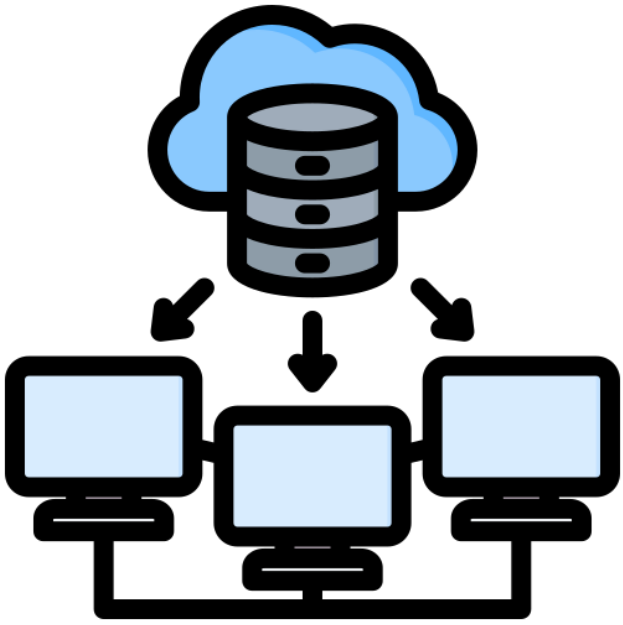
Data Base Project

{Blood Bank}



Members:

Basm alahmadi 2240107

Mohmmed haddad 2240328

Abdullah al-Ansari 2240003

Problem description:

The Blood Donation Management System aims to address the need for efficient management of blood donors, doctors, blood bank inventory, and blood donation records. The system will provide a centralized platform to store and retrieve information, streamlining the blood donation process and ensuring accurate tracking of donor information and blood units.

Information Needs:

The following information can be obtained from the provided tables:

1. Donor Information:

- **Donor ID**
- **Donor Name**
- **Donor Age**
- **Last Donation Date**
- **Blood Type**

2. Doctor Information:

- **Doctor ID**
- **Doctor Name**

3. Blood Bank Inventory:

- **Blood Type**
- **Quantity of Blood Units Available**

4. Donation Records:

- **Donation ID**
- **Donor ID**
- **Doctor ID**
- **Units of Blood Donated**
- **Blood Type**

By querying the tables, you can retrieve information such as:

- Details of all donors, including their names, ages, last donation dates, and blood types.

- Information about doctors involved in the blood donation process, including their names and IDs.

- Inventory of blood units available in the blood bank, categorized by blood type and quantity.

- Records of blood donations, including the donors, doctors, units of blood donated, and blood types.

This information can help in managing and organizing blood donation activities, identifying suitable donors based on blood type, and maintaining an up-to-date inventory of available blood units.

Distribution of duties for the project:

1-Problem description: mohmmed

2-ER-Diagram:basm

3-Schema Diagram:basm

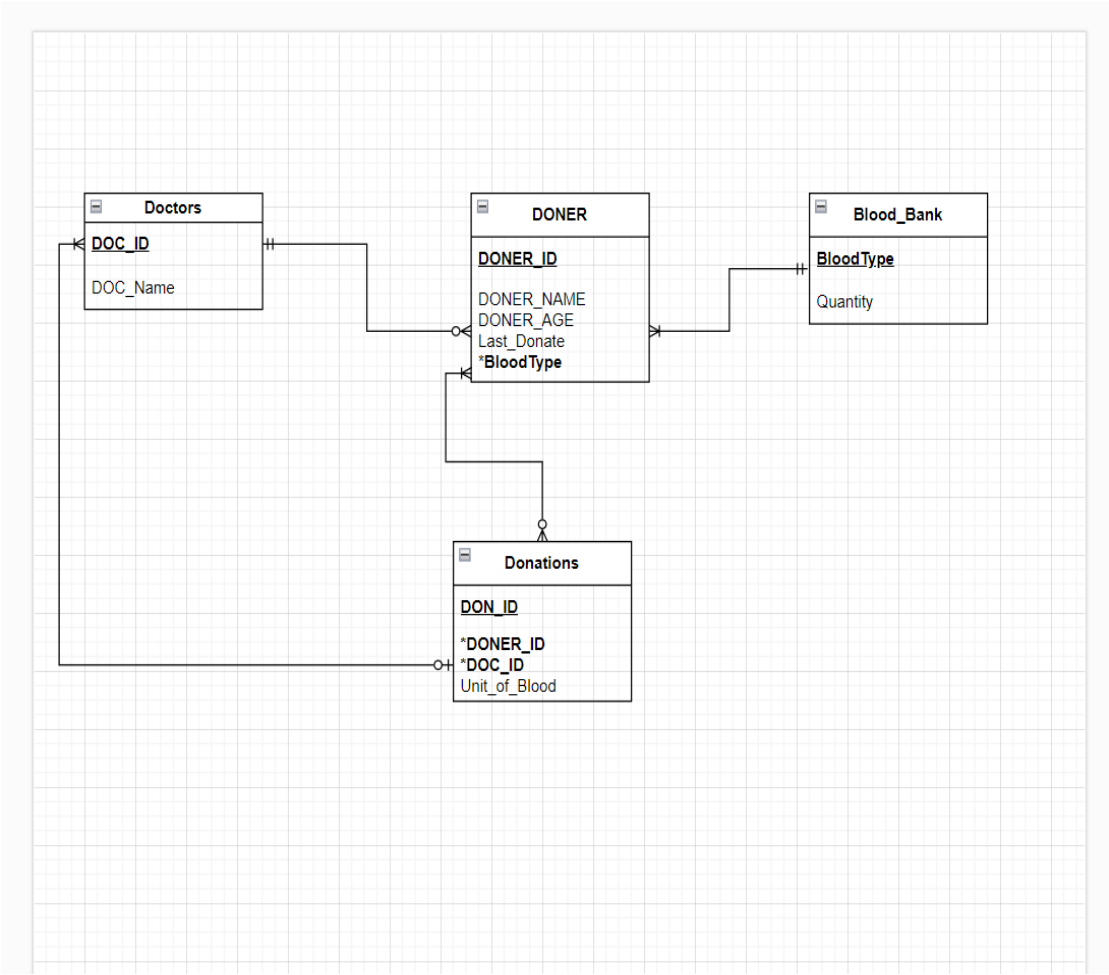
4-Normalization: Abdullah

5-TABLES:(BloodBank,Doctor:mohmmed),(donations:basm),(Doner:Abdullah)

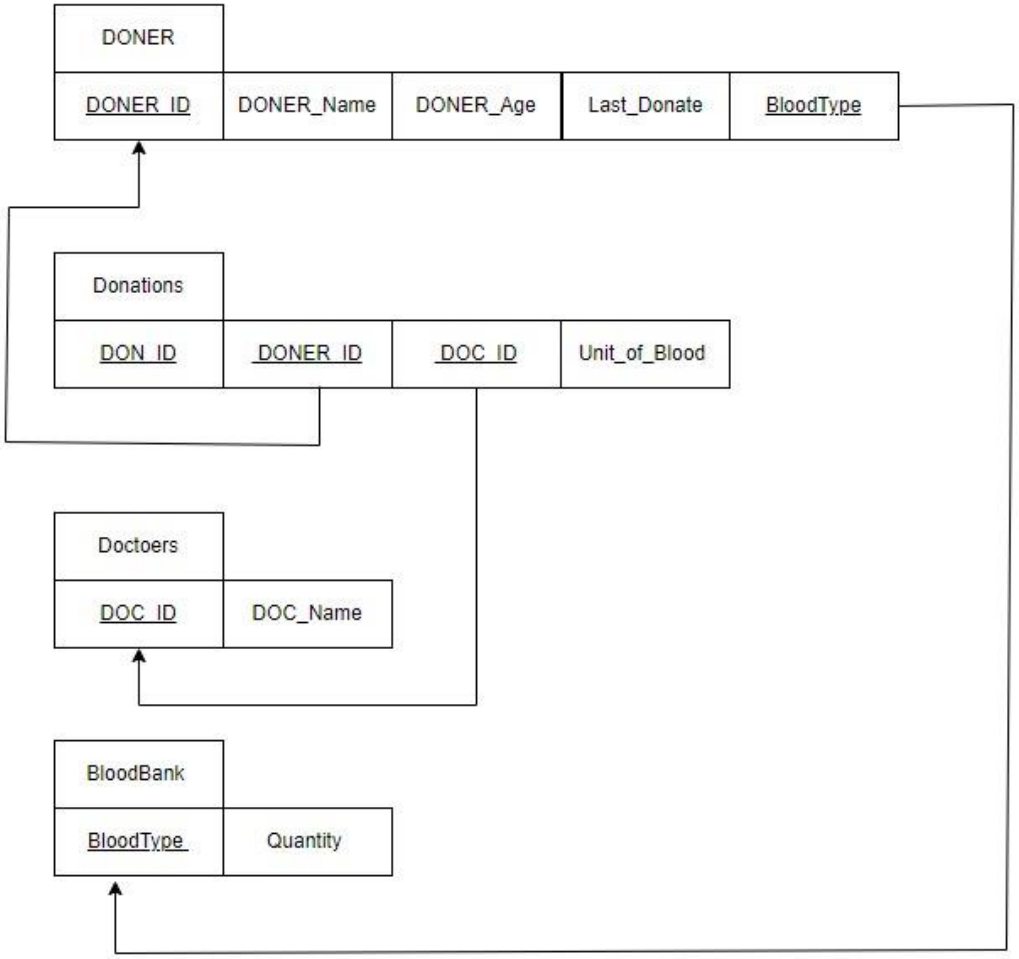
6-Queries:Mohmmed

7- procedures:(Doner:Abdullah),(Doctor:basm),(GetDonorsByBloodType:mommed)

ER-Diagram:


Doctors
DOC_ID
DOC_Name
DONER
DONER_ID
DONER_NAME
DONER_AGE
Last_Donate
*BloodType
Blood_Bank
BloodType
Quantity
Donations
DON_ID
*DONER_ID
*DOC_ID
Unit_of_Blood

Schema Diagram:



Normalization:

The relations in 3NF already.

TABLES:

1-DONER:

```
CREATE TABLE DONER(
   DONER_ID VARCHAR2(1000) PRIMARY KEY,
   DONER_Name VARCHAR2(30) NOT NULL ,
   DONER_Age NUMBER (2),
   Last_Donate DATE NOT NULL,
   BloodType varchar2(3) NOT NULL check(BloodType IN('A+', 'A-','B+', 'B-','O+','O-
','AB+','AB-')) ,
  FOREIGN KEY (BloodType) REFERENCES  Blood_Bank(BloodType)
  ON DELETE CASCADE
);


INSERT INTO DONER
VALUES('1','Salman Mohammed Al-Zahrani',26,'23-NOV-2023','O+');
INSERT INTO DONER
VALUES('2','Talal Nawaf Al-Otaibi',30,'23-OCT-2023','AB-');
INSERT INTO DONER
VALUES('3','Ahmad Khalid Al-Shehri',25,'22-MAY-2020','A+');
INSERT INTO DONER
VALUES('4','Mohammed Abdullah Al-Qahtani',19,'22-OCT-2023','B+');
INSERT INTO DONER
VALUES('5','Bander Ali Al-Hashimi',40,'14-SEP-2023','O-');
INSERT INTO DONER
VALUES('6','Adel Bander Al-Amri',35,'1-NOV-2023','AB+');
INSERT INTO DONER
VALUES('7','Ali Salman Al-Johani ',33,'5-FEB-2018','A-');
INSERT INTO DONER
VALUES('8','Abdullah Mohammed Al-Ghamdi',22,'10-OCT-2023','B-');
INSERT INTO DONER
```

```
VALUES('9','Bader Ahmad Al-Harbi',46,'9-AUG-2023','O+');
INSERT INTO DONER
VALUES('10','Khalid Abdullah Al-Ansari',18,'29-OCT-2023','B+');
```

2-Docter

```
CREATE TABLE Doctors(
DOC_ID VARCHAR2(1000)PRIMARY KEY,
DOC_Name VARCHAR2(30) NOT NULL
);
INSERT INTO Doctors
VALUES ('1','Ali Ahmad Al-Farisi');
INSERT INTO Doctors
VALUES ('2','Aamir Abd Al-Aziz AL-Shamri');
INSERT INTO Doctors
VALUES ('3','Abd Al-Hamid Abdullah Alghamdi');
INSERT INTO Doctors
VALUES ('4','Abd al-Kader Khalid Alzahrani');
INSERT INTO Doctors
VALUES ('5','Abd Al-Latif Ahamad Al-Subaiy');
INSERT INTO Doctors
VALUES ('6','NAWAF Khalid Al-Qahtani');
INSERT INTO Doctors
VALUES ('7','Abdulah Mohammed Al-ansari');
INSERT INTO Doctors
VALUES ('8','Faisal Mohammed Maliki');
INSERT INTO Doctors
VALUES ('9','Hossam Ahmad Alghamdi');
INSERT INTO Doctors
VALUES ('10','Faisal Abdullah Alzahrani');
INSERT INTO Doctors
VALUES ('11','Badr Abdelmohsen Al-Farisi');
```

```
INSERT INTO Doctors
VALUES ('12','Ahmad Faisal Al-Qurashi ');
INSERT INTO Doctors
VALUES('13','Mohammed AbdAl-Aziz Al-Thaqafi');
INSERT INTO Doctors
VALUES ('14','Khalid Hashim Al-Mutairi');
INSERT INTO Doctors
VALUES ('15','Ahmad Abdullah Alotaibi');
```

3-Blood Bank:

```
CREATE TABLE Blood_Bank(
BloodType varchar2(3) , check(BloodType IN('A+', 'A-','B+', 'B-','O+','O-','AB+','AB-')),
Quantity INT NOT NULL,
PRIMARY KEY (BloodType)
);
INSERT INTO Blood_Bank
VALUES ('O+',110);
INSERT INTO Blood_Bank
VALUES ('O-',90);
INSERT INTO Blood_Bank
VALUES ('AB+',200);
INSERT INTO Blood_Bank
VALUES ('AB-',100);
INSERT INTO Blood_Bank
VALUES ('A+',250);
INSERT INTO Blood_Bank
VALUES ('A-',60);
INSERT INTO Blood_Bank
VALUES ('B+',88);
INSERT INTO Blood_Bank
VALUES ('B-',160);
```

4-Donations:

```
CREATE TABLE Donations(
DON_ID VARCHAR2(1000)PRIMARY KEY,
DONER_ID VARCHAR2(1000) NOT NULL,
DOC_ID VARCHAR2(1000) NOT NULL,
Unit_of_Blood NUMBER(1) NOT NULL ,
FOREIGN KEY (DONER_ID)REFERENCES  DONER(DONER_ID),
FOREIGN KEY (DOC_ID)REFERENCES  Doctors(DOC_ID)
  ON DELETE CASCADE
);
INSERT INTO Donations
VALUES('1','1','1',2);
INSERT INTO Donations
VALUES('2','2','2',1);
INSERT INTO Donations
VALUES('3','3','3',1);
INSERT INTO Donations
VALUES('4','4','4',1);
INSERT INTO Donations
VALUES('5','5','5',2);
INSERT INTO Donations
VALUES('6','6','6',1);
INSERT INTO Donations
VALUES('7','7','7',2);
INSERT INTO Donations
VALUES('8','8','8',1);
INSERT INTO Donations
VALUES('9','9','9',1);
INSERT INTO Donations
VALUES('10','10','10',1);
```

Queries:

1-SELECT DONER_Name, DONER.BloodType,DONER_Age

FROM DONER WHERE DONER_Name IN(SELECT DONER_Name FROM DONER WHERE DONER.BloodType IN('O+','AB+') AND DONER_Age>20);

2-SELECT AVG(DONER_Age) AS Average_Age FROM DONER;

3-SELECT SUM(Quantity) AS Total_Quantity FROM Blood_Bank;

4- SELECT DON_ID , DONER_ID, DOC_ID, Unit_of_Blood FROM Donations WHERE DOC_ID = '5';

5-SELECT BloodType, Quantity FROM Blood_Bank WHERE Quantity < 80;

6- SELECT DONER_ID, DONER_Name, BloodType, DONER_Age ,Last_Donate

FROM DONER

WHERE BloodType = 'B+' AND DONER_Age < 70; 7-SELECT DON_ID ,DONER_ID ,DOC_ID ,UNIT_OF_BLOOD FROM Donations

WHERE DOC_ID IN (SELECT DOC_ID FROM Doctors WHERE DOC_Name NOT LIKE 'A.%'); 8- SELECT DONER_ID,DONER_NAME,DONER_AGE,LAST_DONATE, BLOODTYPE FROM DONER

WHERE Last_Donate < ADD_MONTHS(SYSDATE, -3);

9- SELECT DONER_ID , DONER_NAME ,DONER_AGE ,BLOODTYPE ,LAST_DONATE

FROM DONER WHERE DONER_ID IN (SELECT DONER_ID FROM Donations GROUP BY DONER_ID HAVING SUM(Unit_of_Blood) >= 2);

10-SELECT DONER_ID, SUM(Unit_of_Blood) AS TotalDonatedUnits FROM Donations GROUP BY DONER_ID ORDER BY TotalDonatedUnits DESC;

11-SELECT BloodType, AVG(DONER_Age) AS AverageAge FROM DONER GROUP BY BloodType;

12-SELECT BloodType, SUM(Quantity) AS TotalQuantity FROM Blood_Bank GROUP BY BloodType ORDER BY TotalQuantity DESC;

13- SELECT DOC_ID ,DOC_NAME FROM Doctors ORDER BY DOC_Name ASC;

```
14-SELECT d.DOC_Name
FROM Doctors d
JOIN Donations dn ON d.DOC_ID = dn.DOC_ID
JOIN DONER dr ON dn.DONER_ID = dr.DONER_ID
WHERE dr.BloodType = 'A+';

15-SELECT BloodType, Quantity
FROM Blood_Bank
WHERE Quantity > (SELECT AVG(Quantity) FROM Blood_Bank);

16-SELECT DONER_Name
FROM DONER
WHERE DONER_ID IN (
  SELECT DONER_ID
  FROM Donations
  GROUP BY DONER_ID
  HAVING SUM(Unit_of_Blood) = (
    SELECT MAX(TotalUnits)
    FROM (
      SELECT DONER_ID, SUM(Unit_of_Blood) AS TotalUnits
      FROM Donations
     GROUP BY DONER_ID
    )
  )
);
```

17-SELECT d.DOC_Name, SUM(don.Unit_of_Blood) AS TotalDonatedUnits

FROM Doctors d

JOIN Donations don ON d.DOC_ID = don.DOC_ID

JOIN DONER dr ON don.DONER_ID = dr.DONER_ID

WHERE dr.DONER_Age BETWEEN 18 AND 30

GROUP BY d.DOC_Name

ORDER BY TotalDonatedUnits DESC;

Stored procedures:

1-CREATE OR REPLACE PROCEDURE InsertDonor(

p_DONER_ID IN VARCHAR2,

p_DONER_Name IN VARCHAR2,

p_DONER_Age IN NUMBER,

p_Last_Donate IN DATE,

p_BloodType IN VARCHAR2

)

AS

BEGIN

INSERT INTO DONER (DONER_ID, DONER_Name, DONER_Age, Last_Donate, BloodType)

VALUES (p_DONER_ID, p_DONER_Name, p_DONER_Age, p_Last_Donate, p_BloodType);

COMMIT;

END;

/

2-CREATE OR REPLACE PROCEDURE InsertDoctor(

p_DOC_ID IN VARCHAR2,

p_DOC_Name IN VARCHAR2

)

AS

BEGIN

INSERT INTO Doctors (DOC_ID, DOC_Name)

VALUES (p_DOC_ID, p_DOC_Name);

COMMIT;

```
   DBMS_OUTPUT.PUT_LINE('Doctor inserted successfully.');
EXCEPTION
   WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM);
      ROLLBACK;
END;

3-CREATE OR REPLACE PROCEDURE GetDonorsByBloodType(
   p_BloodType IN VARCHAR2,
   p_Donors OUT SYS_REFCURSOR
)
AS
BEGIN
   OPEN p_Donors FOR
   SELECT *
   FROM DONER
   WHERE BloodType = p_BloodType;
END;
/
```

Queries Output:

```
1  SELECT DON_ID , DONER_ID, DOC_ID,  Unit_of_Blood  FROM Donations WHERE DOC_ID = '5';
2
```

DON_ID	DONER_ID	DOC_ID	UNIT_OF_BLOOD
5	5	5	2

```
1  SELECT BloodType, Quantity FROM Blood_Bank WHERE Quantity < 80;
2
```

BLOODTYPE	QUANTITY
A-	60

```
1   SELECT DONER_ID, DONER_Name, BloodType, DONER_Age ,Last_Donate
2  FROM DONER
3  WHERE BloodType = 'B+' AND DONER_Age < 70;
```

DONER_ID	DONER_NAME	BLOODTYPE	DONER_AGE	LAST_DONATE
4	Mohammed Abdullah Al-Qahtani	B+	19	22-OCT-23
10	Khalid Abdullah Al-Ansari	B+	18	29-OCT-23

```
SELECT DON_ID ,DONER_ID ,DOC_ID ,UNIT_OF_BLOOD FROM Donations
WHERE DOC_ID IN ( SELECT DOC_ID FROM Doctors WHERE DOC_Name NOT LIKE 'A.%' );
```

DON_ID	DONER_ID	DOC_ID	UNIT_OF_BLOOD
1	1	1	2
2	2	2	1
3	3	3	1
4	4	4	1
5	5	5	2
6	6	6	1
7	7	7	2
8	8	8	1
9	9	9	1
10	10	10	1

```
SELECT DONER_ID,DONER_NAME,DONER_AGE,LAST_DONATE, BLOODTYPE FROM DONER
WHERE Last_Donate < ADD_MONTHS(SYSDATE, -3);
```

DONER_ID	DONER_NAME	DONER_AGE	LAST_DONATE	BLOODTYPE
3	Ahmad Khalid Al-Shehri	25	22-MAY-20	A+
7	Ali Salman Al-Johani	33	05-FEB-18	A-
9	Bader Ahmad Al-Harbi	46	09-AUG-23	O+

```
SELECT DONER_ID , DONER_NAME ,DONER_AGE ,BLOODTYPE ,LAST_DONATE FROM DONER WHERE DONER_ID
    IN (SELECT DONER_ID FROM Donations GROUP BY DONER_ID HAVING SUM(Unit_of_Blood) >= 2);
```

DONER_ID	DONER_NAME	DONER_AGE	BLOODTYPE	LAST_DONATE
1	Salman Mohammed Al-Zahrani	26	O+	23-NOV-23
5	Bander Ali Al-Hashimi	40	O-	14-SEP-23
7	Ali Salman Al-Johani	33	A-	05-FEB-18

```sql
SELECT DONER_ID, SUM(Unit_of_Blood) AS TotalDonatedUnits
FROM Donations GROUP BY DONER_ID ORDER BY TotalDonatedUnits DESC;
```

DONER_ID	TOTALDONATEDUNITS
7	2
1	2
5	2
6	1
9	1
10	1
4	1
3	1
2	1
8	1

```sql
SELECT BloodType, AVG(DONER_Age) AS AverageAge FROM DONER GROUP BY BloodType;
```

BLOODTYPE	AVERAGEAGE
O+	36
AB+	35
B+	18.5
A+	25
O-	40
A-	33
B-	22
AB-	30

```
SELECT BloodType, SUM(Quantity) AS TotalQuantity FROM
Blood_Bank GROUP BY BloodType ORDER BY TotalQuantity DESC;
```

BLOODTYPE	TOTALQUANTITY
A+	250
AB+	200
B-	160
O+	110
AB-	100
O-	90
B+	88
A-	60

```sql
SELECT DOC_ID ,DOC_NAME FROM Doctors ORDER BY DOC_Name ASC;
```

DOC_ID	DOC_NAME
2	Aamir Abd Al-Aziz AL-Shamri
3	Abd Al-Hamid Abdullah Alghamdi
5	Abd Al-Latif Ahamad Al-Subaiy
4	Abd al-Kader Khalid Alzahrani
7	Abdulah Mohammed Al-ansari
15	Ahmad Abdullah Alotaibi
12	Ahmad Faisal Al-Qurashi
1	Ali Ahmad Al-Farisi
11	Badr Abdelmohsen Al-Farisi
10	Faisal Abdullah Alzahrani
8	Faisal Mohammed Maliki
9	Hossam Ahmad Alghamdi
14	Khalid Hashim Al-Mutairi
13	Mohammed AbdAl-Aziz Al-Thaqafi
6	NAWAF Khalid Al-Qahtani

```sql
SELECT d.DOC_Name
FROM Doctors d
JOIN Donations dn ON d.DOC_ID = dn.DOC_ID
JOIN DONER dr ON dn.DONER_ID = dr.DONER_ID
WHERE dr.BloodType = 'A+';
```

DOC_NAME
Abd Al-Hamid Abdullah Alghamdi

```sql
SELECT BloodType, Quantity
FROM Blood_Bank
WHERE Quantity > (SELECT AVG(Quantity) FROM Blood_Bank);
```

BLOODTYPE	QUANTITY
AB+	200
A+	250
B-	160

```sql
SELECT DONER_Name FROM DONER WHERE DONER_ID IN (
SELECT DONER_ID FROM Donations  GROUP BY DONER_ID
HAVING SUM(Unit_of_Blood) = ( SELECT MAX(TotalUnits)
FROM (SELECT DONER_ID, SUM(Unit_of_Blood) AS TotalUnits
FROM Donations GROUP BY DONER_ID ) ) );
```

DONER_NAME
Salman Mohammed Al-Zahrani
Bander Ali Al-Hashimi
Ali Salman Al-Johani

```sql
SELECT d.DOC_Name, SUM(don.Unit_of_Blood) AS TotalDonatedUnits
FROM Doctors d
JOIN Donations don ON d.DOC_ID = don.DOC_ID
JOIN DONER dr ON don.DONER_ID = dr.DONER_ID
WHERE dr.DONER_Age BETWEEN 18 AND 30
GROUP BY d.DOC_Name
ORDER BY TotalDonatedUnits DESC;
```

DOC_NAME	TOTALDONATEDUNITS
Ali Ahmad Al-Farisi	2
Abd Al-Hamid Abdullah Alghamdi	1
Abd al-Kader Khalid Alzahrani	1
Faisal Abdullah Alzahrani	1
Aamir Abd Al-Aziz AL-Shamri	1
Faisal Mohammed Maliki	1

Tables output:

```
1  Select * from DONER ;
```

DONER_ID	DONER_NAME	DONER_AGE	LAST_DONATE	BLOODTYPE
1	Salman Mohammed Al-Zahrani	26	23-NOV-23	O+
2	Talal Nawaf Al-Otaibi	30	23-OCT-23	AB-
3	Ahmad Khalid Al-Shehri	25	22-MAY-20	A+
4	Mohammed Abdullah Al-Qahtani	19	22-OCT-23	B+
5	Bander Ali Al-Hashimi	40	14-SEP-23	O-
6	Adel Bander Al-Amri	35	01-NOV-23	AB+
7	Ali Salman Al-Johani	33	05-FEB-18	A-
8	Abdullah Mohammed Al-Ghamdi	22	10-OCT-23	B-
9	Bader Ahmad Al-Harbi	46	09-AUG-23	O+
10	Khalid Abdullah Al-Ansari	18	29-OCT-23	B+

DOC_ID	DOC_NAME
1	Ali Ahmad Al-Farisi
2	Aamir Abd Al-Aziz AL-Shamri
3	Abd Al-Hamid Abdullah Alghamdi
4	Abd al-Kader Khalid Alzahrani
5	Abd Al-Latif Ahamad Al-Subaiy
6	NAWAF Khalid Al-Qahtani
7	Abdulah Mohammed Al-ansari
8	Faisal Mohammed Maliki
9	Hossam Ahmad Alghamdi
10	Faisal Abdullah Alzahrani
11	Badr Abdelmohsen Al-Farisi
12	Ahmad Faisal Al-Qurashi
13	Mohammed AbdAl-Aziz Al-Thaqafi
14	Khalid Hashim Al-Mutairi
15	Ahmad Abdullah Alotaibi

```
1  Select * from Blood_Bank ;
```

BLOODTYPE	QUANTITY
O+	110
O-	90
AB+	200
AB-	100
A+	250
A-	60
B+	88
B-	160

```
1  Select * from Donations ;
```

DON_ID	DONER_ID	DOC_ID	UNIT_OF_BLOOD
1	1	1	2
2	2	2	1
3	3	3	1
4	4	4	1
5	5	5	2
6	6	6	1
7	7	7	2
8	8	8	1
9	9	9	1
10	10	10	1