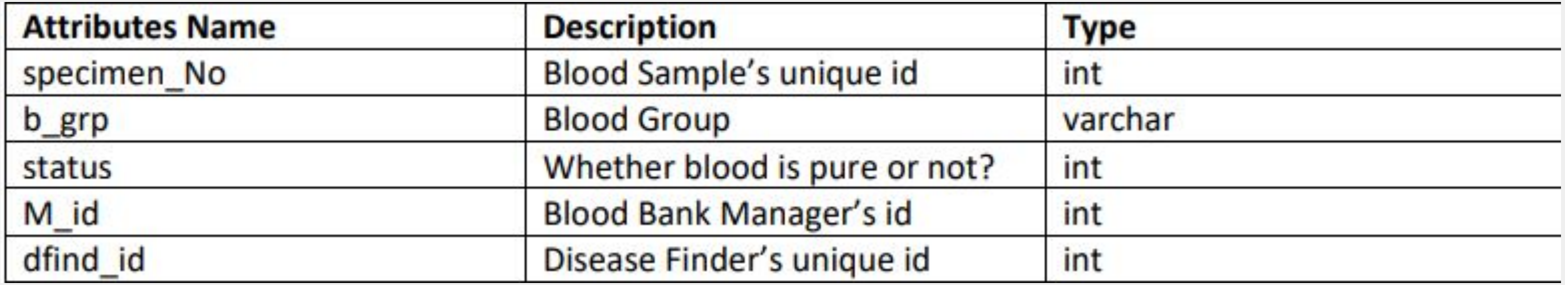
Attributes Name	Description	Type
city_id	City’s unique id	int
city_name	City’s name	varchar

RECORDING STAFF TABLE



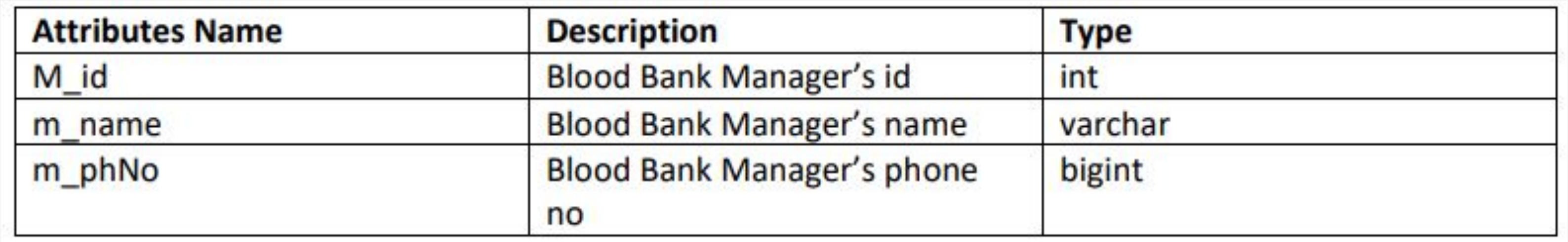
Attributes Name	Description	Type
reco_id	Recording Staff's id	int
reco_name	Recording Staff's Name	Varchar
reco_PhNo	Recording Staff's Phone number	bigint

BLOOD SPECIMEN TABLE



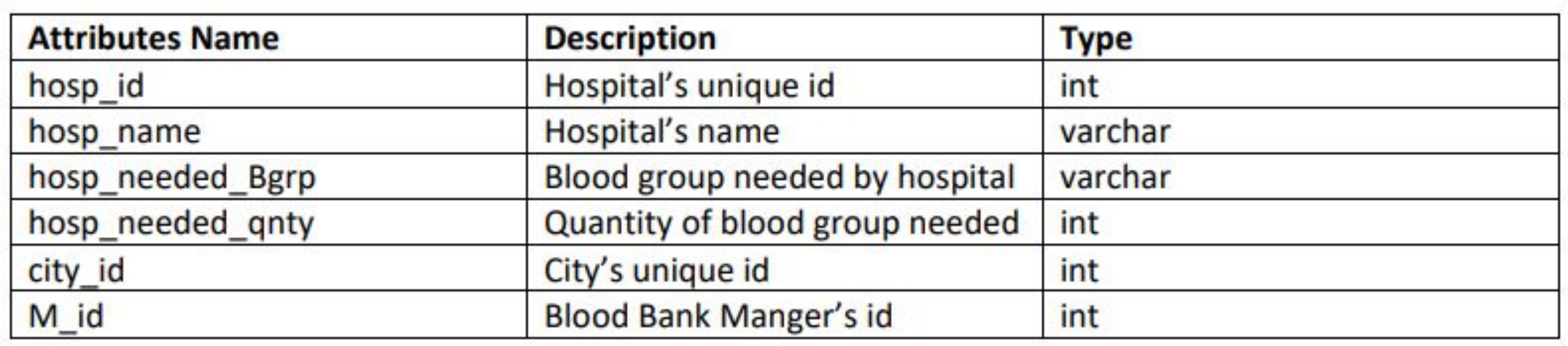
Attributes Name	Description	Type
specimen_No	Blood Sample's unique id	int
b_grp	Blood Group	varchar
status	Whether blood is pure or not?	int
M_id	Blood Bank Manager's id	int
dfind_id	Disease Finder's unique id	int

BLOOD BANK MANAGER TABLE



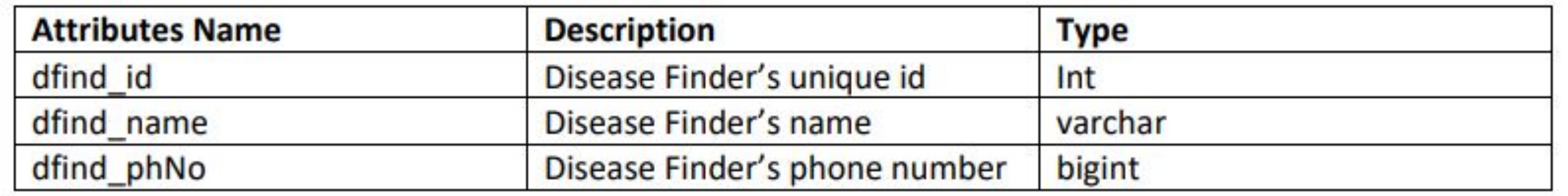
Attributes Name	Description	Type
M_id	Blood Bank Manager's id	int
m_name	Blood Bank Manager's name	varchar
m_phNo	Blood Bank Manager's phone no	bigint

HOSPITAL INFO TABLE



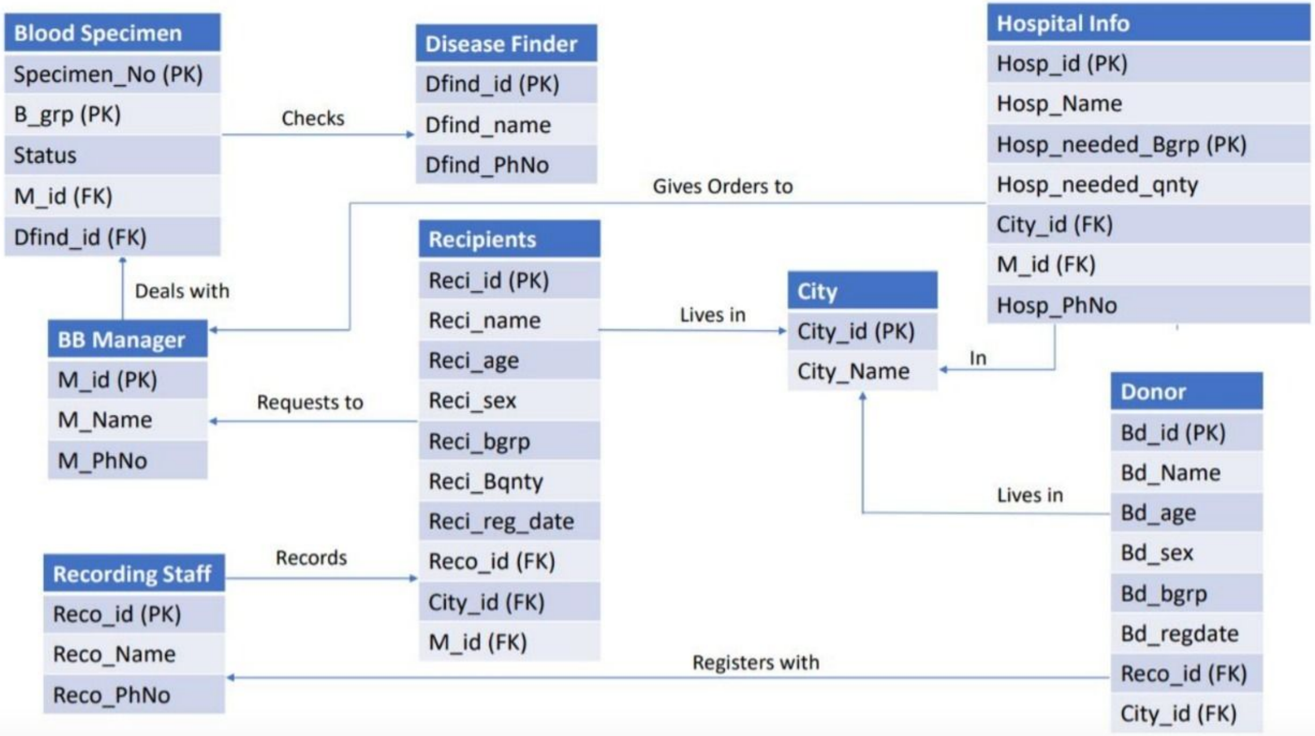
Attributes Name	Description	Type
hosp_id	Hospital’s unique id	int
hosp_name	Hospital’s name	varchar
hosp_needed_Bgrp	Blood group needed by hospital	varchar
hosp_needed_qnty	Quantity of blood group needed	int
city_id	City’s unique id	int
M_id	Blood Bank Manger’s id	int

DISEASE FINDER TABLE



Attributes Name	Description	Type
dfind_id	Disease Finder’s unique id	Int
dfind_name	Disease Finder’s name	varchar
dfind_phNo	Disease Finder’s phone number	bigint

ER DIAGRAM WITH TABLES



Blood Specimen
Specimen_No (PK)
B_grp (PK)
Status
M_id (FK)
Dfind_id (FK)

Disease Finder
Dfind_id (PK)
Dfind_name
Dfind_PhNo

Hospital Info
Hosp_id (PK)
Hosp_Name
Hosp_needed_Bgrp (PK)
Hosp_needed_qnty
City_id (FK)
M_id (FK)
Hosp_PhNo

BB Manager
M_id (PK)
M_Name
M_PhNo

Recipients
Reci_id (PK)
Reci_name
Reci_age
Reci_sex
Reci_bgrp
Reci_Bqnty
Reci_reg_date
Reco_id (FK)
City_id (FK)
M_id (FK)

City
City_id (PK)
City_Name

Donor
Bd_id (PK)
Bd_Name
Bd_age
Bd_sex
Bd_bgrp
Bd_regdate
Reco_id (FK)
City_id (FK)

Recording Staff
Reco_id (PK)
Reco_Name
Reco_PhNo

NORMALIZATION

TABLE 1

Blood_Donor (bd_Id, bd_name, bd_phNo bd_sex, bd_age, bd_reg_date, bd_Bgroup, reco_ID, City_ID)
{bd_Id} = > {bd_name} (functional dependency exists, because two different bd_name do not correspond to the same bd_Id).
{bd_ID} = > {bd_sex} (functional dependency exists).
{bd_ID} = > {bd_age} (functional dependency exists).
{bd_ID} = > {bd_reg_date} date (functional dependency exists).
{bd_ID} = > {reco_id} (functional dependency exists).
{bd_ID} = > {city_id} (functional dependency exists).
{bd_ID} = > {bd_Bgroup} (functional dependency exists).
As the attributes of this table does not have sub attributes, it is in first normal form.
Because every non-primary key attribute is fully functionally dependent on the primary key of the table and it is already in first normal form, this table is now in second normal form.
Since the table is in second normal form and no non-primary key attribute is transitively dependent on the primary key, the table is now in 3NF.

TABLE 2:

City (city_id , city_name)
{city_id}= > {city_name}
The table is in first normal form.
The table is in second normal form.
The table is in third normal form.

TABLE 3:

Recording_staff (reco_name, reco_ID, reco_phNo)
{reco_id} = > {reco_name} (functional dependency exists).
{reco_id} = > {reco_phNo} (functional dependency exists).
The table is in first normal form.
The table is in second normal form.
The table is in third normal form.

TABLE 4:

Blood_recipient (reci_Id, reci_sex, reci_phNo, reci_age, reci_date, reci_name, reci_Bqnty, reci_Bgrp, reco_id, city_id, m_id)
{reci_Id} = > {reci_sex} (functional dependency exists).
{reci_Id} = > {reci_age} (functional dependency exists).
{reci_Id} = > {reci_date} (functional dependency exists).
{reci_Id} = > {reci_name} (functional dependency exists).
{reci_Id} = > {reci_bqnty} (functional dependency exists).
{reci_Id} = > {reci_Bgrp} (functional dependency exists).
{reci_Id} = > {reco_id} (functional dependency exists).
{reci_Id} = > {city_id} (functional dependency exists).
{reci_Id} = > {m_id} (functional dependency exists).
The table is in first normal form.
The table is in second normal form.
The table is in third normal form.

TABLE 5:

Blood Specimen (b_group, specimen_no, status, dfind_id, m_id)
{b_group, specimen _no} = > {status} (functional dependency exists).
{b_group, specimen _no} = > {dfind _id} (functional dependency exists).
{b_group, specimen _no} = > {m_id} (functional dependency exists).
The table is in first normal form.
The table is in second normal form.
The table is in third normal form.

TABLE 6:

Disease_finder (dfind_id, dfind_name, dfind_PhNo)
{ dfind_id } = > { dfind_name }
{ dfind_id } = > { dfind_PhNo } (functional dependency exists).
The table is in first normal form.
The table is in second normal form.
The table is in third normal form.

TABLE 7:

BB_manager (M_id, m_name, m_phNo)
{M_id} = >{m_name}
{M_id} = > {m_phNo} (functional dependency exists)
The table is in first normal form.
The table is in second normal form.
The table is in third normal form.

TABLE 8:

Hospital_Info (hosp_Id, hosp_Name, hosp_phNo, hosp_needed_Bgrp, hosp_needed_qty, city_id, m_id)
{hosp_Id}= > {hosp_Name, hosp_phNo city_id, m_id}
{hosp_Id, hosp_needed_Bgrp } = > hosp_needed_qty (functional dependency exists)
The table is in first normal form.
Since every non-primary key attribute is not fully functionally dependent on the primary key of the table, this table is not in second normal form. Hence we have to split the table.
Hospital_1 (hosp_Id, hosp_phNo, hosp_Name, city_id, m_id).
Hospital_2 (hosp_Id, hosp_needed_Bgrp, hosp_needed_qty)
Now it is in second normal form. The table is in third normal form.

Thanks!