AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)

Course Title: Introduction to Database

Section: C

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Final Project

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Business Environment

Our system is a desktop application. It supports the operating system – Windows 7, Windows 8, Windows 10, Linux. Using our database the required information can be accessed with the proper administrative permission. Our database will contain all the blood donor and blood banks record which will be recorded by the administrative employees. Every donor will be given an Id which will be known as D_ID. In every sector of their donation, this D_ID will be used as their identity. During donation, all the donor info will be saved in their D_ID and in any requirement, blood banks or other administrative employee will get information about them just in a second. For managing blood bank stuffs and their details every stuff will also get an S_ID which will be used to manage their details information. There are table ADDRESS and CONTACT tables which contains every details address and contact information of the blood banks, donor and stuffs. By these tables any address/contact information can be found in seconds. The CONDITION and MEDICAL CONDITION table will kepp track about the donor's health condition and the environmental condition of the medical centers. Using the database application any data stored can be retrieved within a second .

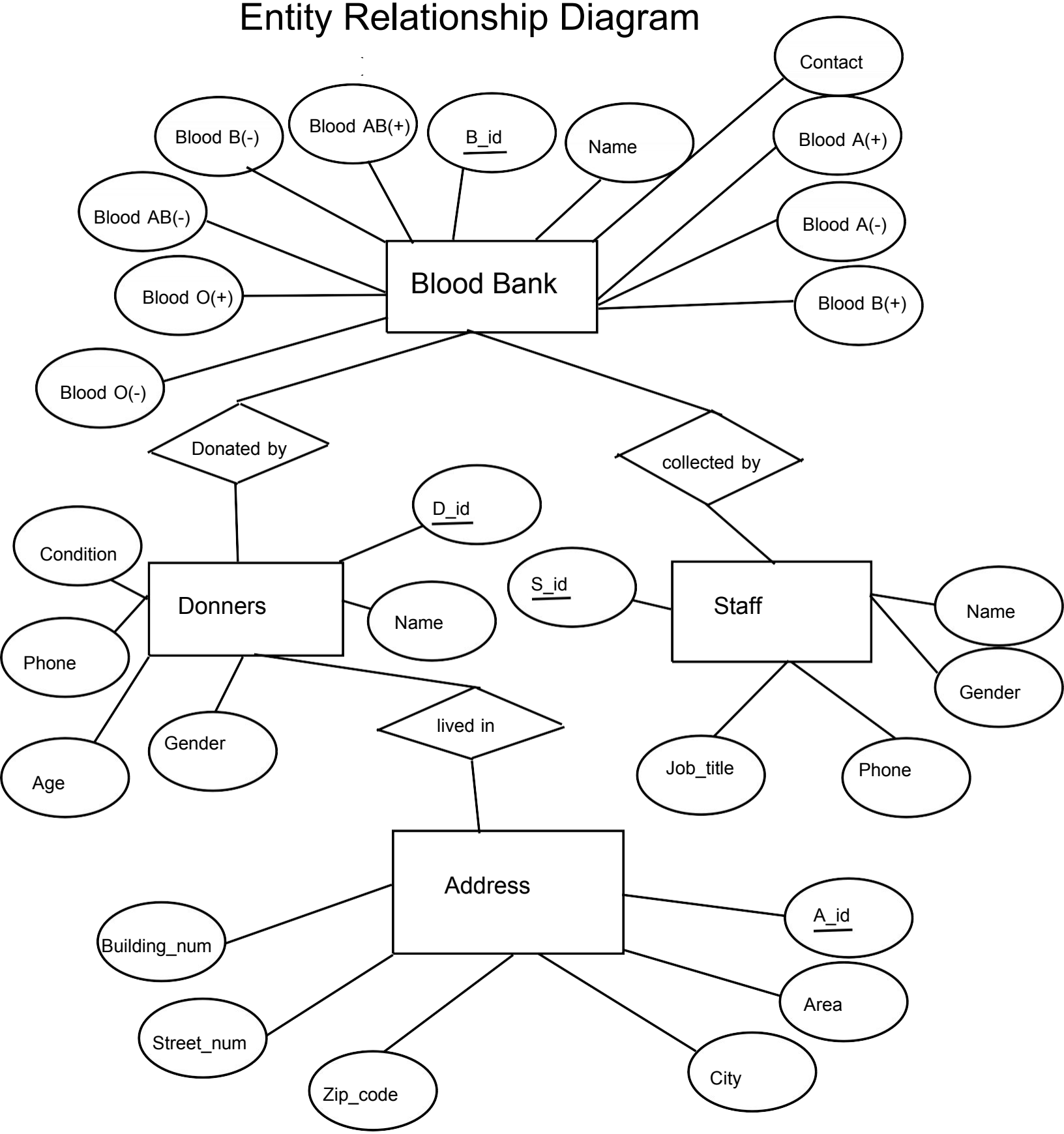
Project Objectives

- ➔ **Planned working environment:** The working environment in the blood bank would be planned and organized. As the data would be properly stored, it would help the administrators to retrieve data as much as we want.
- ➔ **Easy Operation:** The system would be easy to operate and user friendly. Anyone with a small technical knowledge would be able to operate this system.
- ➔ **Accuracy:** The level of accuracy would be very much provided in the system.
- ➔ **Reliability:** The fact of reliability would be higher because of the proper storage of information.
- ➔ **No redundancy:** No redundancy of data would be in the system .This would assure economic use of storage space consistency of the data stored.

There are also some other objectives:

- Maintaining all the blood bank details.
- Maintaining records of all the blood donors.
- Maintaining details of blood bank stuffs.
- Maintaining details condition of the medical centers.
- Providing different facilities for a donor and records their details.
- Administrative user can search a donor record only by knowing their D_ID.This project provides different facilities for a blood bank and its management. Administrative users can search a donor or stuff record by their id.

Entity Relationship Diagram



Normalization

Blood banks table:

B_id	name	contact	Blood A(+)	Blood A(-)	Blood B(+)	Blood B(-)	Blood AB(-)	Blood AB(+)	Blood O(+)	Blood O(-)

1NF:
Here contact is multivalued attribute. So we remove contact from blood banks table to another table and get 1NF form.

B_id	name	Blood A(+)	Blood A(-)	Blood B(+)	Blood B(-)	Blood AB(-)	Blood AB(+)	Blood O(+)	Blood O(-)

B_id	contact

2NF:
There is no partial dependency. So there is no need to do 2NF.

3NF:
There is no transitive dependency. So there is no need to do 3NF

Address table:

A_id	Building_num	Street_num	area	city	Zip_code

1NF:
There is no multivalued attributes in the table. So it is in 1NF.

2NF:
There is no partial dependency. So there is no need to do 2NF.

3NF:
There is no transitive dependency. So there is no need to do 3NF

Staff table:

S_id	name	gender	Job_title	phone

1NF:
There is no multivalued attributes in the table. So it is in 1NF.

2NF:
There is no partial dependency. So there is no need to do 2NF.

3NF:

There is no transitive dependency. So there is no need to do 3NF

Donors Table:

D_id	name	Age	gender	phone	condition

1NF:
Here condition is multivalued attribute. So we remove condition from blood banks table to another table and get 1NF form.

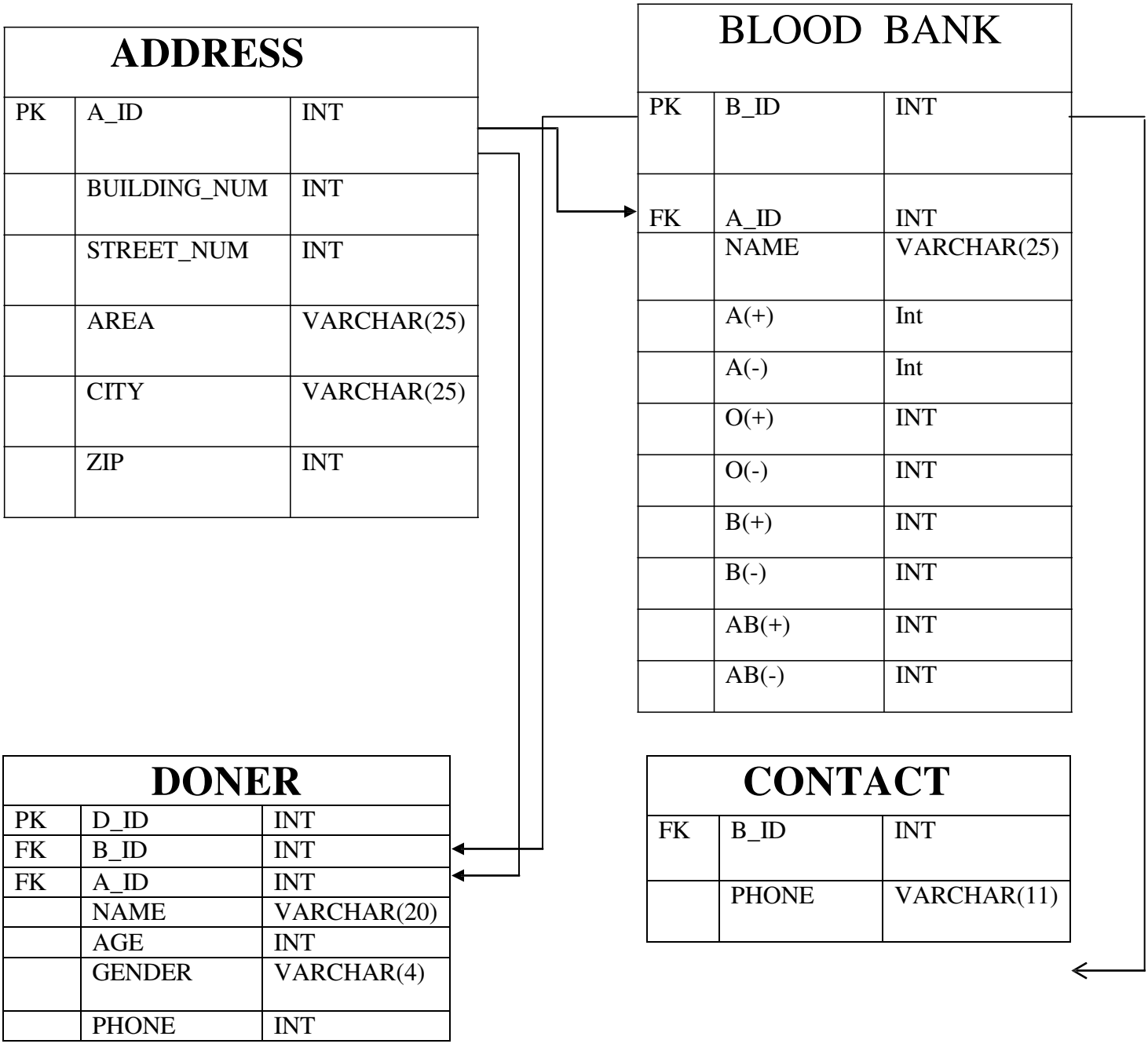
D_id	name	Age	gender	phone

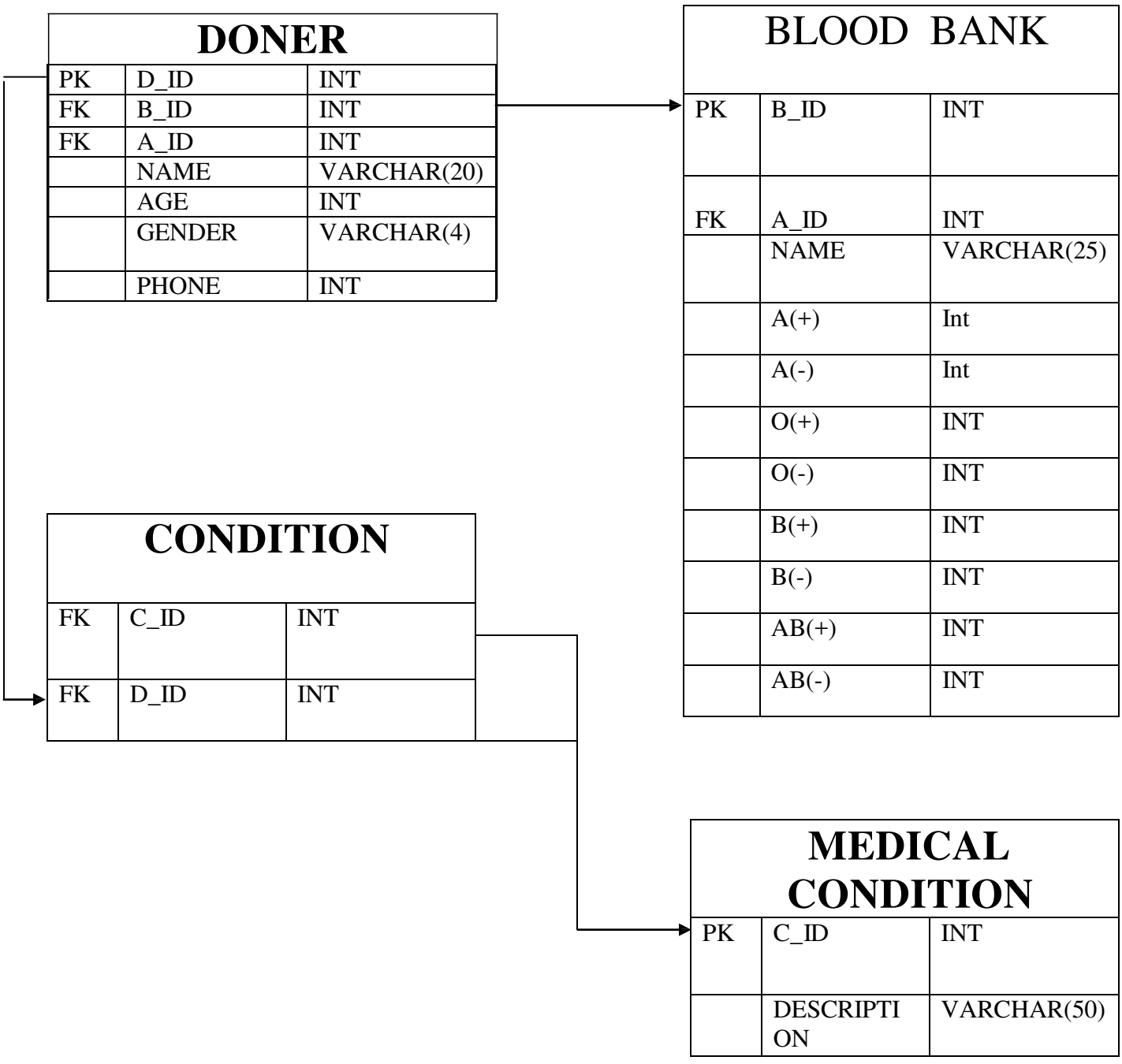
C_id	description

2NF:
There is no partial dependency. So there is no need to do 2NF.

3NF:
There is no transitive dependency. So there is no need to do 3NF

Relationship Diagram




DONER
PK D_ID INT
FK B_ID INT
FK A_ID INT
NAME VARCHAR(20)
AGE INT
GENDER VARCHAR(4)
PHONE INT
BLOOD BANK
PK B_ID INT
FK A_ID INT
NAME VARCHAR(25)
A(+) Int
A(-) Int
O(+) INT
O(-) INT
B(+) INT
B(-) INT
AB(+) INT
AB(-) INT
CONDITION
FK C_ID INT
FK D_ID INT
MEDICAL CONDITION
PK C_ID INT
DESCRIPTION VARCHAR(50)

Address Table

create table Address(a_id int not null, building_num int not null,street_num int not null, area varchar(25) not null,city varchar(25) not null, zip int not null, constraint a_pk primary key(a_id));

- insert into Address values(1001,25,5,' Paltan','dhaka','1000');
- insert into Address values(1002,10,2, 'Ramna','dhaka','1212');
- insert into Address values(1003,5,7, 'Tejgaon','dhaka','1000');
- insert into Address values(1004,12,7, 'Lalbug','dhaka','1162');
- insert into Address values(1005,10,6, 'mirpur', 'Dhaka' ,'1263');
- insert into Address values(1006,18,2, 'Kotowali', 'comilla','1132');
- insert into Address values(1007,3,11,'Shabagh','dhaka','1000');
- insert into Address values(1008,10,1, 'Khulna Sadar','Khulna','1208');

select * from address;

Results Explain Describe Saved SQL History

A_ID	BUILDING_NUM	STREET_NUM	AREA	CITY	ZIP
1001	25	5	Paltan	dhaka	1000
1002	10	2	Ramna	dhaka	1212
1003	5	7	Tejgaon	dhaka	1000
1005	10	6	Mirpur	dhaka	1263
1004	12	7	Lalbug	dhaka	1162
1006	18	2	Kotowali	comilla	1132
1007	3	11	Shabagh	dhaka	1000
1008	10	1	Khulna Sadar	Khulna	1208

Blood Bank Table

create table blood_bank(b_id int not null, a_id int not null, b_name varchar(25) not null, o_p int, o_n int, a_p int, a_n int, b_p int, b_n int, ab_p int, ab_n int, constraint b_pk primary key(b_id),constraint a_fk foreign key(a_id) references address(a_id));

- insert into blood_bank values (1501,1001,' Quantam Foundation',15,7,12,4,30,10,14,8);
- insert into blood_bank values (1502,1002, 'Red Crecent Blood Center',25,2,15,9,25,8,7,10);
- insert into blood_bank values (1503,1003,' Sandhani',10,15,18,4,20,12,37,0);
- insert into blood_bank values (1504,1004, 'Sandhani',12,0,13,2,5,10,3,10);
- insert into blood_bank values (1505,1005, 'Sandhani',10,30,33,12,50,16,23,15);
- insert into blood_bank values (1506,1006,' Red Crecent Blood Center',20,4,13,22,5,11,24,11);
- insert into blood_bank values (1507,1007, 'Badhan,22,2,63,12,45,10,34,10);
- insert into blood_bank values (1508,1008, 'Sandhani',2,12,0,16,5,50,3,15);

select * from blood_bank;

Results Explain Describe Saved SQL History

B_ID	A_ID	B_NAME	O_P	O_N	A_P	A_N	B_P	B_N	AB_P	AB_N
1501	1001	Quantam Foundation	15	7	12	4	30	10	14	8
1502	1002	Red Crecent Blood Center	25	2	15	9	25	8	7	10
1503	1003	Sandhani	10	15	18	4	20	12	37	0
1504	1004	Sandhani	12	0	13	2	5	10	3	10
1505	1005	Sandhani	10	30	33	12	50	16	23	15
1506	1006	Red Crecent Blood Center	20	4	13	22	5	11	24	11
1507	1007	Badhan	22	2	63	12	45	10	34	10
1508	1008	Sandhani	2	12	0	16	5	50	3	15

Contact Table

create table contact(b_id int not null, phone varchar(11), constraint c_fk foreign key(b_id) references blood_bank(b_id));

- insert into contact values (1501,'01742242231');
- insert into contact values (1502,'01723548934');
- insert into contact values (1503,'01943776288');
- insert into contact values (1504,'01621637676');
- insert into contact values (1505,'01521634692');
- insert into contact values (1506,'031616625');
- insert into contact values (1507,'05314787');
- insert into contact values (1508,'0041761509');

select * from contact;

Results | Explain | Describe | Saved SQL | History

B_ID	PHONE
1501	01742242231
1502	01723548934
1503	01943776288
1504	01621637676
1505	01521634692
1506	031616625
1507	05314787
1508	0041761509

Staff Table

create table staff(s_id int not null, b_id int not null, sname varchar(15) not null,
gender varchar(4) not null, job_title varchar(10) not null, phone varchar(11), sal int, constraint
s_pk primary key(s_id), constraint s_fk foreign key(b_id) references blood_bank(b_id));
insert into staff values ('2001','1501','Nadim','M','Guard','01677464122',5000);

- insert into staff values ('2002','1501','Ishrat','F','technician','01539697419',15000);
- insert into staff values ('2003','1505','Nabila','F','Nurse','01739752937',7000);
- insert into staff values ('2004','1503','Imran','M','Doctor','01681541337', 30000);
- insert into staff values ('2005','1506','Mehrab','M','Manager','01682031118',25000);
- insert into staff values ('2006','1504','Ruhi','F','Nurse','01694729791',7000);
- insert into staff values ('2007','1506','Shayla','F','Doctor','01947230920',30000);
- insert into staff values ('2008','1503','Nazrul','M','Guard','01923886931',5000);
- insert into staff values ('2009','1504','Taslima','f','Nurse','01734793274',5000);
- insert into staff values ('2010','1504','Aman','M','Guard','01723764993',6000);

select * from staff;

Results Explain Describe Saved SQL History

S_ID	B_ID	SNAME	GENDER	JOB_TITLE	PHONE	SAL
2001	1501	Nadim	M	Guard	01677464122	5000
2002	1501	Ishrat	F	technician	01539697419	15000
2003	1501	Nabila	F	Nurse	01739752937	7000
2004	1503	Imran	M	Doctor	01681541337	35000
2005	1501	Mehrab	M	Manager	01682031118	25000
2006	1501	Ruhi	F	Nurse	01694729791	7000
2007	1501	Shayla	F	Doctor	01947230920	30000
2008	1503	Nazrul	M	Guard	01923886931	5000
2009	1504	Taslima	f	Nurse	01734793274	8000
2010	1504	Aman	M	Guard	01723764993	6000

Donors Table

create table donors(d_id int not null, b_id int not null, a_id int not null, name varchar(20) not null, age int not null, gender varchar(1) not null, phone varchar(11), constraint d_pk primary key(d_id), constraint d1_fk foreign key(b_id) references blood_bank(b_id), constraint d2_fk foreign key(a_id) references address(a_id));

- insert into donors values (101,1501,1001,'Asaduzzaman',21,'M','01681541338');
- insert into donors values (102,1502,1003,'Mahbub Hasan',20,'M','01681541339');
- insert into donors values (103,1503,1002,'Taijul islam',21,'M','01523646264');
- insert into donors values (104,1504,1005,'Noor Hasan',40,'M','01890378424');
- insert into donors values (105,1502,1004,'Abdullah Al Imran',21,'M','01683746729');
- insert into donors values (106,1505,1003,'Imran hossain',21,'M','01681541337');

select * from donors;

Results Explain Describe Saved SQL History

D_ID	B_ID	A_ID	NAME	AGE	GENDER	PHONE
101	1501	1001	Asaduzzaman	21	M	01681541338
102	1502	1003	Mahbub Hasan	20	M	01681541339
103	1503	1002	Taijul islam	21	M	01523646264
104	1504	1005	Noor Hasan	40	M	01890378424
105	1502	1004	Abdullah Al Imran	21	M	01683746729
106	1505	1003	Imran hossain	21	M	01681541337

Medical Condition Table

create table Medical(c_id int not null, description varchar(50), constraint m_pk primary key(c_id));

- insert into Medical values (3001,'Need to rest');
- insert into Medical values (3002,'Healthy');
- insert into Medical values (3003,'Good');
- insert into Medical values (3004,'Take proper rest');
- insert into Medical values (3005,’bad’);
- insert into Medical values (3006,'Healthy');
- insert into Medical values (3007,'Very bad situation');
- insert into Medical values (3008,'Good');

select * from medical;

Results | Explain | Describe | Saved SQL | History

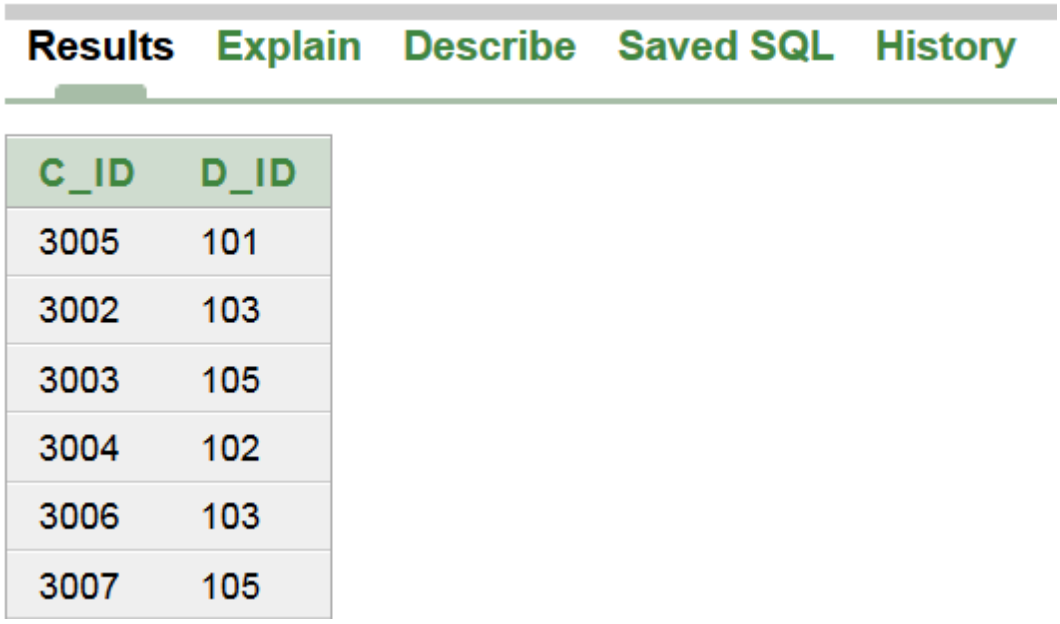
C_ID	DESCRIPTION
3001	Need to rest
3002	Healthy
3003	Good
3004	Take proper rest
3005	Bad
3006	Healthy
3007	Very bad situation
3008	Good

Condition Table

create table condition(c_id int not null,d_id int not null,constraint con1_fk foreign key(c_id) references medical(c_id), constraint con2_fk foreign key(d_id) references donar(d_id));

- insert into condition values (3001,104);
- insert into condition values (3002,103);
- insert into condition values (3003,105);
- insert into condition values (3004,102);
- insert into condition values (3005,101);
- insert into condition values (3006,103);
- insert into condition values (3007,105);

select * from condition;



C_ID	D_ID
3005	101
3002	103
3003	105
3004	102
3006	103
3007	105

View Creation

Simple View:

CREATE VIEW Staff11

AS SELECT s_id Staff_id, sname staff_name, job_title

FROM staff

WHERE b_id =1501;

select * from staff11;

Results Explain Describe Saved SQL History

STAFF_ID	STAFF_NAME	JOB_TITLE
2001	Nadim	Guard
2002	Ishrat	technician
2003	Nabila	Nurse
2005	Mehrab	Manager
2006	Ruhi	Nurse
2007	Shayla	Doctor

CREATE VIEW donors30

AS SELECT D_ID DONOR_ID, Name DONOR_name, PHONE PHONE_NUMBER

FROM DONORS

WHERE AGE =21;

SELECT * FROM donors30;

Results Explain Describe Saved SQL History

DONOR_ID	DONOR_NAME	PHONE_NUMBER
101	Asaduzzaman	01681541338
103	Taijul islam	01523646264
105	Abdullah Al Imran	01683746729
106	Imran hossain	01681541337

Complex View:

```
CREATE VIEW BANK_SAL(name, minsal, maxsal, avgsal)
AS SELECT B.B_NAME, MIN(S.sal), MAX(S.sal),ROUND(AVG(S.sal),2)
FROM BLOOD_BANK B, STAFF S
WHERE S.B_ID = B.B_ID
GROUP BY B.B_NAME;
```

SELECT * FROM BANK_SAL;

Results | Explain | Describe | Saved SQL | History

NAME	MINSAL	MAXSAL	AVGSAL
Sandhani	5000	35000	13500
Quantam Foundation	5000	30000	14833.33

Some Queries

1. List the staff whose name's second letter is 'a'

   select * from staff where sname like'_a%';

Results Explain Describe Saved SQL History

S_ID	B_ID	SNAME	GENDER	JOB_TITLE	PHONE	SAL
2001	1501	Nadim	M	Guard	01677464122	5000
2003	1501	Nabila	F	Nurse	01739752937	7000
2008	1503	Nazrul	M	Guard	01923886931	5000
2009	1504	Taslima	f	Nurse	01734793274	8000

2. List the contactno & salary of all 'Nurse','Doctor','guard' along with their name.

   select job_title,sname,phone,sal from staff where job_title in('Nurse','Doctor','Guard');

Results Explain Describe Saved SQL History

JOB_TITLE	SNAME	PHONE	SAL
Guard	Nadim	01677464122	5000
Nurse	Nabila	01739752937	7000
Doctor	Imran	01681541337	35000
Nurse	Ruhi	01694729791	7000
Doctor	Shayla	01947230920	30000
Guard	Nazrul	01923886931	5000
Nurse	Taslima	01734793274	8000
Guard	Aman	01723764993	6000

3. Display all blood bank's info and address

   select b.b_id,b.b_name,a.building_num,a.street_num,a.area,a.city,a.zip

from address a, blood_bank b

where a.a_id=b.a_id;

Results Explain Describe Saved SQL History

B_ID	B_NAME	BUILDING_NUM	STREET_NUM	AREA	CITY	ZIP
1501	Quantam Foundation	25	5	Paltan	dhaka	1000
1502	Red Crecent Blood Center	10	2	Ramna	dhaka	1212
1503	Sandhani	5	7	Tejgaon	dhaka	1000
1504	Sandhani	12	7	Lalbug	dhaka	1162
1505	Sandhani	10	6	Mirpur	dhaka	1263
1506	Red Crecent Blood Center	18	2	Kotowali	comilla	1132
1507	Badhan	3	11	Shabagh	dhaka	1000
1508	Sandhani	10	1	Khulna Sadar	Khulna	1208

4. Display all Donors name, age, phone number and their medical description

select c.c_id,c.d_id,d.name,d.age,d.phone, m.description

from condition c,medical m,donors d

where c.c_id= m.c_id

and c.d_id=d.d_id;

Results Explain Describe Saved SQL History

C_ID	D_ID	NAME	AGE	PHONE	DESCRIPTION
3001	104	Noor Hasan	40	01890378424	Need to rest
3002	103	Taijul islam	21	01523646264	Healthy
3003	105	Abdullah Al Imran	21	01683746729	Good
3004	102	Mahbub Hasan	20	01681541339	Take proper rest
3005	101	Asaduzzaman	21	01681541338	Bad
3006	103	Taijul islam	21	01523646264	Healthy
3007	105	Abdullah Al Imran	21	01683746729	Very bad situation

5. Display all blood bank name, the quantity of blood group's, and phone number

select b.b_id,b.b_name,b.o_p as "O(+)",b.o_n as "O(-)",b.A_p as "A(+)",b.A_n as

"A(-)",b.B_p as "B(+)",b.B_n as "B(-)",b.AB_p as "AB(+)",b.AB_n as "AB(-)",c.phon

from blood_bank b, contact c

where b.b_id=c.b_id;

Results Explain Describe Saved SQL History

B_ID	B_NAME	O(+)	O(-)	A(+)	A(-)	B(+)	B(-)	AB(+)	AB(-)	PHONE
1501	Quantam Foundation	15	7	12	4	30	10	14	8	01742242231
1502	Red Crecent Blood Center	25	2	15	9	25	8	7	10	01723548934
1503	Sandhani	10	15	18	4	20	12	37	0	01943776288
1504	Sandhani	12	0	13	2	5	10	3	10	01621637676
1505	Sandhani	10	30	33	12	50	16	23	15	01521634692
1506	Red Crecent Blood Center	20	4	13	22	5	11	24	11	031616625
1507	Badhan	22	2	63	12	45	10	34	10	05314787
1508	Sandhani	2	12	0	16	5	50	3	15	0041761509

6. Display all donors name whose age is less then 25

select d_id, name, gender, phone

from donors

where age < 25;

Results Explain Describe Saved SQL History

D_ID	NAME	GENDER	PHONE
101	Asaduzzaman	M	01681541338
102	Mahbub Hasan	M	01681541339
103	Taijul islam	M	01523646264
105	Abdullah Al Imran	M	01683746729
106	Imran hossain	M	01681541337

7. Display blood bank's staff's max, min and average salary.

SELECT B.B_NAME, MIN(S.sal), MAX(S.sal),ROUND(AVG(S.sal),2)

```
FROM BLOOD_BANK B, STAFF S
WHERE S.B_ID = B.B_ID
GROUP BY B.B_NAME;
```

Results Explain Describe Saved SQL History

B_NAME	MIN(S.SAL)	MAX(S.SAL)	ROUND(AVG(S.SAL),2)
Sandhani	5000	35000	13500
Quantam Foundation	5000	30000	14833.33

Summarization

This system supports:

- ✓ Maintaining blood bank details.
- ✓ Maintaining blood donor details.
- ✓ Providing Medical condition details.
- ✓ Providing donor health condition details.
- ✓ Managing stuffs of blood bank.

Every steps are to maintained properly so that other portion dependent on them can operate properly. Every table of required attributes should be fill up by giving proper value entry. The details of every blood donor are given in their required places. Their details,health condition, medical condition and current status are also required to save their records forever. The blood bank stuffs are also under this system. This system will store all the data about their details. Whenever the administrative users need to know the details of any donor/stuff, he / she can get to know every details stored in the database within a second. Not only donors, stuff management is also very important in a blood bank because failure in the maintenance of stuff can cause anarchy.

Thank You!