AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)

INTRODUCTION TO DATABASE

FALL 2022-2023

Section: G Group: 05

PROJECT REPORT ON

ORGAN BANK MANAGEMENT SYSTEM

Supervised By

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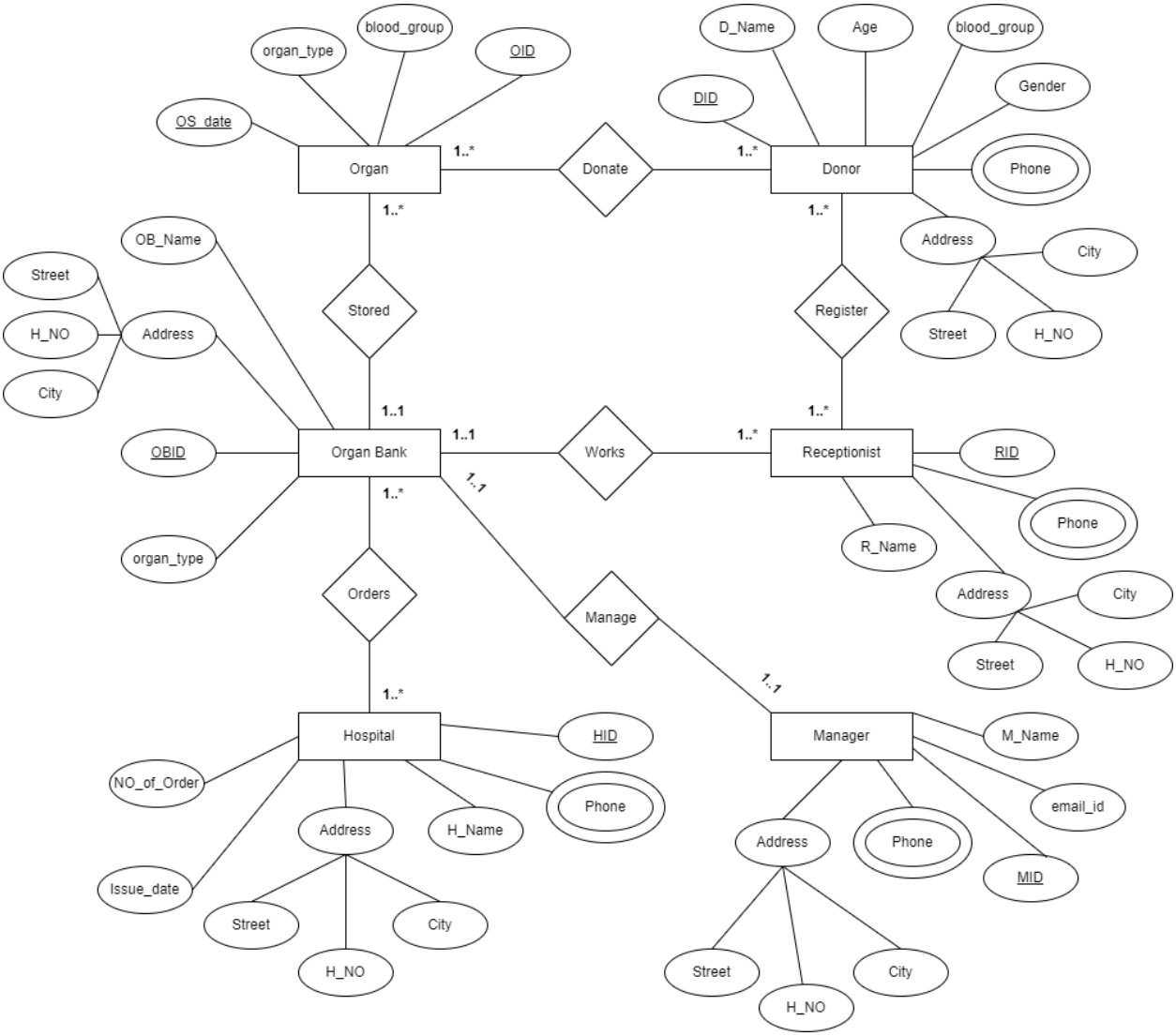
INTRODUCTION

The Organ Bank Management System is required for managing organ, designed for use by the Life Angel Organ Bank. The system is designed to connect with an extensive database of donor, organ, manager etc. details. These entities are organized the Organ Bank in hierarchal structure which can be traversed briefly, giving commanders a visual summary of statuses through an Oracle 10g Database system interface.

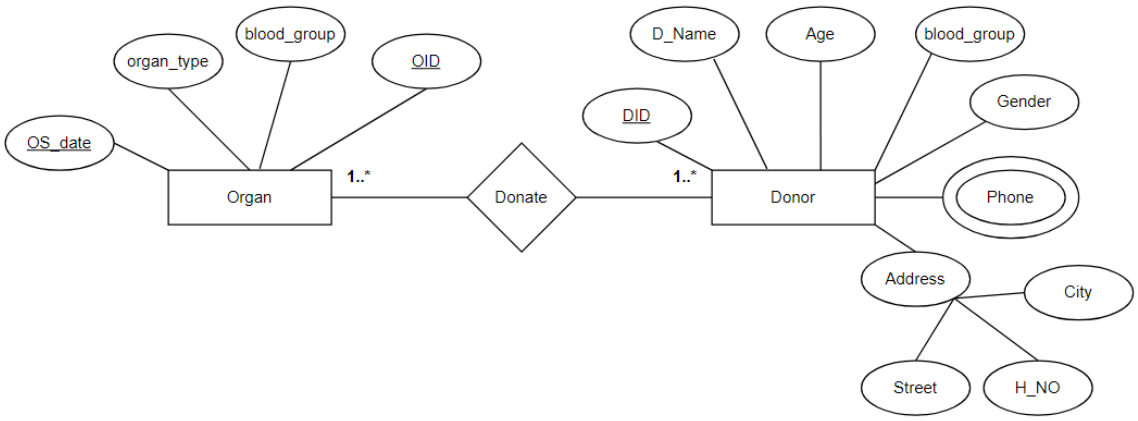
Scenario Description

An organ bank stores various types of organs. Many donors can donate different type of organ. A donor may donate organ more than once and he/she is identified by a donor id, name, age, gender, address, and phone number. The organ donated by the donor is distinguish by organ type, organ id, blood group and organ stored date. Before each donor donates his/her organ, he/she is required to register himself as a donor with the receptionist who works at the organ bank. The receptionist is characterized by receptionist id, name, address, and phone number. The organ banks receive orders for organ from many hospitals for emergency purposes and other surgical requirements and organ bank issues the same of required type of organ. The hospitals are identified by hospital id, name, address, organ issue date, orders, and phone number. Organ bank has organ bank id, name, address, and organ types stored. The organ bank is managed by the manager who is identified by manager id, name, e-mail id, address, and phone number. He/she is responsible for the proper management of the organ bank.

Entity Relationship Diagram



NORMALIZATION



Donate:

UNF:

DID, D_NAME, AGE, BLOOD_GROUP, GENDER, PHONE, H_NO, STREET, CITY, OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE

1NF: PHONE is a multivalued attribute.

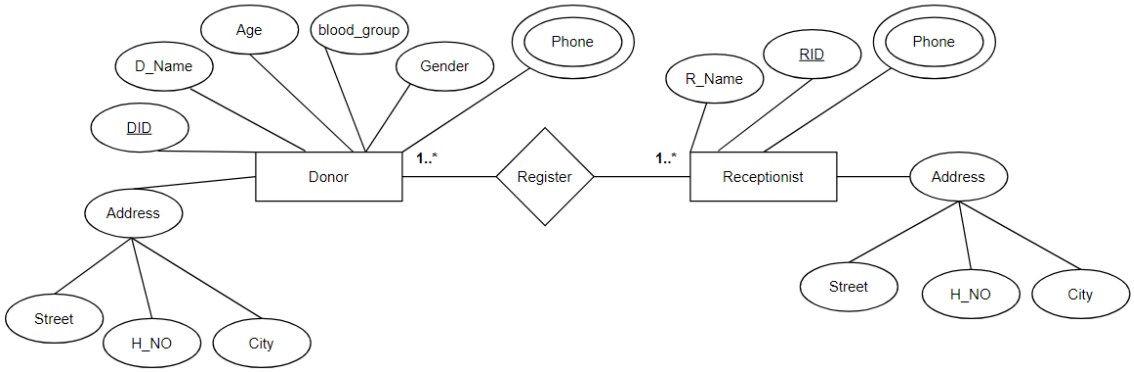
DID, D_NAME, AGE, BLOOD_GROUP, GENDER, H_NO, STREET, CITY, OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE

2NF:

1. DID, D_NAME, AGE, BLOOD_GROUP, GENDER, H_NO, STREET, CITY, OID, PID
2. PHONE, PID
3. OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE

3NF:

1. DID, D_NAME, AGE, BLOOD_GROUP, GENDER, OID, PID, AID
2. PID, PHONE
3. AID, H_NO, STREET, CITY
4. OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE



Register:

UNF:

DID, D_NAME, AGE, BLOOD_GROUP, GENDER, PHONE, H_NO, STREET, CITY, RID, R_NAME, PHONE, H_NO, STREET, CITY

1NF: PHONE is a multivalued attribute.

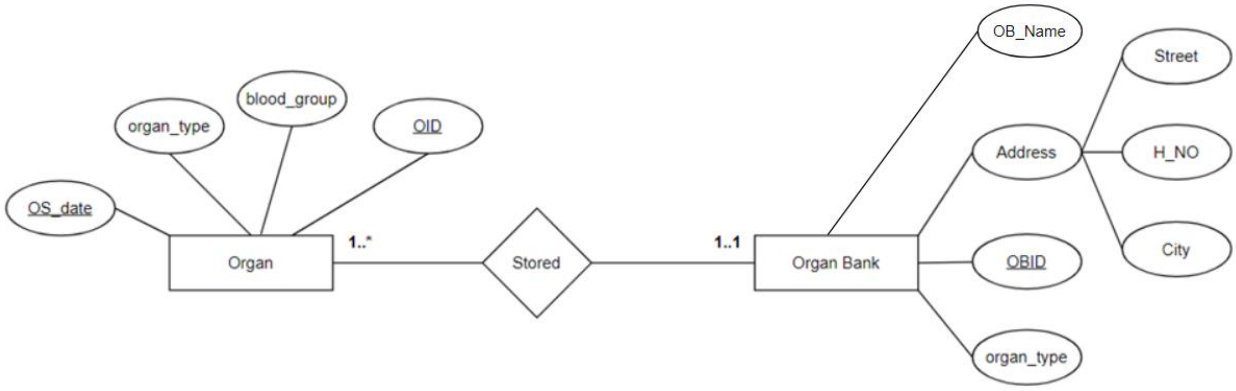
DID, D_NAME, AGE, BLOOD_GROUP, GENDER, H_NO, STREET, CITY, RID, R_NAME, PHONE, H_NO, STREET, CITY

2NF:

1. DID, D_NAME, AGE, BLOOD_GROUP, GENDER, H_NO, STREET, CITY, RID, PID
2. PID, PHONE
3. RID, R_NAME, H_NO, STREET, CITY, PID

3NF:

1. DID, D_NAME, AGE, BLOOD_GROUP, RID, PID, AID
2. PID, PHONE
3. AID, H_NO, STREET, CITY
4. RID, R_NAME, PID, AID



Stored:

UNF:

OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE, OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY

1NF: NO multivalued attribute. (SAME AS **UNF**)

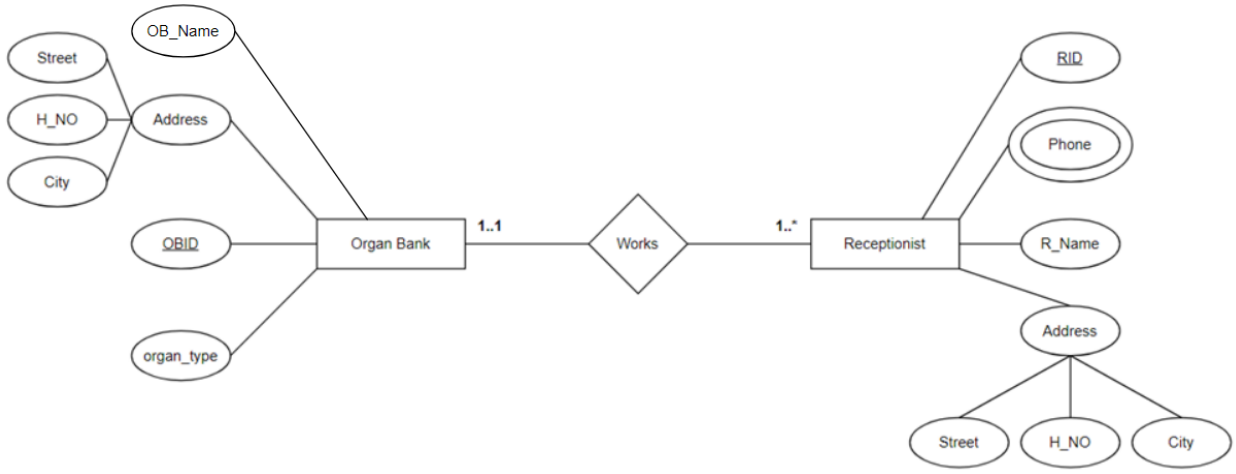
OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE, OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY

2NF:

1. OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE, OBID
2. OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY

3NF:

1. OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE, OBID
2. OBID, OB_NAME, ORGAN_TYPE, AID
3. AID, H_NO, STREET, CITY



Works:

UNF:

OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY, RID, R_NAME, PHONE, H_NO, STREET, CITY

1NF: PHONE is a multivalued attribute.

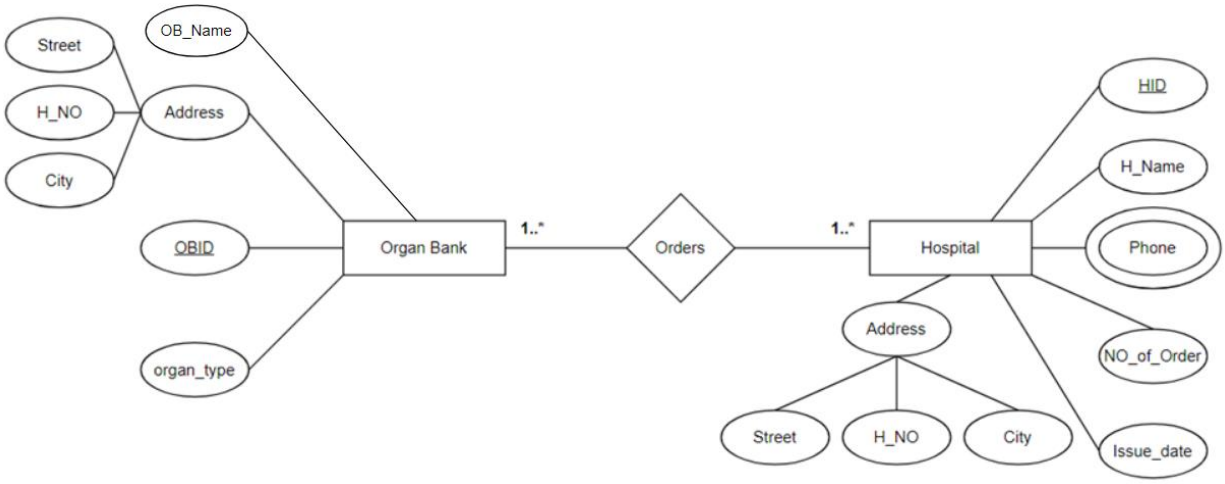
OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY, RID, R_NAME, H_NO, STREET, CITY

2NF:

1. OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY
2. PID, PHONE
3. RID, R_NAME, PHONE, H_NO, STREET, CITY, OBID, PID

3NF:

1. OBID, OB_NAME, ORGAN_TYPE, AID
2. PID, PHONE
3. AID, H_NO, STREET, CITY
4. RID, R_NAME, OBID, PID, AID



Orders:

UNF:

OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY, HID, H_NAME, PHONE, NO_OF_ORDER, ISSUE_DATE, H_NO, STREET, CITY

1NF: PHONE is a multivalued attribute.

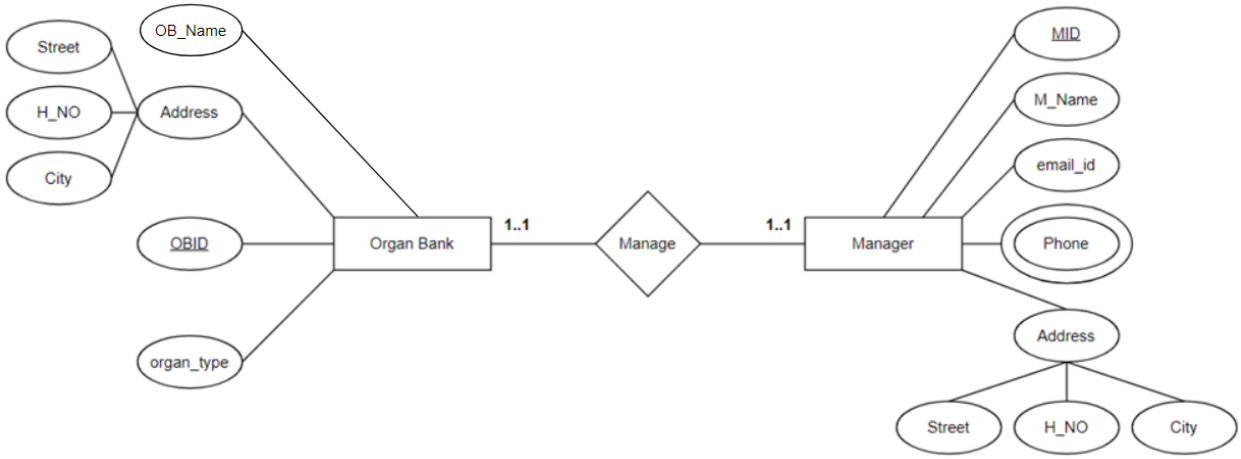
OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY, HID, H_NAME, NO_OF_ORDER, ISSUE_DATE, H_NO, STREET, CITY

2NF:

1. OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY
2. PID, PHONE
3. HID, H_NAME, NO_OF_ORDER, ISSUE_DATE, H_NO, STREET, CITY, OBID, PID

3NF:

1. OBID, OB_NAME, ORGAN_TYPE, AID
2. PID, PHONE
3. AID, H_NO, STREET, CITY
4. HID, H_NAME, NO_OF_ORDER, ISSUE_DATE, OBID, PID, AID



Manage:

UNF:

OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY, MID, M_NAME, EMAIL_ID, PHONE, H_NO, STREET, CITY

1NF: PHONE is a multivalued attribute.

OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY, MID, M_NAME, EMAIL_ID, H_NO, STREET, CITY

2NF:

1. OBID, OB_NAME, ORGAN_TYPE, H_NO, STREET, CITY
2. PID, PHONE
3. MID, M_NAME, EMAIL_ID, H_NO, STREET, CITY, OBID, PID

3NF:

1. OBID, OB_NAME, ORGAN_TYPE, AID
2. PID, PHONE
3. AID, H_NO, STREET, CITY
4. MID, M_NAME, EMAIL_ID, OBID, PID, AID

TOTAL TABLE

1. DID, D_NAME, AGE, BLOOD_GROUP, GENDER, OID, PID, AID
2. PID, PHONE
3. AID, H_NO, STREET, CITY
4. OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE
5. DID, D_NAME, AGE, BLOOD_GROUP, RID, PID, AID
6. PID, PHONE
7. AID, H_NO, STREET, CITY
8. RID, R_NAME, PID, AID
9. OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE, OBID
10. OBID, OB_NAME, ORGAN_TYPE, AID
11. AID, H_NO, STREET, CITY
12. OBID, OB_NAME, ORGAN_TYPE, AID
13. PID, PHONE
14. AID, H_NO, STREET, CITY
15. RID, R_NAME, OBID, PID, AID
16. OBID, OB_NAME, ORGAN_TYPE, AID
17. PID, PHONE
18. AID, H_NO, STREET, CITY
19. HID, H_NAME, NO_OF_ORDER, ISSUE_DATE, OBID, PID, AID
20. OBID, OB_NAME, ORGAN_TYPE, AID
21. PID, PHONE
22. AID, H_NO, STREET, CITY
23. MID, M_NAME, EMAIL_ID, OBID, PID, AID

FINALIZATION

1. PID, PHONE
2. AID, H_NO, STREET, CITY
3. OBID, OB_NAME, AID
4. OID, BLOOD_GROUP, ORGAN_TYPE, OS_DATE, OBID
5. HID, H_NAME, NO_OF_ORDER, ISSUE_DATE, OBID, PID, AID
6. RID, R_NAME, OBID, PID, AID
7. DID, D_NAME, AGE, BLOOD_GROUP, GENDER, OID, PID, AID
8. MID, M_NAME, EMAIL_ID, OBID, PID, AID

Constraints

1. PHONE_NUMBER:

Column Name	Data Type	Constraints
PID	VARCHAR2(5)	PRIMARY KEY
PHONE	VARCHAR2(11)	NOT NULL

2. ADDRESS:

Column Name	Data Type	Constraints
AID	VARCHAR2(5)	PRIMARY KEY
H_NO	NUMBER (4,0)	NOT NULL
STREET_NUMBER	NUMBER (3,0)	NOT NULL
CITY	VARCHAR2(255)	NOT NULL

3. ORGAN_BANK:

Column Name	Data Type	Constraints
OBID	VARCHAR2(6)	PRIMARY KEY
OB_NAME	VARCHAR2(15)	NOT NULL
AID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from “ADDRESS”

4. ORGAN:

Column Name	Data Type	Constraints
OID	VARCHAR2(5)	PRIMARY KEY
BLOOD_GROUP	VARCHAR2(3)	CHECK, NOT NULL
ORGAN_TYPE	VARCHAR2(255)	NOT NULL
OS_DATE	DATE	NOT NULL
OBID	VARCHAR2(6)	NOT NULL, FOREIGN KEY from “ORGAN_BANK”

5. HOSPITAL:

Column Name	Data Type	Constraints
HID	VARCHAR2(5)	PRIMARY KEY
H_NAME	VARCHAR2(255)	NOT NULL
NO_OF_ORDER	NUMBER (3)	NOT NULL
ISSUE_DATE	DATE	NOT NULL
OBID	VARCHAR2(6)	NOT NULL, FOREIGN KEY from "ORGAN_BANK"
PID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from "PHONE_NUMBER"
AID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from "ADDRESS"

6. RECIPTIONIST:

Column Name	Data Type	Constraints
RID	VARCHAR2(5)	PRIMARY KEY
R_NAME	VARCHAR2(255)	NOT NULL
OBID	VARCHAR2(6)	NOT NULL, FOREIGN KEY from "ORGAN_BANK"
PID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from "PHONE_NUMBER"
AID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from "ADDRESS"

7. DONOR

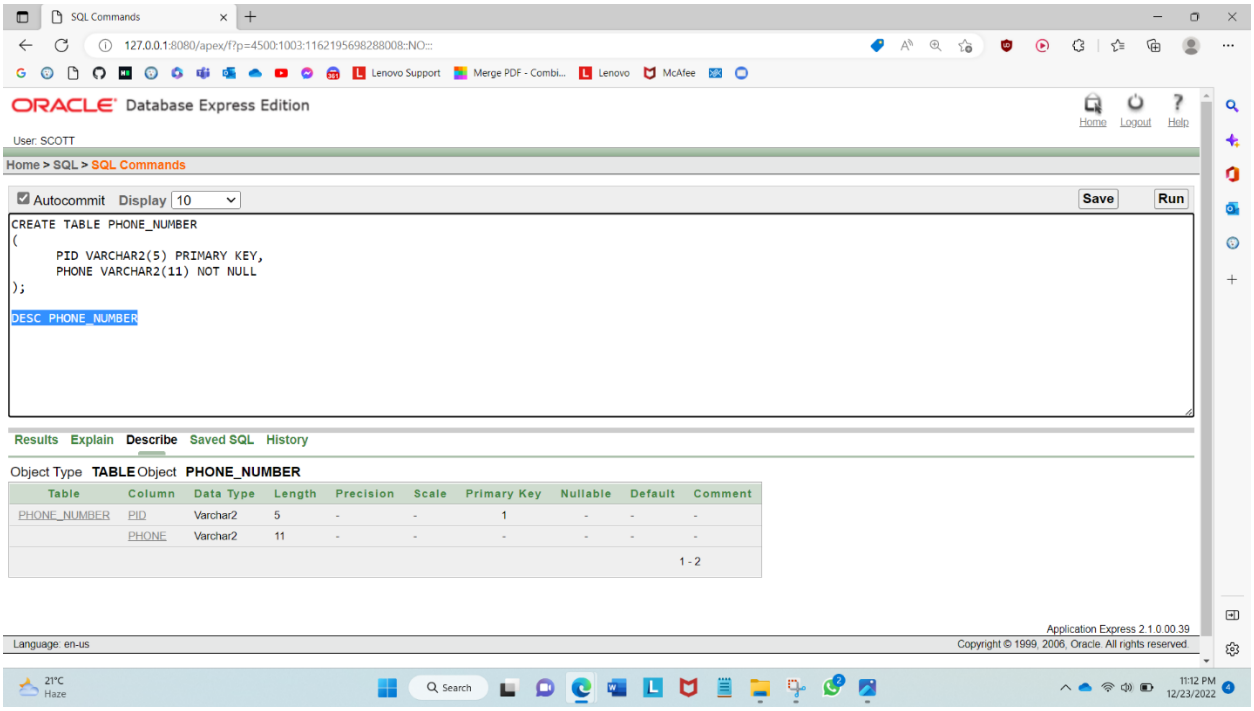
Column Name	Data Type	Constraints
DID	VARCHAR2(5)	PRIMARY KEY
D_NAME	VARCHAR2(255)	DEFAULT
AGE	NUMBER (3)	NOT NULL
BLOOD_GROUP	VARCHAR2(3)	CHECK, NOT NULL
GENDER	VARCHAR2(255)	CHECK, NOT NULL
OID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from “ORGAN”
PID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from “PHONE_NUMBER”
AID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from “ADDRESS”

8. MANAGER:

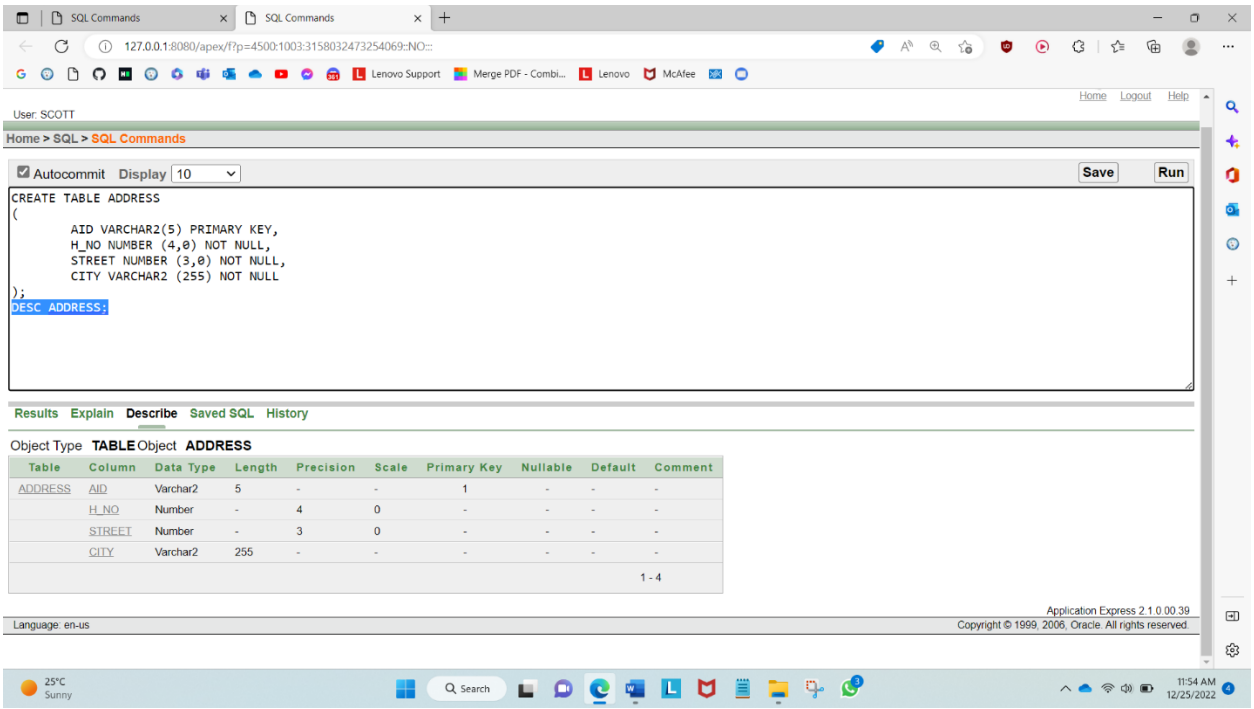
Column Name	Data Type	Constraints
MID	VARCHAR2(5)	PRIMARY KEY
M_NAME	VARCHAR2(255)	NOT NULL
EMAIL_ID	VARCHAR2(255)	NOT NULL
OBID	VARCHAR2(6)	NOT NULL, FOREIGN KEY from “ORGAN_BANK”
PID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from “PHONE_NUMBER”
AID	VARCHAR2(5)	NOT NULL, FOREIGN KEY from “ADDRESS”

TABLE CREATION

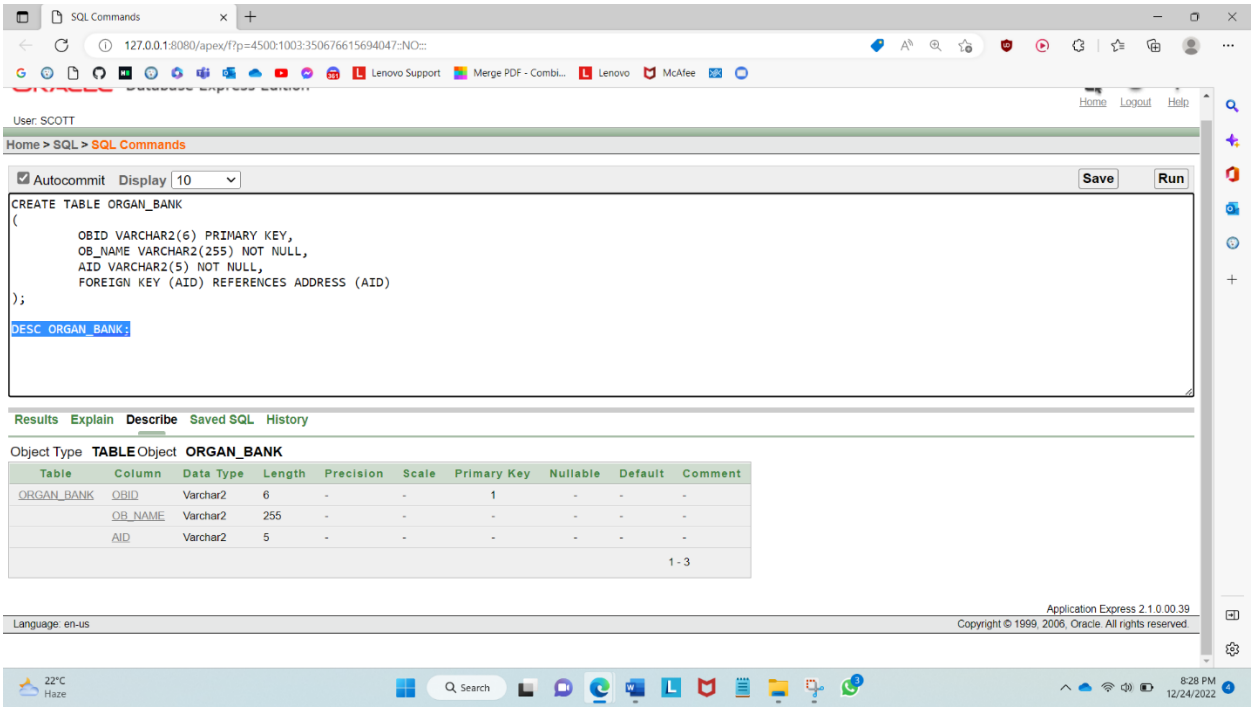
1. PHONE_NUMBER:



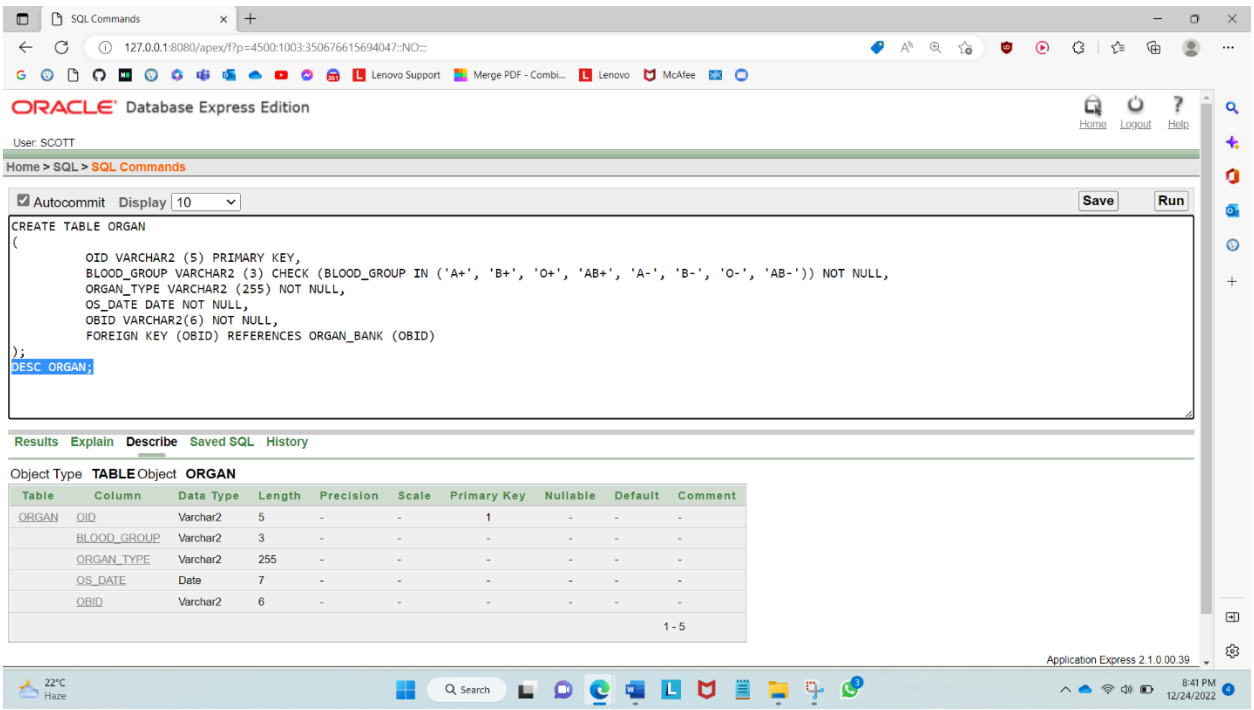
2. ADDRESS:



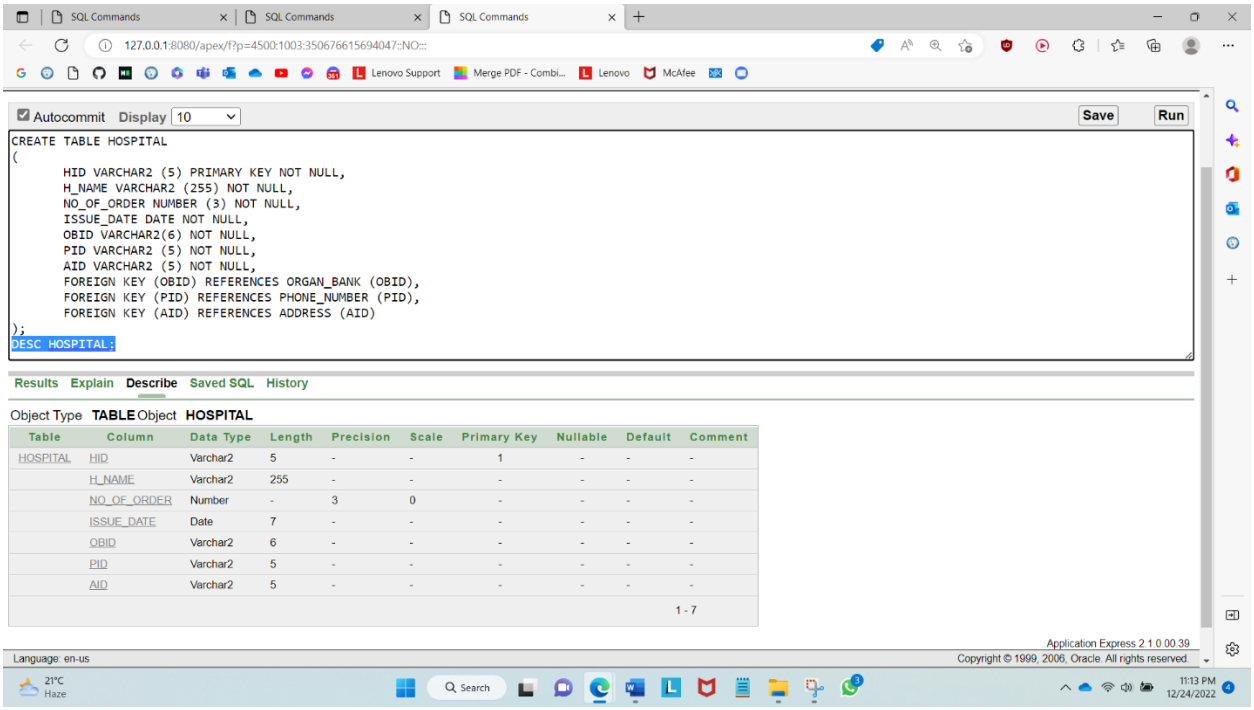
3. ORGAN_BANK:



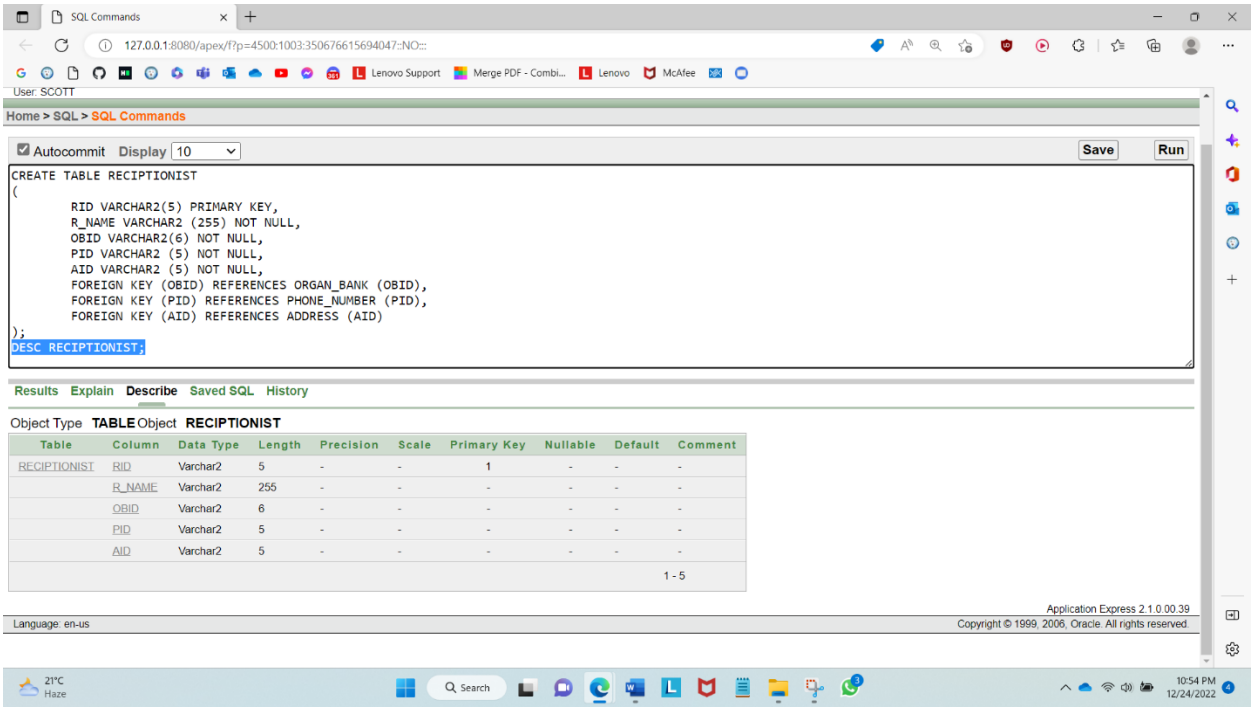
4. ORGAN:



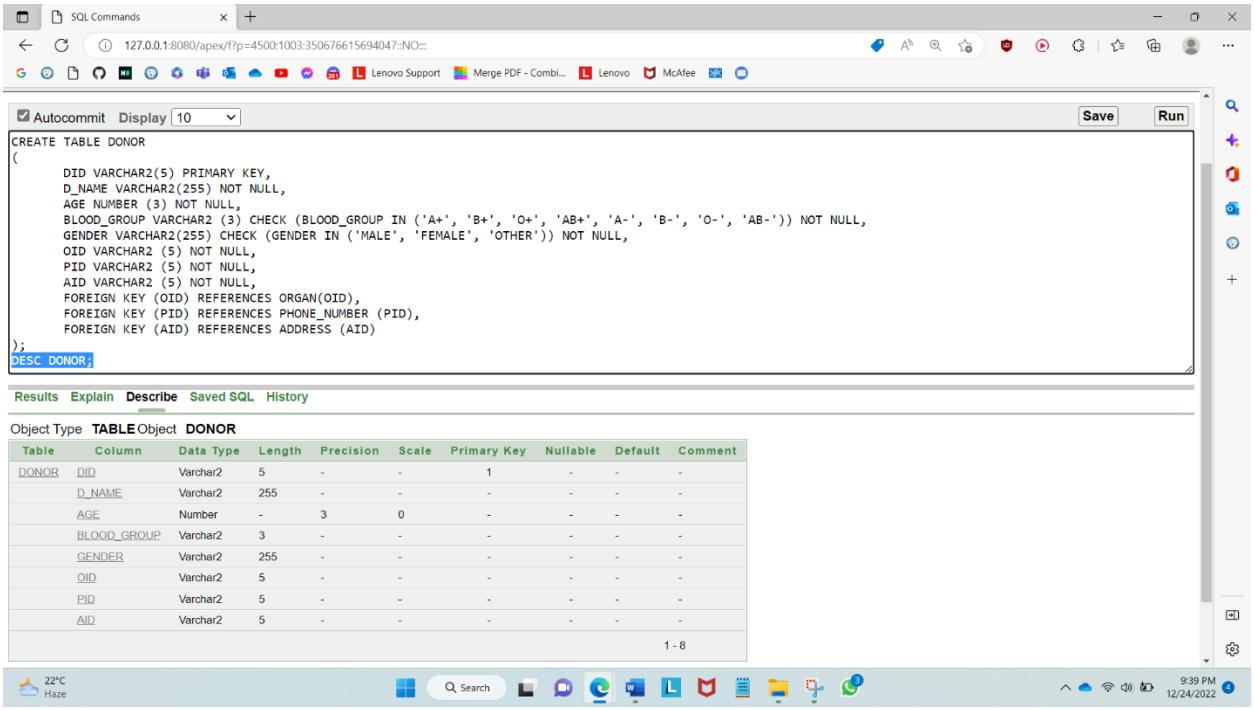
5. HOSPITAL:



6. RECIPTIONIST:



7. DONOR:



```
CREATE TABLE DONOR
(
	DID VARCHAR2(5) PRIMARY KEY,
	D_NAME VARCHAR2(255) NOT NULL,
	AGE NUMBER (3) NOT NULL,
	BLOOD_GROUP VARCHAR2 (3) CHECK (BLOOD_GROUP IN ('A+', 'B+', 'O+', 'AB+', 'A-', 'B-', 'O-', 'AB-')) NOT NULL,
	GENDER VARCHAR2(255) CHECK (GENDER IN ('MALE', 'FEMALE', 'OTHER')) NOT NULL,
	OID VARCHAR2 (5) NOT NULL,
	PID VARCHAR2 (5) NOT NULL,
	AID VARCHAR2 (5) NOT NULL,
	FOREIGN KEY (OID) REFERENCES ORGAN(OID),
	FOREIGN KEY (PID) REFERENCES PHONE_NUMBER (PID),
	FOREIGN KEY (AID) REFERENCES ADDRESS (AID)
);
DESC DONOR;
```

Object Type **TABLE** Object **DONOR**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DONOR	DID	Varchar2	5	-	-	1	-	-	-
	D_NAME	Varchar2	255	-	-	-	-	-	-
	AGE	Number	-	3	0	-	-	-	-
	BLOOD_GROUP	Varchar2	3	-	-	-	-	-	-
	GENDER	Varchar2	255	-	-	-	-	-	-
	OID	Varchar2	5	-	-	-	-	-	-
	PID	Varchar2	5	-	-	-	-	-	-
	AID	Varchar2	5	-	-	-	-	-	-

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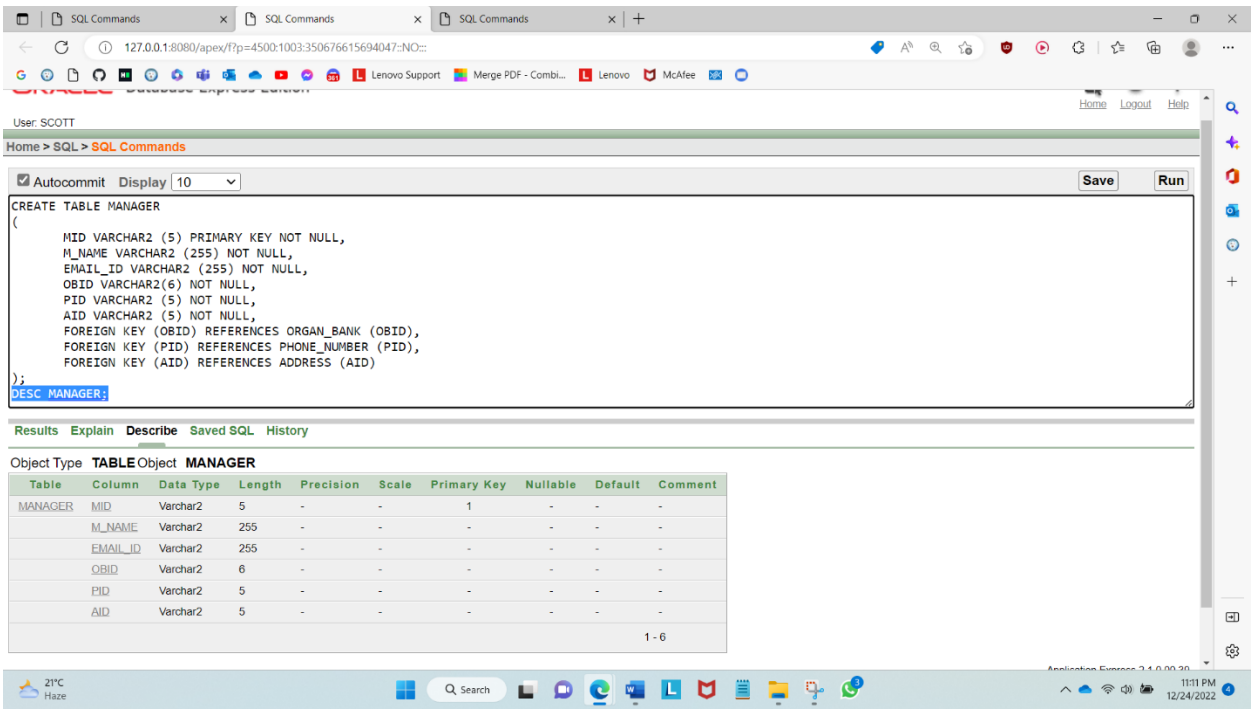
8. MANAGER:



```
CREATE TABLE MANAGER
(
	MID VARCHAR2 (5) PRIMARY KEY NOT NULL,
	M_NAME VARCHAR2 (255) NOT NULL,
	EMAIL_ID VARCHAR2 (255) NOT NULL,
	OBID VARCHAR2(6) NOT NULL,
	PID VARCHAR2 (5) NOT NULL,
	AID VARCHAR2 (5) NOT NULL,
	FOREIGN KEY (OBID) REFERENCES ORGAN_BANK (OBID),
	FOREIGN KEY (PID) REFERENCES PHONE_NUMBER (PID),
	FOREIGN KEY (AID) REFERENCES ADDRESS (AID)
);
DESC MANAGER;
```

Object Type **TABLE** Object **MANAGER**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
MANAGER	MID	Varchar2	5	-	-	1	-	-	-
	M_NAME	Varchar2	255	-	-	-	-	-	-
	EMAIL_ID	Varchar2	255	-	-	-	-	-	-
	OBID	Varchar2	6	-	-	-	-	-	-
	PID	Varchar2	5	-	-	-	-	-	-
	AID	Varchar2	5	-	-	-	-	-	-

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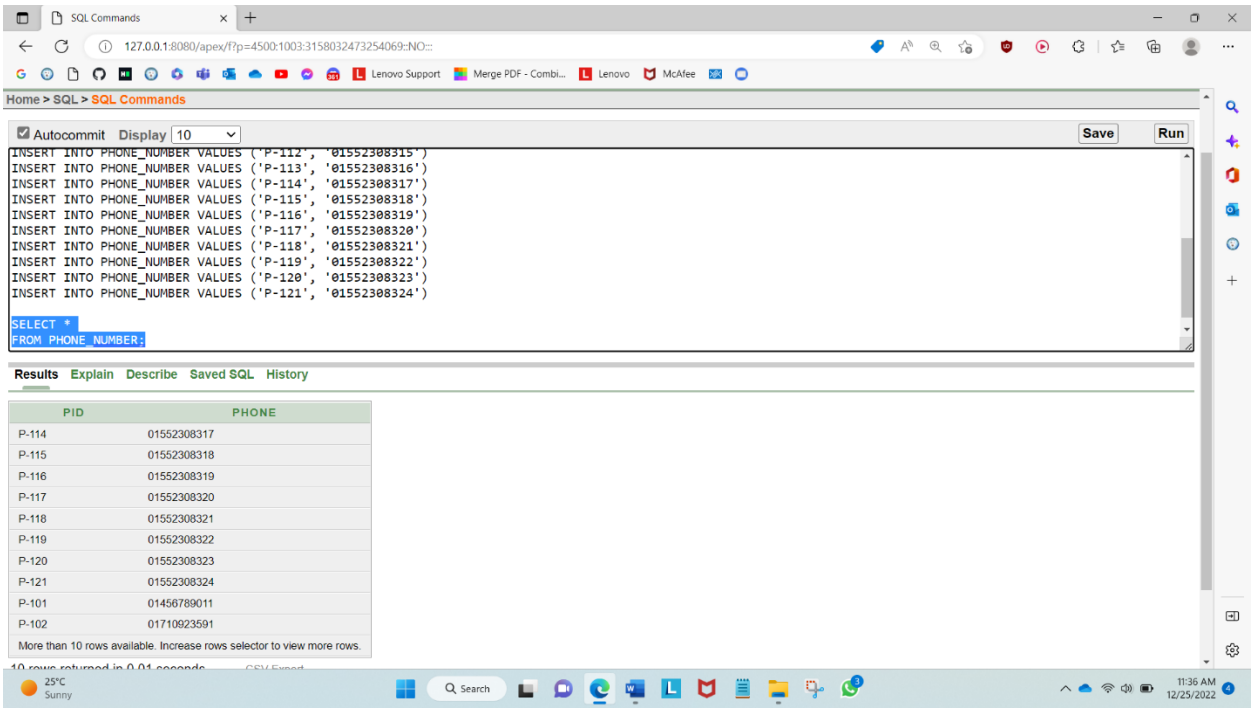
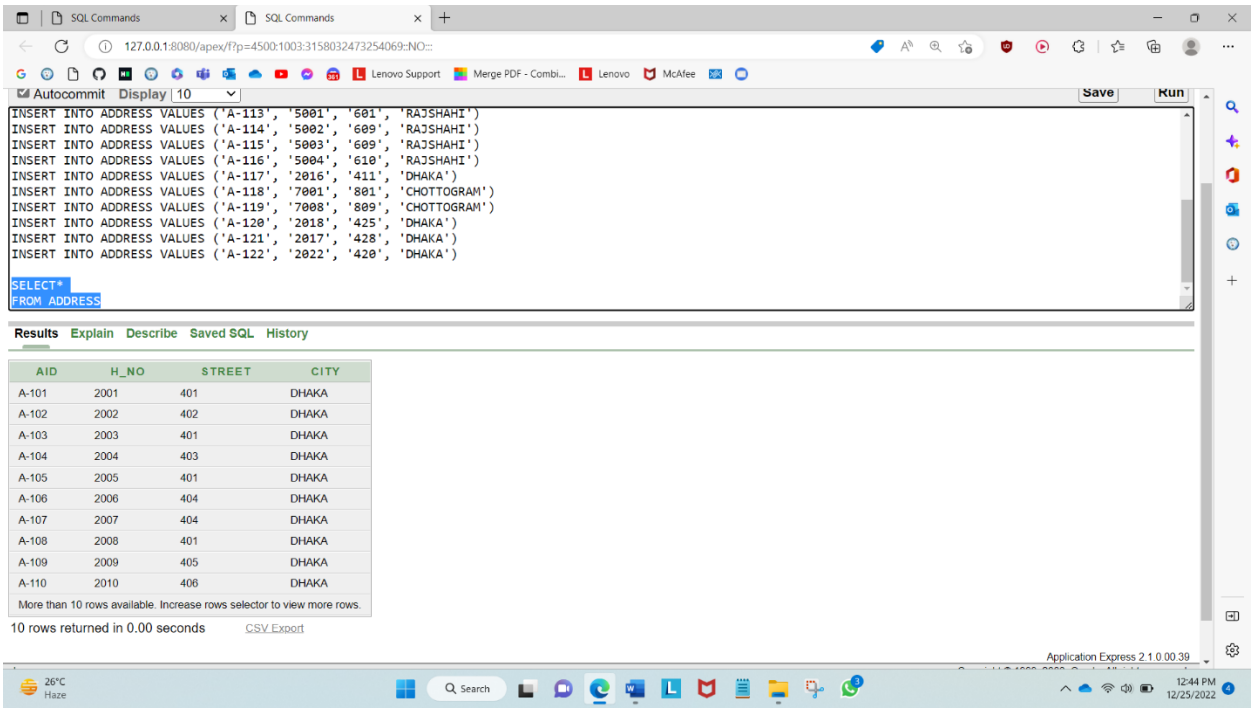
DATA INSERTION

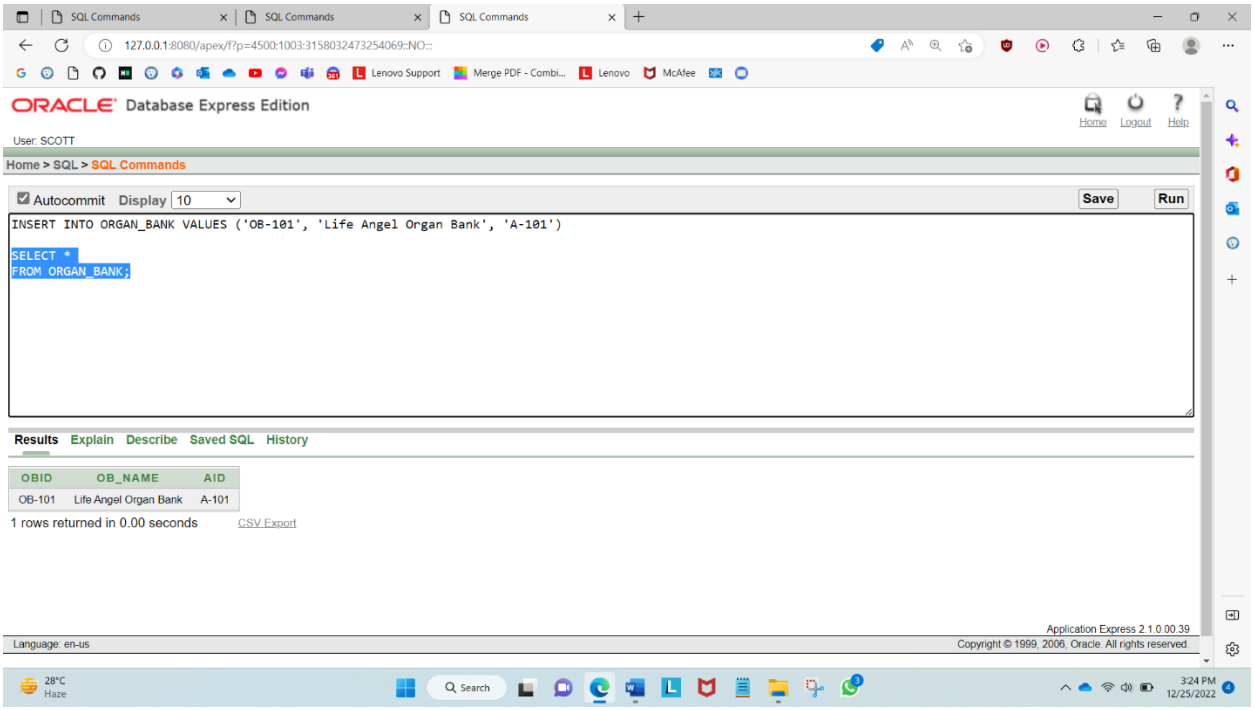
1. PHONE_NUMBER:



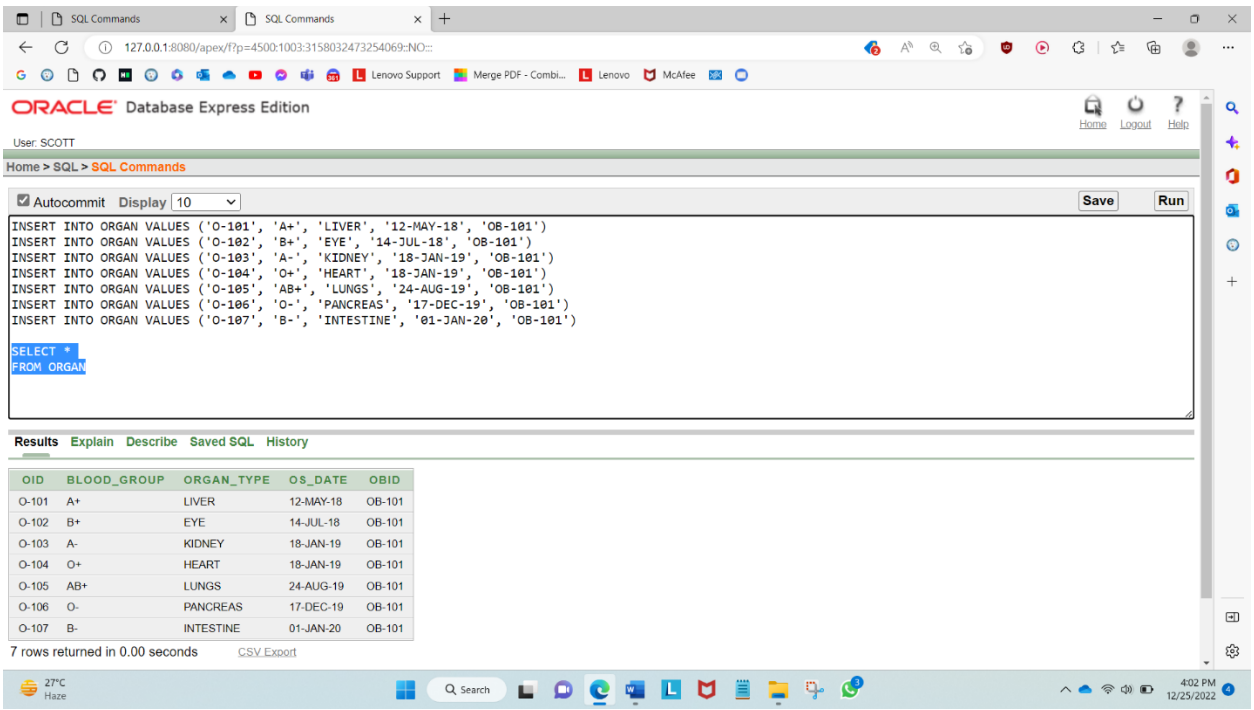
2. ADDRESS:



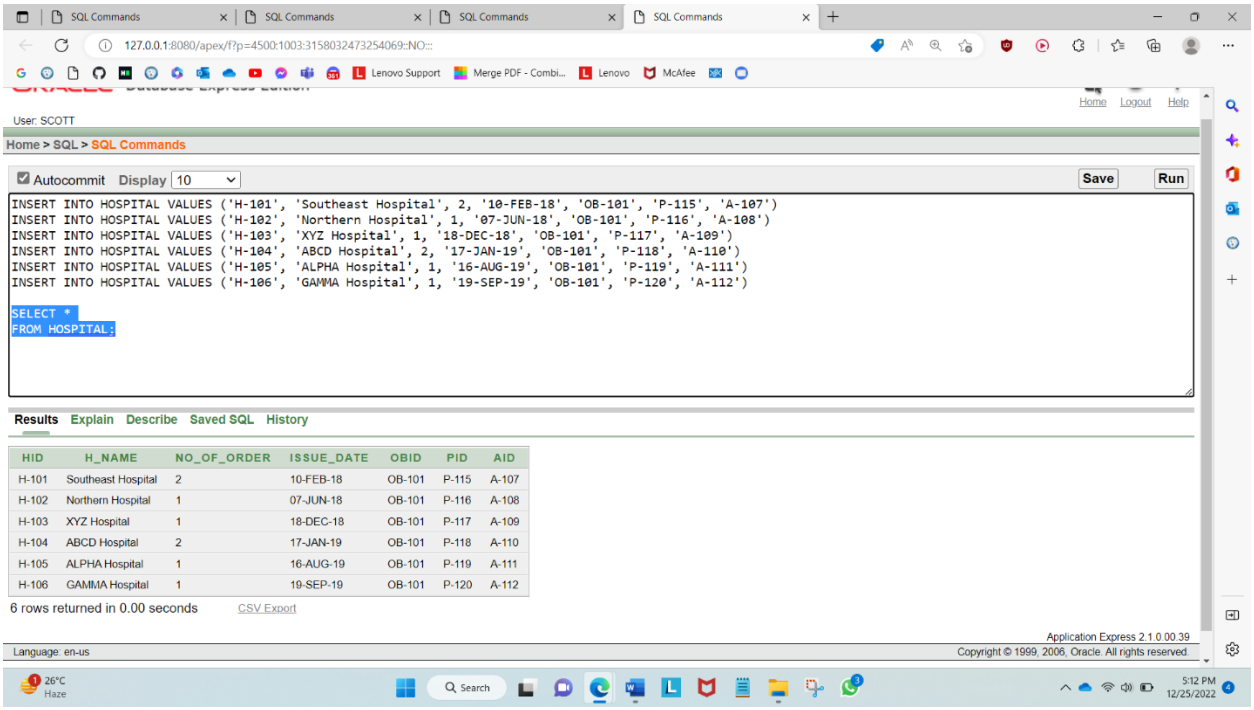
3. ORGAN_BANK:



4. ORGAN:



5. HOSPITAL:

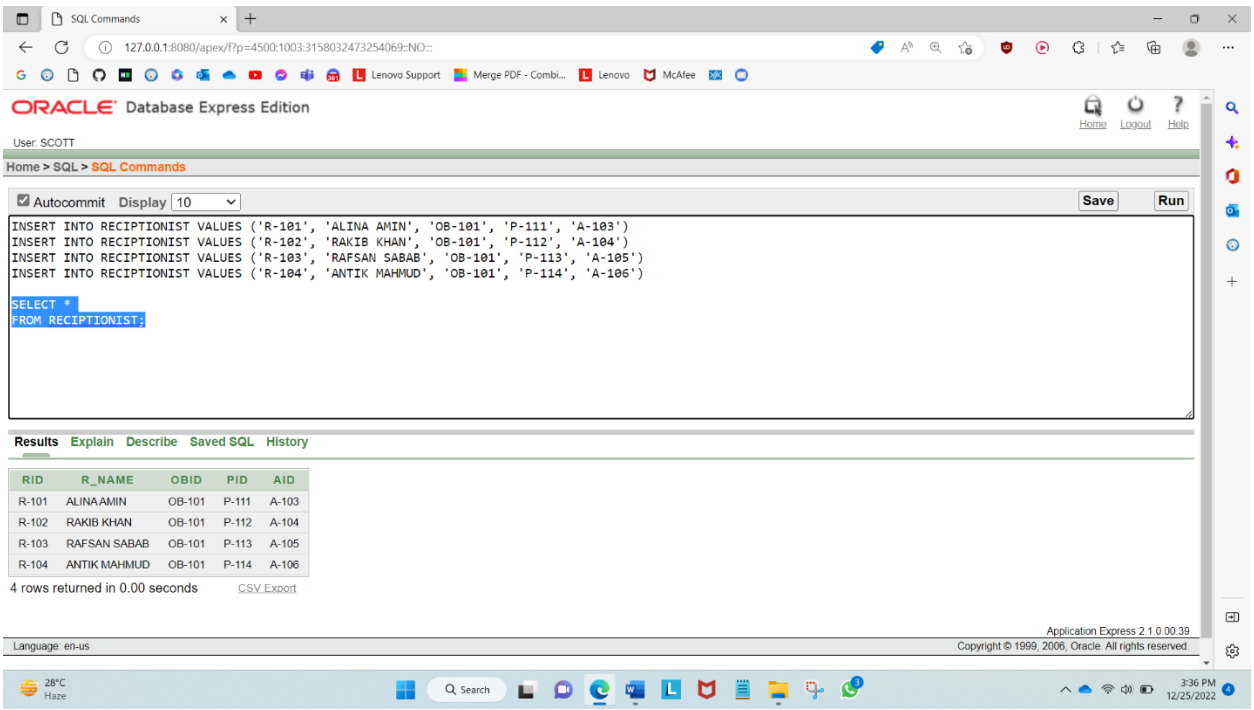


```
INSERT INTO HOSPITAL VALUES ('H-101', 'Southeast Hospital', 2, '10-FEB-18', 'OB-101', 'P-115', 'A-107')
INSERT INTO HOSPITAL VALUES ('H-102', 'Northern Hospital', 1, '07-JUN-18', 'OB-101', 'P-116', 'A-108')
INSERT INTO HOSPITAL VALUES ('H-103', 'XYZ Hospital', 1, '18-DEC-18', 'OB-101', 'P-117', 'A-109')
INSERT INTO HOSPITAL VALUES ('H-104', 'ABCD Hospital', 2, '17-JAN-19', 'OB-101', 'P-118', 'A-110')
INSERT INTO HOSPITAL VALUES ('H-105', 'ALPHA Hospital', 1, '16-AUG-19', 'OB-101', 'P-119', 'A-111')
INSERT INTO HOSPITAL VALUES ('H-106', 'GAMMA Hospital', 1, '19-SEP-19', 'OB-101', 'P-120', 'A-112')

SELECT *
FROM HOSPITAL;
```

HID	H_NAME	NO_OF_ORDER	ISSUE_DATE	OBID	PID	AID
H-101	Southeast Hospital	2	10-FEB-18	OB-101	P-115	A-107
H-102	Northern Hospital	1	07-JUN-18	OB-101	P-116	A-108
H-103	XYZ Hospital	1	18-DEC-18	OB-101	P-117	A-109
H-104	ABCD Hospital	2	17-JAN-19	OB-101	P-118	A-110
H-105	ALPHA Hospital	1	16-AUG-19	OB-101	P-119	A-111
H-106	GAMMA Hospital	1	19-SEP-19	OB-101	P-120	A-112

6 rows returned in 0.00 seconds

6. RECIPTIONIST:

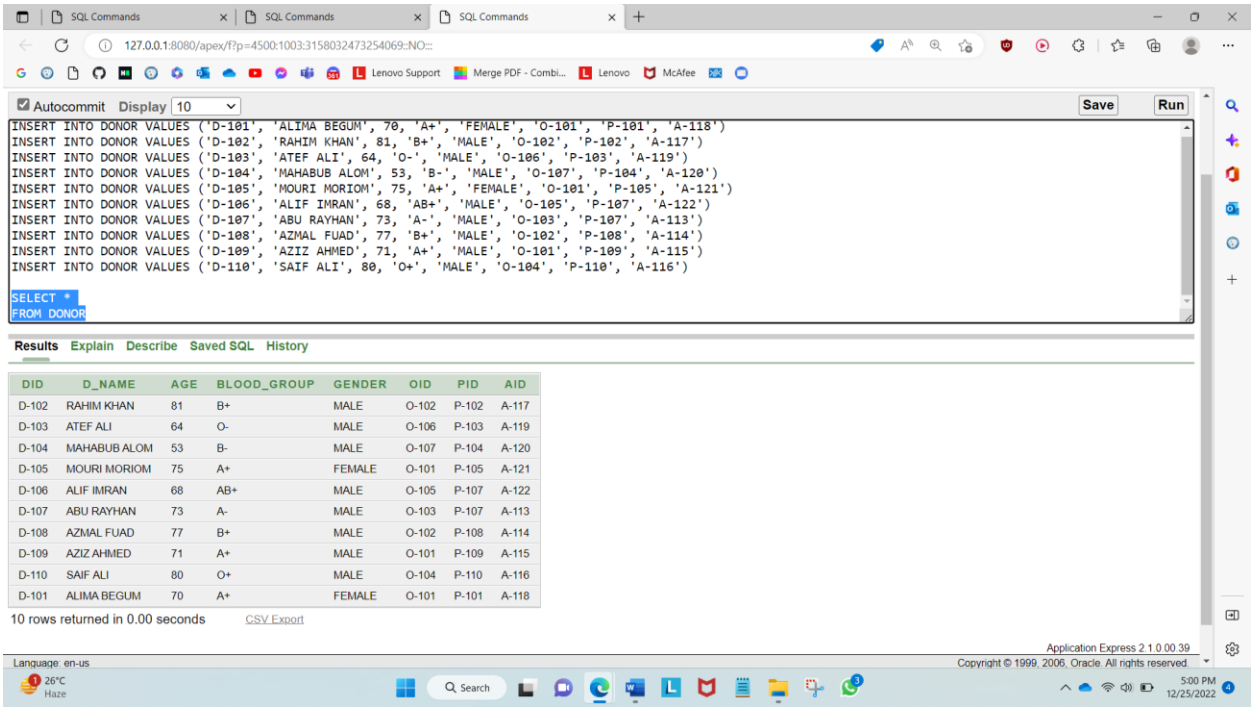


```
INSERT INTO RECIPTIONIST VALUES ('R-101', 'ALINA AMIN', 'OB-101', 'P-111', 'A-103')
INSERT INTO RECIPTIONIST VALUES ('R-102', 'RAKIB KHAN', 'OB-101', 'P-112', 'A-104')
INSERT INTO RECIPTIONIST VALUES ('R-103', 'RAFSAN SABAB', 'OB-101', 'P-113', 'A-105')
INSERT INTO RECIPTIONIST VALUES ('R-104', 'ANTIK MAHMUD', 'OB-101', 'P-114', 'A-106')

SELECT *
FROM RECIPTIONIST;
```

RID	R_NAME	OBID	PID	AID
R-101	ALINA AMIN	OB-101	P-111	A-103
R-102	RAKIB KHAN	OB-101	P-112	A-104
R-103	RAFSAN SABAB	OB-101	P-113	A-105
R-104	ANTIK MAHMUD	OB-101	P-114	A-106

4 rows returned in 0.00 seconds

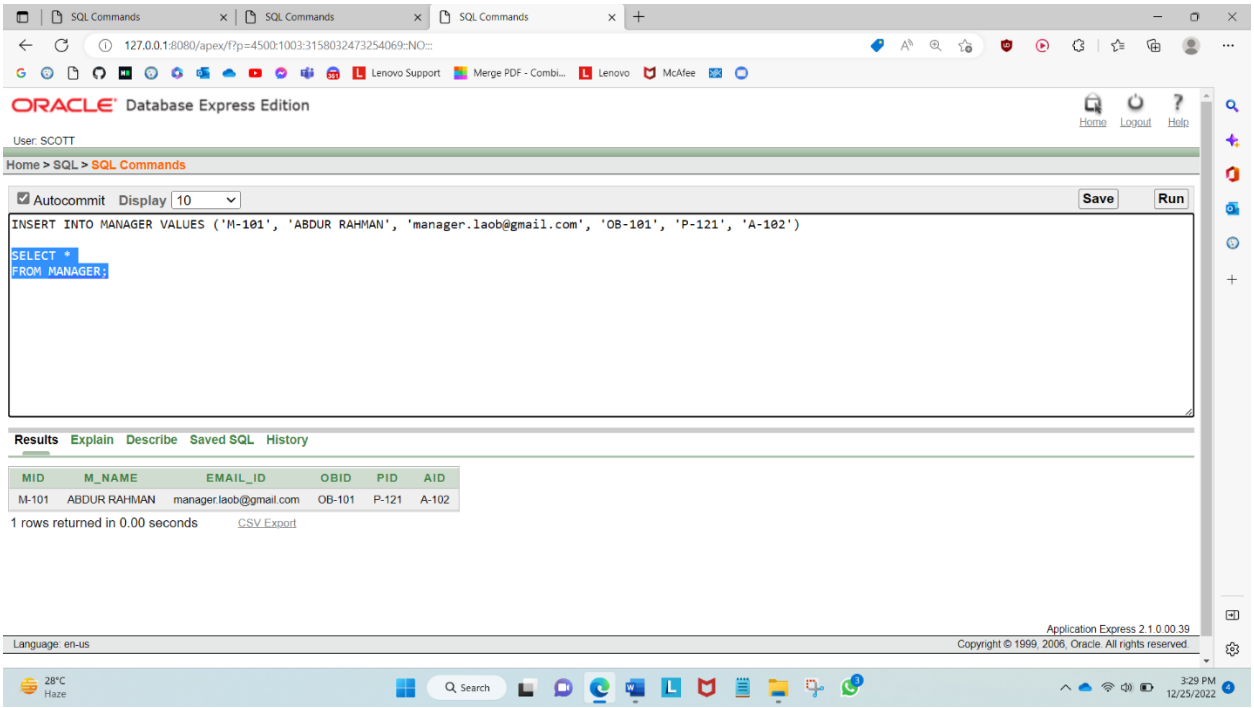
7. DONOR:



```
INSERT INTO DONOR VALUES ('D-101', 'ALIMA BEGUM', 70, 'A+', 'FEMALE', 'O-101', 'P-101', 'A-118')
INSERT INTO DONOR VALUES ('D-102', 'RAHIM KHAN', 81, 'B+', 'MALE', 'O-102', 'P-102', 'A-117')
INSERT INTO DONOR VALUES ('D-103', 'ATEF ALI', 64, 'O-', 'MALE', 'O-106', 'P-103', 'A-119')
INSERT INTO DONOR VALUES ('D-104', 'MAHABUB ALOM', 53, 'B-', 'MALE', 'O-107', 'P-104', 'A-120')
INSERT INTO DONOR VALUES ('D-105', 'MOURI MORIOM', 75, 'A+', 'FEMALE', 'O-101', 'P-105', 'A-121')
INSERT INTO DONOR VALUES ('D-106', 'ALIF IMRAN', 68, 'AB+', 'MALE', 'O-105', 'P-107', 'A-122')
INSERT INTO DONOR VALUES ('D-107', 'ABU RAYHAN', 73, 'A-', 'MALE', 'O-103', 'P-107', 'A-113')
INSERT INTO DONOR VALUES ('D-108', 'AZMAL FUAD', 77, 'B+', 'MALE', 'O-102', 'P-108', 'A-114')
INSERT INTO DONOR VALUES ('D-109', 'AZIZ AHMED', 71, 'A+', 'MALE', 'O-101', 'P-109', 'A-115')
INSERT INTO DONOR VALUES ('D-110', 'SAIF ALI', 80, 'O+', 'MALE', 'O-104', 'P-110', 'A-116')

SELECT *
FROM DONOR
```

DID	D_NAME	AGE	BLOOD_GROUP	GENDER	OID	PID	AID
D-102	RAHIM KHAN	81	B+	MALE	O-102	P-102	A-117
D-103	ATEF ALI	64	O-	MALE	O-106	P-103	A-119
D-104	MAHABUB ALOM	53	B-	MALE	O-107	P-104	A-120
D-105	MOURI MORIOM	75	A+	FEMALE	O-101	P-105	A-121
D-106	ALIF IMRAN	68	AB+	MALE	O-105	P-107	A-122
D-107	ABU RAYHAN	73	A-	MALE	O-103	P-107	A-113
D-108	AZMAL FUAD	77	B+	MALE	O-102	P-108	A-114
D-109	AZIZ AHMED	71	A+	MALE	O-101	P-109	A-115
D-110	SAIF ALI	80	O+	MALE	O-104	P-110	A-116
D-101	ALIMA BEGUM	70	A+	FEMALE	O-101	P-101	A-118

8. MANAGER:



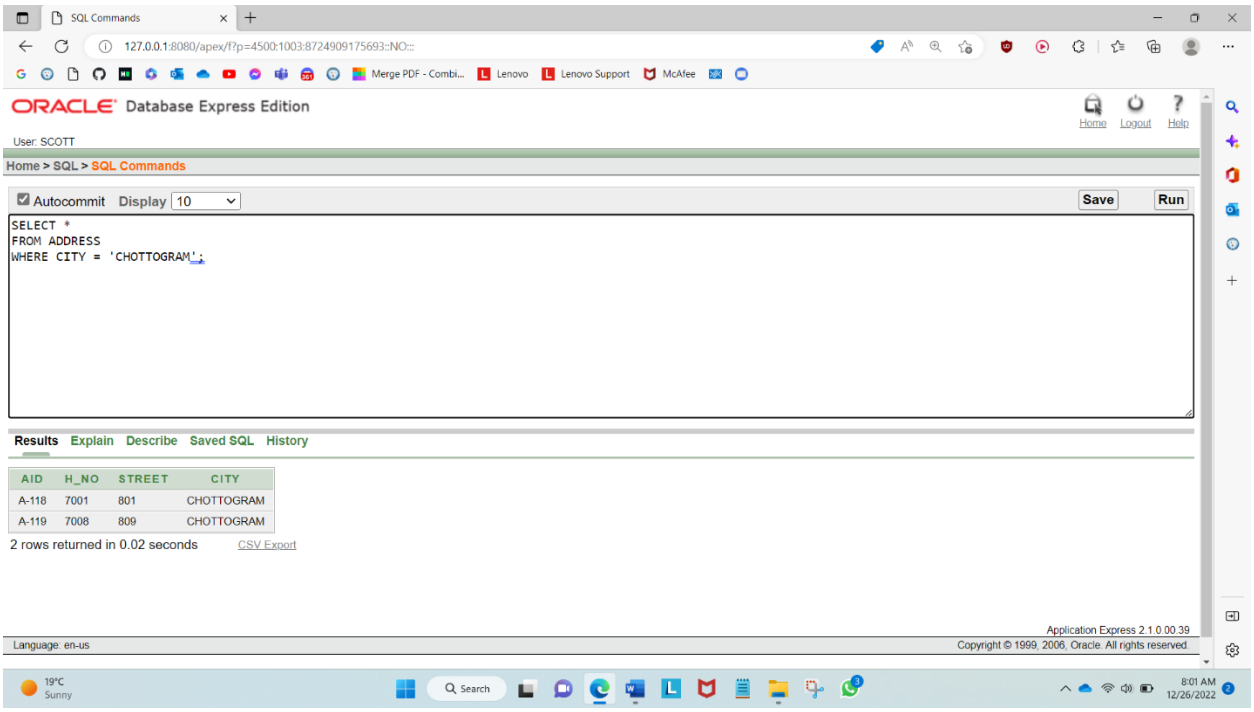
```
INSERT INTO MANAGER VALUES ('M-101', 'ABDUR RAHMAN', 'manager.laob@gmail.com', 'OB-101', 'P-121', 'A-102')

SELECT *
FROM MANAGER;
```

MID	M_NAME	EMAIL_ID	OBID	PID	AID
M-101	ABDUR RAHMAN	manager.laob@gmail.com	OB-101	P-121	A-102

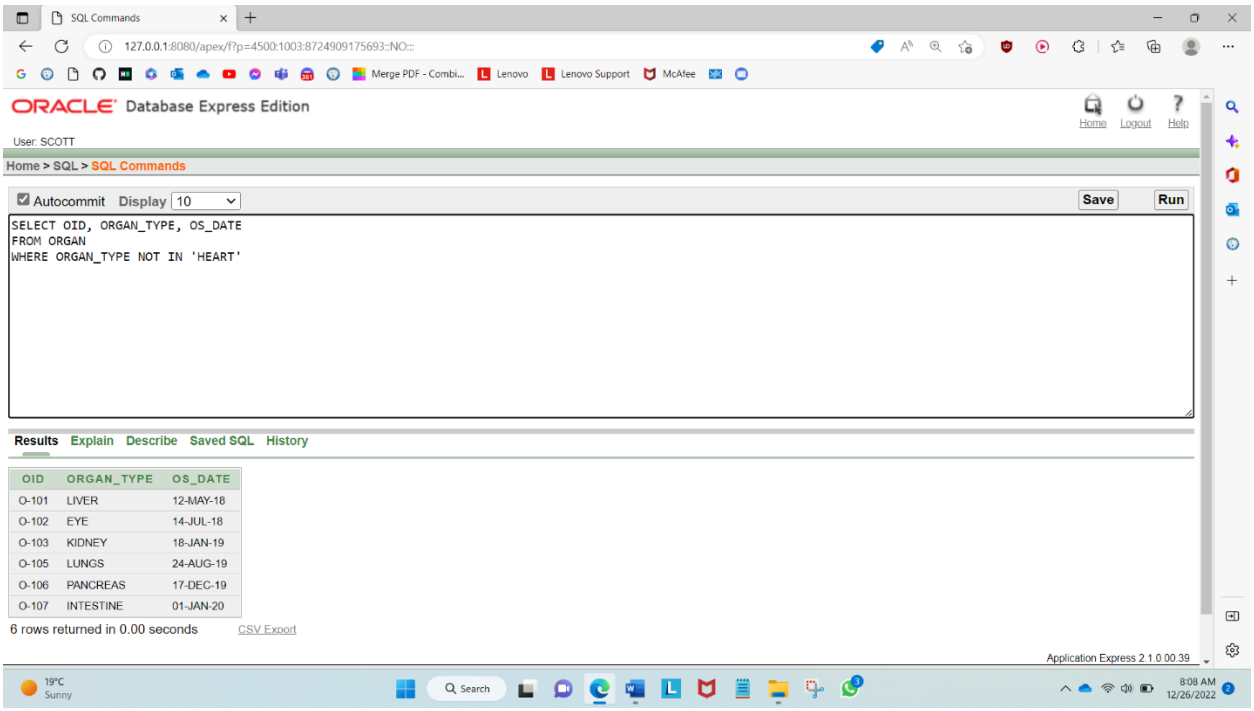
QUERY TEST

Basic Query

1. Show the address info whose location (city) in CHOTTAGRAM.

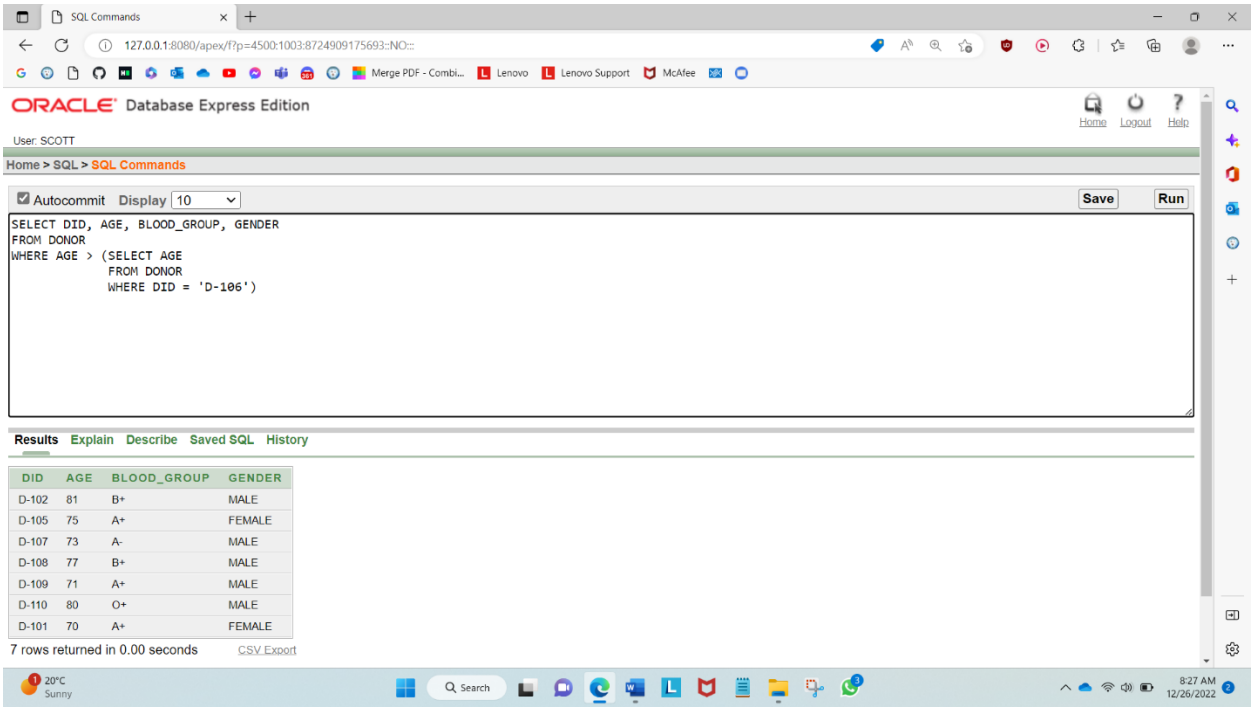


2. Show organ id, organ type, organ stored date where heart doesn't exist

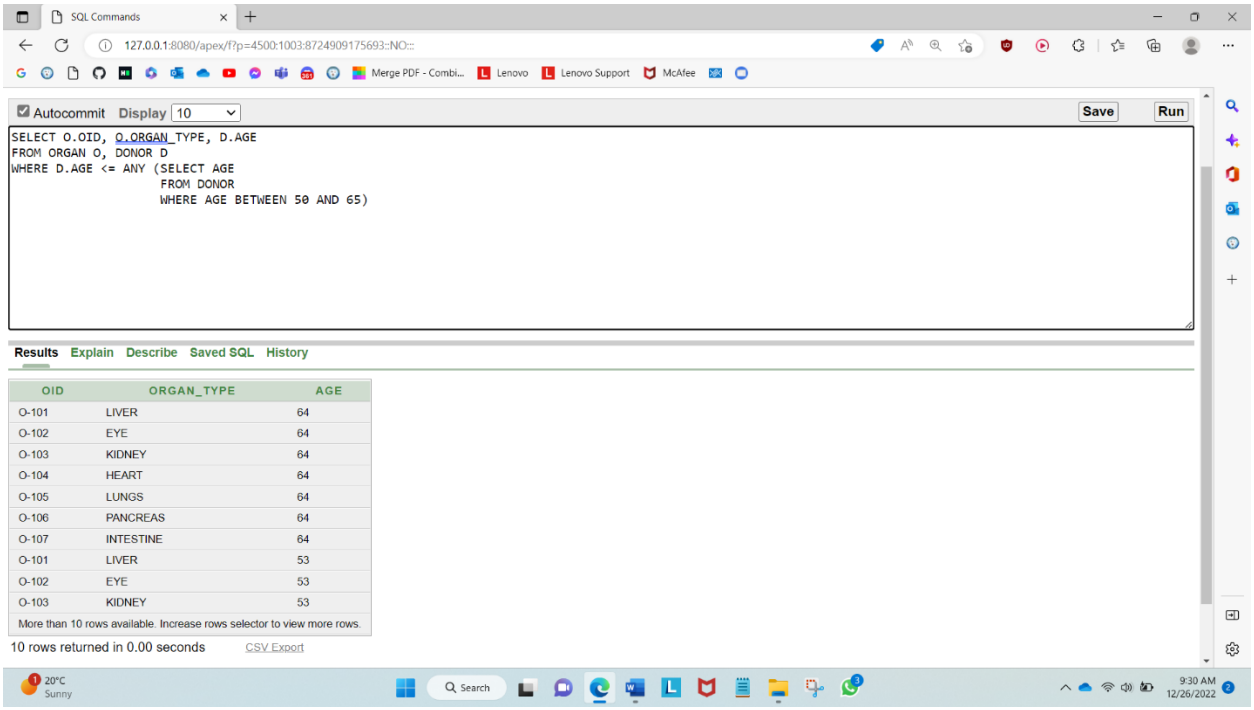


Sub Query

1. Display the donor id, age, blood group, gender whose age is greater than donor id = D-106

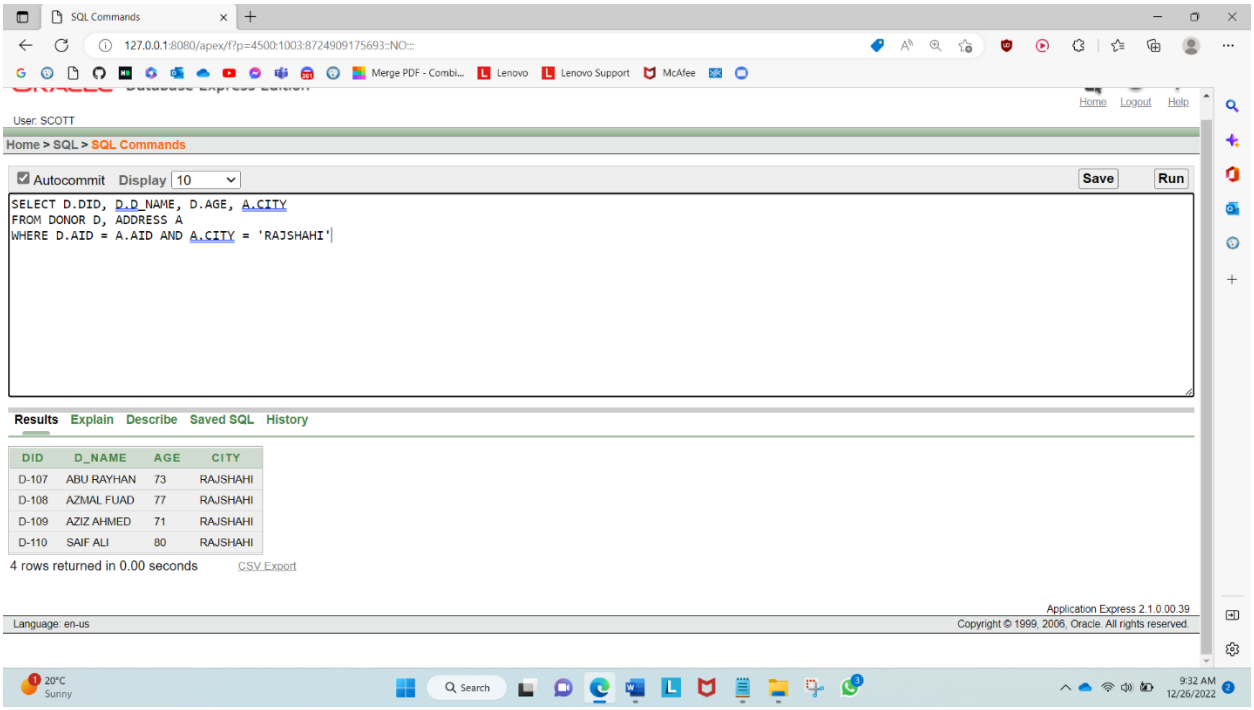


2. Display organ id, organ type and age whose age is between 50 to 65

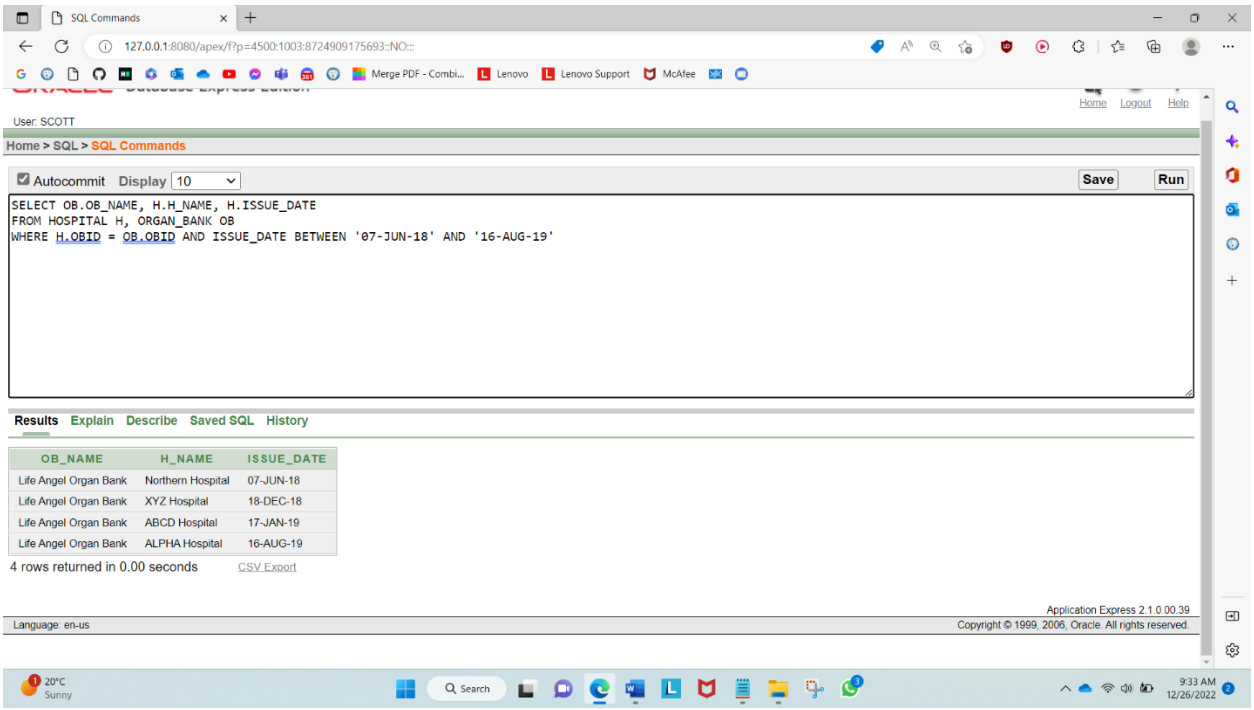


Joining

1. Show the donor id, donor name, donor age those are from the city RAJSHAHI

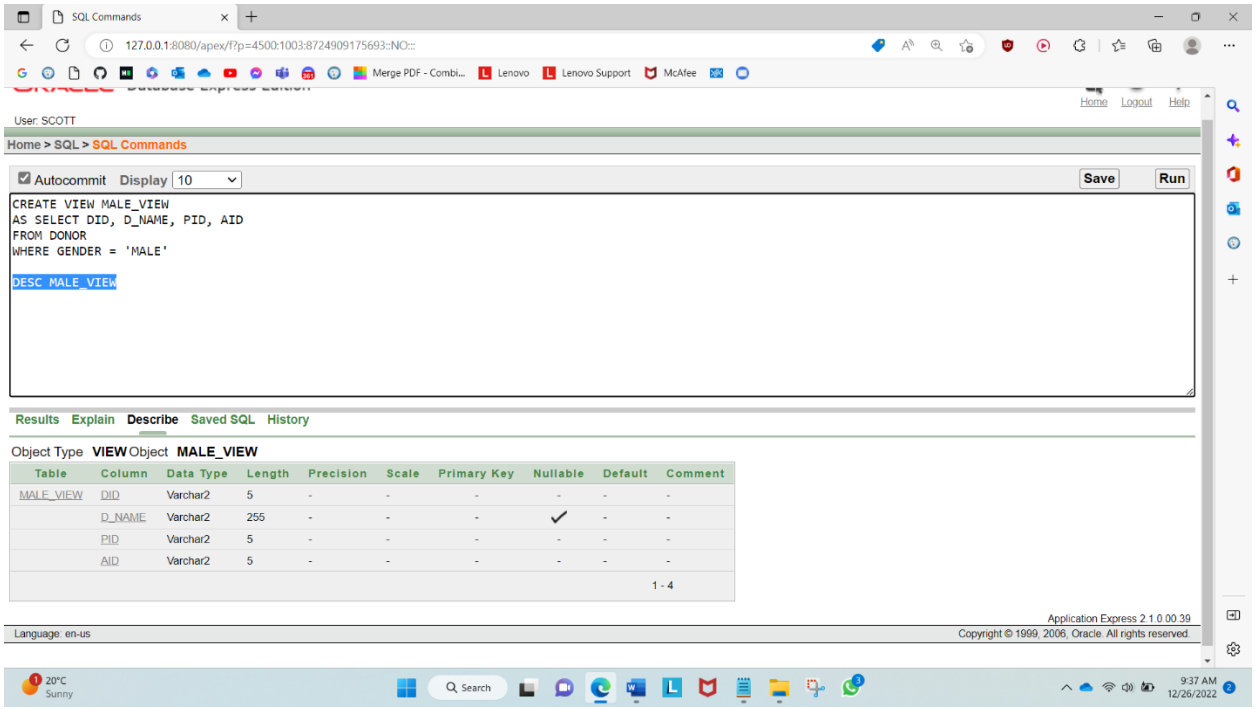


2. Show organ bank name, hospital name, issue date where issue date between 07-JUN-18 to 16-AUG-19

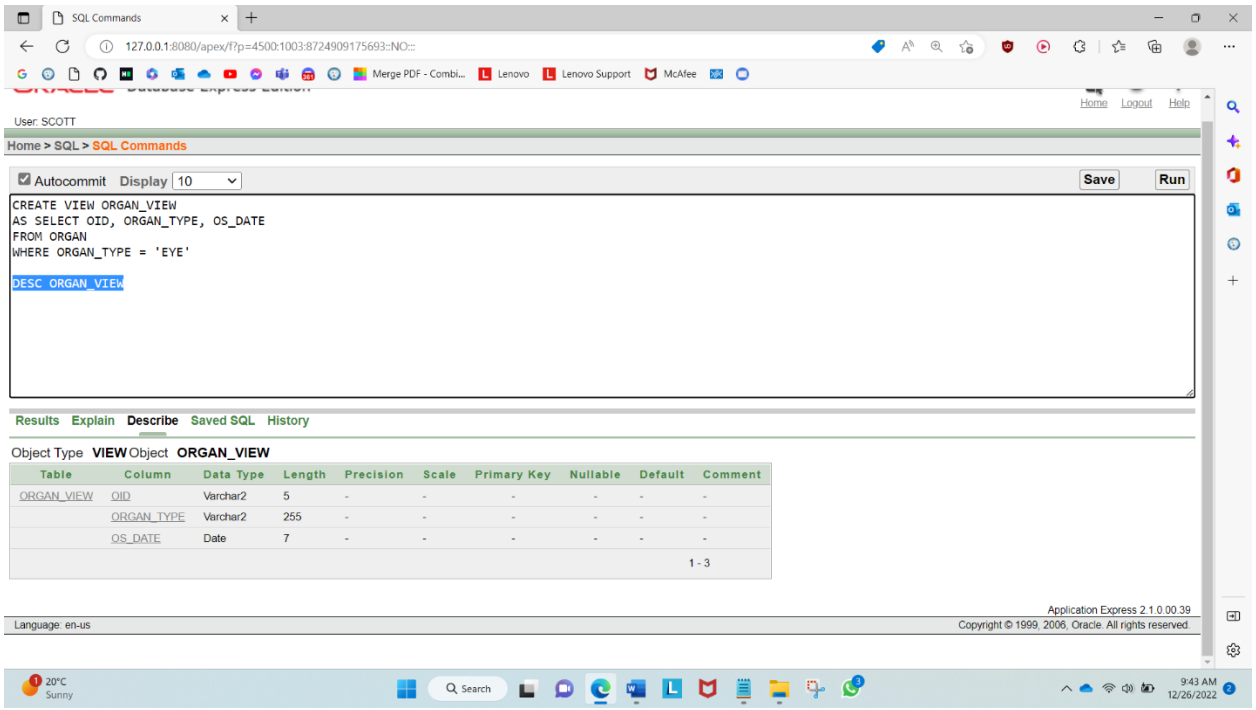


Create View

1. Create a view of DID, D_NAME, PID and AID from DONOR table where gender is male



2. Create a view of OID, ORGAN_TYPE, and OS_DATE form ORGAN table where organ is EYE



CONCLUSION

Our Database project is about Organ Bank Management System. While doing this project we had learnt many things. When we were doing ER Diagram, we faced some difficulties in arranging everything. Then comes normalization. It was a big challenge for us because there are too many rows. After completing normalization, we created our all tables. Then while inserting values we faced some difficulties with foreign keys. Also, we used Oracle 10G and it wasn't supporting multiple lines, so we had to insert every line manually. Then Query part and it was fun. Overall, we had many new experiences while doing this project. Solving every problem felt like a great achievement for us. After finishing this project, we have a clearer concept in Databases.

THANK YOU