NATIONAL INSTITUTE OF TECHNOLOGY WARANGAL

Department of Computer Science and Engineering

CSE-II , B.TECH

DATABASE MANAGEMENT SYSTEM PROJECT ON BLOOD BANK MANAGEMENT DATABASE

SUBMITTED BY :

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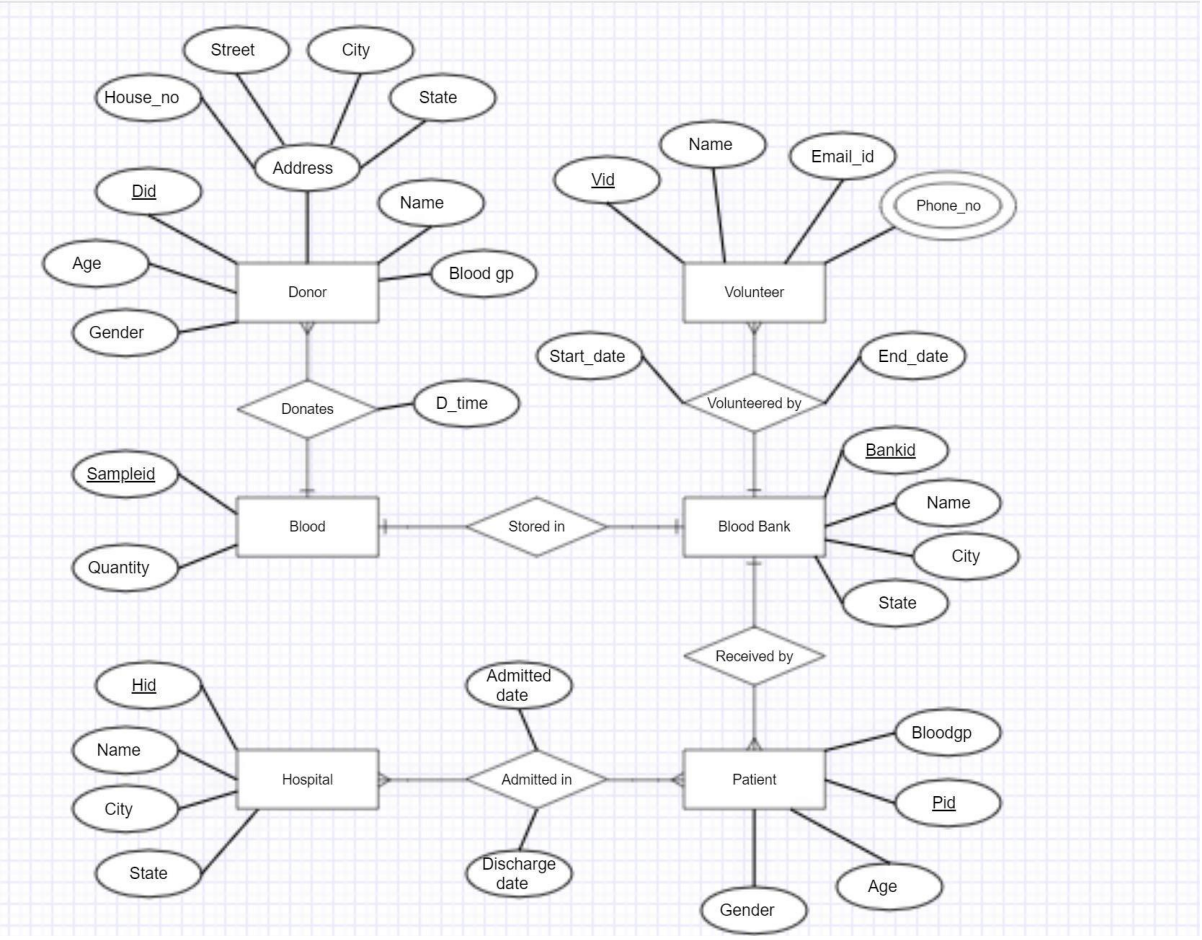
PROBLEM STATEMENT AND DESCRIPTION:

The **'BLOOD BANK MANAGEMENT SYSTEM'** project is to connect all blood banks, hospitals, and donors into a single network, validate data, and preserve information on each person's blood. This technique is used to store data on a centralised server that has a database that no one else can access.
It focuses on these entities and relationship between them with all key constraints and participation constraints.

CONTENTS:

- **ER Diagram**
- **Schema**
- **Creation of Tables**
- **Normalization**
- **Relational Schema with Normalized tables**
- **Insertion of tables**
- **Queries**

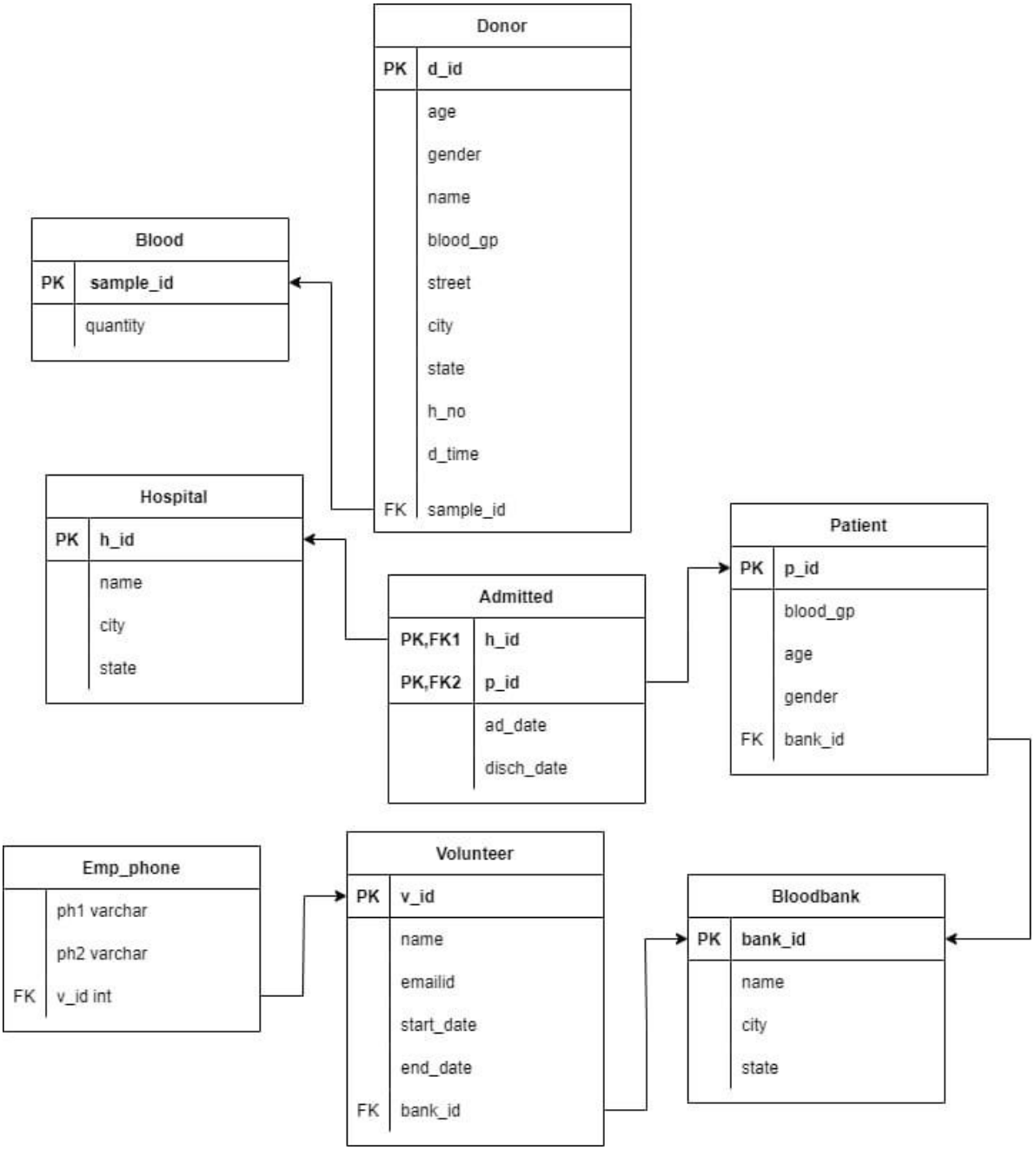
ER DIAGRAM:


Street
City
House_no
State
Address
Did
Name
Age
Donor
Blood gp
Gender
Donates
D_time
Sampleid
Blood
Quantity
Stored in
Blood Bank
Bankid
Name
City
State
Name
Email_id
Vid
Phone_no
Volunteer
Start_date
End_date
Volunteered by
Received by
Hid
Name
City
State
Hospital
Admitted date
Admitted in
Discharge date
Patient
Bloodgp
Pid
Age
Gender

RELATIONSHIPS:

Entity1	Entity2	Relationship name	Relation
Donor	Blood	Donates	Many to one
Blood	Blood Bank	Stored in	one to one
Blood Bank	Volunteer	Volunteered by	One to many
Blood Bank	Patient	Received by	One to many
Patient	Hospital	Admitted in	Many to many

RELATIONAL SCHEMA :



FUNCTIONAL DEPENDENCIES AND NORMALISATION

BLOOD :

Address attribute is a composite attribute. So, we represent all the derived attributes in the relation in tuples. Finally, this ensures atomicity. So, it is in 1nf.

The functional dependencies are sample_id->sample_id,quantity.

The relation does not have any partial dependencies. So, it is in 2nf.

The relation does not have any transitive dependencies. So, it is in 3nf.

The table is in bcnf.

DONOR :

The functional dependencies are

1)d_id →age,d_time,gender,name,blood_group,house_no,street,city,state

2)city → state

It satisfies 2nf but not 3nf due to transitive dependency of city → state

So now, we decompose the relation into two relations r1(contains all attributes except state),r2(city(pk),state)

By this decomposition we will achieve both relations will be in 3nf and bcnf

BLOOD BANK :

The functional dependencies are

1) bank_id → state,name,city

2) city → state

It satisfies 2nf but not 3nf due to transitive dependency of city → state

So now, we decompose the relation into two relations r1(contains all attributes except state),r2(city(pk),state)

By this decomposition we will achieve both relations will be in 3nf and bcnf.

PATIENT :

The functional depencies are p_id → blood_group,age,gender.

The relation does not have any partial dependencies. So, it is in 2nf.

The relation does not have any transitive dependencies. So, it is in 3nf.

The table is in bcnf.

HOSPITAL :

The functional dependencies are

1)h-id → state,name,city.

2)city → state

It satisfies 2nf but not 3nf due to transitive dependency of city → state

So now, we decompose the relation into two relations r1(contains all attributes except state),r2(city(pk),state)

By this decomposition we will achieve both relations will be in 3nf and bcnf .

VOLUNTEER :

The functional dependencies are

V_id → name,email_id,start_date,end_date,bank_id,V_id.

The relation does not have any partial dependencies. So, it is in 2nf.

The relation does not have any transitive dependencies. So, it is in 3nf.

The table is in bcnf.

EMP_PHONE :

It is a multi value attribute.so, we created a new table. Now it is in 1nf.

The functional dependencies are Emp_id → ph1,ph2,v_id.

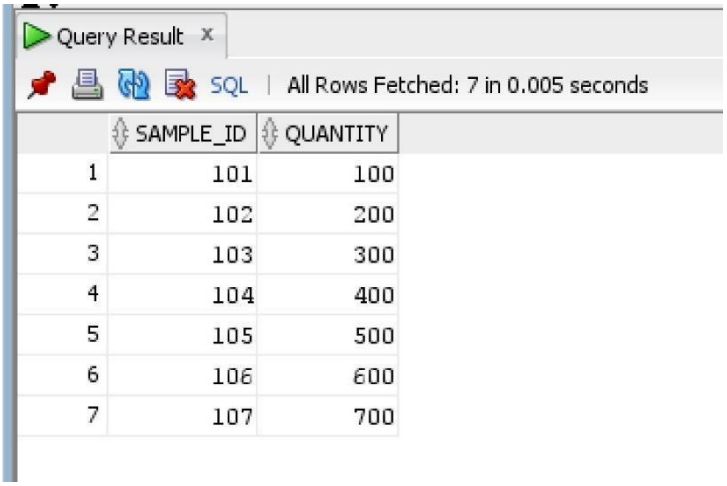
The relation does not have any partial dependencies. So, it is in 2nf.
The relation does not have any transitive dependencies. So, it is in 3nf.
The table is in bcnf.

ADMITTED :

The functional dependencies are
P_id h_id → ad_date,discharge_date.
The relation does not have any partial dependencies. So, it is in 2nf.
The relation does not have any transitive dependencies. So, it is in 3nf.
The table is in bcnf

TABLES CREATION AND VALUES INSERTION :

create table **blood2**(sample_id int primary key,quantity int);
insert into blood2 values(101,100);
insert into blood2 values(102,200);
insert into blood2 values(103,300);
insert into blood2 values(104,400);
insert into blood2 values(105,500);
insert into blood2 values(106,600);
insert into blood2 values(107,700);



Query Result

SQL | All Rows Fetched: 7 in 0.005 seconds

	SAMPLE_ID	QUANTITY
1	101	100
2	102	200
3	103	300
4	104	400
5	105	500
6	106	600
7	107	700

create table **donor2**(did int primary key,age int,d_time date,gender char,name varchar(15),blood_gp varchar(5), h_no int ,street varchar(15) ,city varchar(10) , state varchar(15), sample_id references blood2(sample_id));

insert into donor2 values(201,23,to_date ('01-01-2022','DD-MM-YYYY'),'F','nisha','B',24,'chandanagar','warangal','AP',102);

insert into donor2 values(202,24,to_date ('02-02-2022','DD-MM-YYYY'),'M','pavan','O',23,'gandhinagar','hyderabad','telangana',101);

insert into donor2 values(202,25,to_date ('03-03-2022','DD-MM-YYYY'),'F','akansha','AB',25,'miyapur','mumbai','TN',103);

insert into donor2 values(204,26,to_date ('04-04-2022','DD-MM-YYYY'),'M','shashank','A',26,'hydernagar','chennai','KN',104);

insert into donor2 values(205,27,to_date ('05-05-2022','DD-MM-YYYY'),'M','deepak','O',27,'lingampally','bangalore','MH',105);

insert into donor2 values(206,28,to_date ('06-06-2022','DD-MM-YYYY'),'F','devika','A',28,'uppal','delhi','punjab',106);

Query Result

SQL | All Rows Fetched: 5 in 0.005 seconds

	DID	AGE	D_TIME	GENDER	NAME	BLOOD_GP	H_NO	STREET	CITY	STATE	SAMPLE_ID
1	201	23	01-01-22	F	nisha	B	24	chandanagar	warangal	AP	102
2	202	24	02-02-22	M	pavan	O	23	gandhinagar	hyderabad	telangana	101
3	204	26	04-04-22	M	shashank	A	26	hydernagar	chennai	KN	104
4	205	27	05-05-22	M	deepak	O	27	lingampally	bangalore	MH	105
5	206	28	06-06-22	F	devika	A	28	uppal	delhi	punjab	106

create table **bloodbank2**(bank_id int primary key,name1 varchar(30),city varchar(30),state1 varchar(30));

insert into bloodbank2 values(301,'ABC','bangalore','MH');

insert into bloodbank2 values(302,'BCD','hyderabad','MH');

insert into bloodbank2 values(303,'CDE','warangal','MH');

insert into bloodbank2 values(304,'DEF','mumbai','MH');

insert into bloodbank2 values(305,'EFG','chennai','MH');

insert into bloodbank2 values(306,'FGH','delhi','MH');

insert into bloodbank2 values(307,'GHI','panaji','MH');

Query Result

SQL | All Rows Fetched: 7 in 0.002 seconds

	BANK_ID	NAME1	CITY	STATE1
1	301	ABC	bangalore	MH
2	302	BCD	hyderabad	MH
3	303	CDE	warangal	MH
4	304	DEF	mumbai	MH
5	305	EFG	chennai	MH
6	306	FGH	delhi	MH
7	307	GHI	panaji	MH

create table **patient2**(blood_gp varchar(5),p_id int primary key, age int,gender char,bank_id references bloodbank2(bank_id));

insert into patient2 values('A',401,31,'M',301);

insert into patient2 values('B',402,32,'M',302);

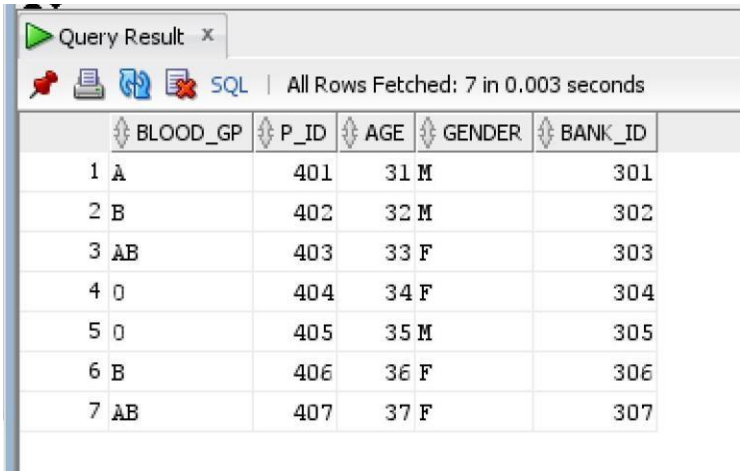
insert into patient2 values('AB',403,33,'F',303);

insert into patient2 values('O',404,34,'F',304);

insert into patient2 values('O',405,35,'M',305);

insert into patient2 values('B',406,36,'F',306);

insert into patient2 values('AB',407,37,'F',307);



Query Result

SQL | All Rows Fetched: 7 in 0.003 seconds

	BLOOD_GP	P_ID	AGE	GENDER	BANK_ID
1	A	401	31	M	301
2	B	402	32	M	302
3	AB	403	33	F	303
4	O	404	34	F	304
5	O	405	35	M	305
6	B	406	36	F	306
7	AB	407	37	F	307

create table **hospital2**(h_id int primary key,name1 varchar(30),city varchar(30),state1 varchar(30));

insert into hospital2 values(501,'kims','bangalore','mh');

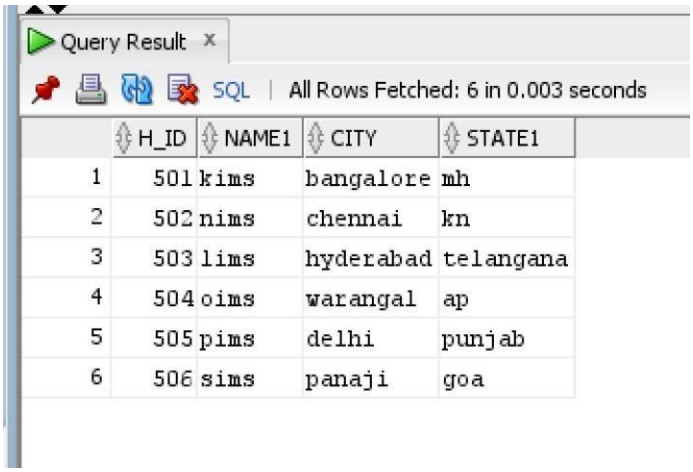
insert into hospital2 values(502,'nims','chennai','kn');

insert into hospital2 values(503,'lims','hyderabad','telangana');

insert into hospital2 values(504,'oims','warangal','ap');

insert into hospital2 values(505,'pims','delhi','punjab');

insert into hospital2 values(506,'sims','panaji','goa');



	H_ID	NAME1	CITY	STATE1
1	501	kims	bangalore	mh
2	502	nims	chennai	kn
3	503	lims	hyderabad	telangana
4	504	oims	warangal	ap
5	505	pims	delhi	punjab
6	506	sims	panaji	goa

create table **admitted2**(ad_date date, disch_date date, h_id references hospital2(h_id), p_id references patient2(p_id));

insert into admitted2 values(to_date ('02-02-2003','DD-MM-YYYY'),to_date ('03-03-2003','DD-MM-YYYY'),501,401);

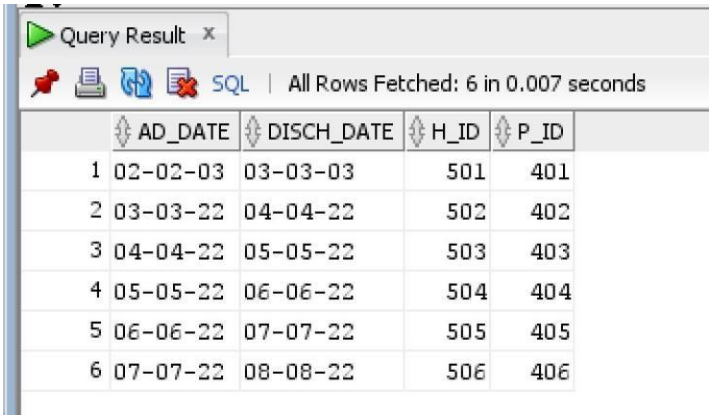
insert into admitted2 values(to_date ('03-03-2022','DD-MM-YYYY'),to_date ('04-04-2022','DD-MM-YYYY'),502,402);

insert into admitted2 values(to_date ('04-04-2022','DD-MM-YYYY'),to_date ('05-05-2022','DD-MM-YYYY'),503,403);

insert into admitted2 values(to_date ('05-05-2022','DD-MM-YYYY'),to_date ('06-06-2022','DD-MM-YYYY'),504,404);

insert into admitted2 values(to_date ('06-06-2022','DD-MM-YYYY'),to_date ('07-07-2022','DD-MM-YYYY'),505,405);

insert into admitted2 values(to_date ('07-07-2022','DD-MM-YYYY'),to_date ('08-08-2022','DD-MM-YYYY'),506,406);


Query Result

SQL | All Rows Fetched: 6 in 0.007 seconds

	AD_DATE	DISCH_DATE	H_ID	P_ID
1	02-02-03	03-03-03	501	401
2	03-03-22	04-04-22	502	402
3	04-04-22	05-05-22	503	403
4	05-05-22	06-06-22	504	404
5	06-06-22	07-07-22	505	405
6	07-07-22	08-08-22	506	406

create table **volunteer2**(v_id int primary key,name1 varchar(30),emailid varchar(30), start_date date, end_date date, bank_id references bloodbank2(bank_id));

insert into volunteer2 values(601,'kushal','kushal@mail.com',to_date ('02-02-2022','DD-MM-YYYY'),to_date ('03-03-2022','DD-MM-YYYY'),301);

insert into volunteer2 values(602,'chaitanya','chaitanya@mail.com',to_date ('03-03-2022','DD-MM-YYYY'),to_date ('04-04-2022','DD-MM-YYYY'),302);

insert into volunteer2 values(603,'jp','jp@mail.com',to_date ('04-04-2022','DD-MM-YYYY'),to_date ('05-05-2022','DD-MM-YYYY'),303);

insert into volunteer2 values(604,'loki','loki@mail.com',to_date ('05-05-2022','DD-MM-YYYY'),to_date ('06-06-2022','DD-MM-YYYY'),304);

insert into volunteer2 values(605,'thor','thor@mail.com',to_date ('06-06-2022','DD-MM-YYYY'),to_date ('07-07-2022','DD-MM-YYYY'),305);

insert into volunteer2 values(606,'ironman','ironman@mail.com',to_date ('07-07-2022','DD-MM-YYYY'),to_date ('08-08-2022','DD-MM-YYYY'),306);

Query Result

SQL | All Rows Fetched: 6 in 0.001 seconds

	V_ID	NAME1	EMAILID	START_DATE	END_DATE	BANK_ID
1	601	kushal	kushal@mail.com	02-02-22	03-03-22	301
2	602	chaitanya	chaitanya@mail.com	03-03-22	04-04-22	302
3	603	jp	jp@mail.com	04-04-22	05-05-22	303
4	604	loki	loki@mail.com	05-05-22	06-06-22	304
5	605	thor	thor@mail.com	06-06-22	07-07-22	305
6	606	ironman	ironman@mail.com	07-07-22	08-08-22	306

create table **Emp_phone2**(ph1 varchar(10), ph2 varchar(30), v_id references volunteer2(v_id));

insert into Emp_phone2 values(9490012336,9032012335,601);

insert into Emp_phone2 values(9618759356,9010055313,602);

insert into Emp_phone2 values(9675467685,9704594084,603);

insert into Emp_phone2 values(6754328623,9866593458,604);

insert into Emp_phone2 values(8956340101,9688935780,605);

insert into Emp_phone2 values(6754329870,9367012537,606);

Query Result

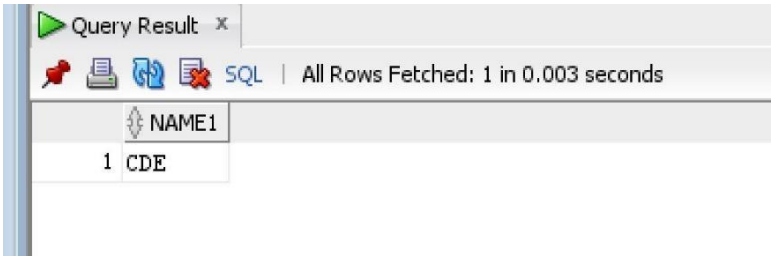
SQL | All Rows Fetched: 6 in 0.005 seconds

	PH1	PH2	V_ID
1	9490012336	9032012335	601
2	9618759356	9010055313	602
3	9675467685	9704594084	603
4	6754328623	9866593458	604
5	8956340101	9688935780	605
6	6754329870	9367012537	606

QUERIES:

1.Find the names of bloodbanks which are present in Warangal?

```
select name1 from bloodbank2
where city='warangal';
```



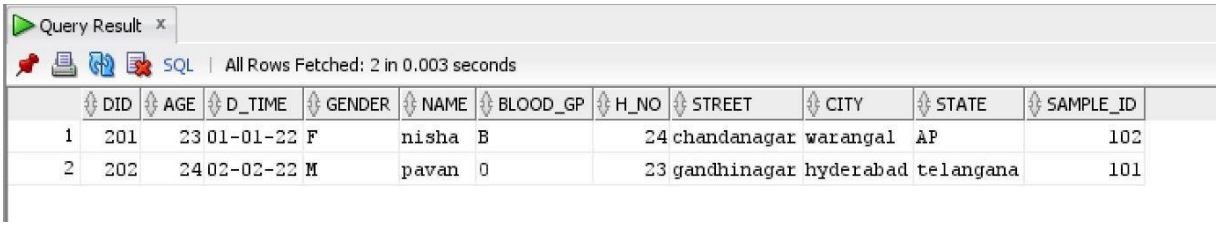
Query Result

SQL | All Rows Fetched: 1 in 0.003 seconds

	NAME1
1	CDE

2.Find the donors whose age < 25?

```
select * from donor2
where age < 25;
```



Query Result

SQL | All Rows Fetched: 2 in 0.003 seconds

	DID	AGE	D_TIME	GENDER	NAME	BLOOD_GP	H_NO	STREET	CITY	STATE	SAMPLE_ID
1	201	23	01-01-22	F	nisha	B	24	chandanagar	warangal	AP	102
2	202	24	02-02-22	M	pavan	O	23	gandhinagar	hyderabad	telangana	101

3.Find the patients who has rare blood group ?

```
select * from patient2
where blood_gp='AB';
```

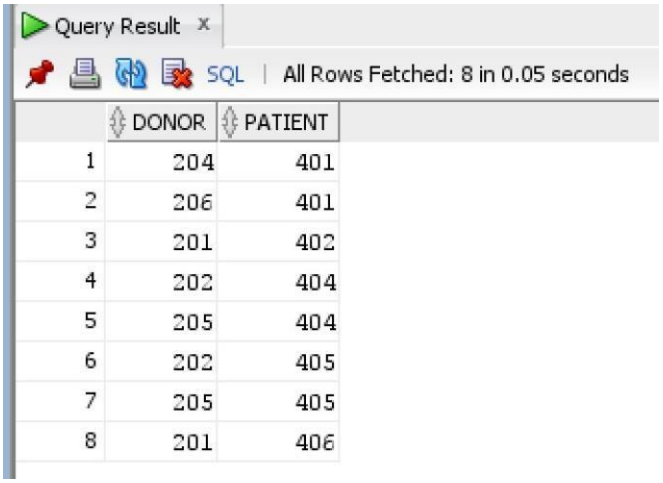
Query Result

SQL | All Rows Fetched: 2 in 0.042 seconds

	BLOOD_GP	P_ID	AGE	GENDER	BANK_ID
1	AB	403	33	F	303
2	AB	407	37	F	307

4.Find donor,patient pairs which has correct blood_type for transmission?

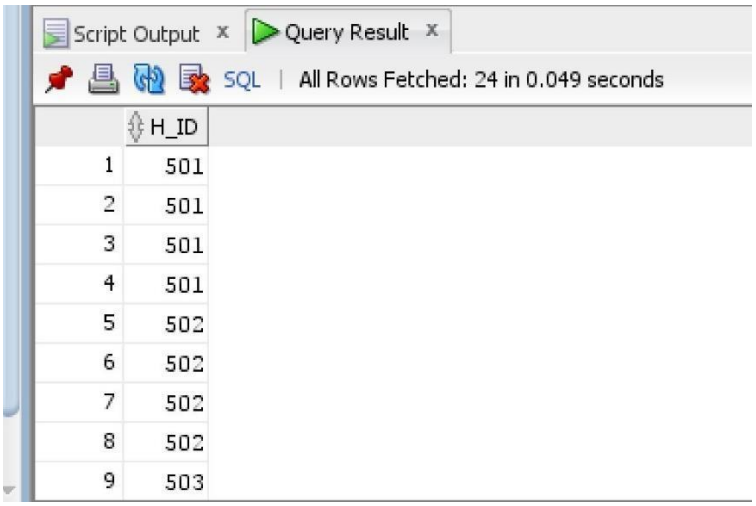
```
select d.did as donor,p.p_id as patient
from donor2 d,patient2 p
where  p.blood_gp=d.blood_gp;
```



	DONOR	PATIENT
1	204	401
2	206	401
3	201	402
4	202	404
5	205	404
6	202	405
7	205	405
8	201	406

5. Find names of patients who were admitted after 01-03-2022 and diacharged before 01-05-2022?

```
select hospital2.h_id from
hospital2,admitted2
where admitted2.ad_date > to_date('01-03-2002','dd-mm-yyyy') and
admitted2.disch_date < to_date('01-05-2022','dd-mm-yyyy');
```



	H_ID
1	501
2	501
3	501
4	501
5	502
6	502
7	502
8	502
9	503