Information Systems and Data Modeling – IT1090

Assignment

Title: Online Apartment Sales System

Batch Number: Y1S2.WD.CSNE.01.02	Group Number: MLB_WD_CSNE_01.02_04

Declaration:

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Hypothetical Scenario

Elite Manor is a real estate agency that facilitates buying and selling apartments in various cities around the country. To keep up with the modern world, the agency decided to create an online apartment sales system. The system was streamlined to cater to the needs of the buyers by letting them view the facilities of the apartment and buy the apartment from sellers. Sellers can list their apartments and provide descriptions about their facilities and state the price of the apartment. The buyers can make online payments when purchasing apartments either in full or in installments. The payments will then be transferred to the seller by the system. The system will have records of all the apartments listed, the sellers who list them and the buyers who buy apartments through the system. The system will also store records of all the transactions made for the apartment including the amount and the date of payment.

Requirements Analysis

- The system will register sellers before they list their apartments with their seller ID, name, email address and contact information. The seller should be able to list one or multiple apartments at the same time.
- The buyers should register before purchasing apartments through the system by entering their name, Email address and contact information. A buyer ID will automatically be assigned to the buyer at the time of registration. A buyer is allowed to purchase multiple apartments at the same time.
- The system should allow sellers to list their apartments along with the apartment ID, address, price of the apartment and description of the apartment which includes the number of bathrooms, the number of rooms and whether the apartment is AC or non-AC.
- Every apartment should have a separate parking slot assigned to it for which the system should have the record of its parking ID and the type of parking, whether it is indoors or outdoors. There can only be one parking slot assigned per apartment.
- The buyers should be able to make online payments to the seller in full or in installments for which the system should record the payment ID of each payment, the amount and the date of the payment.
- The buyers should be able to submit reviews of the purchased apartment and the experience through the system with ratings and comments. Each review will contain a review ID and a buyer can only submit one review for an apartment.

DATA REQUIREMENTS

Entity	**Attributes**

Apartment	Apartment ID(Apartment_ID)
	Price(Price)
	Address(Address)
	Description(Bathrooms,AC/nonAC,No_of_Rooms)

Seller	Seller ID(Seller_ID)
	Name(First_Name,Last_Name)
	Email(Email)
	Contact Number(Contact_No)

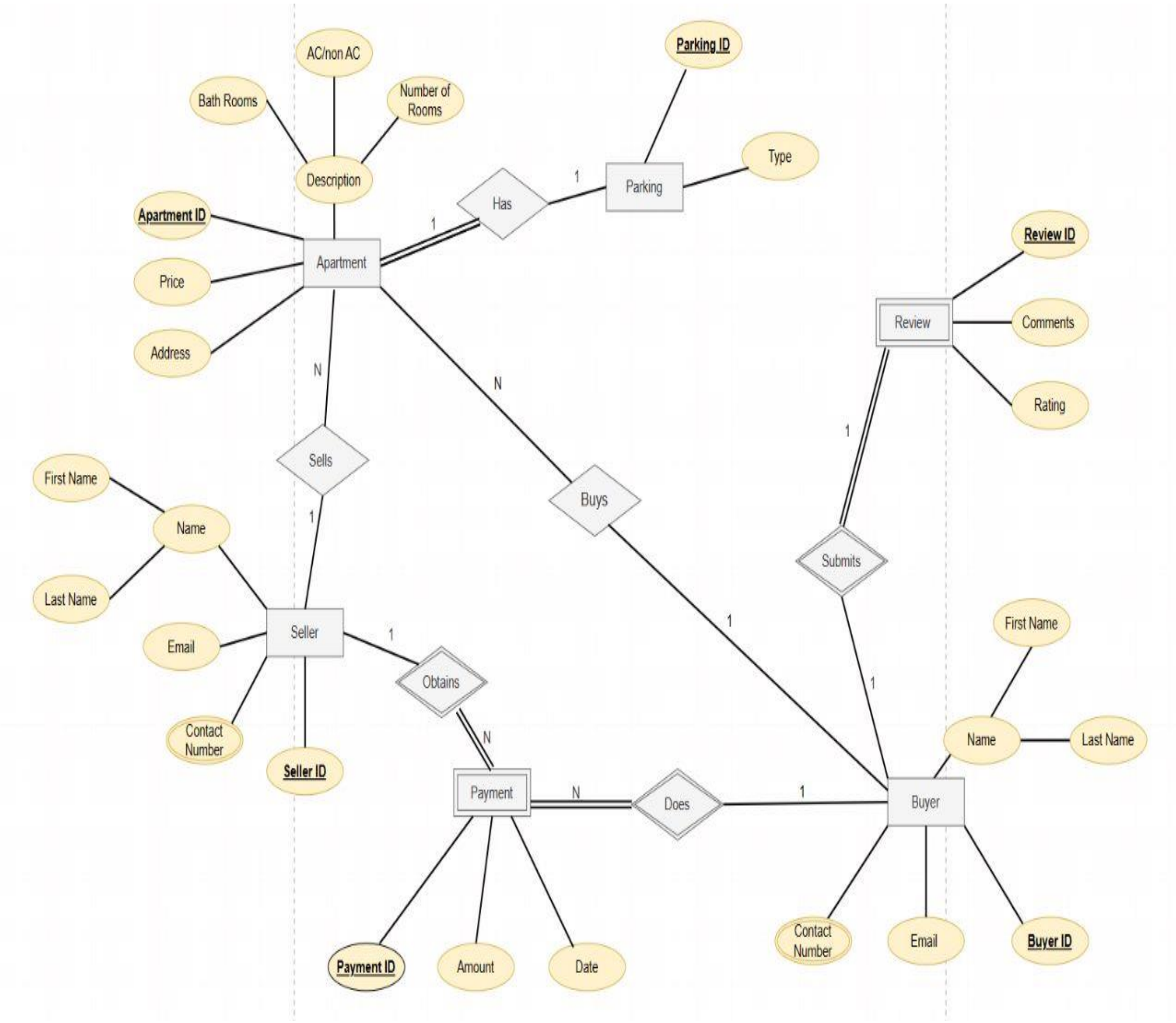
Payment	Payment ID(Payment_ID)
	Amount(Amount)
	Date(Date)

Buyer	Buyer ID(Buyer_ID)
	Name(First_Name,Last_Name)
	Email(Email)
	Contact Number(Contact_No)

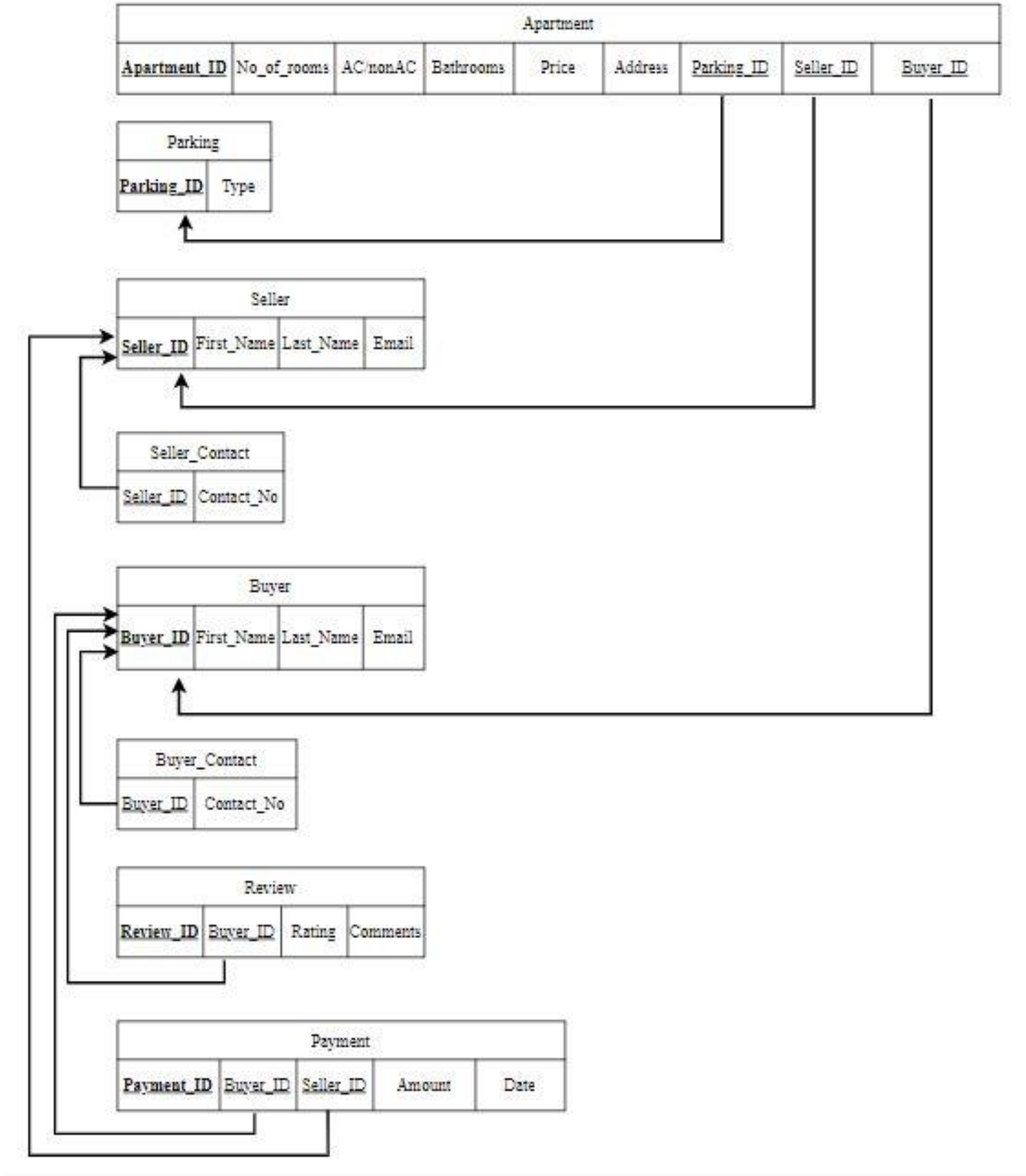
Review	Review ID(Review_ID)
	Comments(Comments)
	Rating(Rating)

Parking	Parking ID(Parking_ID) Type(Type)

ER DIAGRAM


AC/non AC
Parking ID
Bath Rooms
Number of Rooms
Description
Has
1
Parking
Type
Apartment ID
1
Apartment
Price
Review ID
Address
Review
Comments
N
N
Rating
1
Sells
First Name
Buys
1
Name
Submits
Last Name
1
Seller
First Name
Email
1
Obtains
1
Contact Number
N
Name
Last Name
Seller ID
Payment
N
Does
1
Buyer
Contact Number
Email
Buyer ID
Payment ID
Amount
Date

Relational Schema



Apartment

Apartment_ID	No_of_rooms	AC/nonAC	Bathrooms	Price	Address	Parking_ID	Seller_ID	Buyer_ID

Parking

Parking_ID	Type

Seller

Seller_ID	First_Name	Last_Name	Email

Seller_Contact

Seller_ID	Contact_No

Buyer

Buyer_ID	First_Name	Last_Name	Email

Buyer_Contact

Buyer_ID	Contact_No

Review

Review_ID	Buyer_ID	Rating	Comments

Payment

Payment_ID	Buyer_ID	Seller_ID	Amount	Date

SQL Queries

```
--Seller table

CREATE TABLE Seller (
       Seller_ID char(10) NOT NULL,
       First_Name varchar(20) NOT NULL,
       Last_Name varchar(20),
       Email varchar(50),
       constraint pk_seller primary key (Seller_ID)
);

--Seller_Contact table

CREATE TABLE Seller_Contact (
       Seller_ID char(10) NOT NULL,
       Contact_No Char(10) ,
       constraint fk_seller_contact foreign key (Seller_ID) references
Seller(Seller_ID)
);

--Buyer table

CREATE TABLE Buyer (
       Buyer_ID char(10) NOT NULL,
       First_Name char(20) NOT NULL,
       Last_Name char(20) ,
       Email varchar(50) NOT NULL,
       constraint pk_buyer primary key (Buyer_ID),
);

--Buyer_Contact table

CREATE TABLE Buyer_Contact (
       Buyer_ID char(10) NOT NULL,
       Contact_No char(10),
       constraint fk_buyer_contact foreign key (Buyer_ID) references Buyer(Buyer_ID)
);

--Payment table

CREATE TABLE Payment (
       Payment_ID char(10) NOT NULL,
       Date date NOT NULL,
       Amount real NOT NULL,
       Buyer_ID char(10) NOT NULL,
       Seller_ID char(10) NOT NULL,
       constraint pk_payment primary key (Payment_ID),
       constraint fk_payment foreign key (Buyer_ID) references Buyer(Buyer_ID),
       constraint fk_payment1 foreign key (Seller_ID) references Seller(Seller_ID),
       constraint chk_Payment_ID check (Payment_ID like ('PID%'))
);
```

```sql
--Review table

CREATE TABLE Review (
       Review_ID char(10) NOT NULL,
       Buyer_ID char(10) NOT NULL,
       Ratings int NOT NULL,
       Comments varchar(128) ,
       constraint pk_review primary key (Review_ID),
       constraint fk_review foreign key (Buyer_ID) references Buyer(Buyer_ID)
);

--Parking table

CREATE TABLE Parking (
       Parking_ID char(10) NOT NULL,
       Parking_Type char(10) NOT NULL,
       constraint pk_parking primary key (Parking_ID),
       constraint chk_parking_type check (Parking_Type in ('indoor' , 'outdoor'))
);

--Apartment table

CREATE TABLE Apartment (
       Apartment_ID char(10) NOT NULL,
       Address varchar(100) NOT NULL,
       Price real NOT NULL,
       No_of_Bathrooms int NOT NULL,
       AC_nonAC char(10) NOT NULL,
       No_of_Rooms int NOT NULL,
       Parking_ID char(10) NOT NULL,
       Seller_ID char(10) NOT NULL,
       Buyer_ID char(10),
       constraint pk_apartment primary key (Apartment_ID),
       constraint fk_apartment foreign key (Parking_ID) references
Parking(Parking_ID),
       constraint fk_apartment1 foreign key (Seller_ID) references Seller(Seller_ID),
       constraint fk_apartment2 foreign key (Buyer_ID) references Buyer(Buyer_ID)
);

--inserting data for table Seller

INSERT INTO Seller VALUES
('SID001' , 'David' , 'Ryan' , 'david77@gmail.com'),
('SID002' , 'John' , 'Andrew' , 'john8@gmail.com'),
('SID003' , 'Anna' , 'Grace' , 'annagrace@gmail.com'),
('SID004' , 'Celia' , 'Rose' , 'rose1@gmail.com'),
('SID005' , 'Roy' , 'Lee' , ' roylee@gmail.com');

--inserting data for table Seller_Contact

INSERT INTO Seller_Contact VALUES
('SID001' , 0713333334),
('SID001' , 0767555554),
('SID002' , 0766666667),
('SID003' , 0743222233),
('SID003' , 0790887777),
('SID004' , 0723333334),
('SID004' , 0743333346),
('SID005' , 0776666678);

--inserting data for table Buyer

INSERT INTO Buyer VALUES
('BID001' , 'Ella' , 'Jane' , 'ellajane@gmail.com'),
('BID002' , 'Avery' , 'James' , 'averyjames@gmail.com'),
('BID003' , 'Sarah' , 'Kate' , 'sarahkate@gmail.com'),
('BID004' , 'Emma' , 'Michael' , 'emmamichael@gmail.com'),
('BID005' , 'Ann' , 'Claire' , 'annclaire@gmail.com');

--inserting data for table Buyer_Contact

INSERT INTO Buyer_Contact VALUES
('BID001' , 0713333345),
('BID001' , 078999999),
('BID002' , 0761122332),
('BID002' , 0725555554),
('BID003' , 0745555565),
('BID003' , 0784433567),
('BID004' , 0776655676),
('BID004' , 0711234323),
('BID005' , 0767878787);

--inserting data for table Payment

INSERT INTO Payment VALUES
('PID001' , '2023-02-11' , 1000000 , 'BID001' , 'SID001'),
('PID002' , '2023-03-27' , 1000000, 'BID002' , 'SID003'),
('PID003' , '2023-01-12' , 1000000 , 'BID003' , 'SID003'),
('PID004' , '2023-02-04' , 1000000, 'BID004', 'SID004'),
('PID005' , '2023-03-09' , 1000000, 'BID005' , 'SID002');

--insering data for table Review

INSERT INTO Review VALUES
('RID001' , 'BID001' , 4 , 'Lovely apartment in great location'),
('RID002' , 'BID002' , 5 , 'Nice , comfortable and clean apartment and perfect view
from the balcony'),
('RID003' , 'BID003' , 3 , 'Need more improvement'),
('RID004' , 'BID004' , 5 , 'Great place with extra security'),
('RID005' , 'BID005' , 4 , 'Modern apartment with friendly staff');

--inserting data for table Parking

INSERT INTO Parking VALUES
('PARKING01' , 'outdoor'),
('PARKING02' , 'indoor'),
('PARKING03' , 'outdoor'),
('PARKING04' , 'indoor'),
('PARKING05' , 'indoor'),
('PARKING06' , 'indoor'),
('PARKING07' , 'outdoor');

--inserting data for table Apartment

INSERT INTO Apartment VALUES
('AID001' , 'No 1, First floor, Elite Manor' , 1000000 , 1 , 'NON A/C' , 2
,'PARKING01' , 'SID002' , NULL),
('AID002' , 'No 2, First floor, Elite Manor' , 2000000 , 1 , 'A/C' , 3 , 'PARKING02'
, 'SID001' , 'BID001'),
('AID003' , 'No 3, Second floor, Elite Manor' , 2500000 , 2 , 'NON A/C' , 2 ,
'PARKING03' , 'SID005' , NULL),
('AID004' , 'No 4, Second floor, Elite Manor' , 5000000, 2 , 'A/C' , 2 , 'PARKING04'
, 'SID004' , 'BID004'),
('AID005' , 'No 5, Third floor, Elite Manor' , 6000000 , 3 , 'A/C' , 3 , 'PARKING05',
'SID003' , 'BID002'),
('AID006' , 'No 6, Fourth floor, Elite Manor' , 8000000 , 4 , 'A/C' , 4 ,
'PARKING06', 'SID003' , 'BID005'),
('AID007' , 'No 7, Fifth floor, Elite Manor' , 3000000 , 2 , 'NON A/C' , 2 ,
'PARKING07', 'SID002' , 'BID003');
```

Performance Considerations

- Up to five thousand buyers can view apartments at the same time.
- When an apartment is selected by a buyer, the apartment should be delisted from the system for the other users to avoid confusion.
- Every transaction should be verified by the system and should inform the buyer about the payment as soon as possible.
- The system should be user friendly so that the sellers can easily list their apartments and the buyers should be able to swiftly choose the apartment of their preference and make the payment.
- The online payment method should support various online payment gateways to avoid inconveniences.
- Every requirement of the user should be taken care of with the least response time.
- The system should take backups frequently to avoid loss of data in case of service disruptions.
- The system should be available 24 hours for all 7 days of the week.
- The system should be accessible in various digital platforms to facilitate the user experience.

Security Requirements

- The buyers and sellers will have to verify their phone numbers and email addresses via OTP during the registration process.
- The backups made by the system should be encrypted.
- The buyer will have to verify their identity before making any purchases via OTP that will be sent to their contact number and email address.
- Ensure that all data entered are valid and only expected data can be inserted to the database to avoid system getting compromised through malicious inputs.