PROJECT

SUBMITTED BY

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SUBMITTED TO

SIR NAVEED ANWAR BUTT

Database Management System

UNIVERSITY OF GUJRAT

Requirements Analysis

“Business rule ”

We have a standalone blood bank that supplies hospitals with the required quantities of blood, The blood bank consists of:

- **EMPLOYEE** has a name , SSN , employee ID , nationality , gender , and position . Employees perform tasks according to their position. Tasks may include drawing blood from donors, testing and storing blood.

- **DONOR** who donates blood. The donor has a name , SSN , health condition to specify if he has any disease, phone number (doner may have many phone numbers at most three phone numbers), address , gender , donation date , date of birth (People born before a certain year are not allowed to donate), latest donation date (it is not possible in any way for a person to donate more than once in 3 months) and number of previous donations . A donor can donate more than once, and the employee draws blood from him.

Requirements Analysis

“Business rule ”

- **BLOOD** that has been drawn from a donor, has blood type , blood ID , lab result (to check if there is something that will prevent us from using it), age in days (blood after 45 days will be expired), and validity (depends on lab result and the blood age will determine if it is ok to be given or not).

- **BLOOD STOCK** is where the blood is stored, has blood type , quantity (if any type of blood is less than 10 that means we have shortage), and stock ID . Each stock is managed by an employee. Each stock contains number of blood bags of the same type or be empty.

Requirements Analysis

“Business rule ”

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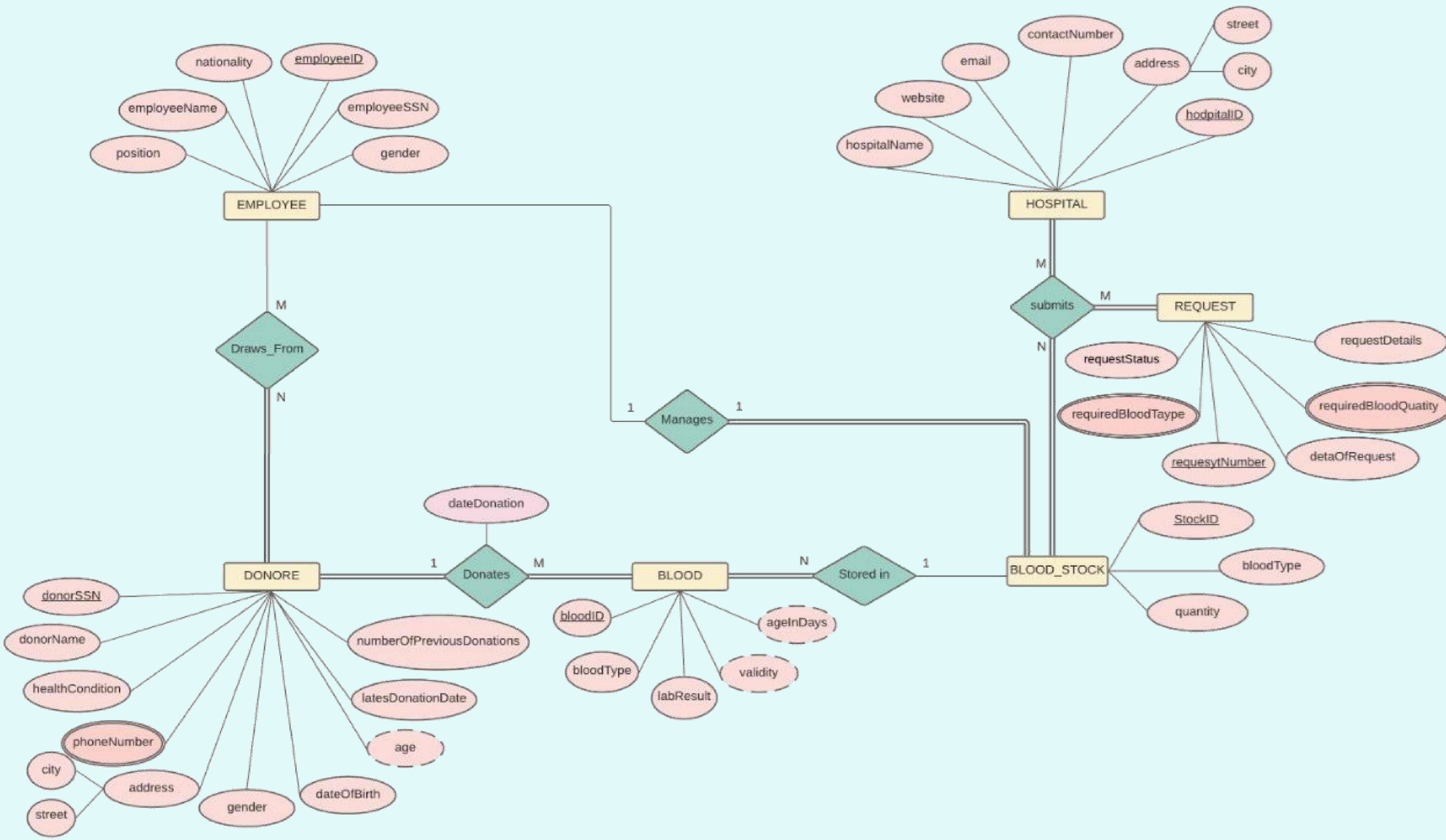
HOSPITAL requests and receives blood. the hospital has a hospital name , hospital ID , address , contact number , email , and website . The hospital submits a request to the bank stating all the required blood types and quantities.

DONATION REQUEST submitted by hospital. The Donation request has Request number , required blood type , required blood quantity , request state, request Details and date of request . Hospital can submit many requests. If the request is fully granted, the request state will be stored as ACCEPTED. If some of the required blood types or quantities were insufficient or unavailable, the request state will be stored as ACCEPTED and the hospital will be informed in request details of which part of the request was not granted. If all the requirements were unavailable, the request state will be stored as DECLINED.

ER Diagram


nationality
employeeID
employeeName
employeeSSN
position
gender
EMPLOYEE
M
Draws_From
N
1
Manages
1
contactNumber
email
website
hospitalName
address
street
city
hodpitalID
HOSPITAL
M
submits
M
REQUEST
N
requestStatus
requestDetails
requiredBloodTaype
requiredBloodQuatity
requesytNumber
detaOfRequest
dateDonation
1
Donates
M
DONORE
BLOOD
N
Stored in
1
BLOOD_STOCK
StockID
bloodType
quantity
donorSSN
donorName
healthCondition
phoneNumber
city
address
street
gender
dateOfBirth
age
latesDonationDate
numberOfPreviousDonations
bloodID
bloodType
labResult
validity
ageInDays

Schema: blood_bank , Table1: DONOR

```sql
CREATE SCHEMA Blood_Bank ;
USE Blood_Bank; -- insted of double click

CREATE TABLE DONOR (
    donSSN INT(10) NOT NULL,
    NameD VARCHAR(40),
    HealthCond VARCHAR(10),
    City VARCHAR(20),
    Street VARCHAR(20),
    Gender CHAR(1) CHECK (Gender IN ('F','M')),
    DateOfBirth DATE,
    LatestDonationDate DATE,
    NoPrevDonations INT(4),
    CONSTRAINT DONOR_PK PRIMARY KEY (donSSN)
);
```

Tables 2, 3, 4:

DONOR_PHONES, EMPLOYEE, BLOOD_STOCK

```sql
CREATE TABLE DONOR_PHONES (
    donSSN INT(10) NOT NULL,
    phoneNO INT (10) NOT NULL,
    CONSTRAINT DONOR_PHONES_FK1 FOREIGN KEY (donSSN) REFERENCES DONOR(donSSN) ON DELETE CASCADE,
    CONSTRAINT DONOR_PHONES_PK PRIMARY KEY (donSSN ,phoneNO)
);
CREATE TABLE EMPLOYEE (
    EmployeeID INT(10) NOT NULL,
    EmployeeName VARCHAR(40),
    Nationality VARCHAR(20),
    EmployeePosition VARCHAR(20),
    EmployeeSSN INT(5) UNIQUE,
    Gender CHAR(1) CHECK (Gender IN ('F','M')),
    CONSTRAINT EMPLOYEE_PK PRIMARY KEY (EmployeeID)
);

CREATE TABLE BLOOD_STOCK(
    StockID INT(10) NOT NULL,
    BloodType VARCHAR(3) CHECK (BloodType IN ('A+','A-','B+','B-','AB+','AB-','O+','O-')),
    Quantity INT (5),
    ManagerID INT (10) UNIQUE,
    CONSTRAINT BLOOD_STOCK_PK PRIMARY KEY (StockID),
    CONSTRAINT BLOOD_STOCK_FK1 FOREIGN KEY (ManagerID) REFERENCES EMPLOYEE(EmployeeID) ON DELETE SET NULL
);
```

Tables 5, 6, 7:

REQUEST, REQUEST_BLOOD_TYPES, HOSPITAL

```sql
CREATE TABLE REQUEST (
    RequestNumber INT(10) NOT NULL,
    DateOfRequest DATE,
    RequestStatus VARCHAR(20),
    details VARCHAR(100),
    CONSTRAINT REQUEST_PK PRIMARY KEY (RequestNumber)
);

CREATE TABLE REQUEST_BLOOD_TYPES (
    RequestNumber INT(10) NOT NULL,
    RequiredBloodType VARCHAR(3) NOT NULL CHECK (RequiredBloodType IN ('A+','A-','B+','B-','AB+','AB-','O+','O-')),
    RequiredBloodQuantity INT(5),
    CONSTRAINT REQUEST_BLOOD_TYPES_FK1 FOREIGN KEY (RequestNumber) REFERENCES REQUEST(RequestNumber) ON DELETE CASCADE,
    CONSTRAINT REQUEST_BLOOD_TYPES_PK PRIMARY KEY (RequestNumber,RequiredBloodType)
);

CREATE TABLE HOSPITAL (
    hospitalID INT(10) NOT NULL,
    website VARCHAR(20) UNIQUE,
    email VARCHAR(255) UNIQUE,
    contactNumber INT(10) UNIQUE,
    street VARCHAR(10),
    city VARCHAR(10),
    hospitalName VARCHAR(15),
    CONSTRAINT HOSPITAL_PK PRIMARY KEY (hospitalID)
);
```

Tables 8, 9, 10:

SUPMITS, DRAWS_FROM , BLOOD

```
62
63  CREATE TABLE SUPMITS (
64      hospitalID  INT (10) NOT NULL,
65      RequestNumber INT (10) NOT NULL,
66      stockID INT (10) NOT NULL,
67      CONSTRAINT SUPMITS_FK1 FOREIGN KEY (hospitalID) REFERENCES HOSPITAL(hospitalID) ON DELETE CASCADE,
68      CONSTRAINT SUPMITS_FK2 FOREIGN KEY (RequestNumber) REFERENCES REQUEST(RequestNumber) ON DELETE CASCADE,
69      CONSTRAINT SUPMITS_FK3 FOREIGN KEY (stockID) REFERENCES BLOOD_STOCK(StockID) ON DELETE CASCADE,
70      CONSTRAINT SUPMITS_PK PRIMARY KEY (hospitalID , RequestNumber , stockID)
71  );
73  CREATE TABLE DROWS_FROM (
74      employeeID  INT (10) NOT NULL,
75      donSSN INT(10) NOT NULL,
76      CONSTRAINT DROWS_FROM_FK1 FOREIGN KEY (employeeID) REFERENCES EMPLOYEE(EmployeeID) ON DELETE CASCADE,
77      CONSTRAINT DROWS_FROM_FK2 FOREIGN KEY (donSSN) REFERENCES DONOR(donSSN) ON DELETE CASCADE,
78      CONSTRAINT DROWS_FROM_PK PRIMARY KEY (employeeID , donSSN)
79  );
80
81  CREATE TABLE BLOOD (
82      bloodID INT (10) NOT NULL,
83      bloodType VARCHAR(3) CHECK (bloodType IN ('A+','A-','B+','B-','AB+','AB-','O+','O-')),
84      labResult VARCHAR (15),
85      dnt_donorSSN INT (10) ,
86      dnt_donation_date DATE,
87      Store_bloodStockID INT (10),
88      CONSTRAINT BLOOD_FK1 FOREIGN KEY (dnt_donorSSN) REFERENCES DONOR(donSSN) ON DELETE SET NULL,
89      CONSTRAINT BLOOD_FK2 FOREIGN KEY (Store_bloodStockID) REFERENCES BLOOD_STOCK(StockID) ON DELETE SET NULL,
90      CONSTRAINT BLOOD_PK PRIMARY KEY (bloodID)
91  );
```

Table 1: DONOR

```
102 •   INSERT INTO blood_bank.donor
103     VALUES (1000000001,'Ahmed Ali', 'fit', 'Makkah', 'Al_Zaher','M', '1999-11-19' , '2021-01-12' , 4);
104
105 •   INSERT INTO blood_bank.donor
106     VALUES (1000000002,'Wasn Yasser', 'unfit', 'Makkah', 'Al_Zaydi','F', '1997-03-17' , '2021-09-03' , 0);
107
108 •   INSERT INTO blood_bank.donor
109     VALUES (1000000003,'Mohammed Khalid', 'fit', 'Makkah', 'Al_Zaher','M', '2000-08-18' , '2021-04-24' , 2);
110
111 •   INSERT INTO blood_bank.donor
112     VALUES (1000000004,'Amjad Walid', 'fit', 'Makkah', 'Al_Haaj','F', '1999-12-20' , '2021-02-20' , 1);
113
114 •   INSERT INTO blood_bank.donor
115     VALUES (1000000005,'Mira Mohammed', 'fit', 'Makkah', 'Al_Seteen','F', '2002-01-22' , '2021-01-22' , 3);
116
117 •   SELECT *
118     FROM blood_bank.donor;
```

donSSN	NameD	HealthCond	City	Street	Gender	DateOfBirth	LatestDonationDate	NoPrevDonations
1000000001	Ahmed Ali	fit	Makkah	Al_Zaher	M	1999-11-19	2021-01-12	4
1000000002	Wasn Yasser	unfit	Makkah	Al_Zaydi	F	1997-03-17	2021-09-03	0
1000000003	Mohammed Khalid	fit	Makkah	Al_Zaher	M	2000-08-18	2021-04-24	2
1000000004	Amjad Walid	fit	Makkah	Al_Haaj	F	1999-12-20	2021-02-20	1
1000000005	Mira Mohammed	fit	Makkah	Al_Seteen	F	2002-01-22	2021-01-22	3

Table 2: EMPLOYEE

```
121 •   INSERT INTO blood_bank.employee
122     VALUES (143,'Lamar Saleh', 'Saudi', 'Doctor', 2000000001,'F');
123
124 •   INSERT INTO blood_bank.employee
125     VALUES (254,'Salem Ali', 'Saudi', 'Nurse', 2000000002,'M');
126
127 •   INSERT INTO blood_bank.employee
128     VALUES (335,'Saad Kamel', 'Saudi', 'Nurse', 2000000003,'M');
129
130 •   INSERT INTO blood_bank.employee
131     VALUES (244,'Noha Ashraf', 'Saudi', 'Manager', 2000000004,'F');
132
133 •   INSERT INTO blood_bank.employee
134     VALUES (533,'Hanan Ahamd', 'Saudi', 'Manager', 2000000005,'F');
135
136 •   INSERT INTO blood_bank.employee
137     VALUES (192,'Hatan Khaled', 'Saudi', 'Manager', 2000000006,'F');
138
139 •   INSERT INTO blood_bank.employee
140     VALUES (216,'Hadeel Mujalled', 'Saudi', 'Manager', 2000000007,'M');
141
142 •   SELECT * FROM blood_bank.employee;
```

	EmployeeID	EmployeeName	Nationality	EmployeePosition	EmployeeSSN	Gender
▶	143	Lamar Saleh	Saudi	Doctor	2000000001	F
	192	Hatan Khaled	Saudi	Manager	2000000006	F
	216	Hadeel Mujalled	Saudi	Manager	2000000007	M
	244	Noha Ashraf	Saudi	Manager	2000000004	F
	254	Salem Ali	Saudi	Nurse	2000000002	M
	335	Saad Kamel	Saudi	Nurse	2000000003	M
	533	Hanan Ahamd	Saudi	Manager	2000000005	F

Table 3: REQUEST

```
144 •   INSERT INTO blood_bank.request
145     VALUES (5433,'2021-04-22', 'acceptable', 'all required bloods were valid');
146
147 •   INSERT INTO blood_bank.request
148     VALUES (1234,'2021-05-11', 'Partially acceptable', 'O- wasn`t exist');
149
150 •   INSERT INTO blood_bank.request
151     VALUES (4564,'2021-10-03', 'unacceptable', 'B+ wasn`t enough');
152
153 •   INSERT INTO blood_bank.request
154     VALUES (7776,'2021-01-12', 'canceled', 'The hospital find the blood in other bank');
155
156 •   INSERT INTO blood_bank.request(requestNumber, dateOfRequest, requestStatus)
157     VALUES (6565,'2021-12-10', 'underway');
158
159 •   SELECT *
160     FROM blood_bank.request;
```

	RequestNumber	DateOfRequest	RequestStatus	details
▶	1234	2021-05-11	Partially acceptable	O- wasn`t exist
	4564	2021-10-03	unacceptable	B+ wasn`t enough
	5433	2021-04-22	acceptable	all required bloods were valid
	6565	2021-12-10	underway	NULL
	7776	2021-01-12	canceled	The hospital find the blood in other bank

Table 4: HOSPITAL

```
162 •   INSERT INTO blood_bank.hospital
163     VALUES (1000,'www.Faqeeh.com', 'Faqeeh@gmail.com', 0551234567, 'Al_Hamra', 'Jeddah', 'Faqeeh');
164
165 •   INSERT INTO blood_bank.hospital
166     VALUES (2000,'www.Al_Noor.com', 'Al_Noor@gmail.com', 0559876533, 'Al_Naseem', 'Makkah', 'Al_Noor');
167
168 •   INSERT INTO blood_bank.hospital
169     VALUES (3000,'www.Ajyad.com', 'Ajyad@gmail.com', 0598438932, 'Ajyad', 'Makkah', 'Ajyad');
170
171 •   INSERT INTO blood_bank.hospital
172     VALUES (4000,'www.MunaAl_Wadi.com', 'MunaAl_Wadi@gmail.com', 0598499999, 'King Fahad', 'Makkah', 'Muna Al_Wadi');
173
174 •   INSERT INTO blood_bank.hospital
175     VALUES (5000,'www.K_AbduAllah.com', 'KingAbduAllah@gmail.com', 0555538932, 'Muzdalifah', 'Makkah', 'King Abdu_Allah');
176
177 •   SELECT *
178     FROM blood_bank.hospital;
```

	hospitalID	website	email	contactNumber	street	city	hospitalName
▶	1000	www.Faqeeh.com	Faqeeh@gmail.com	551234567	Al_Hamra	Jeddah	Faqeeh
	2000	www.Al_Noor.com	Al_Noor@gmail.com	559876533	Al_Naseem	Makkah	Al_Noor
	3000	www.Ajyad.com	Ajyad@gmail.com	598438932	Ajyad	Makkah	Ajyad
	4000	www.MunaAl_Wadi.com	MunaAl_Wadi@gmail.com	598499999	King Fahad	Makkah	Muna Al_Wadi
	5000	www.K_AbduAllah.com	KingAbduAllah@gmail.com	555538932	Muzdalifah	Makkah	King Abdu_Allah

Table 5: BLOOD_STOCK

```
180 •   INSERT INTO blood_bank.blood_stock
181     VALUES (111, 'A+',10, 533);
182
183 •   INSERT INTO blood_bank.blood_stock
184     VALUES (112, 'AB-',5, 244);
185
186 •   INSERT INTO blood_bank.blood_stock
187     VALUES (113, 'O-',8, 216);
188
189 •   INSERT INTO blood_bank.blood_stock
190     VALUES (114, 'O+',4, 192);
191
192 •   SELECT *
193     FROM blood_bank.blood_stock;
```

	StockID	BloodType	Quantity	ManagerID
▶	111	A+	10	533
	112	AB-	5	244
	113	O-	8	216
	114	O+	4	192

Table 6: DROWS_FROM

```
195 •   INSERT INTO blood_bank.drows_from
196     VALUES (143, 1000000003);
197
198 •   INSERT INTO blood_bank.drows_from
199     VALUES (254, 1000000005);
200
201 •   INSERT INTO blood_bank.drows_from
202     VALUES (254, 1000000004);
203
204 •   INSERT INTO blood_bank.drows_from
205     VALUES (335, 1000000002);
206
207 •   INSERT INTO blood_bank.drows_from
208     VALUES (254, 1000000001);
209
210 •   SELECT *
211     FROM blood_bank.drows_from;
```

	employeeID	donSSN
▶	254	1000000001
	335	1000000002
	143	1000000003
	254	1000000004
	254	1000000005

Table 7: DONOR_PHONES

```
213 •   INSERT INTO blood_bank.donor_phones
214     VALUES (1000000001,0592271025);
215
216 •   INSERT INTO blood_bank.donor_phones
217     VALUES (1000000001,0553311349);
218
219 •   INSERT INTO blood_bank.donor_phones
220     VALUES (1000000004,0512345556);
221
222 •   INSERT INTO blood_bank.donor_phones
223     VALUES (1000000004,0512346789);
224
225 •   INSERT INTO blood_bank.donor_phones
226     VALUES (1000000002,0550501234);
227
228 •   INSERT INTO blood_bank.donor_phones
229     VALUES (1000000003,0507188770);
230
231 •   INSERT INTO blood_bank.donor_phones
232     VALUES (1000000005,0554047519);
233
234 •   SELECT * FROM blood_bank.donor_phones;
```

	donSSN	phoneNO
▶	1000000001	553311349
	1000000001	592271025
	1000000002	550501234
	1000000003	507188770
	1000000004	512345556
	1000000004	512346789
	1000000005	554047519

Table 8: BLOOD

```
236 •   INSERT INTO blood_bank.blood
237     VALUES (1231,'A+', 'normal',1000000001,'2021-11-12', 111);
238
239 •   INSERT INTO blood_bank.blood
240     VALUES (1232,'O+', 'normal',1000000005,'2021-10-22', 114);
241
242 •   INSERT INTO blood_bank.blood
243     VALUES (1233,'AB-', 'abnormal',1000000003,'2021-12-04', 112);
244
245 •   INSERT INTO blood_bank.blood
246     VALUES (1234,'O-', 'normal',1000000004,'2021-09-20', 113);
247
248 •   INSERT INTO blood_bank.blood
249     VALUES (1235,'A+', 'normal',1000000001,'2021-04-06', 111);
250
251 •   SELECT *
252     FROM blood_bank.blood;
```

	bloodID	bloodType	labResult	dnt_donorSSN	dnt_donation_date	Store_bloodStockID
▶	1231	A+	normal	1000000001	2021-11-12	111
	1232	O+	normal	1000000005	2021-10-22	114
	1233	AB-	abnormal	1000000003	2021-12-04	112
	1234	O-	normal	1000000004	2021-09-20	113
	1235	A+	normal	1000000001	2021-04-06	111

Table 9 :REQUEST_BLOOD_TYPES

```
254 •  INSERT INTO blood_bank.request_blood_types
255    VALUES (1234,'A+', 2 );
256
257 •  INSERT INTO blood_bank.request_blood_types
258    VALUES (1234,'AB-', 4 );
259
260 •  INSERT INTO blood_bank.request_blood_types
261    VALUES (1234,'O-', 6 );
262
263 •  INSERT INTO blood_bank.request_blood_types
264    VALUES (4564,'A+', 4 );
265
266 •  INSERT INTO blood_bank.request_blood_types
267    VALUES (4564,'B+', 8 );
268
269 •  INSERT INTO blood_bank.request_blood_types
270    VALUES (7776,'AB+', 5 );
271
272 •  INSERT INTO blood_bank.request_blood_types
273    VALUES (5433,'A+', 12 );
274
275 •  INSERT INTO blood_bank.request_blood_types
276    VALUES (6565,'B-', 5 );
277
278 •  INSERT INTO blood_bank.request_blood_types
279    VALUES (6565,'AB+', 9 );
280
281 •  SELECT *
282    FROM blood_bank.request_blood_types;
```

	RequestNumber	RequiredBloodType	RequiredBloodQuantity
▶	1234	A+	2
	1234	AB-	4
	1234	O-	6
	4564	A+	4
	4564	B+	8
	5433	A+	12
	6565	AB+	9
	6565	B-	5
	7776	AB+	5

Table 10: SUPMITS

```
284 •    INSERT INTO blood_bank.supmits
285      VALUES (1000,1234, 111 );
286
287 •    INSERT INTO blood_bank.supmits
288      VALUES (2000,4564, 112 );
289
290 •    INSERT INTO blood_bank.supmits
291      VALUES (3000,5433, 113 );
292
293 •    INSERT INTO blood_bank.supmits
294      VALUES (4000,6565, 114 );
295
296 •    INSERT INTO blood_bank.supmits
297      VALUES (5000,7776, 111);
298
299 •    SELECT *
300      FROM blood_bank.supmits;
```

	hospitalID	RequestNumber	stockID
▶	1000	1234	111
	2000	4564	112
	3000	5433	113
	4000	6565	114
	5000	7776	111

UPDATE

```
394     # update a donor's (ssn = 1000000003) phone number
395 •   UPDATE donor_phones
396     SET phoneNO = 551617420
397     where donSSN = 1000000003 and phoneNO = 507188770;
398
399 •   SELECT * FROM donor_phones;
```

befor

donSSN	phoneNO
1000000001	553311349
1000000001	592271025
1000000002	550501234
1000000003	507188770
1000000004	512345556
1000000004	512346789
1000000005	554047519

after

donSSN	phoneNO
1000000001	553311349
1000000001	592271025
1000000002	550501234
1000000003	551617420
1000000004	512345556
1000000004	512346789
1000000005	554047519

DELETE

```
401     -- delete all blood older than 3 months or has an abnormal lab results.
402 •   DELETE FROM blood
403     WHERE labResult = 'abnormal'
404           OR DATEDIFF(CURRENT_DATE(),dnt_donation_date) >= 30 * 3;
```

befor

	bloodID	bloodType	labResult	dnt_donorSSN	dnt_donation_date	Store_bloodStockID
▶	1231	A+	normal	1000000001	2021-11-12	111
	1232	O+	normal	1000000005	2021-10-22	114
	1233	AB-	abnormal	1000000003	2021-12-04	112
	1234	O-	normal	1000000004	2021-09-20	113
	1235	A+	normal	1000000001	2021-04-06	111

after

	bloodID	bloodType	labResult	dnt_donorSSN	dnt_donation_date	Store_bloodStockID
▶	1231	A+	normal	1000000001	2021-11-12	111
	1232	O+	normal	1000000005	2021-10-22	114
	1234	O-	normal	1000000004	2021-09-20	113

Using: GROUP BY

```
304     # 1- SHOW THE NUMBER OF EMPLOYEES IN EACH POSITION
305 •   SELECT
306         EmployeePosition, COUNT(EmployeeID) AS count
307     FROM
308         blood_bank.employee
309     GROUP BY EmployeePosition;
```

	EmployeePosition	count
▶	Doctor	1
	Manager	4
	Nurse	2

Using: join

```
311     # 2- show hospitalID, name , request number and date of request
312     # of pending requests in decsending order by date of request.
313 •   SELECT
314         h.hospitalID,
315         h.hospitalName,
316         r.RequestNumber,
317         r.DateOfRequest
318     FROM
319         hospital h,
320         request r,
321         supmits s
322     WHERE
323         s.RequestNumber = r.RequestNumber
324         AND s.hospitalID = h.hospitalID
325         AND r.RequestStatus = 'underway'
326     ORDER BY 4 DESC;
```

	hospitalID	hospitalName	RequestNumber	DateOfRequest
▶	4000	Muna Al_Wadi	6565	2021-12-10

Using: ORDER BY

```
328     # SHOW THE MOST REQUESTED BLOOD TYPE WITH IT'S QUANTITY
329     # 3- list each requested bloodType with its total quantity, to get the max later
330 •   CREATE VIEW total AS
331     SELECT
332         RequiredBloodType, SUM(RequiredBloodQuantity) AS sum
333     FROM
334         request_blood_types
335     GROUP BY RequiredBloodType
336     ORDER BY 2 DESC;
337
338     # 4- get the most request blood type
339 •   SELECT RequiredBloodType as bloodType , MAX(sum) as quantity
340     FROM total;
```

	bloodType	quantity
▶	A+	18

Using: HAVING

```
342     # 5- SHOW HOW MANY TIMES EACH GENDER DONATED IF IT'S GREATER THAN FOUR.
343 •   SELECT gender , SUM(NoPrevDonations) as sum
344     FROM donor
345     GROUP BY gender
346     HAVING sum > 4;
```

	gender	sum
▶	M	6

Using: WHERE

```
348     # 6- show latest Donation Date of the donor 'Amjad Walid'
349     # to check if she can donate again
350 •   SELECT nameD, latestDonationDate
351     FROM Donor
352     WHERE nameD = 'Amjad Walid';
```

	nameD	latestDonationDate
▶	Amjad Walid	2021-02-20

Using: GROUP BY

```
354     # 7- display the number of donors for each blood type
355     # to know which blood type has greatest number of donors
356 •   SELECT bloodType, COUNT(bloodID) AS DonorsNumber
357     FROM blood
358     GROUP BY bloodType
359     ORDER BY 2 DESC;
```

	bloodType	DonorsNumber
▶	A+	2
	O+	1
	AB-	1
	O-	1

Using: join

```
361     # 8- display each stack with his manager`s name and ssn
362     # by joining two tables
363 •   SELECT StockID, employeeSSN, employeeName
364     FROM blood_Stock, Employee
365     WHERE managerID = EmployeeID
366     ORDER BY stockID;
```

	StockID	employeeSSN	employeeName
▶	111	2000000005	Hanan Ahamd
	112	2000000004	Noha Ashraf
	113	2000000007	Hadeel Mujalled
	114	2000000006	Hatan Khaled

Using: subquery

```
368     # 9- list all phone numbers for all donors whose blood results
369     # came out as abnormal to tell them
370 •   SELECT d.donSSN, nameD, phoneNO
371     FROM donor d, donor_phones ph
372     WHERE  ph.donSSN = d.donSSN AND d.donSSN IN (SELECT dnt_donorSSN
373                                                  FROM blood
374                                                  WHERE labResult = 'abnormal') ;
```

	donSSN	nameD	phoneNO
▶	1000000003	Mohammed Khalid	507188770

Using: WHERE

```
376     # 10- list all the quantities of blood that can be given to B+
377 •   SELECT bloodType, quantity
378     FROM blood_Stock
379     WHERE bloodType NOT IN ('A+', 'A-', 'AB+', 'AB-');
```

	bloodType	quantity
▶	O-	8
	O+	4

Using: ORDER BY

```
381     # 11- select the blood bags of type O- that are valid for donation,
382     # order by date of donation
383 •   SELECT
384         bloodID, bloodType, dnt_donation_date, Store_bloodStockID
385     FROM
386         blood
387     WHERE
388         bloodType = 'O-' AND labResult = 'normal'
389     ORDER BY 3 ASC;
```

	bloodID	bloodType	dnt_donation_date	Store_bloodStockID
▶	1234	O-	2021-09-20	113