University of British Columbia, Vancouver

Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 2

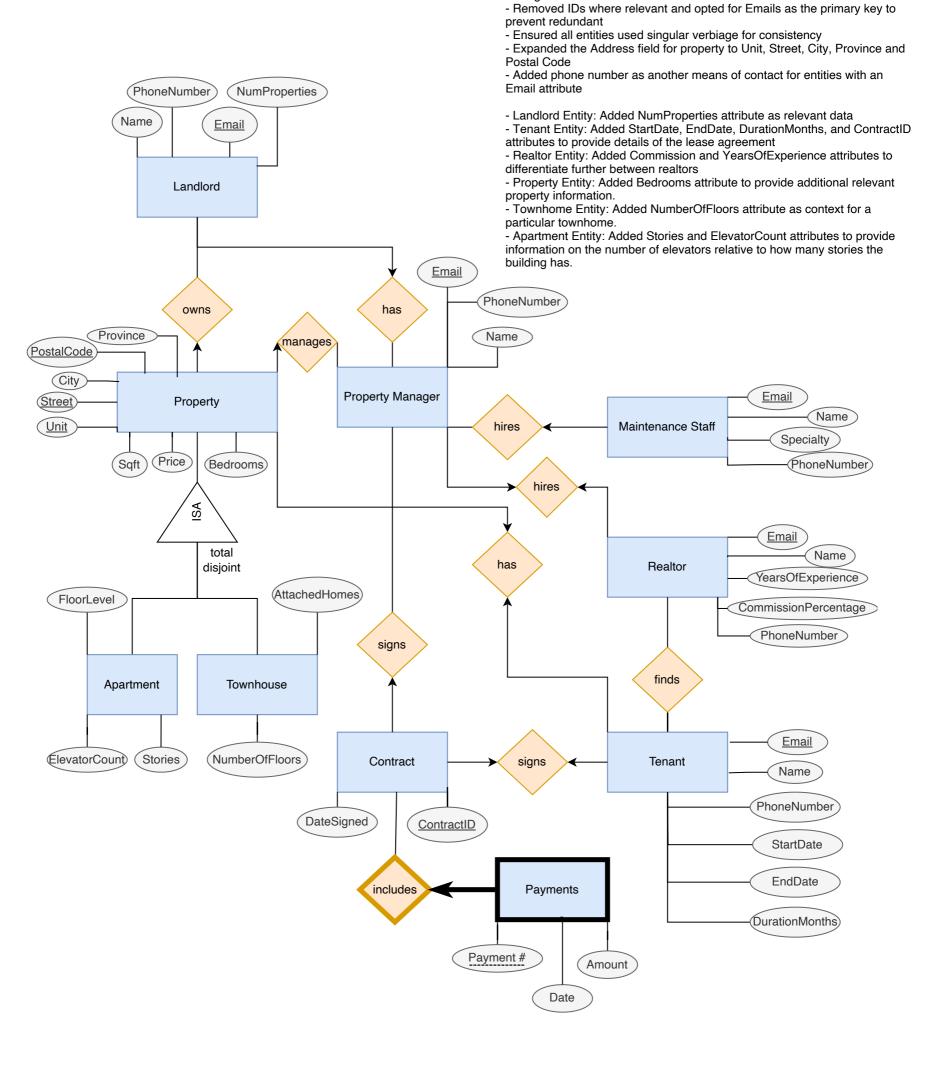
Date: Oct 20th, 2023

Group Number: 37

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Erping Sun	28353969	d4t6o	erpingsun@gmail.com
Fahim Gbonjubola	45657541	e6h9h	fahim.gbon@gmail.com
Borna Shani	48472450	k8i4l	borna471@gmail.com

By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia



Changes:

Overview:

As the city of Vancouver continues to grow, the demand for rental housing skyrockets as people seek out accommodation, prompting a parallel surge in the need for property management teams.

Domain & Specification:

The application's domain focuses on providing Property Managers with a dashboard for efficient day-to-day operations and stakeholder management. These stakeholders include landlords, tenants, realtors, and maintenance staff. The core functionalities of our database surround the ability to add, remove, modify, and view stakeholder data, catering to the specific needs of property management teams.

Table Definition:

Landlord (Email: VARCHAR, Name: VARCHAR, PhoneNumber: INTEGER, NumProperties: INTEGER)

PropertyManager (Email: VARCHAR, Name: VARCHAR, PhoneNumber: INTEGER)

Tenant (<u>Email</u>: VARCHAR, Name: VARCHAR, PhoneNumber: INTEGER, StartDate: DATE, EndDate: DATE, DurationMonths: INTEGER, **ContractID**: INTEGER)

Realtor (<u>Email</u>: VARCHAR, Name: VARCHAR, PhoneNumber: INTEGER, YearsOfExperience: INTEGER, CommissionPercentage: NUMBER)

MaintenanceStaff (Email: VARCHAR, Name: VARCHAR, Speciality: VARCHAR, PhoneNumber: INTEGER)

Property (<u>Unit</u>: VARCHAR, <u>Street</u>: VARCHAR, City: VARCHAR, Province: VARCHAR, <u>PostalCode</u>: CHAR(6), Price: INTEGER, Sqft: INTEGER, Bedrooms: INTEGER)

Apartment (<u>Unit</u>: VARCHAR, <u>Street</u>: VARCHAR, <u>PostalCode</u>: CHAR(6), FloorLevel: INTEGER, Stories: INTEGER, ElevatorCount: INTEGER)

Townhome (**Unit**: VARCHAR, **Street**: VARCHAR, **PostalCode**: CHAR(6), AttachedHomes: INTEGER, NumberOfFloors: INTEGER)

Contract (ContractID: INTEGER, DateSigned: DATE)

Payment (ContractID: INTEGER, PaymentNumber: INTEGER, Amount: NUMBER, Date: DATE)

PKs, CKs, FKs & Constraints

- Landlord
 - o PRIMARY KEY (Email)
 - CANDIDATE KEY (PhoneNumber)
- Property Management Team
 - o PRIMARY KEY (Email)
 - CANDIDATE KEY (PhoneNumber)
- Tenant
 - o PRIMARY KEY (Email)
 - FOREIGN KEY (ContractID)
 - CANDIDATE KEY (PhoneNumber)
 - NOT NULL (ContractID)
- Realtor
 - PRIMARY KEY (Email)
 - CANDIDATE KEY (PhoneNumber)
- Property
 - PRIMARY KEY (Unit, Street, PostalCode)
- Apartment
 - PRIMARY KEY (Unit, Street, PostalCode)
 - FOREIGN KEY (Unit, Street, PostalCode)
- Townhome
 - PRIMARY KEY (Unit, Street, PostalCode)
 - FOREIGN KEY (Unit, Street, PostalCode)
- Contract
 - PRIMARY KEY (ContractID)
- Payment
 - PRIMARY KEY (ContractID, Number)
 - FOREIGN KEY (ContractID)
- Maintenance Staff
 - o PRIMARY KEY (Email)
 - CANDIDATE KEY (PhoneNumber)

Functional Dependencies

- Landlord(Email, Name, PhoneNumber, NumProperties)
 - Email → Name, PhoneNumber, NumProperties
- PropertyManager(<u>Email</u>, Name, PhoneNumber)
 - Email → Name, PhoneNumber
- Tenant(Email, Name, PhoneNumber, StartDate, EndDate, DurationMonths, ContractID)
 - Email → Name, PhoneNumber, StartDate, EndDate, DurationMonths, ContractID
 - StartDate, EndDate → DurationMonths
- Realtor(<u>Email</u>, Name, PhoneNumber, YearsOfExperience, CommissionPercentage)
 - Email → Name, PhoneNumber, YearsOfExperience, CommissionPercentage
 - YearsOfExperience → CommissionPercentage
- Property(<u>Unit</u>, <u>Street</u>, City, Province, <u>PostalCode</u>, Price, Sqft, Bedrooms)
 - Unit, Street, PostalCode → City, Province, Price, Sqft, Bedrooms
 - Sqft, Bedrooms → Price
- Apartment(<u>Unit</u>, <u>Street</u>, <u>PostalCode</u>, FloorLevel, Stories, ElevatorCount)
 - Unit, Street, PostalCode → FloorLevel, Stories, ElevatorCount
- Townhome(<u>Unit</u>, <u>Street</u>, <u>PostalCode</u>, AttachedHomes, NumberOfFloors)
 - Unit, Street, PostalCode → AttachedHomes, NumberOfFloors)
- Contract(ContractID, DateSigned)
 - ContractID → DateSigned
- Payment(ContractID, PaymentNumber, Amount, Date)
 - ContractID, PaymentNumber → PaymentAmount, PaymentDate
- MaintenanceStaff(<u>Email</u>, Name, Speciality, PhoneNumber)
 - Email → Name, Speciality, PhoneNumber

Normalization

Normalization from Tenant:

Tenant(<u>Email</u>, Name, PhoneNumber, ContractID, StartDate, EndDate) LeaseLength(<u>StartDate</u>, <u>EndDate</u>, DurationMonths)

	Tenant
FD:	Ernent -> Name, PhoneNumber, StartDate, End Date,
	Aurutiun Months, Contract ID)
	Start Date, End Date -> Duration Months
	Ly Woltes BCKUE
	e e e e e e e e e e e e e e e e e e e
	Email + = { Email, Name, PhoneMumber, StartDate
	Email + - 7 Chang
	Eris Date, Arrition Morths, Cortaid ID
	ENDATE, Abration Months, Control ID
	ENDATE, Abration Months, Control ID
	ENDRIE, ArritionMorths, Contract ID Startate, Endate + = {Startate, Endate, ArationMorths}
	ENDRIE, ArritionMorths, Contract ID Startate, Endate + = {Startate, Endate, ArationMorths}
	ENDLIE, Derution Morths, Contract ID StartParte, EndDate + = {StartParte, EndDate, Derution Morths }
	ENDRIE, ArritionMorths, Contract ID Startate, Endate + = {Startate, Endate, ArationMorths}
· · · · · · · · · · · · · · · · · · ·	ENDRIE, ArritionMorths, Contract ID Startate, Endate + = {Startate, Endate, ArationMorths}

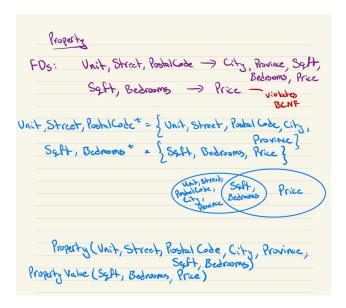
Normalization from Realtor:

Realtor(<u>Email</u>, Name, PhoneNumber, YearsOfExperience)
RealtorExperience(<u>YearsOfExperience</u>, CommissionPercentage)



Normalization from Property:

Property(<u>Unit</u>, <u>Street</u>, City, Province, <u>PostalCode</u>, Sqft, Bedrooms) PropertyValue(<u>Sqft</u>, <u>Bedrooms</u>, Price)



New Table Definitions

Landlord(Email, Name, PhoneNumber, NumProperties)

PropertyManager(Email, Name, PhoneNumber)

Tenant(Email, Name, PhoneNumber, ContractID, StartDate, EndDate)

LeaseLength(<u>StartDate</u>, <u>EndDate</u>, DurationMonths)

Realtor(Email, Name, PhoneNumber, YearsOfExperience)

RealtorExperience(YearsOfExperience, CommissionPercentage)

Property(<u>Unit</u>, <u>Street</u>, City, Province, <u>PostalCode</u>, Sqft, Bedrooms)

PropertyValue(<u>Sqft</u>, <u>Bedrooms</u>, Price)

Apartment(**Unit**, **Street**, **PostalCode**, FloorLevel, Stories, ElevatorCount)

Townhome(**Unit**, **Street**, **PostalCode**, AttachedHomes, NumberOfFloors)

Contract(ContractID, DateSigned)

Payment(ContractID, PaymentNumber, Amount, Date)

MaintenanceStaff(Email, Name, Speciality, PhoneNumber)

SQL DDL Statements

CREATE TABLE Landlord (

Email VARCHAR PRIMARY KEY,

Name VARCHAR, PhoneNumber INTEGER, NumProperties INTEGER);

CREATE TABLE PropertyManager (

Email VARCHAR PRIMARY KEY,

Name VARCHAR, PhoneNumber INTEGER);

CREATE TABLE Tenant (

Email VARCHAR PRIMARY KEY,

Name VARCHAR,
PhoneNumber INTEGER,
StartDate DATE,
EndDate DATE,
ContractID INTEGER,

FOREIGN KEY (ContractID) REFERENCES Contract(ContractID));

CREATE TABLE LeaseLength (

StartDate DATE,
EndDate DATE,
DurationMonths INTEGER,
PRIMARY KEY (StartDate, EndDate));

CREATE TABLE Realtor (

Email VARCHAR PRIMARY KEY,

Name VARCHAR, PhoneNumber INTEGER, YearsOfExperience INTEGER);

CREATE TABLE RealtorExperience (

YearsOfExperience INTEGER PRIMARY KEY,

CommissionPercentage NUMBER);

(We are assuming that as you get more YearsOfExperience, your CommissionPercentage increases)

CREATE TABLE Property (

Unit VARCHAR,
Street VARCHAR,
City VARCHAR,
Province VARCHAR,
PostalCode CHAR(6),
Sqft INTEGER,
Bedrooms INTEGER,

PRIMARY KEY (Unit, Street, PostalCode));

CREATE TABLE PropertyValue (

Sqft INTEGER, Bedrooms INTEGER, Price INTEGER,

PRIMARY KEY (Sqft, Bedrooms));

CREATE TABLE Apartment (

Unit VARCHAR,
Street VARCHAR,
PostalCode CHAR(6),
FloorLevel INTEGER,
Stories INTEGER,
ElevatorCount INTEGER,

PRIMARY KEY (Unit, Street, PostalCode),

FOREIGN KEY (Unit, Street, PostalCode) REFERENCES Property);

CREATE TABLE Townhome (

Unit VARCHAR,
Street VARCHAR,
PostalCode CHAR(6),
AttachedHomes INTEGER,
NumberOfFloors INTEGER,

PRIMARY KEY (Unit, Street, PostalCode),

FOREIGN KEY (Unit, Street, PostalCode) REFERENCES Property);

CREATE TABLE Contract (

ContractID INTEGER PRIMARY KEY,

DateSigned DATE);

CREATE TABLE Payment (

ContractID INTEGER,
PaymentNumber INTEGER,
Amount NUMBER,
Date DATE,

PRIMARY KEY (ContractID, PaymentNumber),

FOREIGN KEY (ContractID) REFERENCES Contract(ContractID), ON DELETE CASCADE);

CREATE TABLE MaintenanceStaff (

Email VARCHAR, Name VARCHAR, Speciality VARCHAR,

PhoneNumber INTEGER);

INSERT Statements

INSERT INTO Landlord (Email, Name, PhoneNumber, NumProperties) VALUES ('hspecter@gmail.com', 'Harvey Specter', '6045555294', '10');

INSERT INTO Landlord (Email, Name, PhoneNumber, NumProperties) VALUES ('mross@gmail.com', 'Mike Ross', '6045551234', '5');

INSERT INTO Landlord (Email, Name, PhoneNumber, NumProperties) VALUES ('llitt@gmail.com', 'Louis Litt', '6045555678', '7');

INSERT INTO Landlord (Email, Name, PhoneNumber, NumProperties) VALUES (jpearson@gmail.com', 'Jessica Pearson', '6045559876', '9');

INSERT INTO Landlord (Email, Name, PhoneNumber, NumProperties) VALUES ('rzane@gmail.com', 'Rachel Zane', '6045553456', '3');

INSERT INTO Landlord (Email, Name, PhoneNumber, NumProperties) VALUES ('dpaulsen@gmail.com', 'Donna Paulsen', '6045557890', '6');

INSERT INTO PropertyManager (Email, Name, PhoneNumber) VALUES ('jake@bosa.com', 'Jake Peralta', '7785550924');

INSERT INTO PropertyManager (Email, Name, PhoneNumber) VALUES ('amy@bosa.com', 'Amy Santiago', '7785551234');

INSERT INTO PropertyManager (Email, Name, PhoneNumber) VALUES ('terry@bosa.com', 'Terry Jeffords', '7785555678');

INSERT INTO PropertyManager (Email, Name, PhoneNumber) VALUES ('rosa@bosa.com', 'Rosa Diaz', '7785559876');

INSERT INTO PropertyManager (Email, Name, PhoneNumber) VALUES ('raymond@bosa.com', 'Raymond Holt', '7785553456');

INSERT INTO PropertyManager (Email, Name, PhoneNumber) VALUES ('gina@bosa.com', 'Gina Linetti', '7785557890');

INSERT INTO Tenant (Email, Name, PhoneNumber, StartDate, EndDate, ContractID) VALUES ('robin@gmail.com', Robin Scherbatsky', '6045550130', '01-MAR-2022', '01-MAR-2024', '3044);

INSERT INTO Tenant (Email, Name, PhoneNumber, StartDate, EndDate, ContractID) VALUES ('barney@gmail.com', 'Barney Stinson', '6045552468', '01-APR-2021', '01-APR-2024', '3045');

INSERT INTO Tenant (Email, Name, PhoneNumber, StartDate, EndDate, ContractID) VALUES ('lily@gmail.com', 'Lily Aldrin', '6045558642', '01-MAY-2020', '01-MAY-2025', '3046');

INSERT INTO Tenant (Email, Name, PhoneNumber, StartDate, EndDate, ContractID) VALUES ('marshall@gmail.com', 'Marshall Eriksen', '6045557310', '01-JAN-2023', '01-NOV-2024', '3047');

INSERT INTO Tenant (Email, Name, PhoneNumber, StartDate, EndDate, ContractID) VALUES ('ted@gmail.com', 'Ted Mosby', '6045559175', '01-JUL-2022', '01-DEC-2023', '3048');

INSERT INTO Tenant (Email, Name, PhoneNumber, StartDate, EndDate, ContractID) VALUES ('tracy@gmail.com', 'Tracy McConnell', '6045556089', '01-AUG-2022', '01-AUG-2028', '3049');

INSERT INTO LeaseLength (StartDate, EndDate, DurationMonths) VALUES ('01-MAR-2022', '01-MAR-2024', '24')

INSERT INTO LeaseLength (StartDate, EndDate, DurationMonths) VALUES ('01-APR-2022', '01-APR-2024', '24')

INSERT INTO LeaseLength (StartDate, EndDate, DurationMonths) VALUES ('01-JUL-2022', '01-DEC-2023', '18')

INSERT INTO LeaseLength (StartDate, EndDate, DurationMonths) VALUES ('01-MAR-2020', '01-MAR-2024', '48')

INSERT INTO LeaseLength (StartDate, EndDate, DurationMonths) VALUES ('01-MAR-2023', '01-MAR-2028', '60')

INSERT INTO LeaseLength (StartDate, EndDate, DurationMonths) VALUES ('01-JAN-2023', '01-JAN-2030', '84')

INSERT INTO Realtor (Email, Name, PhoneNumber, YearsOfExperience) VALUES ('walterwhite@bosa.com', 'Walter White', '1112223334', '1');

INSERT INTO Realtor (Email, Name, PhoneNumber, YearsOfExperience) VALUES ('gusfring@bosa.com', 'Gus Fring', '1122233354', '15');

INSERT INTO Realtor (Email, Name, PhoneNumber, YearsOfExperience) VALUES ('mikeehrmantraut@bosa.com', 'Mike Ehrmantraut', '1142273364', '14');

INSERT INTO Realtor (Email, Name, PhoneNumber, YearsOfExperience) VALUES ('jessepinkman@bosa.com', 'Jesse Pinkman', '116223555', '6');

INSERT INTO Realtor (Email, Name, PhoneNumber, YearsOfExperience) VALUES ('skylerwhite@bosa.com', 'Skyler White', '1112828834', '2');

INSERT INTO RealtorExperience(YearsOfExperience, CommissionPercentage) VALUES ('2', '0.02')

INSERT INTO RealtorExperience(YearsOfExperience, CommissionPercentage) VALUES ('15', '0.25')

INSERT INTO RealtorExperience(YearsOfExperience, CommissionPercentage) VALUES ('14', '0.22')

INSERT INTO RealtorExperience(YearsOfExperience, CommissionPercentage) VALUES ('6', '0.08')

INSERT INTO RealtorExperience(YearsOfExperience, CommissionPercentage) VALUES ('1', '0.01')

INSERT INTO Property (Unit, Street, City, Province, PostalCode, Sqft, Bedrooms) VALUES ('101', '1408 Fir St', 'Vancouver', 'BC', 'V5P9F5', '1000', '2');

INSERT INTO Property (Unit, Street, City, Province, PostalCode, Sqft, Bedrooms) VALUES ('202', '123 Main St', 'Vancouver', 'BC', 'V6H2X2', '800', '3');

INSERT INTO Property (Unit, Street, City, Province, PostalCode, Sqft, Bedrooms) VALUES ('203', '789 Elm St', 'Vancouver', 'BC', 'V7R1Z1', '1200', '2');

INSERT INTO Property (Unit, Street, City, Province, PostalCode, Sqft, Bedrooms) VALUES ('104', '456 Oak St', 'Vancouver', 'BC', 'V6E3Y5', '700', '1');

INSERT INTO Property (Unit, Street, City, Province, PostalCode, Sqft, Bedrooms) VALUES ('205', '987 Maple St', 'Vancouver', 'BC', 'V5N6W8', '900', '2');

INSERT INTO PropertyValue (Sqft, Bedrooms, Price) VALUES ('1000', '2', '2000000');

INSERT INTO PropertyValue (Sqft, Bedrooms, Price) VALUES ('3300', '3', '1500000');

INSERT INTO PropertyValue (Sqft, Bedrooms, Price) VALUES ('1200', '2', '1800000');

INSERT INTO PropertyValue (Sqft, Bedrooms, Price) VALUES ('700', '1', '900000');

INSERT INTO PropertyValue (Sqft, Bedrooms, Price) VALUES ('900', '2', '1200000');

INSERT INTO Apartment (Unit, Street, PostalCode, FloorLevel, Stories, ElevatorCount) VALUES (121', '6597 Maclean Rd', 'V9M2J7', '1', '20', '4');

INSERT INTO Apartment (Unit, Street, PostalCode, FloorLevel, Stories, ElevatorCount) VALUES ('305', '1234 Elm Street', V6J2J9', '3', '4', '1');

INSERT INTO Apartment (Unit, Street, PostalCode, FloorLevel, Stories, ElevatorCount) VALUES ('402', '456 Oak Avenue', 'V9M2J3', '4', '12', '3');

INSERT INTO Apartment (Unit, Street, PostalCode, FloorLevel, Stories, ElevatorCount) VALUES ('500', '789 Pine Road', 'V7K2L7', '5', '6', '2');

INSERT INTO Apartment (Unit, Street, PostalCode, FloorLevel, Stories, ElevatorCount) VALUES ('250', '1010 Maple Lane', 'V9Y5P4', '2', '8', '1');

INSERT INTO Townhome (Unit, Street, PostalCode, AttachedHomes, NumberOfFloors) VALUES ('101', '1408 Fir St', 'V5P9F5', '3', '3');

INSERT INTO Townhome (Unit, Street, PostalCode, AttachedHomes, NumberOfFloors)VALUES ('202', '123 Main St', 'V6H2X2', '4', '2');

INSERT INTO Townhome (Unit, Street, PostalCode, AttachedHomes, NumberOfFloors) VALUES ('203', '789 Elm St', 'V7R1Z1', '2', '4');

INSERT INTO Townhome (Unit, Street, PostalCode, AttachedHomes, NumberOfFloors) VALUES ('104', '456 Oak St', 'V6E3Y5', '1', '3');

INSERT INTO Townhome (Unit, Street, PostalCode, AttachedHomes, NumberOfFloors) VALUES ('205', '987 Maple St', 'V5N6W8', '3', '2');

INSERT INTO Townhome (Unit, Street, PostalCode, AttachedHomes, NumberOfFloors) VALUES ('206', '321 Pine St', 'V7K8Q3', '2', '4');

INSERT INTO Contract (ContractID, DateSigned) VALUES ('15000', '01-JAN-2023');

INSERT INTO Contract (ContractID, DateSigned) VALUES ('16000', '01-JAN-2022');

INSERT INTO Contract (ContractID, DateSigned) VALUES ('17000', '15-MAR-2022');

INSERT INTO Contract (ContractID, DateSigned) VALUES ('18000', '05-MAY-2022');

INSERT INTO Contract (ContractID, DateSigned) VALUES ('19000', '20-JAN-2022');

INSERT INTO Contract (ContractID, DateSigned) VALUES ('20000', '10-AUG-2022');

INSERT INTO Payment (ContractID, PaymentNumber, Amount, Date) VALUES ('15000', '5000', '2750.00', '01-OCT-2023');

INSERT INTO Payment (ContractID, PaymentNumber, Amount, Date) VALUES ('16000', '5001', '3000.00', '15-OCT-2023');

INSERT INTO Payment (ContractID, PaymentNumber, Amount, Date) VALUES ('17000', '5002', '3250.50', '15-NOV-2023');

INSERT INTO Payment (ContractID, PaymentNumber, Amount, Date) VALUES ('18000', '5003', '2800.75', '01-NOV-2023');

INSERT INTO Payment (ContractID, PaymentNumber, Amount, Date) VALUES ('19000', '5004', '2900.25', '15-DEC-2023');

INSERT INTO Payment (ContractID, PaymentNumber, Amount, Date) VALUES ('20000', '5005', '3100.00', '01-JAN-2024');

INSERT INTO MaintenanceStaff (Email, Name, Speciality, PhoneNumber) VALUES ('<u>plumbing@bosa.com</u>', 'John Smith', 'Plumbing', '2365550101');

INSERT INTO MaintenanceStaff (Email, Name, Speciality, PhoneNumber) VALUES ('electrician@bosa.com', 'Alice Johnson', 'Electrician', '2365550543');

INSERT INTO MaintenanceStaff (Email, Name, Speciality, PhoneNumber) VALUES ('hvac@bosa.com', 'Robert Davis', 'HVAC', '2365555436');

INSERT INTO MaintenanceStaff (Email, Name, Speciality, PhoneNumber) VALUES ('carpenter@bosa.com', 'Emily Turner', 'Carpentry', '2365559999');

INSERT INTO MaintenanceStaff (Email, Name, Speciality, PhoneNumber) VALUES ('painter@bosa.com', 'Michael Clark', 'Painting', '2365554903');

INSERT INTO MaintenanceStaff (Email, Name, Speciality, PhoneNumber) VALUES ('locksmith@bosa.com', 'Sarah White', 'Locksmith', '2365559042');