The Baruch Real Estate Firm Database Final Project

CIS 9340

Section URA

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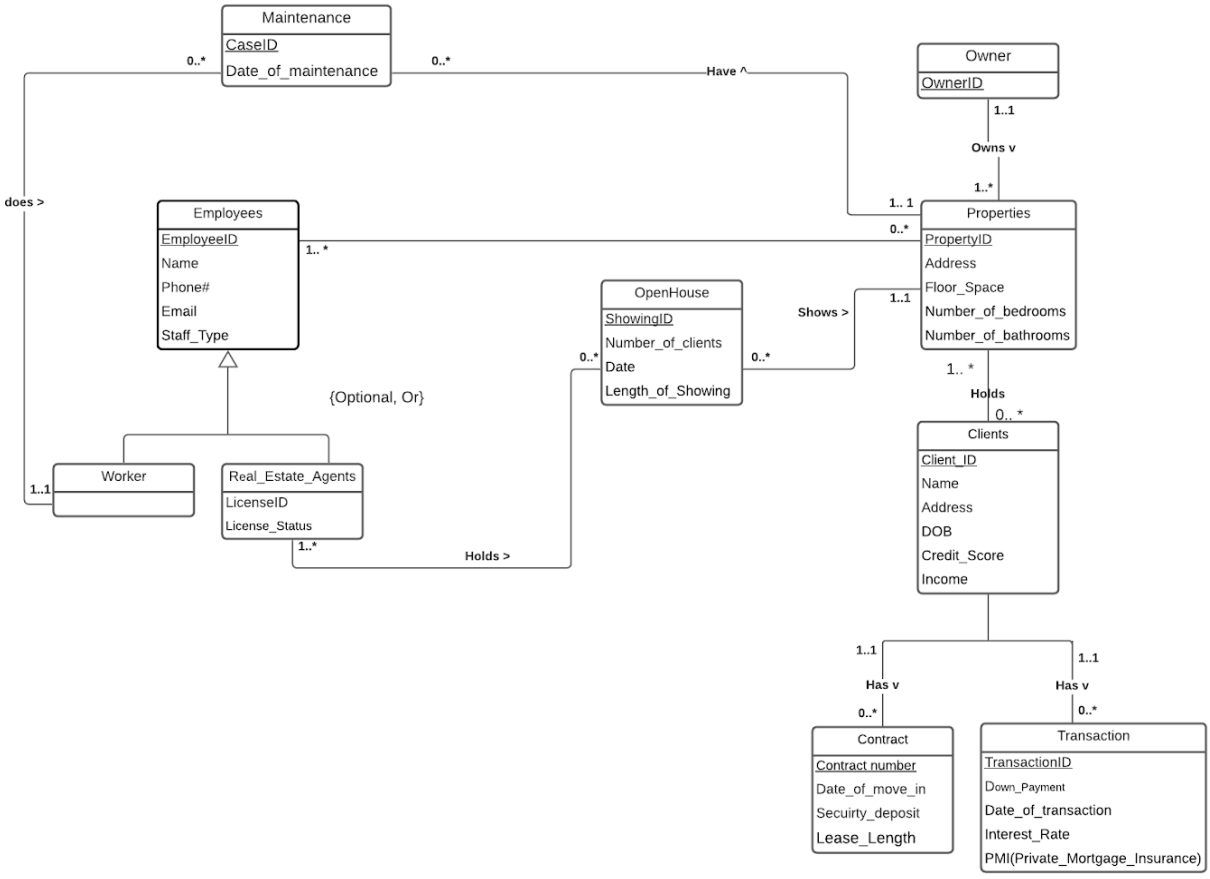
Executive Summary

Business Scenario

Our start-up real estate firm that handles residential properties, has been operating for a few years and has been keeping track of the business transactions on paper. As our business is growing, the problem we were facing was keeping track of everything on paper which was very time consuming and unorganized. This problem led us to our agents losing track of their open house appointments. This unorganized system had cost a lot for our company as it did not leave a good impression of our business to our clients. We wanted to be efficient and switch to a database system to be able to schedule open house tours, easily attain details of available properties, and keep track of agents, clients, and log all sales and transactions.

Through the help of Access and SQL, the problem that we had is a thing of the past. When a client is interested in our business we assign an agent to them. The agent then is able to collect and log all the information that they need to cater to the client, such as: number of bedrooms, number of bathrooms, their desired location, property type and budget for either sale or rental. Now, once we have all the necessary information we are able to schedule open houses for properties that the client might be interested in electronically. If a sale is done, we use access to log the value of the sale, down payment, taxes paid, interest rate and PMI if the down payment is less than 20% of property value, and the commission paid to the agent. If a rental transaction is started we run a background check, see if the client has 40x the rent as their income and lastly write the monthly payment the tenant has to pay on the lease. Now the agents won't have trouble keeping track of all the information they need as everything is being done electronically.

Entity Relationship Diagram



One employee may be either a Worker or Real Estate Agent.

One employee may manage one or many properties.
One property must be managed by at least one or more employees.

One real estate agent may hold one or many open-houses.
One open house must be held by one or more real estate agents.

One worker may be assigned to one or more maintenance cases.
One maintenance case must be done by one worker.

One maintenance case must be performed on one property.
One property can have zero to many maintenance cases.

One owner must own one or many properties.
One property must be owned by one owner.

One property may have zero or more open-houses.
One open house must show one property

One client must hold one or many properties.
One property may be held by zero to many clients.

One contract must belong to one client.
One client may hold zero to many contracts.

One transaction must belong to one client.
One client may have one or many transactions.

Normalized Relations and Functional Dependencies

Employees(EmployeeID, Name, Phone#, Email, Staff_Type)

Worker(EmployeeID)

Real_Estate_Agents(EmployeeID, LicenseID,License_Status)

OpenHouse(ShowingID, Number_of_Clients, Date, Length_of_Showing, PropertyID(fk))

Real_Estate_Agents_OpenHouse(ShowingID(fk), EmployeeID(fk))

Maintenance(CaseID, Date_of_Maintainance, Employeeid(fk), PropertyID(fk),
Owner(OwnerID)

Properties(PropertyID, Address, Floor_space, Number_of_bedrooms, OwnerID(fk))

Properties_Clients(PropertyID(fk),ClientID(fk))

Employees_Properties (EmployeeID(fk), PropertyID (fk))

Contract(Contract_number,Date_of_move_in,Security_Deposit,Lease_length, PropertyID(fk),
ClientID(fk))

Transaction(TransactionID,Price_per_sqft, Down_payment, Date_of_Transaction, Interest_Rate,
PMI(PrivateMortgageInsurance), PropertyID(fk), ClientID(fk))

Clients(Client_ID, Name, Address, DOB, Credit_Score, Income, PropertyID(fk))

Employees(EmployeeID, Name, Phone#, Email, Staff_Type)

R1(<u>EmployeeID</u>, Email)

R2(<u>Email</u>, Name, Phone#, Staff_Type)

###Df1 Email -> EmployeeID, Name, Phone#, Staff_Type

###1NF : EmployeeID Y

###2NF: N

###3NF: Y

###R1(<u>EmployeeID</u>, Email)

###R2(<u>Email</u>, Name, Phone#, Staff_Type)

###1NF : Y, 2NF: N, 3NF: N, BCNF: N

Worker(EmployeeID)

Real_Estate_Agents(EmployeeID, LicenseID,License_Status)

R3(EmployeeID, LicenseID)

R4(LicenseID, License_status)

Df1 EmployeeID -> LicenseID, License_status

Df2 LicenseID -> LicenseID, License_status

###1NF: Y

###2NF: N

###3NF: Y

###R3(EmployeeID, LicenseID)

###R4(LicenseID, License_status)

1NF: Y, 2NF: N, 3NF: N, BCNF: N

Brokers(EmployeeID,LicenseID,License_Status,Broker_LicenseID,Broker_License_Status)

R5(EmployeeID, LicenseID, Broker_LicenseID)

R6(LicenseID, License_Status)

R7(Broker_LicenseID, Broker_License_Status

Df1 EmployeeID -> LicenseID, License_Status, Broker_LicenseID,Broker_License_Status

Df2 LicenseID -> License_Status, Broker_LicenseID

Df3 Broker_LicenseID -> Broker_License_Status

###1NF: Y

###2NF: N

###3NF: Y

###R5(EmployeeID, LicenseID, Broker_LicenseID)

###R6(LicenseID, License_Status)

###R7(Broker_LicenseID, Broker_License_Status)

###1NF: Y, 2NF: N, 3NF: N, BCNF: N

Admin_Staff(EmployeeID)

OpenHouse(ShowingID, Number_of_Clients, Date, Length_of_Showing, PropertyID(fk))

Df1: Showing ID -> Number_of_Clients, Date, Length_of_Showing, PropertyID(fk)

###1NF: Y, 2NF: N, 3NF: N, BCNF: N

Real_Estate_Agents_OpenHouse(ShowingID(fk), EmployeeID(fk))

###1NF: Y, 2NF: N, 3NF: N, BCNF: N

Maintenance(CaseID, Date_of_Maintainance, Employeeid(fk), PropertyID(fk))

Owner(OwnerID)

Properties(PropertyID, Address, Floor_space, Number_of_bedrooms, Property_type, OwnerID(fk))

R10(PropertyID, Address)

R11(Address, Floor_space, Number_of_bedrooms, OwnerID)

Df1: PropertyID -> Address, Floor_space, Number_of_bedrooms, Property_type, OwnerID(fk)

Df2: Address -> Floor_space, Number_of_bedrooms, Property_type, OwnerID

###1NF: Y

###2NF: N

###3NF: Y

###R10(PropertyID, Address,)

###R11(Address, Floor_space, Number_of_bedrooms, Property_type, OwnerID)

###1NF: Y, 2NF: N, 3NF: N, BCNF: N

Employees_Properties (EmployeeID(fk), PropertyID (fk))

Contract(Contract_number,Date_of_move_in,Security_Deposit,Lease_length, PropertyID(fk), ClientID(fk))

R16 (Contract_number, PropertyID, Date_of_move_in)

R17(PropertyID, Date_of_move_in, Security, Deposit, Lease_length, ClientID)

Df1: Contract_number -> Date_of_move_in,Security_Deposit,Lease_length, PropertyID(fk), ClientID(fk)

Df2: PropertyID, Date_of_move_in -> Security, Deposit, Lease_length, ClientID

###1NF: Y

###2NF: N

###3NF: Y

###R16 (Contract_number, PropertyID, Date_of_move_in)

###R17(PropertyID, Date_of_move_in, Security, Deposit, Lease_length, ClientID)

###1NF: Y, 2NF: N, 3NF: N, BCNF: N

Transaction(TransactionID,Price_per_sqft, Down_payment, Date_of_Transaction, Interest_Rate, PMI(PrivateMortgageInsurance, PropertyID(fk), ClientID(fk))

R18 (TransactionID, PropertyID, Date_of_Transaction)

R19 (PropertyID, Date_of_Transaction, Price_per_sqft, Down_payment, Interest_Rate, PMI(PrivateMortgageInsurance), ClientID)

Df1: TransactionID -> Price_per_sqft, Down_payment, Date_of_Transaction, Interest_Rate, PMI(PrivateMortgageInsurance, PropertyID, ClientID)

Df2: PropertyID, Date_of_Transaction -> Price_per_sqft, Down_payment, Interest_Rate, PMI(PrivateMortgageInsurance), ClientID)

###1NF: Y

###2NF: N

###3NF: Y

###R18 (TransactionID, PropertyID, Date_of_Transaction)

###R19 (PropertyID, Date_of_Transaction, Price_per_sqft, Down_payment, Interest_Rate, PMI(PrivateMortgageInsurance, ClientID

###1NF: Y, 2NF: N, 3NF: N, BCNF: N

Clients(Client_ID, Name, Address, DOB, Credit_Score, Income, PropertyID)

Df1: Client_ID -> Name, Address, DOB, Credit_Score, Income, PropertyID

###1NF: Y, 2NF: N, 3NF: N, BCNF: N

SQL

CREATE TABLE Employees(
EmployeeID NUMBER NOT NULL,
Name VARCHAR(50) NOT NULL,
Phone_Number VARCHAR(50),
Email VARCHAR(50),
Staff_Type VARCHAR(50)
);

ALTER TABLE Employees
ADD CONSTRAINT pk_Employees PRIMARY KEY (EmployeeID)

INSERT INTO Employees
VALUES (11335, 'Betty White', '555-123-4567', 'betty.white@baruchrealestate.com', 'Real Estate Agent')
INSERT INTO Employees
VALUES (23867, "James Bond" , "555-444-6666", "bond.james@baruchrealestate.com", "Real Estate Agent")
INSERT INTO Employees
VALUES (82345, 'Rue Clain', '555-999-6666','rue.clain@baruchrealestate.com', 'Real Estate Agent')
INSERT INTO Employees
VALUES (12998, "Mike Hunt", "555-666-9999", "mike.hunt@baruchrealestate.com", "Worker")
INSERT INTO Employees
VALUES (78924, "RuPaul Charles", "123-456-7890", "ru.charles@baruchrealestate.com", "Worker")
INSERT INTO Employees
VALUES (33448, "Charles Manson", "123-456-7788", "charles.manson@baruchrealestate.com", "Worker")
INSERT INTO Employees
VALUES (45678, "Elizabeth Queen", "180-012-1234", "queenie@baruchrealestate.com", "Admin")

EmployeeID	Name	Phone_Number	Email	Staff_Type
11335	Betty White	555-123-4567	betty.white@baruchrealestate.com	Real Estate Agent
12998	Mike Hunt	555-666-9999	mike.hunt@baruchrealestate.com	Worker
23867	James Bond	555-444-6666	bond.james@baruchrealestate.com	Real Estate Agent
33448	Charles Manson	123-456-7788	charles.manson@baruchrealestate.com	Worker
45678	Elizabeth Queen	180-012-1234	queenie@baruchrealestate.com	Admin
78924	RuPaul Charles	123-456-7890	ru.charles@baruchrealestate.com	Worker
82345	Rue Clain	555-999-6666	rue.clain@baruchrealestate.com	Real Estate Agent

CREATE TABLE Owner(

OwnerID NUMBER NOT NULL

);

ALTER TABLE Owner

ADD CONSTRAINT pk_Owner PRIMARY KEY (OwnerID)

INSERT INTO Owner

VALUES("1212")

INSERT INTO Owner

VALUES("1214")

INSERT INTO Owner

VALUES("1215")

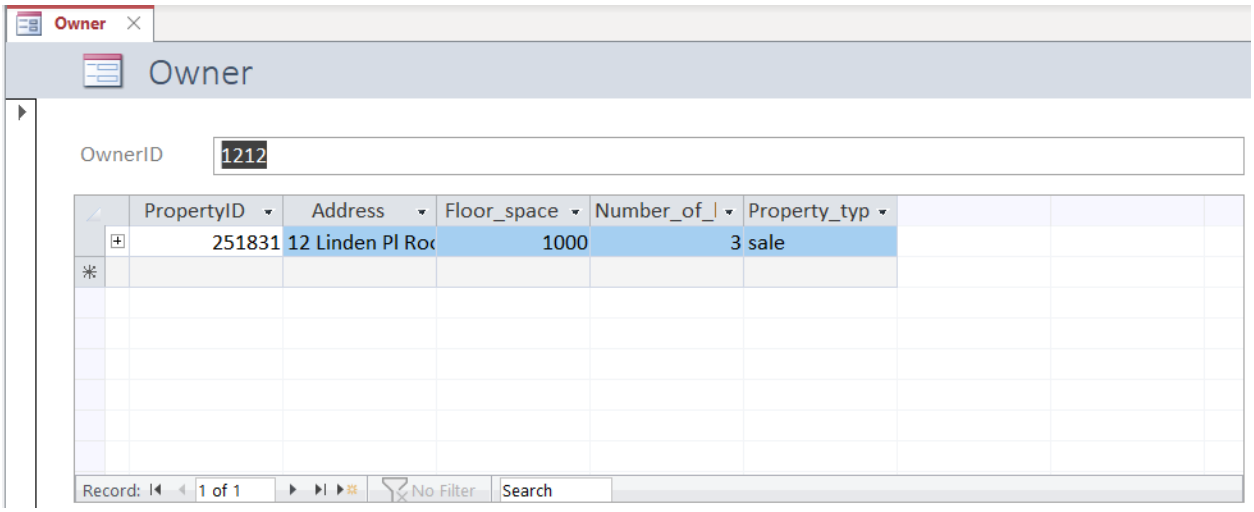
INSERT INTO Owner

VALUES("1311")

INSERT INTO Owner

VALUES("1421")

OwnerID
1212
1214
1215
1311
1421



CREATE TABLE Properties (

PropertyID NUMBER NOT NULL,

Address VARCHAR(50)NOT NULL,

Floor_space NUMBER NOT NULL,

Number_of_bedrooms NUMBER NOT NULL,

Property_type VARCHAR(50) NOT NULL,

OwnerID NUMBER NOT NULL

);

ALTER TABLE Properties

ADD CONSTRAINT pk_Properties PRIMARY KEY (PropertyID)

ALTER TABLE Properties

ADD CONSTRAINT fk_Properties FOREIGN KEY (OwnerID) REFERENCES Owner (OwnerID)

INSERT INTO Properties

VALUES(251831, "12 Linden Pl Roosevelt NY", 1000, 3, "sale", 1212)

INSERT INTO Properties

VALUES(111234, "3412 Hancock St Brooklyn NY", 2500, 3, "sale", 1214)

INSERT INTO Properties

VALUES(354264, "31 30 89th Street Jackson Heights NY", 3000, 6, "rent", 1215)

INSERT INTO Properties

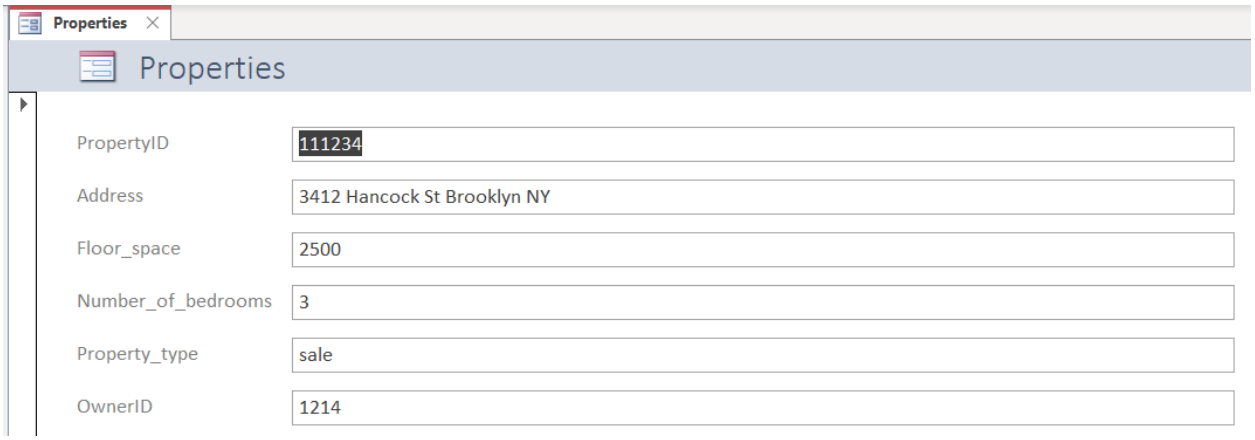
VALUES(436718, "25 56 Fresh Pond Road Floral Park NY", 850, 4, "sale", 1311)

INSERT INTO Properties

VALUES(892341, "104 Mccelland Ave Pitman NJ", 700, 3, "rent", 1421)

Properties

PropertyID	Address	Floor_space	Number_of_bedrooms	Property_type	OwnerID
111234	3412 Hancock St Brooklyn NY	2500	3	sale	1214
251831	12 Linden Pl Roosevelt NY	1000	3	sale	1212
354264	31 30 89th Street Jackson Heights NY	3000	6	rent	1215
436718	25 56 Fresh Pond Road Floral Park NY	850	4	sale	1311
892341	104 Mccelland Ave Pitman NJ	700	3	rent	1421



CREATE TABLE Clients (

Client_ID VARCHAR(7) NOT NULL,

Fname VARCHAR(20) NOT NULL,

Lname VARCHAR(20) NOT NULL,

Address VARCHAR(50) NOT NULL,

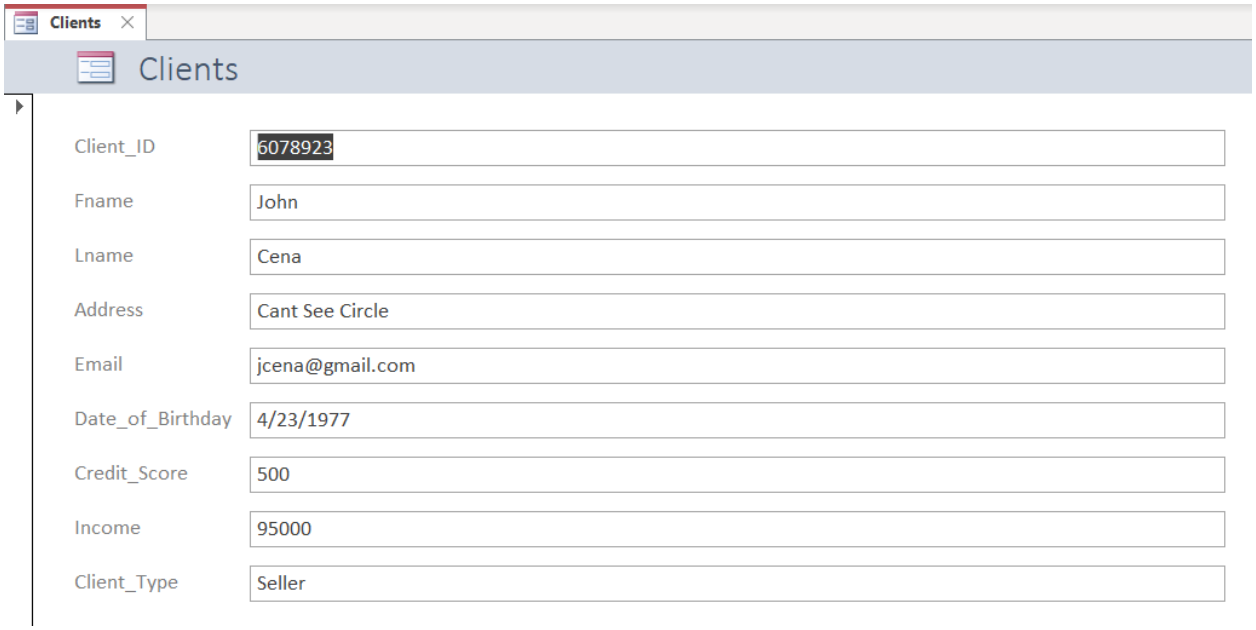
Email VARCHAR(50) NOT NULL,

Date_of_Birthday DATE NOT NULL,

```
Credit_Score NUMBER NOT NULL,
Income NUMBER NOT NULL,
Client_Type VARCHAR(20) NOT NULL
);
ALTER TABLE Clients
ADD CONSTRAINT pk_clients PRIMARY KEY (Client_ID)

INSERT INTO Clients
VALUES(7172345, 'John', 'Stamos', '123 Here Avenue', 'jstamos@gmail.com', '01/02/1998',
'720', '60500', 'Tenant')
INSERT INTO Clients
VALUES(7182897, 'Marie', 'Cuomo', '123 Not Here Avenue', 'mcuomo@gmail.com',
'02/04/1997', '800', '10100', 'Seller')
INSERT INTO Clients
VALUES(7129082, 'Karen', 'Villanova', '225 SomeWhere Avenue', 'kvillanova@gmail.com',
'09/25/1998', '775', '75000', 'Buyer')
INSERT INTO Clients
VALUES(7156123, 'Henry', 'Cavill', '3035 Jacked Lane', 'superman@gmail.com', '07/07/1967',
'800', '120000', 'Buyer')

INSERT INTO Clients
VALUES(6078923, 'John', 'Cena', 'Cant See Circle', 'jcena@gmail.com', '04/23/1977', '500',
'95000', 'Seller')
```

Clients

Client_ID	Fname	Lname	Address	Email	Date_of_Birthday	Credit_Score	Income	Client_Type
6078923	John	Cena	Cant See Circle	jcena@gmail.com	4/23/1977	500	95000	Seller
7129082	Karen	Villanova	225 SomeWhere Avenue	kvillanova@gmail.com	9/25/1998	775	75000	Buyer
7156123	Henry	Cavill	3035 Jacked Lane	superman@gmail.com	7/7/1967	800	120000	Buyer
7172345	John	Stamos	123 Here Avenue	jstamos@gmail.com	1/2/1998	720	60500	Tenant
7182897	Marie	Cuomo	123 Not Here Avenue	mcuomo@gmail.com	2/4/1997	800	10100	Seller



CREATE TABLE Contract(

Contract_number NUMBER NOT NULL,

Date_of_move_in DATE NOT NULL,

Security_Deposit NUMBER NOT NULL,

Lease_length NUMBER NOT NULL,

PropertyID NUMBER NOT NULL,

Client_ID VARCHAR(7) NOT NULL

);

ALTER TABLE Contract

ADD CONSTRAINT pk_contract PRIMARY KEY (Contract_number)

ADD CONSTRAINT fk_contract2 FOREIGN KEY (Client_ID) REFERENCES Clients (Client_ID)

INSERT INTO Contract

VALUES (34366, '30-JUL-21', 3000, 1, 251831, 7172345)

INSERT INTO Contract

VALUES (54321, "18-JUN-21", 3234, 2, 111234, 7182897)

INSERT INTO Contract

VALUES (54324, '02-MAR-21',4234, 1, 354264, 7129082)

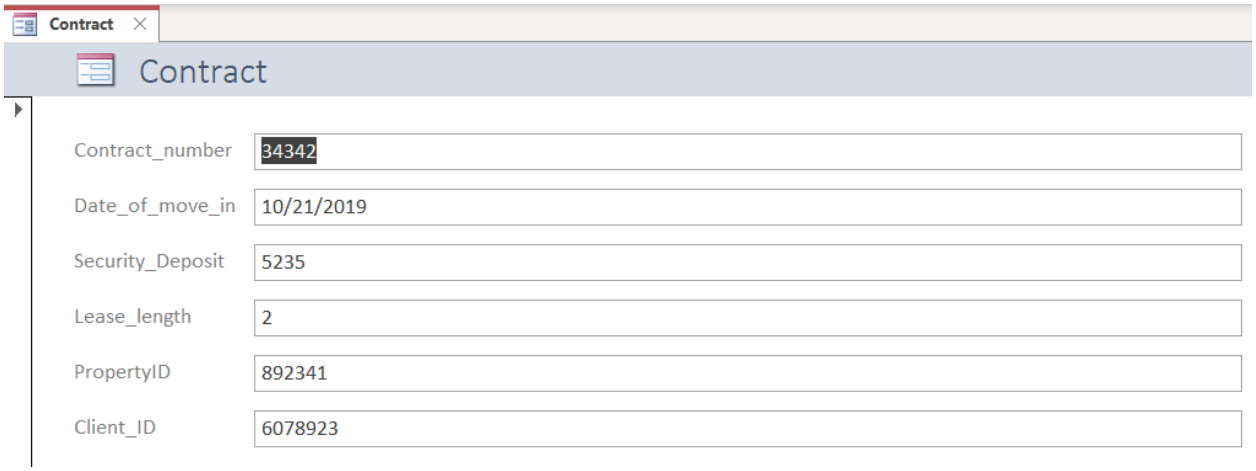
INSERT INTO Contract

VALUES(54325, '18-JUN-21', 2234, 1, 436718, 7156123)

INSERT INTO Contract

VALUES (34342, '21-OCT-19', 5235, 2, 892341, 6078923)

Contract_number	Date_of_move_in	Security_Deposit	Lease_length	PropertyID	Client_ID
34342	10/21/2019	5235	2	892341	6078923
34366	7/30/2021	3000	1	251831	7172345
54321	6/18/2021	3234	2	111234	7182897
54324	3/2/2021	4234	1	354264	7129082
54325	6/18/2021	2234	1	436718	7156123



CREATE TABLE Transaction(

TransactionID NUMBER NOT NULL,

Price_per_sqft NUMBER,

Down_payment NUMBER,

Date_of_Transaction DATE NOT NULL,

Interest_Rate FLOAT,

PrivateMortgageInsurance NUMBER,

PropertyID NUMBER NOT NULL,

Client_ID VARCHAR(7) NOT NULL

);

ALTER TABLE Transaction

ADD CONSTRAINT pk_transaction PRIMARY KEY (transactionID)

ADD CONSTRAINT fk_transaction2 FOREIGN KEY (Client_ID) REFERENCES Clients (Client_ID)

INSERT INTO Transaction

VALUES(4576, 300, 5000, “2/1/2020”, 0.18, 11031, 251831, 7172345)

INSERT INTO Transaction

VALUES(2135, 200, 10000, “1/1/2020”, 0.20, 1235, 111234,7182897)

INSERT INTO Transaction

VALUES(3215, 500, 15000, “12/1/2020”, 0.07, 2215, 354264,7129082)

INSERT INTO Transaction

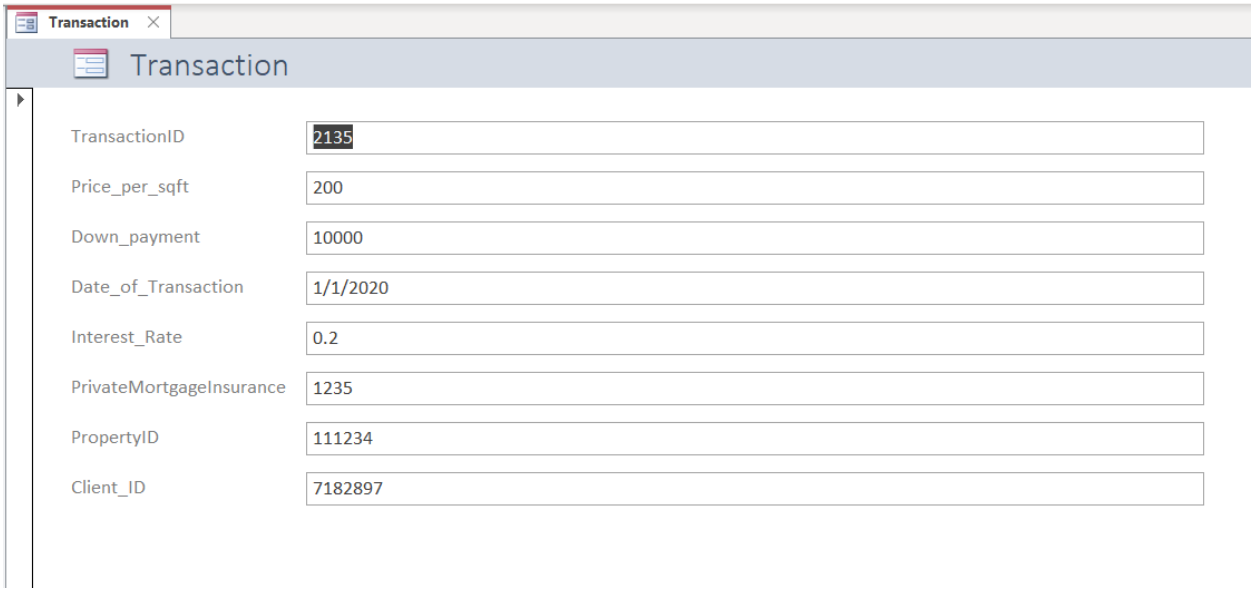
VALUES(4531, 700, 30000, "5/1/2021", 0.10, 3567, 436718, 7156123)

INSERT INTO Transaction

VALUES(7845, 250, 10000, ‘1/1/2021’, 0.09,5411,892341 ,6078923)

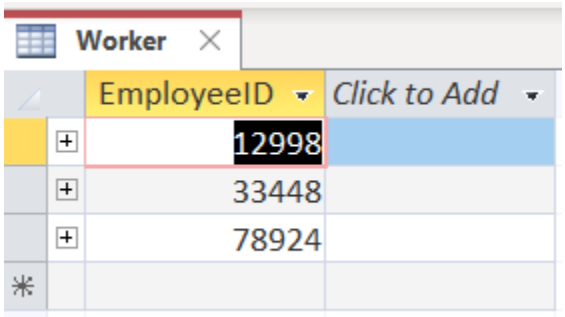
Transaction

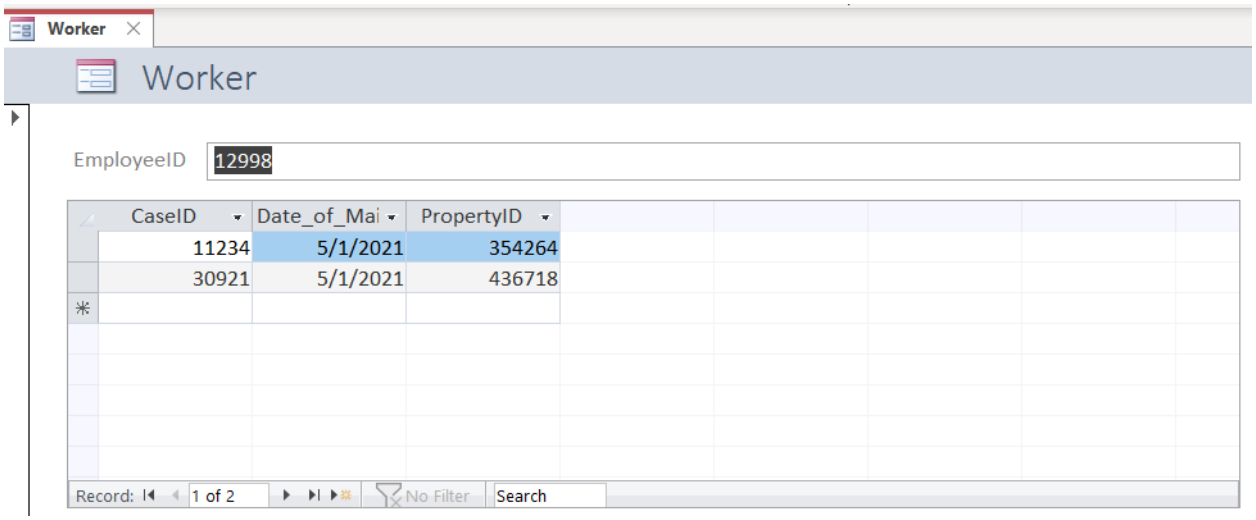
TransactionID	Price_per_sqft	Down_payment	Date_of_Transaction	Interest_Rate	PrivateMortgageInsurance	PropertyID	Client_ID
2135	200	10000	1/1/2020	0.2	1235	111234	7182897
3215	500	15000	12/1/2020	0.07	2215	354264	7129082
4531	700	30000	5/1/2021	0.1	3567	436718	7156123
4576	300	5000	2/1/2020	0.18	11031	251831	7172345
7845	250	10000	1/1/2021	0.09	5411	892341	6078923



CREATE TABLE Worker(

```
EmployeeID NUMBER NOT NULL
);

ALTER TABLE Worker
ADD CONSTRAINT pk_Worker PRIMARY KEY (EmployeeID)

ALTER TABLE Worker
ADD CONSTRAINT fk_Worker FOREIGN KEY (EmployeeID) REFERENCES Employees
(EmployeeID)

INSERT INTO Worker
VALUES ("12998")
INSERT INTO Worker
VALUES (78924)
INSERT INTO Worker
VALUES ("33448")
```





CREATE TABLE Real_Estate_Agents(

EmployeeID NUMBER NOT NULL,

LicenseID NUMBER NOT NULL,

License_Status VARCHAR(50) NOT NULL

);

ALTER TABLE Real_Estate_Agents

ADD CONSTRAINT pk_Real_Estate_Agents PRIMARY KEY (EmployeeID)

ALTER TABLE Real_Estate_Agents

ADD CONSTRAINT fk_Real_Estate_Agents FOREIGN KEY (EmployeeID) REFERENCES Employees (EmployeeID)

INSERT INTO Real_Estate_Agents

VALUES ("11335", "1001", "Active")

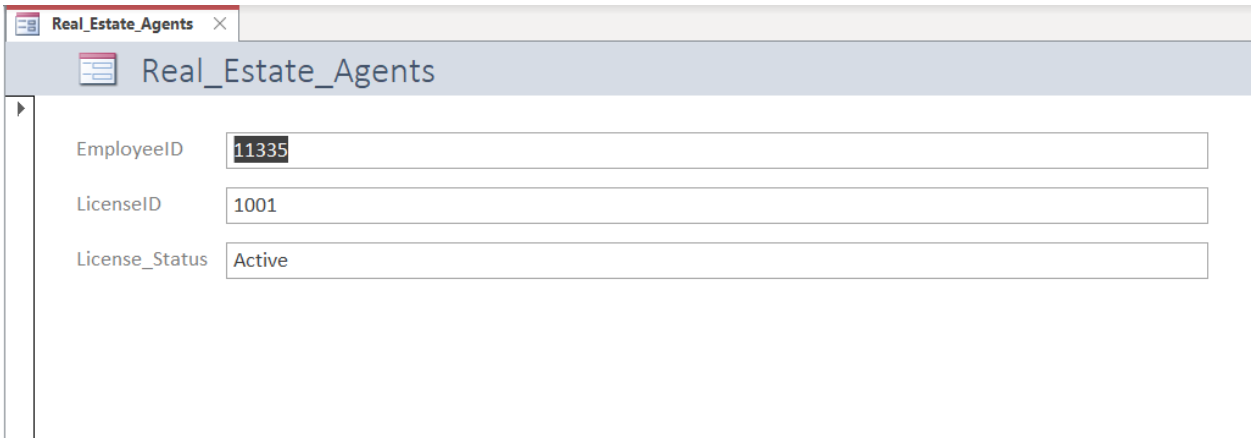
INSERT INTO Real_Estate_Agents

VALUES ("23867", "1002", "Active")

INSERT INTO Real_Estate_Agents

VALUES ("82345", "1003", "Active")

EmployeeID	LicenseID	License_Stat
11335	1001	Active
23867	1002	Active
82345	1003	Active



CREATE TABLE OpenHouse(
ShowingID NUMBER NOT NULL,
Number_of_Clients NUMBER NOT NULL,
Showing_Date DATE NOT NULL,
Length_of_Showing NUMBER NOT NULL,
PropertyID NUMBER NOT NULL
);

ALTER TABLE OpenHouse
ADD CONSTRAINT pk_OpenHouse PRIMARY KEY (ShowingID)

ALTER TABLE OpenHouse
ADD CONSTRAINT fk_OpenHouse FOREIGN KEY (PropertyID) REFERENCES Properties (PropertyID)

INSERT INTO OpenHouse
VALUES (0001, 2, "01/11/2021", 60, 251831)
INSERT INTO OpenHouse
VALUES (0002, 4, "01/12/2021", 45, 251831)

INSERT INTO OpenHouse

VALUES (0003, 2, "01/14/2021", 60, 251831)

INSERT INTO OpenHouse

VALUES (0004, 2, "02/14/2021", 45, 111234)

INSERT INTO OpenHouse

VALUES (0005, 3, "02/15/2021", 35, 111234)

INSERT INTO OpenHouse

VALUES (0006, 3, "02/15/2021", 45, 111234)

INSERT INTO OpenHouse

VALUES (0007, 4, "02/15/2021", 45,436718)

INSERT INTO OpenHouse

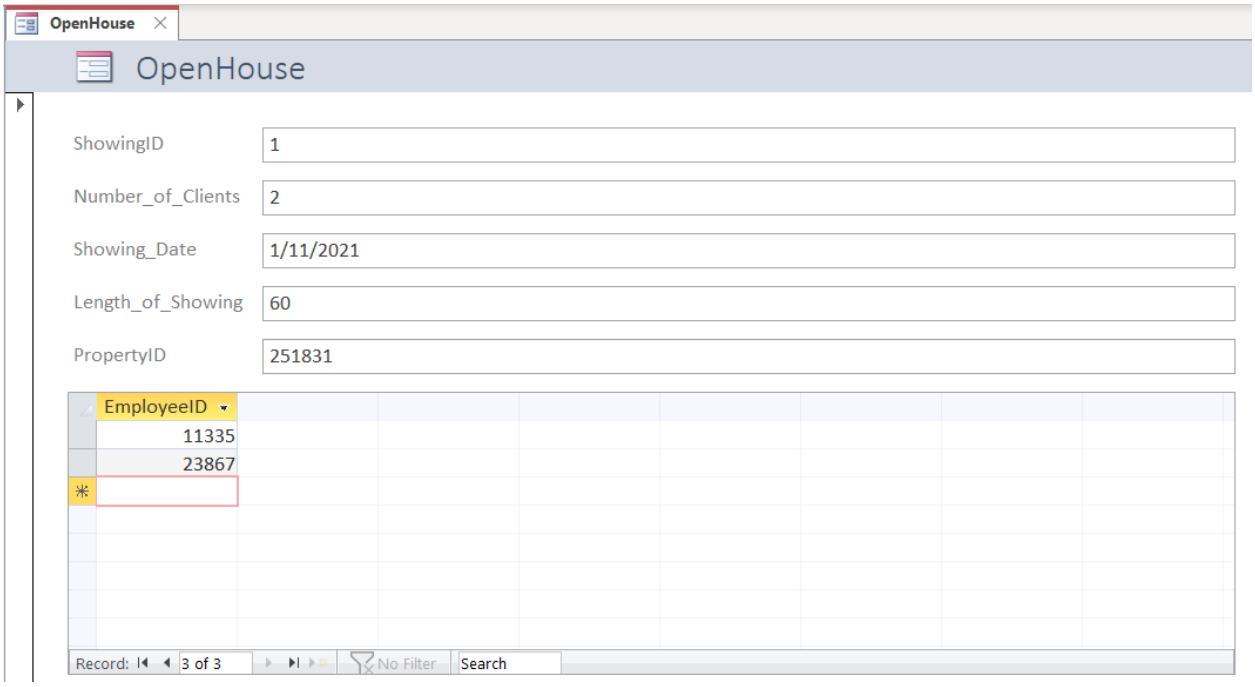
VALUES (0008, 6, "02/18/2021", 65,436718)

INSERT INTO OpenHouse

VALUES (0009, 4, "02/25/2021", 45, 436718)

OpenHouse

ShowingID	Number_of_Clients	Showing_Date	Length_of_Showing	PropertyID
1	2	1/11/2021	60	251831
2	4	1/12/2021	45	251831
3	2	1/14/2021	60	251831
4	2	2/14/2021	45	111234
5	3	2/15/2021	35	111234
6	3	2/15/2021	45	111234
7	4	2/15/2021	45	436718
8	6	2/18/2021	65	436718
9	4	2/25/2021	45	436718



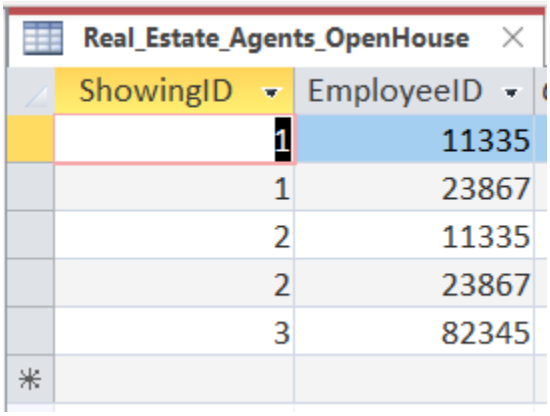
CREATE TABLE Real_Estate_Agents_OpenHouse(
ShowingID NUMBER NOT NULL,
EmployeeID NUMBER NOT NULL
);

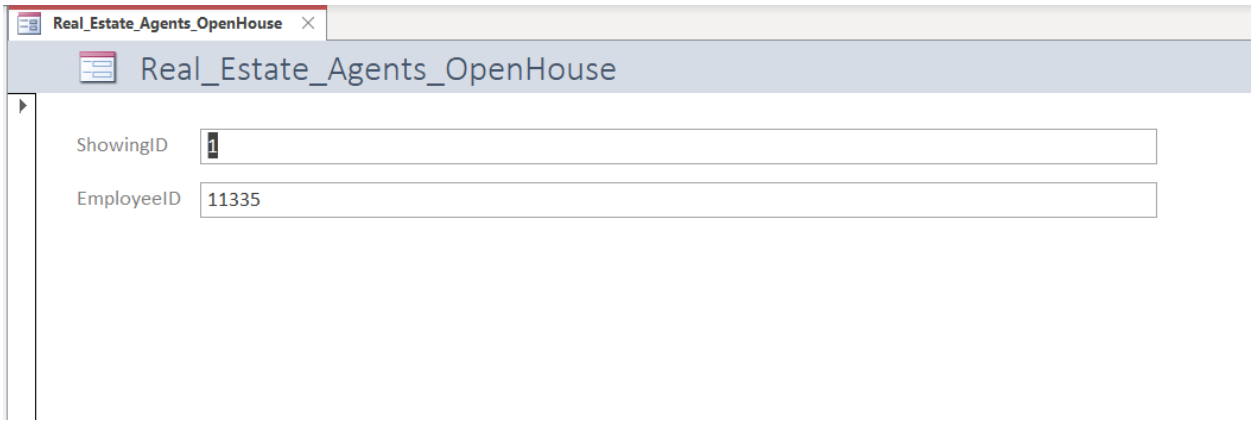
ALTER TABLE Real_Estate_Agents_OpenHouse
ADD CONSTRAINT pk_Real_Estate_Agents_OpenHouse PRIMARY KEY (ShowingID, EmployeeID)

ALTER TABLE Real_Estate_Agents_OpenHouse
ADD CONSTRAINT fk_Real_Estate_Agents_OpenHouse1 FOREIGN KEY (ShowingID)
REFERENCES OpenHouse (ShowingID)

ALTER TABLE Real_Estate_Agents_OpenHouse
ADD CONSTRAINT fk_Real_Estate_Agents_OpenHouse2 FOREIGN KEY (EmployeeID)
REFERENCES Real_Estate_Agents (EmployeeID)
INSERT INTO Real_Estate_Agents_OpenHouse
VALUES(0001, 11335)

INSERT INTO Real_Estate_Agents_OpenHouse
VALUES(0002, 23867)
INSERT INTO Real_Estate_Agents_OpenHouse
VALUES(0003, 82345)
INSERT INTO *Real_Estate_Agents_OpenHouse*
*VALUES(*0001, 23867*)*
INSERT INTO *Real_Estate_Agents_OpenHouse*
VALUES(0002, 11335*)*
INSERT INTO Real_Estate_Agents_OpenHouse
VALUES(0001, 12998)
INSERT INTO Real_Estate_Agents_OpenHouse
VALUES(0003, 82345)



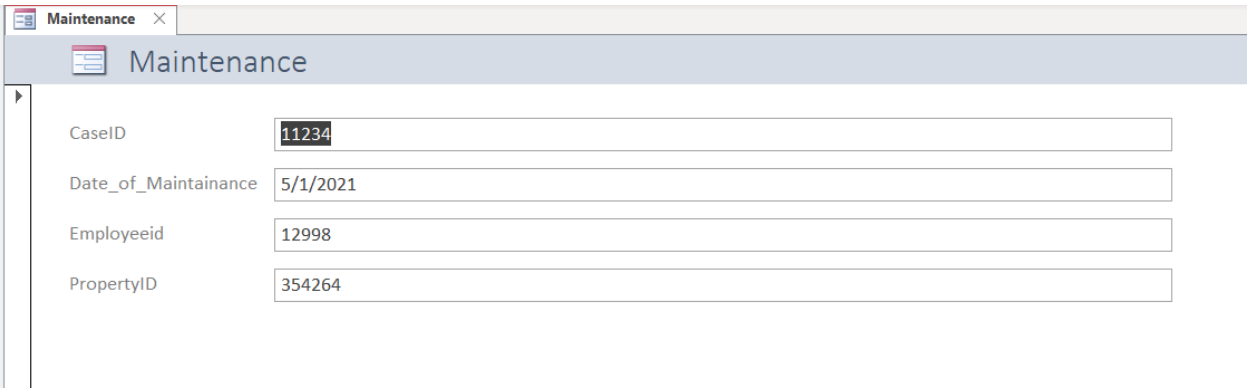


CREATE TABLE Maintenance(
CaseID NUMBER NOT NULL,

```
Date_of_Maintainance DATE NOT NULL,
Employeeid NUMBER NOT NULL,
PropertyID NUMBER NOT NULL
);

ALTER TABLE Maintenance
ADD CONSTRAINT pk_Maintenance PRIMARY KEY (CaseID)

ALTER TABLE Maintenance
ADD CONSTRAINT fk_Maintenance1 FOREIGN KEY (EmployeeID) REFERENCES Worker
(EmployeeID)

ALTER TABLE Maintenance
ADD CONSTRAINT fk_Maintenance2 FOREIGN KEY (PropertyID) REFERENCES
Properties (PropertyID)

INSERT INTO Maintenance
VALUES(22345, '03/25/2021', 78924, 251831)
INSERT INTO Maintenance
VALUES(21234, '03/22/2021', 78924, 111234)
INSERT INTO Maintenance
VALUES(11234, "05/1/2021", 12998,  354264)
INSERT INTO Maintenance
VALUES(30921, "05/1/2021", 12998,  436718)
INSERT INTO Maintenance
VALUES(129411, "04/12/2021", 78924,  892341 )
```

Maintenance

CaseID	Date_of_Maintainance	Employeeid	PropertyID
11234	5/1/2021	12998	354264
21234	3/22/2021	78924	111234
22345	3/25/2021	78924	251831
30921	5/1/2021	12998	436718
129411	4/12/2021	78924	892341



CREATE TABLE Properties_Clients(
PropertyID NUMBER NOT NULL,
Client_ID VARCHAR(7) NOT NULL
);

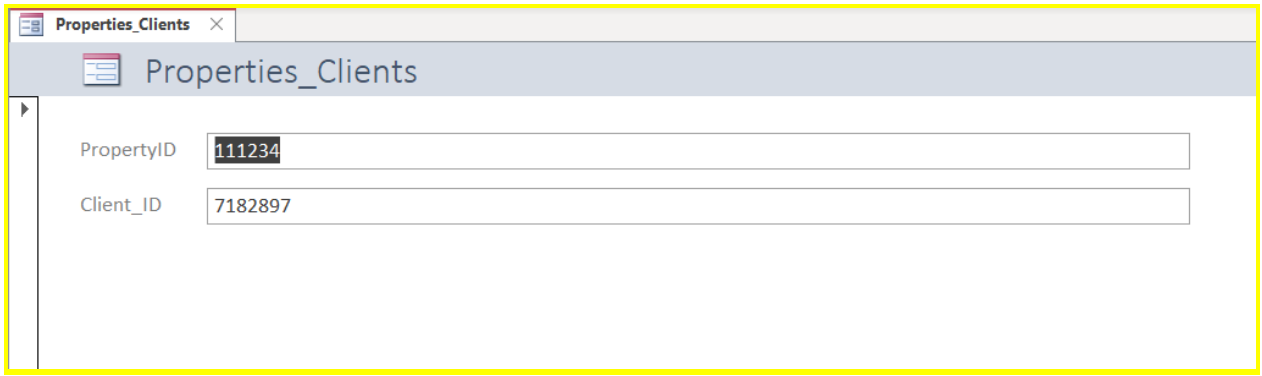
ALTER TABLE Properties_Clients
ADD CONSTRAINT pk_Properties_Clients PRIMARY KEY (PropertyID, Client_ID)

ALTER TABLE Properties_Clients
ADD CONSTRAINT fk_Properties_Clients1 FOREIGN KEY (PropertyID)
REFERENCES Properties (PropertyID)

ALTER TABLE Properties_Clients
ADD CONSTRAINT fk_Properties_Clients2 FOREIGN KEY (Client_ID)
REFERENCES Clients (Client_ID)

INSERT INTO Properties_Clients
VALUES(251831, 7172345)
INSERT INTO Properties_Clients
VALUES(111234, 7182897)
INSERT INTO Properties_Clients
VALUES(354264, 7129082)
INSERT INTO Properties_Clients
VALUES(436718, 7156123)
INSERT INTO Properties_Clients
VALUES(892341,6078923)

PropertyID	Client_ID
111234	7182897
251831	7172345
354264	7129082
436718	7156123
892341	6078923



CREATE TABLE Employees_Properties(
EmployeeID NUMBER NOT NULL,
PropertyID NUMBER NOT NULL
);

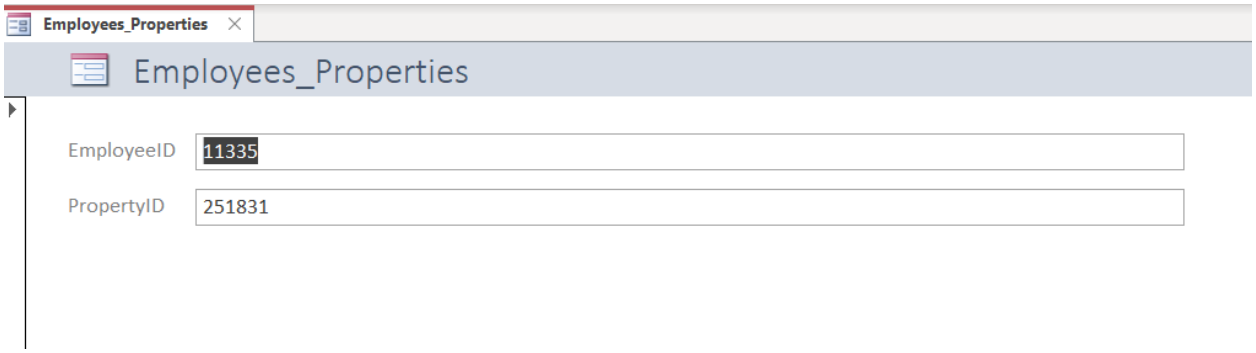
ALTER TABLE Employees_Properties
ADD CONSTRAINT pk_Employees_Properties PRIMARY KEY (EmployeeID, PropertyID)

ALTER TABLE Employees_Properties
ADD CONSTRAINT fk_Employees_Properties1 FOREIGN KEY (EmployeeID)
REFERENCES Real_Estate_Agents (EmployeeID)

ALTER TABLE Employees_Properties
ADD CONSTRAINT fk_Employees_Properties2 FOREIGN KEY (PropertyID)
REFERENCES Properties (PropertyID)

INSERT INTO Employees_Properties
VALUES(11335, 251831)
INSERT INTO Employees_Properties
VALUES(23867, 111234)
INSERT INTO Employees_Properties
VALUES(82345, 354264)
INSERT INTO Employees_Properties
*VALUES(*82345, 436718*)*
INSERT INTO Employees_Properties
*VALUES(*23867, 892341*)*

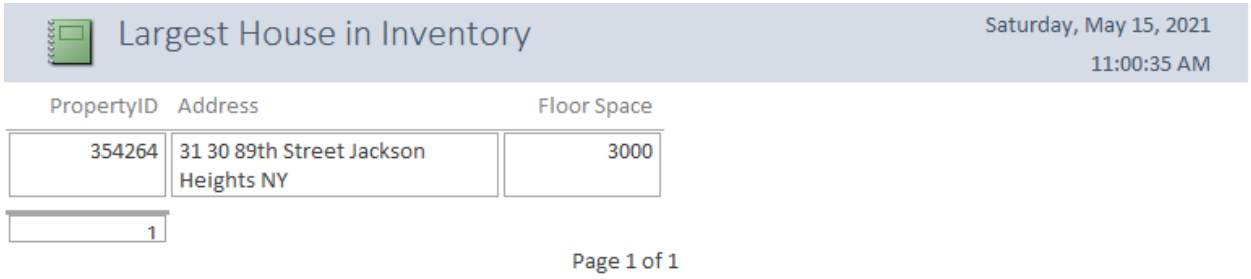
EmployeeID	PropertyID
11335	251831
23867	111234
23867	892341
82345	354264
82345	436718



Queries

(1) Show the PropertyID of the property with the largest square feet value to show it to a client that has a large family and wants a property with big space:

```
SELECT TOP 1 PropertyID, Address, Floor_space
FROM Properties
ORDER BY Floor_space DESC
```



Largest House in Inventory

Saturday, May 15, 2021
11:00:35 AM

PropertyID	Address	Floor Space
354264	31 30 89th Street Jackson Heights NY	3000

1

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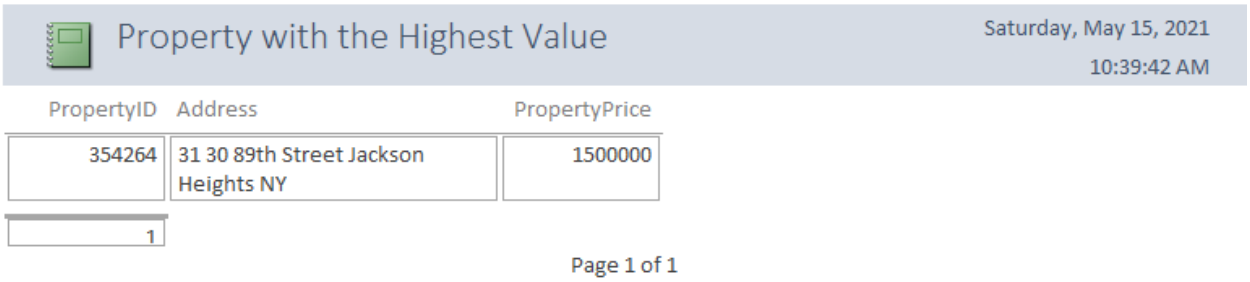
(2) Show the propertyID of the property with the highest value:

```
SELECT TOP 1  p.PropertyID, p.Address, e.PropertyPrice
FROM
        (SELECT p.Floor_space*t.Price_per_sqft as PropertyPrice, t.PropertyID
        FROM Properties p, Transaction t
        WHERE p.PropertyID = t.PropertyID) e, Properties p
WHERE e.PropertyID = p.PropertyID
ORDER BY e.PropertyPrice DESC
```



Property with the Highest Value

Saturday, May 15, 2021
10:39:42 AM

PropertyID	Address	PropertyPrice
354264	31 30 89th Street Jackson Heights NY	1500000

1

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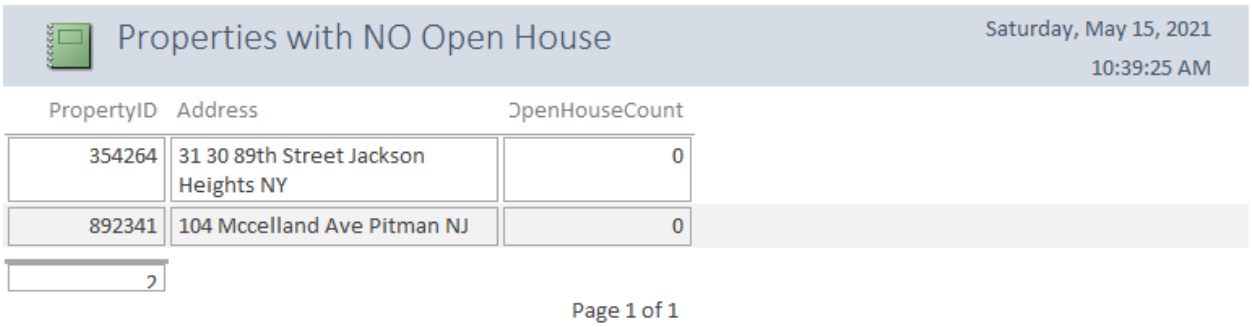
(3)Show the PropertyID for properties that do not have any open houses so the agents know which properties still need to have open house appointments.

SELECT P.PropertyID, P.Address, COUNT(OH.showingID) AS OpenHouseCount
FROM Properties P LEFT JOIN OpenHouse OH ON P.PropertyID=OH.PropertyID
GROUP BY P.PropertyID, P.Address
having(COUNT(OH.showingID))=0



Properties with NO Open House

Saturday, May 15, 2021
10:39:25 AM

PropertyID	Address	OpenHouseCount
354264	31 30 89th Street Jackson Heights NY	0
892341	104 Mccelland Ave Pitman NJ	0
2		

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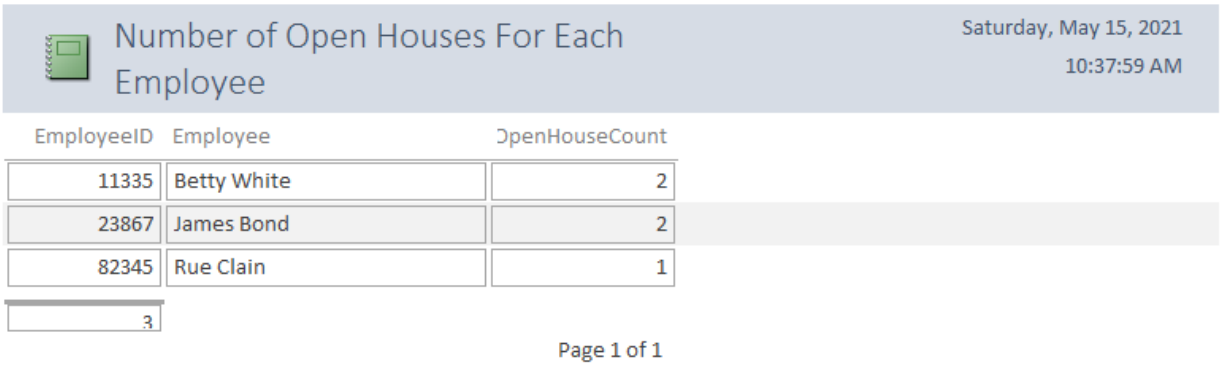
(4)Show count of all the open houses each employee has done with their name and employeeid. We would like to do this as we want to reward employees with a high number of open houses.

SELECT E.EmployeeID, E.name AS Employee , COUNT(RSO.showingID) AS OpenHouseCount
FROM (Employees E INNER JOIN Real_Estate_Agents RS ON
E.EmployeeID=RS.EmployeeID) INNER JOIN Real_Estate_Agents_OpenHouse
RSO ON E.EmployeeID=RSO.EmployeeID
GROUP BY E.name, E.EmployeeID



Number of Open Houses For Each Employee

Saturday, May 15, 2021
10:37:59 AM

EmployeeID	Employee	OpenHouseCount
11335	Betty White	2
23867	James Bond	2
82345	Rue Clain	1
3		

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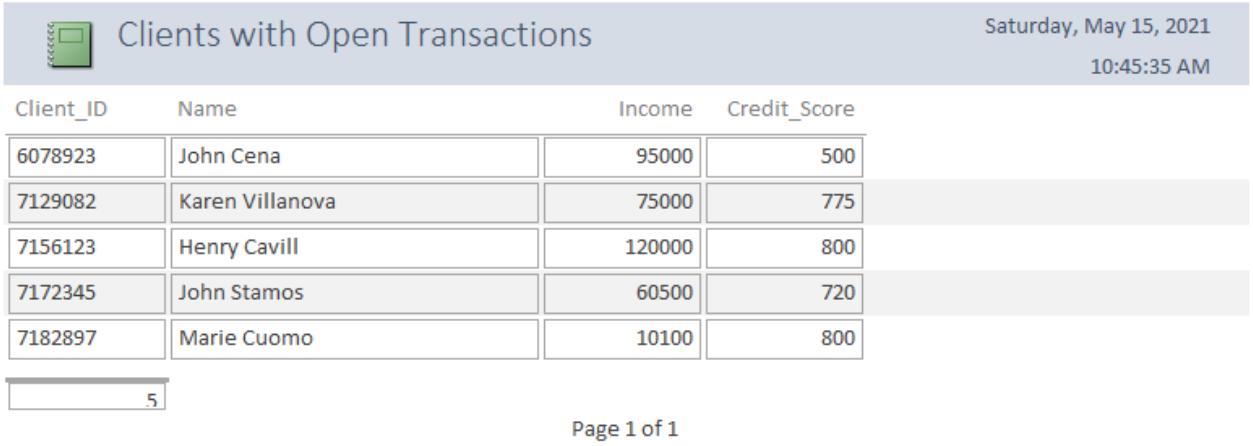
(5)Show all the clients that currently have an ongoing transaction. This helps an employee filter between people who have just gone to open houses and clients who need ongoing help because they're in the process of a transaction.

```
SELECT DISTINCT C.Client_ID, C.FName+' '+C.LName AS Name, C.Income, C.Credit_Score
FROM Clients C, Transaction T
WHERE C.Client_ID=T.Client_ID;
```



Clients with Open Transactions

Saturday, May 15, 2021
10:45:35 AM

Client_ID	Name	Income	Credit_Score
6078923	John Cena	95000	500
7129082	Karen Villanova	75000	775
7156123	Henry Cavill	120000	800
7172345	John Stamos	60500	720
7182897	Marie Cuomo	10100	800

5

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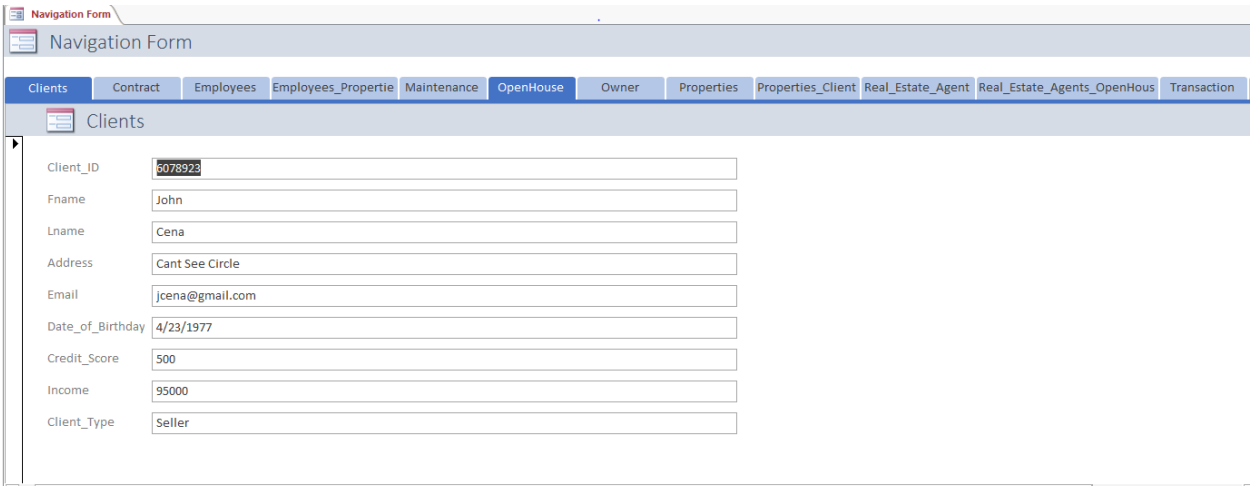
Navigation Form



Conclusion

Overall as a group, we had a great experience with this project. By going through each step of the process one-by-one we were able to fully understand each process from the Entity-Relationship diagram all the way to implementing the SQL. The step that we found the most difficult by far was Normalization. However, having to do the normalization for each table and going through it multiple times allowed us to get more practice with it and we feel it helped us improve. The step we found the easiest was creating the tables in SQL. Since we already had everything set up prior, we were able to refer to our diagrams which helped make things less complex. What we learned that we did not imagine we would have was creating a Database from scratch. We found the process extremely beneficial as it allowed us to practice all the different steps required to implement a database. If we had to do this all over again we would probably try to simplify the number of tables we had. Since we had a lot of tables, it made the normalization process more difficult than imagined.

Originally the real estate firm was doing everything by hand which caused us to lose track of open houses and as our clients grew we became increasingly unorganized. We set out with the intention to deliver on the following fronts, “to be able to schedule open house tours, easily attain details of available properties, and keep track of agents, clients, and log all sales and transactions.”. We believe the database we implemented realizes the benefits proposed by our new system. We also wanted our database to help employees get all the information they needed about their clients such as property type, amount of rooms, amount of bedrooms, location, square footage, and budget. Our database makes it easy for employees to attain this information. Our transaction table allows us to log the value of the sale, down payment, taxes paid, interest rate, and PMI. We can also check if a client has 40x the rent as their income by simply checking their

income in the clients table. Our database fully realizes the benefits we had proposed at the start of this project.