

## **UCS310- Database Management System Lab**

### **Blood Bank Management System**

## **UCS310- Database Management System Project Report**



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## **PROJECT OVERVIEW:**

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 blood banks then group the blood which they receive according to the blood groups. They also make sure that the blood is not contaminated. The main mission of blood banks is to provide the blood to the hospitals and health care systems which saves the patient's life. No hospital can maintain the healthcare system without pure and adequate blood.

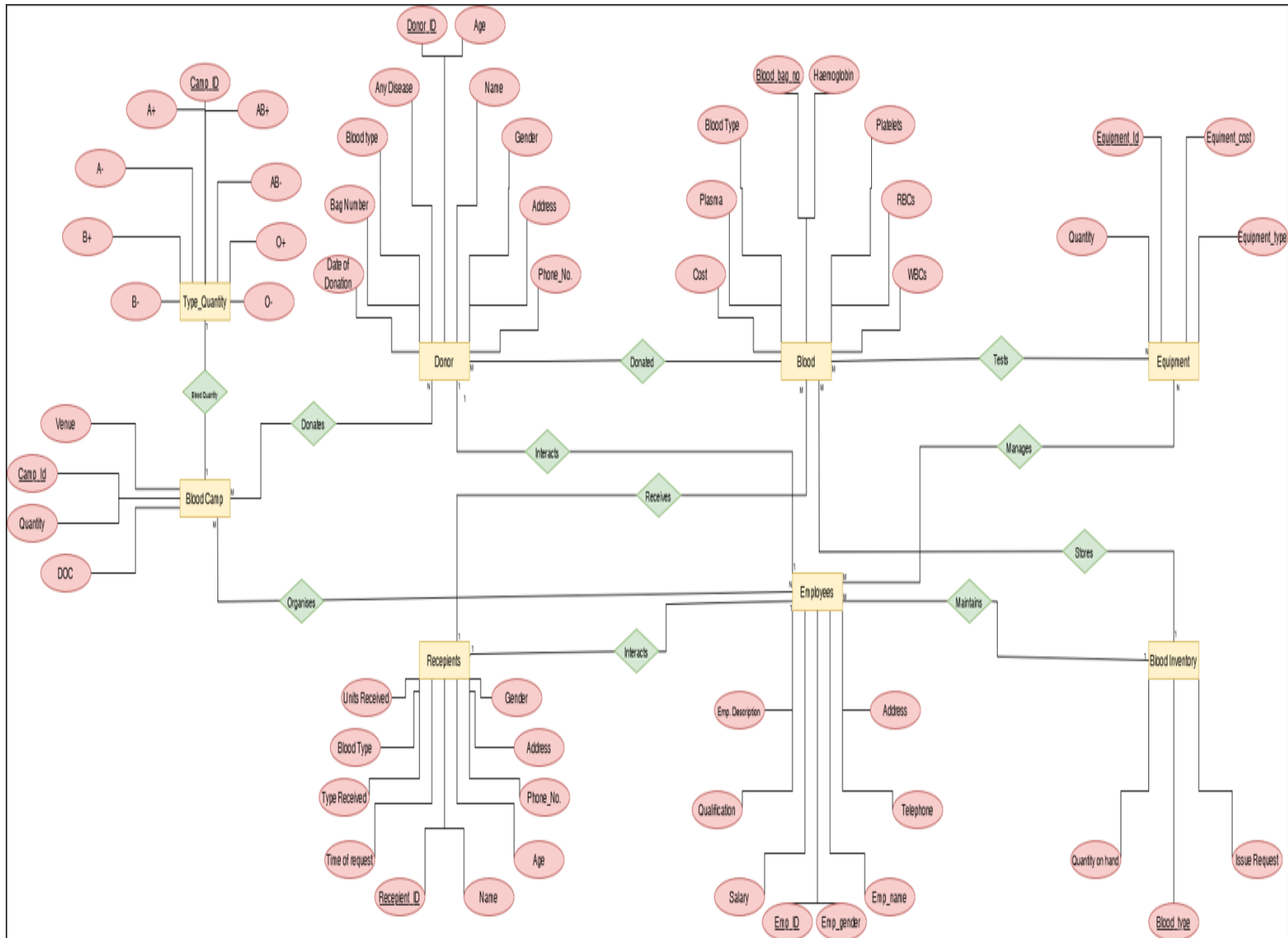
The major concern that each blood bank has is to monitor the quality of blood and people who donate the blood, that is 'donors'. But this is a tough job. The existing system will not satisfy the need of maintaining quality blood and keeping track of donors. To overcome all these limitations we introduced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

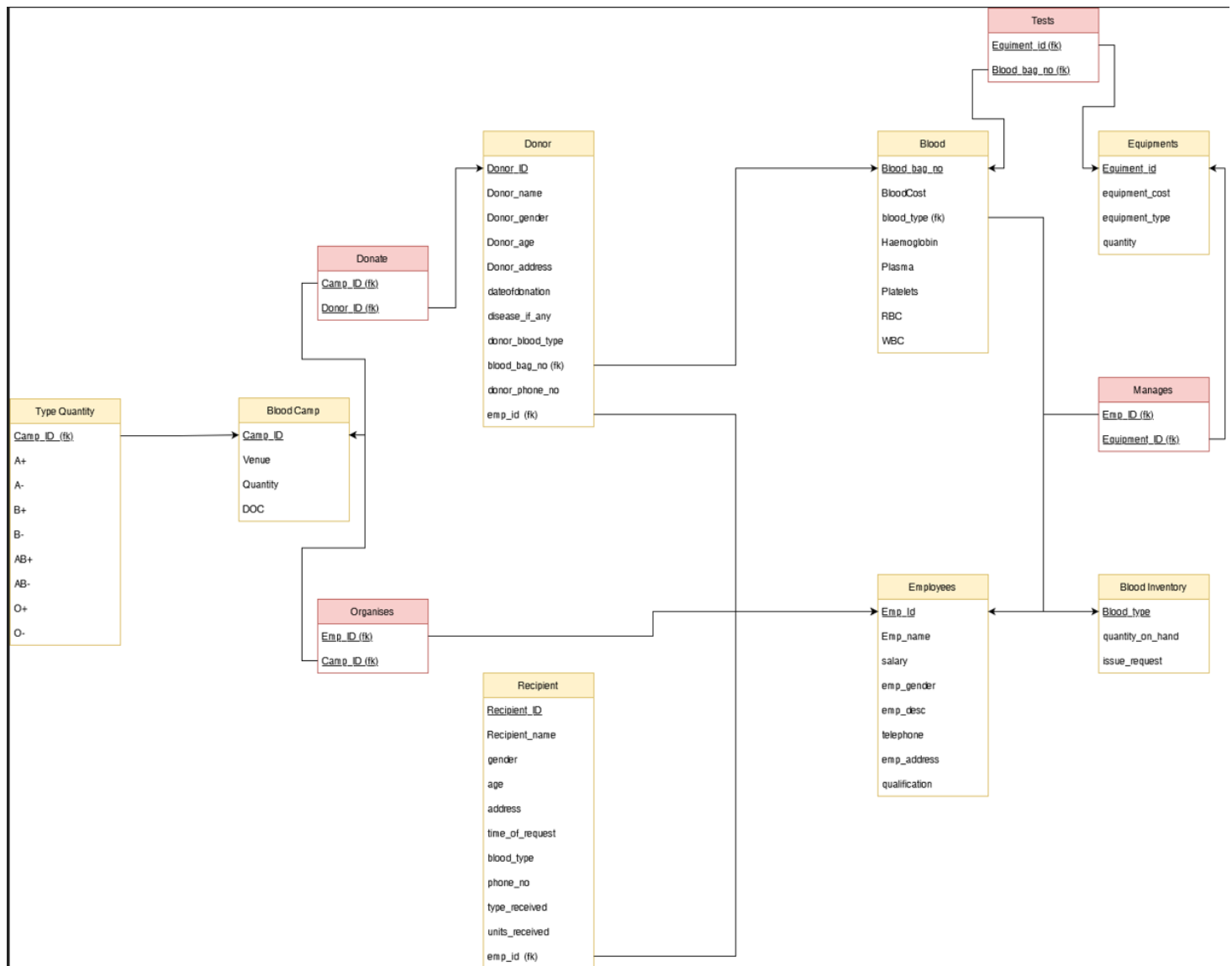
By using this system searching the available blood becomes easy and saves a lot of time than the manual system. It will hoard, operate, recover and analyze information concerned with the administrative and inventory management within a blood bank. This system is developed in a manner that it is manageable,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



## ENTITY - RELATIONSHIP DIAGRAM:



a.) ER Diagram



b.) ER TO TABLE

## NORMALIZED TABLES

### Normalization Rule

Normalization rules are divided into the following normal forms:

1. First Normal Form
2. Second Normal Form
3. Third Normal Form
4. Bounce-Codd Normal Form
5. Fourth Normal Form

### First Normal Form (1NF)

For a table to be in the First Normal Form, it should follow the following 4 rules:

1. It should only have single (atomic) valued attributes/columns.
2. Values stored in a column should be of the same domain
3. All the columns in a table should have unique names.
4. And the order in which data is stored, does not matter.

### Second Normal Form (2NF)

For a table to be in the Second Normal Form,

1. It should be in the First Normal form.
2. And, it should not have Partial Dependency.

### Third Normal Form (3NF)

A table is said to be in the Third Normal Form when,

1. It is in the Second Normal form.
2. And, it doesn't have Transitive Dependency.

### Boyce-Codd Normal Form(BCNF)

A table is said to be in the Boyce-Codd Normal Form when,

1. It is in the Third Normal form.
2. Every determinant should be the primary key.

### Fourth Normal Form(4NF)

A table is said to be in the Fourth Normal Form when

- 1.It is in the Fourth Normal form.
- 2.It has no multivalued dependencies.

Normalization of Blood Bank database:

## BEFORE NORMALIZATION (BCNF)

DONOR_ID	DONOR_NAME	DATEOFDONATION	DONOR_GENDER	DONOR_ADDRESS	DONOR_AGE	DISEASE_IF_ANY	DONOR_BLOOD_TYPE	DONOR_PHONE_NO	BLOOD_BAG_NO	EMP_ID
D101	Atishay	09-AUG-21	M	Model Town	28	-	A+ve	9854102473	B201	E1
D102	Rekha	09-AUG-21	F	Bajoria Road	25	Flu	AB+ve	8754210235	B202	E5
D106	Sanjay	29-SEP-21	M	Shastri Nagar	24	-	O+ve	8547459678	B203	E7
D107	Reema	29-SEP-21	F	Model Town	25	Cold Sore	B+ve	7012001023	B204	E9
D108	Bhavya	09-AUG-21	M	Urban Estate	32	-	B-ve	7878789590	B205	E10
D109	Harsh	30-OCT-21	M	Bajoria Road	35	-	AB-ve	9587956820	B206	E12
D110	Kartikey	09-AUG-21	M	Shastri Nagar	40	-	AB+ve	9825028546	B207	E13
D111	Karan	29-SEP-21	M	Bajoria Road	41	Flu	A-ve	9825028116	B208	E14
D113	Aashima	30-OCT-21	F	Model Town	50	-	AB-ve	9825020006	B209	E16
D115	Abhay	29-SEP-21	M	Bajoria Road	68	-	O-ve	7825028546	B210	E17
D117	Dilraj	09-NOV-21	M	Shastri Nagar	25	Cold Sore	AB+ve	7777028546	B211	E18
D120	Bhavika	09-NOV-21	F	Bajoria Road	55	-	O+ve	9815028546	B212	E19
D122	Monica	10-DEC-21	F	Model Town	69	-	AB+ve	8885028546	B213	E20
D125	Rehmaan	10-DEC-21	M	Shastri Nagar	32	-	A+ve	6825028546	B214	E2
D130	Aayaan	30-OCT-21	M	Bajoria Road	33	-	O+ve	6625028546	B215	E3

[Download CSV](#)

15 rows selected.

## After Normalization:

Donor table split into two tables: one donor table and another donor\_blood

DONOR_BLOOD_TYPE	BLOOD_BAG_NO
A+ve	B201
AB+ve	B202
O+ve	B203
B+ve	B204
B-ve	B205
AB-ve	B206
AB+ve	B207
A-ve	B208
AB-ve	B209
O-ve	B210
AB+ve	B211
O+ve	B212
AB+ve	B213
A+ve	B214
O+ve	B215

[Download CSV](#)

15 rows selected.

DONOR_ID	DONOR_NAME	DATEOFDONATION	DONOR_GENDER	DONOR_ADDRESS	DONOR_AGE	DISEASE_IF_ANY	DONOR_BLOOD_TYPE	DONOR_PHONE_NO	EMP_ID
D101	Atishay	09-AUG-21	M	Model Town	28	-	A+ve	9854102473	E1
D102	Rekha	09-AUG-21	F	Bajoria Road	25	Flu	AB+ve	8754210235	E5
D106	Sanjay	29-SEP-21	M	Shastri Nagar	24	-	O+ve	8547459678	E7
D107	Reema	29-SEP-21	F	Model Town	25	Cold Sore	B+ve	7012001023	E9
D108	Bhavya	09-AUG-21	M	Urban Estate	32	-	B-ve	7878789590	E10
D109	Harsh	30-OCT-21	M	Bajoria Road	35	-	AB-ve	9587956820	E12
D110	Kartikey	09-AUG-21	M	Shastri Nagar	40	-	AB+ve	9825028546	E13
D111	Karan	29-SEP-21	M	Bajoria Road	41	Flu	A-ve	9825028116	E14
D113	Aashima	30-OCT-21	F	Model Town	50	-	AB-ve	9825020006	E16
D115	Abhay	29-SEP-21	M	Bajoria Road	68	-	O-ve	7825028546	E17
D117	Dilraj	09-NOV-21	M	Shastri Nagar	25	Cold Sore	AB+ve	7777028546	E18
D120	Bhavika	09-NOV-21	F	Bajoria Road	55	-	O+ve	9815028546	E19
D122	Monica	10-DEC-21	F	Model Town	69	-	AB+ve	8885028546	E20
D125	Rehmaan	10-DEC-21	M	Shastri Nagar	32	-	A+ve	6825028546	E2
D130	Aayaan	30-OCT-21	M	Bajoria Road	33	-	O+ve	6625028546	E3

[Download CSV](#)

15 rows selected.



## TABLES

### 1. Employees table

```
create table employees(
emp_id varchar(5) primary key,
emp_name varchar(20) not null,
salary number(10) not null,
emp_gender varchar(6) not null,
emp_desc varchar(20) not null,
telephone number(10) not null,
emp_address varchar2(100) not null,
qualification varchar(10) not null
);
```

```
insert into employees values('E1','Kabir Oberoi', 50000, 'M', 'Doctor' ,9876525442, 'Model Town', 'MBBS');
insert into employees values('E2','Maya Malhotra', 90000, 'F', 'Doctor' , 9521480136, 'Urban Estate', 'MBBS-MD-DM');
insert into employees values('E3','Ahad Raza Meer', 50000, 'M', 'Nurse', 8549620136, 'Model Town', 'BSN');
insert into employees values('E4','Shweta Sharma', 70000, 'F', 'Doctor' , 9876525542, 'Aman Nagar', 'MBBS-MD');
insert into employees values('E5','Sajal Ali', 40000, 'F', 'Nurse', 9876510252, 'Urban Estate', 'BSN');
insert into employees values('E6','Rajesh Khanna', 60000, 'M', 'Doctor', 8876525442, 'Model Town', 'MBBS');
insert into employees values('E7','Rajiv Kumar', 30000, 'M', 'Nurse', 7852015442, 'Aman Nagar', 'BSN');
insert into employees values('E8','Preeti Mehta', 80000, 'F', 'Doctor' , 7786525442, 'Patiala Cantt', 'MBBS-MD');
insert into employees values('E9','Anu Kapoor', 30000, 'M', 'Nurse' , 8852525442, 'Urban Estate', 'BSN');
insert into employees values('E10','Ameesha Gupta', 70000, 'F', 'Doctor', 9870000442, 'Patiala Cantt', 'MBBS-MD');
insert into employees values('E11','Kiran Kumari', 10000, 'F', 'Nurse' , 9001225442, 'Aman Nagar', 'BSN');
insert into employees values('E12','Dev Sharma', 40000, 'M', 'Nurse' , 6854120254, 'Rajpura', 'BSN');
insert into employees values('E13','Virat Gupta', 70000, 'M', 'Doctor' , 6876525642, 'Model Town', 'MBBS-MD');
insert into employees values('E14','Ravbeer Kaur', 30000, 'F', 'Nurse', 9999952542, 'Model Town', 'BSN');
insert into employees values('E15','Ravinder Singh', 40000, 'M', 'Nurse', 9876566666, 'Aman Nagar', 'BSN');
insert into employees values('E16','Dilpreet Singh', 50000, 'M', 'Doctor', 9678501254, 'Urban Estate', 'MBBS');
insert into employees values('E17','Ishita Mahajan', 60000, 'F', 'Doctor', 7601852344, 'Aman Nagar', 'MBBS');
insert into employees values('E18','Geet Kaur', 50000, 'F', 'Doctor' , 8888800008, 'Aman Nagar', 'MBBS');
insert into employees values('E19','Abhimanyu Sharma', 70000, 'M', 'Doctor', 9999000081, 'Urban Estate', 'MBBS-MD');
insert into employees values('E20','Abeer Singh', 90000, 'M', 'Doctor' , 6066909900, 'Model Town', 'MBBS-MD-DM');
```

TABLE EMPLOYEES

Column	Null?	Type
EMP_ID	NOT NULL	VARCHAR2(5)
EMP_NAME	NOT NULL	VARCHAR2(20)
SALARY	NOT NULL	NUMBER(10,0)
EMP_GENDER	NOT NULL	VARCHAR2(6)
EMP_DESC	NOT NULL	VARCHAR2(20)
TELEPHONE	NOT NULL	NUMBER(10,0)
EMP_ADDRESS	NOT NULL	VARCHAR2(100)
QUALIFICATION	NOT NULL	VARCHAR2(10)

EMP_ID	EMP_NAME	SALARY	EMP_GENDER	EMP_DESC	TELEPHONE	EMP_ADDRESS	QUALIFICATION
E1	Kabir Oberoi	50000	M	Doctor	9876525442	Model Town	MBBS
E2	Maya Malhotra	90000	F	Doctor	9521480136	Urban Estate	MBBS-MD-DM
E3	Ahad Raza Meer	50000	M	Nurse	8549620136	Model Town	BSN
E4	Shweta Sharma	70000	F	Doctor	9876525542	Aman Nagar	MBBS-MD
E5	Sajal Ali	40000	F	Nurse	9876510252	Urban Estate	BSN
E6	Rajesh Khanna	60000	M	Doctor	8876525442	Model Town	MBBS
E7	Rajiv Kumar	30000	M	Nurse	7852015442	Aman Nagar	BSN
E8	Preeti Mehta	80000	F	Doctor	7786525442	Patiala Cantt	MBBS-MD
E9	Anu Kapoor	30000	M	Nurse	8852525442	Urban Estate	BSN
E10	Ameesha Gupta	70000	F	Doctor	9870000442	Patiala Cantt	MBBS-MD
E11	Kiran Kumari	10000	F	Nurse	9001225442	Aman Nagar	BSN
E12	Dev Sharma	40000	M	Nurse	6854120254	Rajpura	BSN
E13	Virat Gupta	70000	M	Doctor	6876525642	Model Town	MBBS-MD
E14	Ravbeer Kaur	30000	F	Nurse	9999952542	Model Town	BSN
E15	Ravinder Singh	40000	M	Nurse	9876566666	Aman Nagar	BSN
E16	Dilpreet Singh	50000	M	Doctor	9678501254	Urban Estate	MBBS
E17	Ishita Mahajan	60000	F	Doctor	7601852344	Aman Nagar	MBBS
E18	Geet Kaur	50000	F	Doctor	8888800008	Aman Nagar	MBBS
E19	Abhimanyu Sharma	70000	M	Doctor	9999000081	Urban Estate	MBBS-MD
E20	Abeer Singh	90000	M	Doctor	6066909900	Model Town	MBBS-MD-DM

## 2. Donor table

```

create table Donor(
  Donor_Id varchar(10) primary key,
  Donor_name char(30) not null,
  DateOfDonation date not null,
  Donor_gender char(1) not null,
  Donor_Address varchar(40) not null,
  Donor_Age number(2)not null,
  Disease_If_Any char(30),
  Donor_Blood_type varchar(5) not null,
  Donor_Phone_no number not null,
  emp_id varchar(5),
  constraint fk3 foreign key (emp_id) references employees (emp_id)
);

insert into Donor values('D101','Atishay','09-Aug-2021','M','Model Town',28,NULL,'A+ve',9854102473, 'E1');
insert into Donor values('D102','Rekha','09-Aug-2021','F','Bajoria Road',25,'Flu','AB+ve',8754210235, 'E5');
insert into Donor values('D106','Sanjay','29-Sep-2021','M','Shastri Nagar',24,NULL,'O+ve',8547459678, 'E7');
insert into Donor values('D107','Reema', '29-Sep-2021','F','Model Town',25,'Cold Sore','B+ve',7012001023, 'E9');
insert into Donor values('D108','Bhavya', '09-Aug-2021','M','Urban Estate',32,NULL,'B-ve',7878789590, 'E10');
insert into Donor values('D109','Harsh','30-Oct-2021','M','Bajoria Road',35,NULL,'AB-ve',9587956820, 'E12');
insert into Donor values('D110','Kartikey', '09-Aug-2021','M','Shastri Nagar',40,NULL,'AB+ve',9825028546, 'E13');
insert into Donor values('D111','Karan', '29-Sep-2021','M','Bajoria Road',41,'Flu','A-ve',9825028116, 'E14');
insert into Donor values('D113','Aashima', '30-Oct-2021','F','Model Town',50,NULL,'AB-ve',9825020006,'E16');
insert into Donor values('D115','Abhay', '29-Sep-2021','M','Bajoria Road',68,NULL,'O-ve',7825028546, 'E17');
insert into Donor values('D117','Dilraj', '09-Nov-2021','M','Shastri Nagar',25,'Cold Sore','AB+ve',7777028546,'E18');
insert into Donor values('D120','Bhavika', '09-Nov-2021','F','Bajoria Road',55,NULL,'O+ve',9815028546,'E19');
insert into Donor values('D122','Monica', '10-Dec-2021','F','Model Town',69,NULL,'AB+ve',8885028546, 'E20');
insert into Donor values('D125','Rehmaan', '10-Dec-2021','M','Shastri Nagar',32,NULL,'A+ve',6825028546, 'E2');
insert into Donor values('D130','Aayaan', '30-Oct-2021','M','Bajoria Road',33,NULL,'O+ve',6625028546, 'E3');

```

TABLE DONOR

Column	Null?	Type
DONOR_ID	NOT NULL	VARCHAR2(10)
DONOR_NAME	NOT NULL	CHAR(30)
DATEOFDONATION	NOT NULL	DATE
DONOR_GENDER	NOT NULL	CHAR(1)
DONOR_ADDRESS	NOT NULL	VARCHAR2(40)
DONOR_AGE	NOT NULL	NUMBER(2,0)
DISEASE_IF_ANY	-	CHAR(30)
DONOR_BLOOD_TYPE	NOT NULL	VARCHAR2(5)
DONOR_PHONE_NO	NOT NULL	NUMBER
EMP_ID	-	VARCHAR2(5)

DONOR_ID	DONOR_NAME	DATEOFDONATION	DONOR_GENDER	DONOR_ADDRESS	DONOR_AGE	DISEASE_IF_ANY	DONOR_BLOOD_TYPE	DONOR_PHONE_NO	EMP_ID
D101	Atishay	09-AUG-21	M	Model Town	28	-	A+ve	9854102473	E1
D102	Rekha	09-AUG-21	F	Bajoria Road	25	Flu	AB+ve	8754210235	E5
D106	Sanjay	29-SEP-21	M	Shastri Nagar	24	-	O+ve	8547459678	E7
D107	Reema	29-SEP-21	F	Model Town	25	Cold Sore	B+ve	7012001023	E9
D108	Bhavya	09-AUG-21	M	Urban Estate	32	-	B-ve	7878789590	E10
D109	Harsh	30-OCT-21	M	Bajoria Road	35	-	AB-ve	9587956820	E12
D110	Kartikey	09-AUG-21	M	Shastri Nagar	40	-	AB+ve	9825028546	E13
D111	Karan	29-SEP-21	M	Bajoria Road	41	Flu	A-ve	9825028116	E14
D113	Aashima	30-OCT-21	F	Model Town	50	-	AB-ve	9825020006	E16
D115	Abhay	29-SEP-21	M	Bajoria Road	68	-	O-ve	7825028546	E17
D117	Dilraj	09-NOV-21	M	Shastri Nagar	25	Cold Sore	AB+ve	7777028546	E18
D120	Bhavika	09-NOV-21	F	Bajoria Road	55	-	O+ve	9815028546	E19
D122	Monica	10-DEC-21	F	Model Town	69	-	AB+ve	8885028546	E20
D125	Rehmaan	10-DEC-21	M	Shastri Nagar	32	-	A+ve	6825028546	E2
D130	Aayaan	30-OCT-21	M	Bajoria Road	33	-	O+ve	6625028546	E3

### 3. Blood-inventory table

```
create table blood_inventory(
  blood_type varchar(5) primary key,
  quantity_on_hand number(30),
  issue_request number(30) not null
);
```

```
insert into blood_inventory values('A+ve', 20, 5);
insert into blood_inventory values('A-ve', 10, 10);
insert into blood_inventory values('B+ve', 28, 15);
insert into blood_inventory values('B-ve', 10, 7);
insert into blood_inventory values('AB+ve', 20, 9);
insert into blood_inventory values('AB-ve', 15, 6);
insert into blood_inventory values('O+ve', 20, 13);
insert into blood_inventory values('O-ve', 10, 8);
```

TABLE BLOOD\_INVENTORY

Column	Null?	Type
BLOOD_TYPE	NOT NULL	VARCHAR2(5)
QUANTITY_ON_HAND	-	NUMBER(30,0)
ISSUE_REQUEST	NOT NULL	NUMBER(30,0)

BLOOD_TYPE	QUANTITY_ON_HAND	ISSUE_REQUEST
A+ve	20	5
A-ve	10	10
B+ve	28	15
B-ve	10	7
AB+ve	20	9
AB-ve	15	6
O+ve	20	13
O-ve	10	8

#### 4. Blood table

```
create table Blood(
  Blood_Bag_No varchar(10) primary key,
  blood_type varchar(5),
  BloodCost number(6,2) not null,
  Haemoglobin number(6,2) not null,
  Plasma number(6,2) not null,
  Platelets number(6,2) not null,
  RBC number(6,2) not null,
  WBC number(6,2) not null,
  foreign key (blood_type) references blood_inventory (blood_type)
);
```

```
insert into Blood values('B10','A+ve',900,12.5,6,45.5,4.7,45);
insert into Blood values('B55','AB-ve',950,13,6,28,6.1,110);
insert into Blood values('B61','A-ve',900,12.5,6.5,20,6.1,100);
insert into Blood values('B108','A-ve',900,14,8,25,5.5,50);
insert into Blood values('B110','B+ve',850,18,7,45,5.5,45);
insert into Blood values('B125','B-ve',850,18,6.5,42,6.2,90);
insert into Blood values('B165','O+ve',1000,15,7,34,4.9,110);
insert into Blood values('B170','O-ve',1000,12.5,7.2,41,4.9,85);
insert into Blood values('B180','AB+ve',950,12.5,7.1,33,5.3,89);
insert into Blood values('B195','B+ve',850,15,7.1,39.5,5.3,110);
insert into Blood values('B201','A+ve',900,11,6,45.5,4.7,45);
insert into Blood values('B202','AB+ve',950,11.5,7.1,25.5,5.3,10);
insert into Blood values('B203','O+ve',1000,13.5,7.3,38.5,6.1,90);
insert into Blood values('B204','B+ve',850,10.9,6.1,42.5,5.2,70);
insert into Blood values('B205','B-ve',850,18,7.1,39,5.1,75);
insert into Blood values('B206','AB-ve',950,15.5,8,44,5.3,95);
insert into Blood values('B207','AB+ve',950,16.6,6.5,37.5,4.8,110);
insert into Blood values('B208','A-ve',900,15,7.5,45,5,50);
insert into Blood values('B209','AB-ve',950,17.2,6.8,31.5,4.9,65);
insert into Blood values('B210','O-ve',1000,13,6.6,41.5,5.3,75);
insert into Blood values('B211','AB+ve',950,13.8,7.1,33,5.2,110);
insert into Blood values('B212','O+ve',1000,15,7.9,37.5,5,100);
insert into Blood values('B213','AB+ve',950,11,8,39.5,4.9,80);
insert into Blood values('B214','A+ve',900,12,7.5,36,5.2,70);
insert into Blood values('B215','O+ve',1000,13,6.6,36.5,5.3,88);
```

TABLE BLOOD

Column	Null?	Type
BLOOD_BAG_NO	NOT NULL	VARCHAR2(10)
BLOOD_TYPE	-	VARCHAR2(5)
BLOODCOST	NOT NULL	NUMBER(6,2)
HAEMOGLOBIN	NOT NULL	NUMBER(6,2)
PLASMA	NOT NULL	NUMBER(6,2)
PLATELETS	NOT NULL	NUMBER(6,2)
RBC	NOT NULL	NUMBER(6,2)
WBC	NOT NULL	NUMBER(6,2)

BLOOD_BAG_NO	BLOOD_TYPE	BLOODCOST	HAEMOGLOBIN	PLASMA	PLATELETS	RBC	WBC
B10	A+ve	900	12.5	6	45.5	4.7	45
B55	AB-ve	950	13	6	28	6.1	110
B61	A-ve	900	12.5	6.5	20	6.1	100
B108	A-ve	900	14	8	25	5.5	50
B110	B+ve	850	18	7	45	5.5	45
B125	B-ve	850	18	6.5	42	6.2	90
B165	O+ve	1000	15	7	34	4.9	110
B170	O-ve	1000	12.5	7.2	41	4.9	85
B180	AB+ve	950	12.5	7.1	33	5.3	89
B195	B+ve	850	15	7.1	39.5	5.3	110
B201	A+ve	900	11	6	45.5	4.7	45
B202	AB+ve	950	11.5	7.1	25.5	5.3	10
B203	O+ve	1000	13.5	7.3	38.5	6.1	90
B204	B+ve	850	10.9	6.1	42.5	5.2	70
B205	B-ve	850	18	7.1	39	5.1	75
B206	AB-ve	950	15.5	8	44	5.3	95
B207	AB+ve	950	16.6	6.5	37.5	4.8	110
B208	A-ve	900	15	7.5	45	5	50
B209	AB-ve	950	17.2	6.8	31.5	4.9	65
B210	O-ve	1000	13	6.6	41.5	5.3	75
B211	AB+ve	950	13.8	7.1	33	5.2	110
B212	O+ve	1000	15	7.9	37.5	5	100
B213	AB+ve	950	11	8	39.5	4.9	80
B214	A+ve	900	12	7.5	36	5.2	70
B215	O+ve	1000	13	6.6	36.5	5.3	88

### 5. Donor blood table

```
create table Donor_Blood(
Donor_Blood_type varchar(5) not null,
Blood_Bag_No varchar(10) primary key,
Constraint fk12 foreign key (Blood_Bag_No) references Blood (Blood_Bag_No)
);
```

```
insert into Donor_Blood values('A+ve', 'B201');
insert into Donor_Blood values('AB+ve', 'B202');
insert into Donor_Blood values('O+ve', 'B203');
insert into Donor_Blood values('B+ve', 'B204');
insert into Donor_Blood values('B-ve', 'B205');
insert into Donor_Blood values('AB-ve', 'B206');
insert into Donor_Blood values('AB+ve', 'B207');
insert into Donor_Blood values('A-ve', 'B208');
insert into Donor_Blood values('AB-ve', 'B209');
insert into Donor_Blood values('O-ve', 'B210');
insert into Donor_Blood values('AB+ve', 'B211');
insert into Donor_Blood values('O+ve', 'B212');
insert into Donor_Blood values('AB+ve', 'B213');
insert into Donor_Blood values('A+ve', 'B214');
insert into Donor_Blood values('O+ve', 'B215');
```

TABLE DONOR\_BLOOD

Column	Null?	Type
DONOR_BLOOD_TYPE	NOT NULL	VARCHAR2(5)
BLOOD_BAG_NO	NOT NULL	VARCHAR2(10)

[Download CSV](#)

2 rows selected.



DONOR_BLOOD_TYPE	BLOOD_BAG_NO
A+ve	B201
AB+ve	B202
O+ve	B203
B+ve	B204
B -ve	B205
AB -ve	B206
AB+ve	B207
A -ve	B208
AB -ve	B209
O -ve	B210
AB+ve	B211
O+ve	B212
AB+ve	B213
A+ve	B214
O+ve	B215

[Download CSV](#)

15 rows selected.

## 6. Bloodcamp table

```
create table bloodcamp(
  camp_id varchar(5) primary key,
  venue varchar(50) not null,
  DOC date,
  quantity number not null
);
```

```
insert into bloodcamp values('C1', 'Urban Estate', '09-Aug-2021', 63 );
insert into bloodcamp values('C2', 'Model Town', '29-Sep-2021', 121 );
insert into bloodcamp values('C3', 'Aman Nagar', '30-Oct-2021', 53 );
insert into bloodcamp values('C4', 'Patiala Cantt', '09-Nov-2021', 98 );
insert into bloodcamp values('C5', 'Bajoria Road', '10-Dec-2021', 100 );
```

TABLE BLOODCAMP

Column	Null?	Type
CAMP_ID	NOT NULL	VARCHAR2(5)
VENUE	NOT NULL	VARCHAR2(50)
DOC	-	DATE
QUANTITY	NOT NULL	NUMBER

CAMP_ID	VENUE	DOC	QUANTITY
C1	Urban Estate	09-AUG-21	63
C2	Model Town	29-SEP-21	121
C3	Aman Nagar	30-OCT-21	53
C4	Patiala Cantt	09-NOV-21	98
C5	Bajoria Road	10-DEC-21	100

## 7. Type quantity table

```
create table type_quantity(
  camp_id varchar(5),
  A_positive number,
  A_negative number,
  B_positive number,
  B_negative number,
  AB_positive number,
  AB_negative number,
  O_positive number,
  O_negative number,
  foreign key (camp_id) references bloodcamp (camp_id)
);
```

```
insert into type_quantity values('C1',10, 20, 15, 5, NULL, 9, 7, NULL );
insert into type_quantity values('C2',30, 22, 20, 13, 30, 5, NULL, 1 );
insert into type_quantity values('C3', NULL, 15, 16, 5, NULL , NULL, 7, 10 );
insert into type_quantity values('C4', 5, 16, 28, 8, 11, NULL, 15, 15 );
insert into type_quantity values('C5',12, 12, 12, 14, 15, 11, 17, 7 );
```

TABLE TYPE\_QUANTITY

Column	Null?	Type
CAMP_ID	-	VARCHAR2(5)
A_POSITIVE	-	NUMBER
A_NEGATIVE	-	NUMBER
B_POSITIVE	-	NUMBER
B_NEGATIVE	-	NUMBER
AB_POSITIVE	-	NUMBER
AB_NEGATIVE	-	NUMBER
O_POSITIVE	-	NUMBER
O_NEGATIVE	-	NUMBER

CAMP_ID	A_POSITIVE	A_NEGATIVE	B_POSITIVE	B_NEGATIVE	AB_POSITIVE	AB_NEGATIVE	O_POSITIVE	O_NEGATIVE
C1	10	20	15	5	-	9	7	-
C2	30	22	20	13	30	5	-	1
C3	-	15	16	5	-	-	7	10
C4	5	16	28	8	11	-	15	15
C5	12	12	12	14	15	11	17	7

## 8. Recipient table

```

create table recipient(
  recipient_id varchar(20) primary key,
  recipient_name varchar(20) not null,
  time_of_request date not null,
  blood_type varchar(100) not null,
  age number(2) not null,
  gender varchar(10) not null,
  phone_number number not null,
  address varchar(50) not null,
  type_received varchar(100) not null,
  units_received number(2) not null,
  emp_id varchar(5),
  foreign key (emp_id) references employees (emp_id)
);

insert into recipient values('R1','Rahul','8-March-2019','B-ve', 60,'M',9807562356,'Model Town','B-ve',1,'E20');
insert into recipient values('R2','Barney','10-June-2019','A-ve',26,'M',8797656787, 'Shastri Nagar','A-ve',2,'E1');
insert into recipient values('R3','Cristin','20-Sep-2019','AB+ve', 40,'F',9809876798, 'Bajoria Road','A+ve',3,'E15');
insert into recipient values('R4','Robin','18-April-2019','AB-ve', 65,'F',7807654676, 'Urban Estate','AB-ve',4,'E2');
insert into recipient values('R5','Riyaz','5-Nov-2020','A+ve', 61,'M',7675645665, 'Bajoria Road','A+ve',1,'E7');
insert into recipient values('R6','Anmay','9-Dec-2020','O+ve', 34,'M',7656745321, 'Bajoria Road','O+ve',2,'E8');
insert into recipient values('R7','Aayushi','1-May-2020','O+ve', 72,'F',8706223456, 'Model Town','O+ve',4,'E19');
insert into recipient values('R8','Ted','17-Jan-2020','AB+ve', 31,'M',6753476837, 'Urban Estate','AB+ve',2,'E17');
insert into recipient values('R9','Lily','29-Feb-2020','AB+ve', 70,'F',9908765787, 'Shastri Nagar','O+ve',1,'E11');
insert into recipient values('R10','Aahana','19-Dec-2021','B+ve', 54,'F',7786755644, 'Bajoria Road','B+ve',3,'E3');
insert into recipient values('R11','Atif','28-March-2021','AB-ve', 46,'M',8546323156, 'Model Town','AB-ve',1,'E4');
insert into recipient values('R12','Anisha','1-june-2021','A-ve', 56,'F',8797689076, 'Urban Estate','A-ve',2,'E5');
insert into recipient values('R13','Rahul','8-March-2021','B-ve', 60,'M',9809087611, 'Model Town','B-ve',4,'E9');
insert into recipient values('R14','Ishan','10-Dec-2021','AB+ve', 25,'M',9086523512, 'Bajoria Road','AB+ve',1,'E6');
insert into recipient values('R15','Rijul','4-July-2021','O+ve', 45,'F',8897655426, 'Urban Estate','O+ve',3,'E10');
insert into recipient values('R16','Aarohi','20-March-2022','A+ve',32,'F',7805735124, 'Model Town','A+ve',2,'E12');
insert into recipient values('R17','Aayan','10-Feb-2022','B+ve', 20,'M',9712345676, 'Shastri Nagar','B+ve',3,'E13');
insert into recipient values('R18','Rohan','5-March-2022','A+ve',21,'M',9095421356, 'Urban Estate','A+ve',1,'E14');

```

```

insert into recipient values('R19','Sabina','14-Aug-2022','B+ve',50,'F',7897656344,'Bajoria
Road','O+ve',3,'E16');
insert into recipient values('R20','Marshal','7-April-2022','O-ve',84,'M',9874517845,'Model Town','O-
ve',5,'E18');

```

TABLE RECIPIENT

Column	Null?	Type
RECIPIENT_ID	NOT NULL	VARCHAR2(20)
RECIPIENT_NAME	NOT NULL	VARCHAR2(20)
TIME_OF_REQUEST	NOT NULL	DATE
BLOOD_TYPE	NOT NULL	VARCHAR2(100)
AGE	NOT NULL	NUMBER(2,0)
GENDER	NOT NULL	VARCHAR2(10)
PHONE_NUMBER	NOT NULL	NUMBER
ADDRESS	NOT NULL	VARCHAR2(50)
TYPE_RECEIVED	NOT NULL	VARCHAR2(100)
UNITS_RECEIVED	NOT NULL	NUMBER(2,0)
EMP_ID	-	VARCHAR2(5)

RECIPIENT_ID	RECIPIENT_NAME	TIME_OF_REQUEST	BLOOD_TYPE	AGE	GENDER	PHONE_NUMBER	ADDRESS	TYPE_RECEIVED	UNITS_RECEIVED	EMP_ID
R1	Rahul	08-MAR-19	B-ve	60	M	9807562356	Model Town	B-ve	1	E20
R2	Barney	10-JUN-19	A-ve	26	M	8797656787	Shastri Nagar	A-ve	2	E1
R3	Cristin	20-SEP-19	AB+ve	40	F	9809876798	Bajoria Road	A+ve	3	E15
R4	Robin	18-APR-19	AB-ve	65	F	7807654676	Urban Estate	AB-ve	4	E2
R5	Riyaz	05-NOV-20	A+ve	61	M	7675645665	Bajoria Road	A+ve	1	E7
R6	Anmay	09-DEC-20	O+ve	34	M	7656745321	Bajoria Road	O+ve	2	E8
R7	Aayushi	01-MAY-20	O+ve	72	F	8706223456	Model Town	O+ve	4	E19
R8	Ted	17-JAN-20	AB+ve	31	M	6753476837	Urban Estate	AB+ve	2	E17
R9	Lily	29-FEB-20	AB+ve	70	F	9908765787	Shastri Nagar	O+ve	1	E11
R10	Aahana	19-DEC-21	B+ve	54	F	7786755644	Bajoria Road	B+ve	3	E3
R11	Atif	28-MAR-21	AB-ve	46	M	8546323156	Model Town	AB-ve	1	E4
R12	Anisha	01-JUN-21	A-ve	56	F	8797689076	Urban Estate	A-ve	2	E5
R13	Rahul	08-MAR-21	B-ve	60	M	9809087611	Model Town	B-ve	4	E9
R14	Ishan	10-DEC-21	AB+ve	25	M	9086523512	Bajoria Road	AB+ve	1	E6
R15	Rijul	04-JUL-21	O+ve	45	F	8897655426	Urban Estate	O+ve	3	E10
R16	Aarohi	20-MAR-22	A+ve	32	F	7805735124	Model Town	A+ve	2	E12
R17	Aayan	10-FEB-22	B+ve	20	M	9712345676	Shastri Nagar	B+ve	3	E13
R18	Rohan	05-MAR-22	A+ve	21	M	9095421356	Urban Estate	A+ve	1	E14
R19	Sabina	14-AUG-22	B+ve	50	F	7897656344	Bajoria Road	O+ve	3	E16
R20	Marshal	07-APR-22	O-ve	84	M	9874517845	Model Town	O-ve	5	E18

## 9. Equipment table

```
create table equipments(
  equipment_id varchar(10) primary key,
  equipment_cost number not null,
  equipment_type varchar(50) not null,
  quantity number not null
);
```

```
insert into equipments values('EQ1',50000,'Tube-sealer',300);
insert into equipments values('EQ2',80000,'Donor-couch',10);
insert into equipments values('EQ3',80000,'Collection-monitor',100);
insert into equipments values('EQ4',10000,'Plasma-freezer',10);
insert into equipments values('EQ5',12000,'Ultralow deep-freezer',8);
insert into equipments values('EQ6',14000,'Refrigerated centrifuge ',10);
insert into equipments values('EQ7',750000,'Plasma-thawing-bath',5);
insert into equipments values('EQ8',100000,'Platelet-agitator',10);
insert into equipments values('EQ9',40000,'laminar-air-flow',5);
insert into equipments values('EQ10',1000,'Hemoglobinometer',15);
```

TABLE EQUIPMENTS

Column	Null?	Type
EQUIPMENT_ID	NOT NULL	VARCHAR2(10)
EQUIPMENT_COST	NOT NULL	NUMBER
EQUIPMENT_TYPE	NOT NULL	VARCHAR2(50)
QUANTITY	NOT NULL	NUMBER

EQUIPMENT_ID	EQUIPMENT_COST	EQUIPMENT_TYPE	QUANTITY
EQ1	50000	Tube-sealer	300
EQ2	80000	Donor-couch	10
EQ3	80000	Collection-monitor	100
EQ4	10000	Plasma-freezer	10
EQ5	12000	Ultralow deep-freezer	8
EQ6	14000	Refrigerated centrifuge	10
EQ7	750000	Plasma-thawing-bath	5
EQ8	100000	Platelet-agitator	10
EQ9	40000	laminar-air-flow	5
EQ10	1000	Hemoglobinometer	15

## 10. Test table

```
create table tests(
  equipment_id varchar(10),
  Blood_Bag_No varchar(10),
  primary key(equipment_id,Blood_Bag_No),
  constraint fk8 foreign key (equipment_id) references equipments(equipment_id),
  constraint fk9 foreign key (Blood_Bag_No) references Blood(Blood_Bag_No)
);
```

```
insert into tests values('EQ1','B10');
insert into tests values('EQ2','B55');
insert into tests values('EQ5','B61');
insert into tests values('EQ6','B108');
insert into tests values('EQ1','B110');
insert into tests values('EQ9','B125');
insert into tests values('EQ10','B165');
insert into tests values('EQ3','B170');
insert into tests values('EQ4','B180');
insert into tests values('EQ7','B195');
insert into tests values('EQ6','B201');
insert into tests values('EQ8','B202');
insert into tests values('EQ5','B203');
insert into tests values('EQ3','B204');
insert into tests values('EQ4','B205');
insert into tests values('EQ1','B206');
insert into tests values('EQ3','B207');
insert into tests values('EQ9','B208');
insert into tests values('EQ1','B209');
insert into tests values('EQ10','B210');
insert into tests values('EQ4','B211');
insert into tests values('EQ3','B212');
insert into tests values('EQ2','B213');
insert into tests values('EQ4','B214');
insert into tests values('EQ7','B215');
```

TABLE TESTS

Column	Null?	Type
EQUIPMENT_ID	NOT NULL	VARCHAR2(10)
BLOOD_BAG_NO	NOT NULL	VARCHAR2(10)



EQUIPMENT_ID	BLOOD_BAG_NO
EQ1	B10
EQ1	B110
EQ1	B206
EQ1	B209
EQ10	B165
EQ10	B210
EQ2	B213
EQ2	B55
EQ3	B170
EQ3	B204
EQ3	B207
EQ3	B212
EQ4	B180
EQ4	B205
EQ4	B211
EQ4	B214
EQ5	B203
EQ5	B61
EQ6	B108
EQ6	B201
EQ7	B195
EQ7	B215
EQ8	B202
EQ9	B125
EQ9	B208

## 11. Manages table

```
create table manages(
emp_id varchar(5),
equipment_id varchar(10),
primary key(emp_id,equipment_id),
Constraint fk6 foreign key(emp_id )references employees(emp_id),
Constraint fk7 foreign key(equipment_id )references equipments(equipment_id)
);
```

```
insert into manages values('E1','EQ1');
insert into manages values('E2','EQ2');
insert into manages values('E5','EQ3');
insert into manages values('E7','EQ4');
insert into manages values('E8','EQ5');
insert into manages values('E10','EQ6');
insert into manages values('E11','EQ7');
insert into manages values('E12','EQ8');
insert into manages values('E13','EQ9');
insert into manages values('E15','EQ10');
```

TABLE MANAGES

Column	Null?	Type
EMP_ID	NOT NULL	VARCHAR2(5)
EQUIPMENT_ID	NOT NULL	VARCHAR2(10)

EMP_ID	EQUIPMENT_ID
E1	EQ1
E10	EQ6
E11	EQ7
E12	EQ8
E13	EQ9
E15	EQ10
E2	EQ2
E5	EQ3
E7	EQ4
E8	EQ5

## 12. Organises table

```
create table Organises(
  camp_id varchar(5),
  emp_id varchar(5),
  primary key(camp_id,emp_id),
  Constraint fk10 foreign key (camp_id) references bloodcamp (camp_id),
  Constraint fk11 foreign key (emp_id) references employees (emp_id)
);
```

```
insert into Organises values('C1','E1');
insert into Organises values('C1','E2');
insert into Organises values('C1','E3');
insert into Organises values('C1','E4');
insert into Organises values('C2','E5');
insert into Organises values('C2','E6');
insert into Organises values('C2','E7');
insert into Organises values('C2','E8');
insert into Organises values('C3','E9');
insert into Organises values('C3','E10');
insert into Organises values('C3','E11');
insert into Organises values('C3','E12');
insert into Organises values('C4','E13');
insert into Organises values('C4','E14');
insert into Organises values('C4','E15');
insert into Organises values('C4','E16');
insert into Organises values('C5','E17');
insert into Organises values('C5','E18');
insert into Organises values('C5','E19');
insert into Organises values('C5','E20');
```

TABLE ORGANISES

Column	Null?	Type
CAMP_ID	NOT NULL	VARCHAR2(5)
EMP_ID	NOT NULL	VARCHAR2(5)

CAMP_ID	EMP_ID
C1	E1
C1	E2
C1	E3
C1	E4
C2	E5
C2	E6
C2	E7
C2	E8
C3	E10
C3	E11
C3	E12
C3	E9
C4	E13
C4	E14
C4	E15
C4	E16
C5	E17
C5	E18
C5	E19
C5	E20

### 13. Donate table

```
create table Donate(
  camp_id varchar(5),
  Donor_Id varchar(10),
  primary key(camp_id,Donor_id),
  Constraint fk4 foreign key (camp_id) references bloodcamp (camp_id),
  Constraint fk5 foreign key (Donor_Id) references Donor (Donor_Id)
);
```

```
insert into Donate values('C1','D101');
insert into Donate values('C1','D102');
insert into Donate values('C1','D108');
insert into Donate values('C1','D110');
insert into Donate values('C2','D106');
insert into Donate values('C2','D107');
insert into Donate values('C2','D111');
insert into Donate values('C2','D115');
insert into Donate values('C3','D109');
insert into Donate values('C3','D113');
insert into Donate values('C3','D130');
insert into Donate values('C4','D120');
insert into Donate values('C4','D117');
insert into Donate values('C5','D122');
insert into Donate values('C5','D125');
```

TABLE DONATE

Column	Null?	Type
CAMP_ID	NOT NULL	VARCHAR2(5)
DONOR_ID	NOT NULL	VARCHAR2(10)

CAMP_ID	DONOR_ID
C1	D101
C1	D102
C1	D108
C1	D110
C2	D106
C2	D107
C2	D111
C2	D115
C3	D109
C3	D113
C3	D130
C4	D117
C4	D120
C5	D122
C5	D125

# PLSQL

## Cursor

```
DECLARE
```

```
    total_rows integer;
```

```
begin
```

```
    update Donor
```

```
    set Donor_Address = 'Shivalik Vihar'
```

```
    where Donor_Id = 'D101' ;
```

```
    if sql%notfound then
```

```
        dbms_output.put_line('No Donors Address changed');
```

```
    elsif sql%found then
```

```
        total_rows := sql%rowcount;
```

```
        dbms_output.put_line( total_rows || ' Donors address changed ');
```

```
    end if;
```

```
end;
```

Statement processed.

1 Donors address changed

## TRIGGER

1. In inserting if any Donor has any fatal disease, the information will not be inserted.

```
create or replace trigger disease_trg
after insert on Donor
for each row
when(new.Donor_Id>0)
begin
    if :new.Disease_If_Any = 'HepB' then
        dbms_output.put_line('donor with fatal disease!');
        delete from Donor where Donor_Id = :new.Donor_Id;
    end if;
end;
```

```
371 insert into Donor values('D135','Ana','23-may-2020','F','Model Town',29,'HepB','A+ve',9876545677,'E2');
372
373 <
```

ORA-01722: invalid number ORA-06512: at "SYS.DBMS\_SQL", line 1721

2. If there is any update in Donor's location, it will be displayed.

```
create or replace trigger blood_received
before update on Donor
for each row
when(new.Donor_Address != old.Donor_Address)
declare

begin
    dbms_output.put_line('Old Location: ' || :old.Donor_Address);
    dbms_output.put_line('New Location: ' || :new.Donor_Address);
end;
```

Checking:

```
382 UPDATE Donor
383 SET Donor_Address= 'Shashtri Nagar'
384 WHERE Donor_Id = 'D107';
385
```

```
1 row(s) updated.
Old Location: Model Town
New Location: Shashtri Nagar
```

3. If any blood is given to donor, it will be updated and displayed.

```
create or replace trigger blood_issued
before update on blood_inventory
for each row
when (new.quantity_on_hand != old.quantity_on_hand)
declare
given number;
```

```
begin
    given := :old.quantity_on_hand - :new.quantity_on_hand;
    dbms_output.put_line(:old.blood_type || ' Blood type, units= ' || given || ' is
issued.');
```

```
end;
```

```
400 update blood_inventory
401 set quantity_on_hand = '10'
402 where blood_type = 'A+ve';
<
```

```
1 row(s) updated.
A+ve Blood type, units= 10 is issued.
```

## FUNCTION

>>Function to return total number of donors in donor table

```
CREATE OR REPLACE FUNCTION totalDonor
```

```
RETURN number IS
```

```
    total integer := 0;
```

```
BEGIN
```

```
    SELECT count(*) into total
```

```
    FROM Donor;
```

```
    RETURN total;
```

```
END;
```

Function created.

>>Function call

```
DECLARE
```

```
    c number(2);
```

```
BEGIN
```

```
    c := totalDonor();
```

```
    dbms_output.put_line('Total no. of Donors are: ' || c);
```

```
END;
```

Statement processed.

Total no. of Donors are: 15



## LOOP

DECLARE

cnt integer;

d\_name Donor.Donor\_name%type;

d\_blood Donor.Donor\_Blood\_type%type;

d\_place Donor.Donor\_Address%type;

BEGIN

cnt := 101;

while cnt<=110

loop

select Donor\_name into d\_name

from Donor where Donor\_Id = ('D' || TO\_CHAR(cnt));

select Donor\_Blood\_type into d\_blood

from Donor where Donor\_Id = ('D' || TO\_CHAR(cnt));

select Donor\_Address into d\_place

from Donor where Donor\_Id = ('D' || TO\_CHAR(cnt));

if (d\_blood = 'A+' and d\_place = 'Model Town') then

dbms\_output.put\_line('Desired donor : ' || cnt || ' ' || d\_name || ' ' || d\_blood || ' ' || d\_place);

end if;

cnt:=cnt+1;

end loop;

end;

## EXCEPTION HANDLING

```

DECLARE
    bl_type blood_inventory.blood_type%type;
    quantity blood_inventory.quantity_on_hand%type;
    issued blood_inventory.issue_request%type:=20;
BEGIN
    SELECT blood_type, quantity_on_hand INTO bl_type, quantity
    FROM blood_inventory
    WHERE issue_request < issued;
    DBMS_OUTPUT.PUT_LINE ('Blood type is: '|| bl_type);
    DBMS_OUTPUT.PUT_LINE ('Available is: '|| quantity);

EXCEPTION
    WHEN no_data_found THEN
        dbms_output.put_line ('No quantity available. ');
    WHEN others THEN
        dbms_output.put_line ('Issued request not allowed. ');
END;
```

```

Statement processed.
Issued request not allowed.
```

### Query to check:

```

UPDATE blood_inventory
SET issue_request = 30
WHERE blood_type = 'A+ve';
```

```

1 row(s) updated.
```

## Procedure -1:

```
create or replace procedure auto_update(last_date Donor.DateOfDonation%type, nage
Donor.Donor_Age%type, usr Donor.Donor_name%type)
is
update_id number;
begin
select max(Donor_Id)+1 into update_id from Donor;
UPDATE Donor
SET DateOfDonation=last_date, Donor_Age=nage
WHERE Donor_name=usr;
end;
```

Procedure created.

## Procedure -2:

```
create or replace function VALID_BLOOD(B_GROUP Blood.blood_type%TYPE)
return Boolean
IS
cursor c1
is
select blood_type from Blood;
begin
for i in c1 loop
IF(i.blood_type=B_GROUP) then
return true;
END IF;
END LOOP;
return false;
End;
```

Function created.

```
create or replace procedure b_cost(ID Blood.Blood_Bag_No%type,B_GROUP
Blood.blood_type%TYPE,cost Blood.BloodCost%type)
IS
begin
IF (VALID_BLOOD(B_GROUP)) then
INSERT INTO Blood VALUES (ID,B_GROUP,COST,NULL,NULL,NULL,NULL);

ELSE
dbms_output.put_line('BLOOD did not match');
END IF;
End;
```

Procedure created.

## SQL

1.

select Donor\_name, Donor\_Blood\_type from Donor where Donor\_Blood\_type = (select blood\_type from Recipient where recipient\_id=R2);

DONOR_NAME	DONOR_BLOOD_TYPE
Karan	A-ve

[Download CSV](#)

2.

select gender from Recipient group by gender;

GENDER
M
F

3.

select blood\_type,quantity\_on\_hand from blood\_inventory group by blood\_type,quantity\_on\_hand;

BLOOD_TYPE	QUANTITY_ON_HAND
A+ve	20
A-ve	10
B+ve	28
B-ve	10
AB+ve	20
AB-ve	15
O+ve	20
O-ve	10