

DATABASE MANAGEMENT SYSTEM



INDIAN INSTITUTE OF
INFORMATION
TECHNOLOGY

MINI-PROJECT - 1

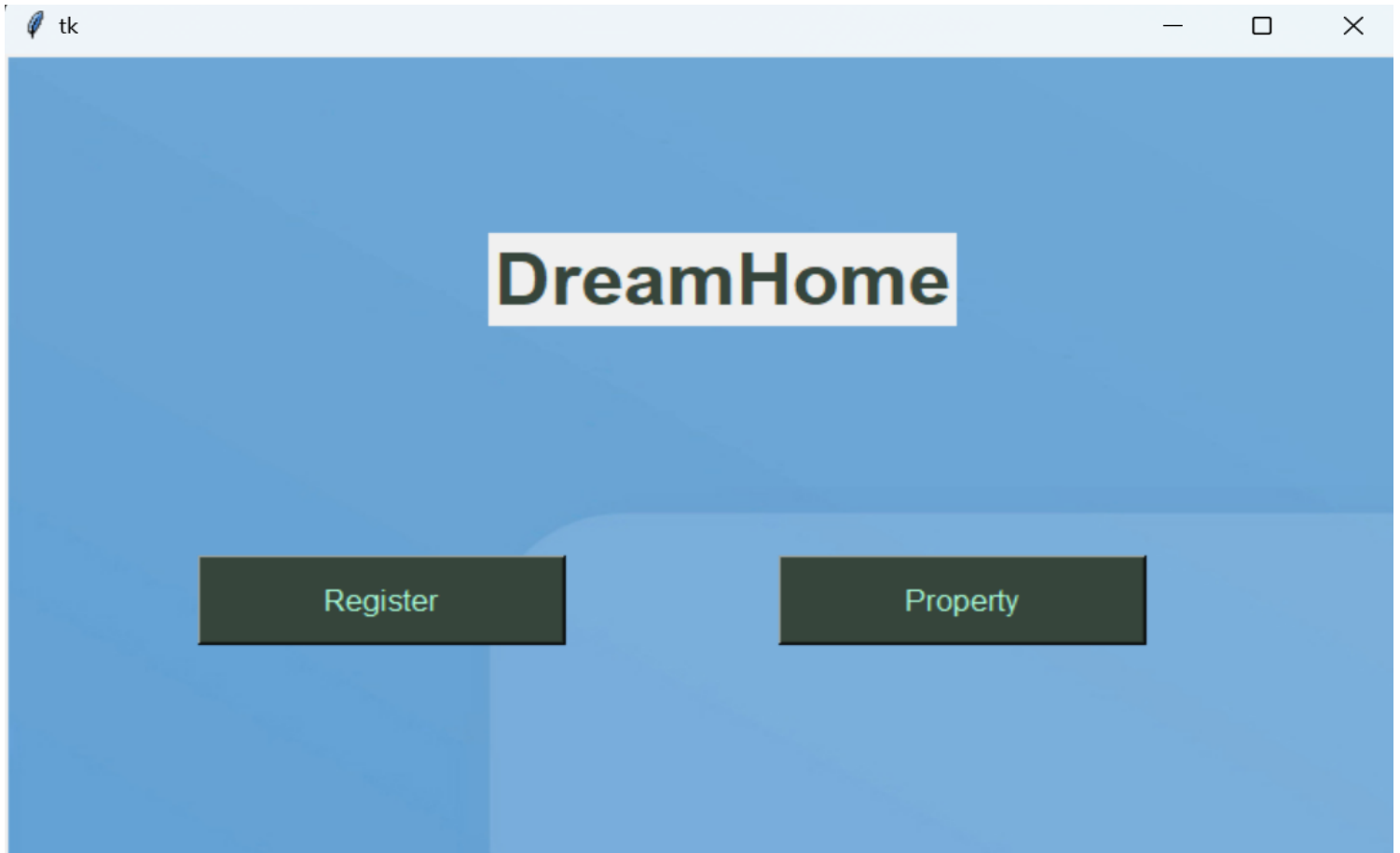
DREAM-HOME

UNDER THE GUIDANCE OF
Dr. PRAMOD YELMEWAD

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CASE STUDY - OVERVIEW OF THE DREAM HOME COMPANY



Dream home is a property rental company. The first branch office of DreamHome was opened in 1992 in a city called Glasgow in the UK. Since then, the Company has grown steadily and now has several offices in most of the main cities of the UK. However, the Company is now so large that more and more administrative staff are being employed to cope with the ever-increasing amount of paperwork. Furthermore, the communication and sharing of information between offices, even in the same city, is poor.

PROBLEM :

The Director of the Company, Sally, feels that too many mistakes are being made and that the success of the Company will be short-lived if she does not do something to remedy the Situation. She knows that a database could help in part to solve the problem. She requests that a database application be developed to support the running of DreamHome. The Director has provided the following brief description of how DreamHome currently operates.

AIM OF THIS PROJECT :

Create and design a database for handling the problems of management of staff clients and properties as the company will grow. And provide better service to its customers.

OUTLINE OF THE PROJECT :

- ❖ The first branch office of DreamHome was opened in 1992 in a city called Glasgow in the UK.
- ❖ Since then, the Company has grown steadily and now has several offices in most of the main cities of the UK.
- ❖ However, the Company is now so large that more and more administrative staff are being employed to cope with the ever-increasing amount of paperwork.
- ❖ Furthermore, the communication and sharing of information between offices, even in the same city, is poor.

OUR PROJECT IMPLEMENTATION :

A. FRONT-END

- We used a simple tech for the front-end that is the tkinter which takes less time to design and implement.
- Then we linked our front-end with the tkinter GUI

B. BACK-END

- We identified all necessary requirements and objectives to create entities for our database .
- Then we added proper attributes to entities
- We designed the schema according to the above requirements.
- Then we added proper relationship and integrity constraints to different entity sets.
- Then we created an ER Diagram.
- After that we wrote all the sql queries for the given problem statements
- Then we tested and executed all the given queries to cross check the required results.

C. TECHNOLOGY USED

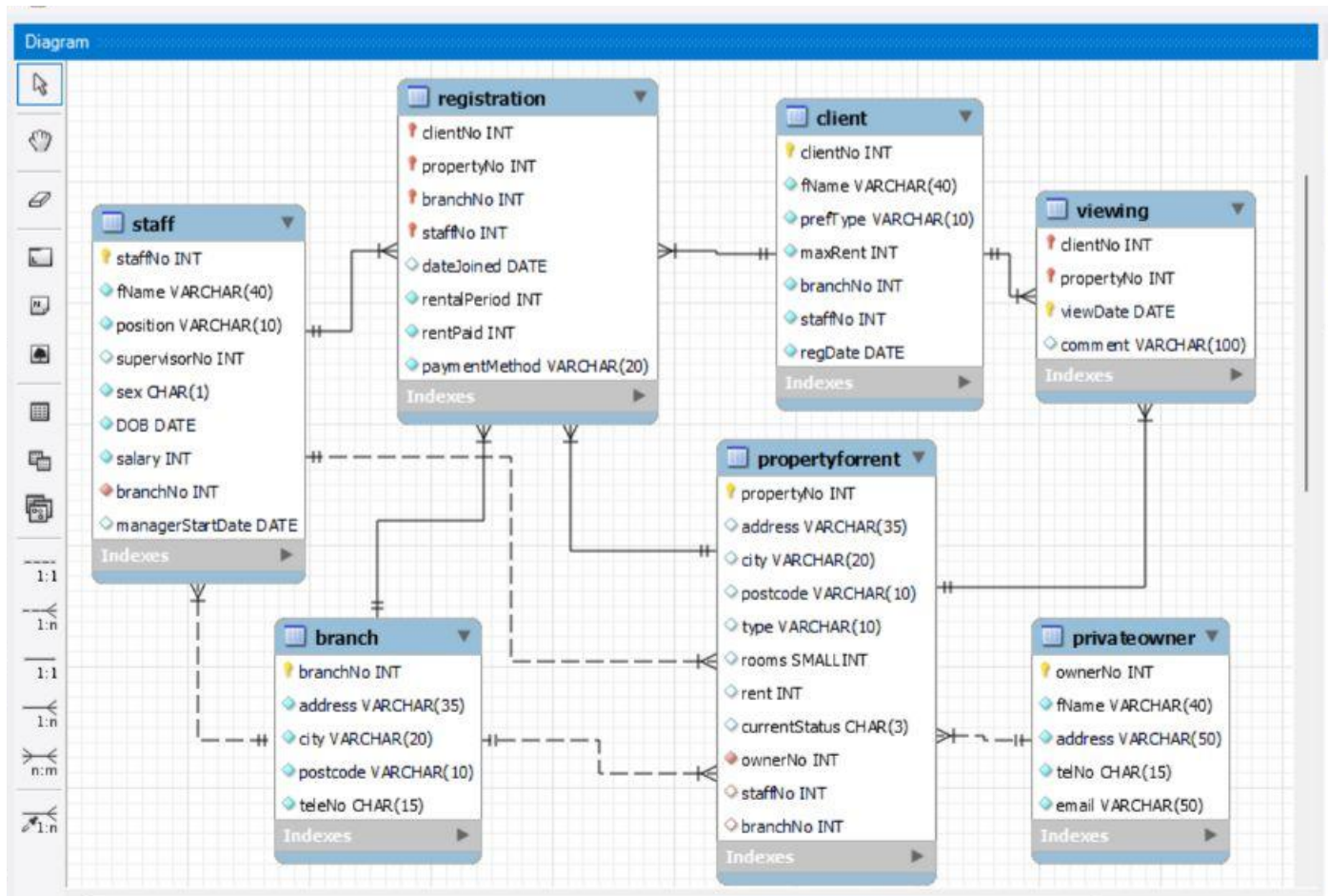
- MYSQL for database creation and storing the data.
- TKINTER for frontend

Mission Statement for DreamHome Database System

The purpose of the dream home database is used to maintain the data that is used and generated to support the property rental business for our client and property owner and to facilitate the sharing and cooperation between the branch and client.

DREAM-HOME PROJECT :

1. ER - DIAGRAM



ALL TABLES :

	branchNo	address	city	postcode	teleNo
►	1001	123 Main St	New York	10001	555-1234
	1002	456 Market St	San Francisco	94103	555-5678
	1003	789 Broadway	New York	10003	555-9012
	1004	321 Pine St	Seattle	98101	555-3456
	1005	654 Oak St	Los Angeles	90001	555-7890

	propertyNo	address	city	postcode	type	rooms	rent	currentStatus	ownerNo	staffNo	branchNo
►	3001	123 Main St	New York	10001	Apartment	2	2000	Y	60001	50001	1001
	3002	456 Oak Ave	Los Angeles	90001	House	3	3000	N	60002	50002	1002
	3003	789 Pine St	San Francisco	94101	Apartment	1	1500	Y	60003	50003	1003
	3004	456 Elm St	Boston	02101	Condo	2	2500	N	60004	50004	1004
	3005	321 Maple Ave	Chicago	60601	House	4	4000	Y	60005	50005	1005
	3006	987 Birch St	New York	10002	Apartment	1	1200	N	60006	50006	1001
	3007	654 Oak Ave	Los Angeles	90002	House	2	2500	Y	60007	50007	1002
	3008	321 Pine St	San Francisco	94102	Apartment	3	1800	N	60008	50008	1003
	3009	888 Elm St	Boston	02102	Condo	1	2000	Y	60009	50009	1004
	3010	555 Maple Ave	Chicago	60602	House	5	4500	N	60010	50010	1005
	3011	222 Birch St	New York	10003	Apartment	2	2200	Y	60011	50011	1001
	3012	777 Oak Ave	Los Angeles	90003	House	3	3500	N	60012	50012	1002
	3013	444 Pine St	San Francisco	94103	Apartment	1	1300	Y	60013	50013	1003
	3014	111 Elm St	Boston	02103	Condo	2	2700	N	60014	50014	1004
	3015	444 Maple Ave	Chicago	60603	House	4	4200	Y	60015	50015	1005

	clientNo	propertyNo	viewDate	comment
►	40001	3001	2023-05-01	Nice property, but needs some maintenance work.
	40002	3002	2023-04-20	Great location, but too small for my family.
	40003	3003	2023-05-10	I love this property, but the rent is too high.
	40004	3004	2023-04-23	The property is in good condition, but the neigh...
	40005	3005	2023-04-27	I am interested in renting this property.
	40006	3001	2023-04-21	The property is in a convenient location.
	40007	3002	2023-04-22	The property is clean and well-maintained.
	40008	3003	2023-05-05	The property is too far from my workplace.
	40009	3004	2023-05-02	The property is spacious and has a great view.
	40010	3005	2023-05-07	The property is too expensive for me.

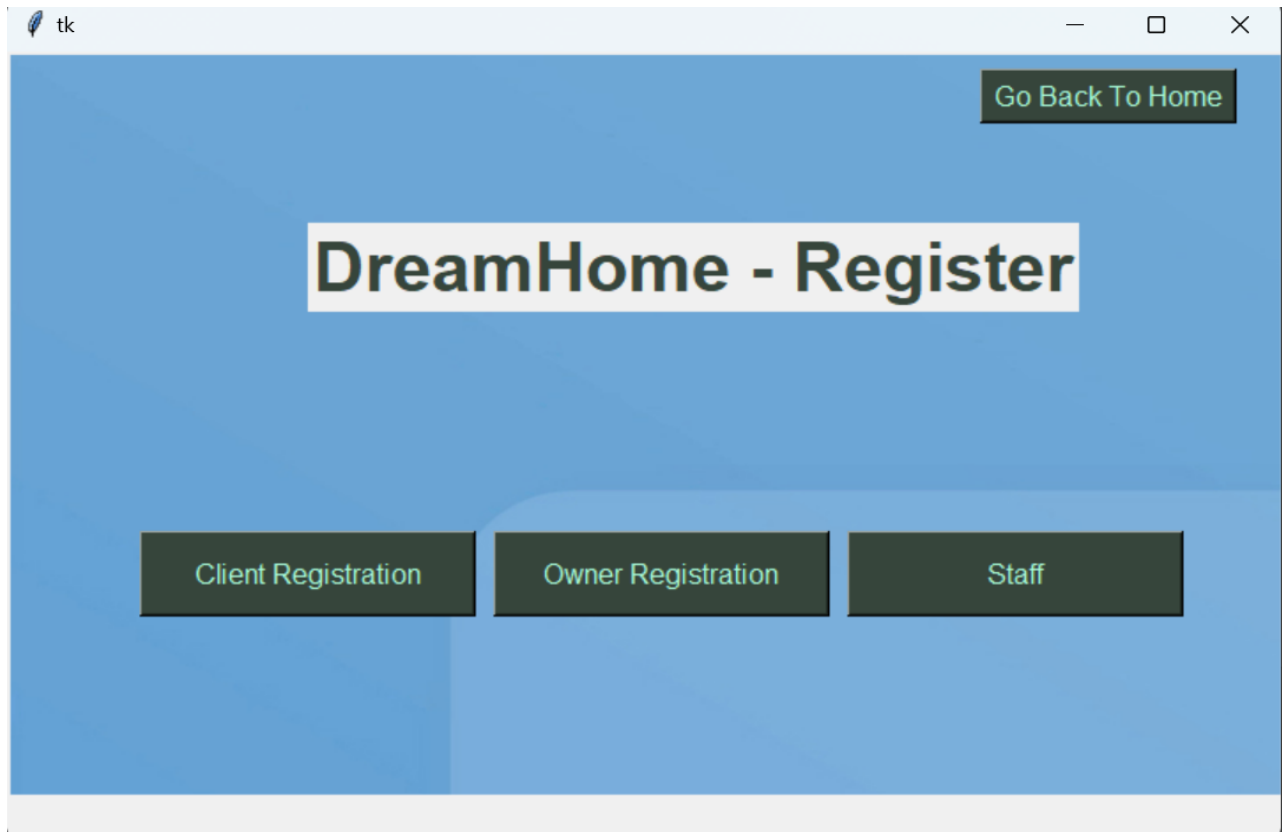
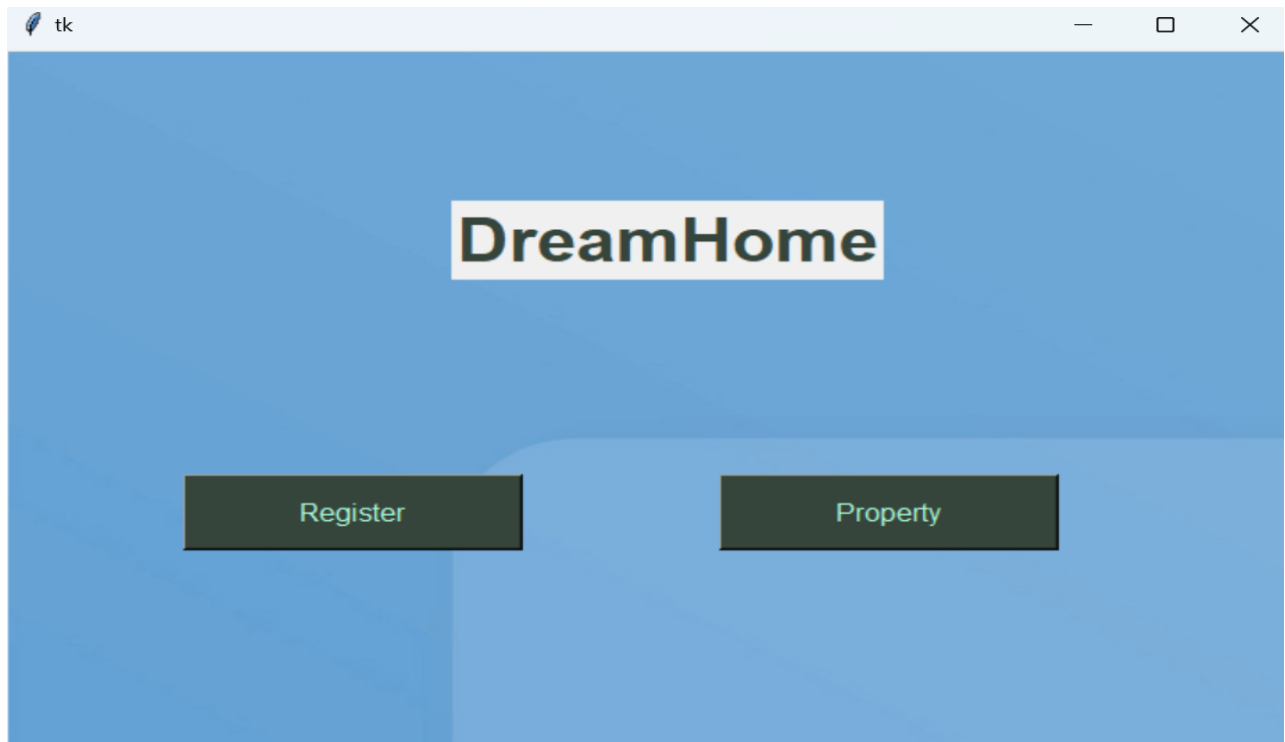
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	clientNo	propertyNo	branchNo	staffNo	dateJoined	rentalPeriod	rentPaid	paymentMethod
▶	40001	3001	1001	50001	2022-03-01	12	1200	Cheque
	40002	3002	1002	50002	2022-04-01	6	1800	Cash
	40003	3003	1003	50003	2022-05-01	12	1500	Cheque
	40004	3004	1004	50004	2022-06-01	9	2000	Cash
	40005	3005	1005	50005	2022-07-01	12	2200	Cash
	40006	3002	1002	50002	2022-08-01	12	2400	Cheque
	40007	3003	1003	50003	2022-09-01	6	1200	Cash

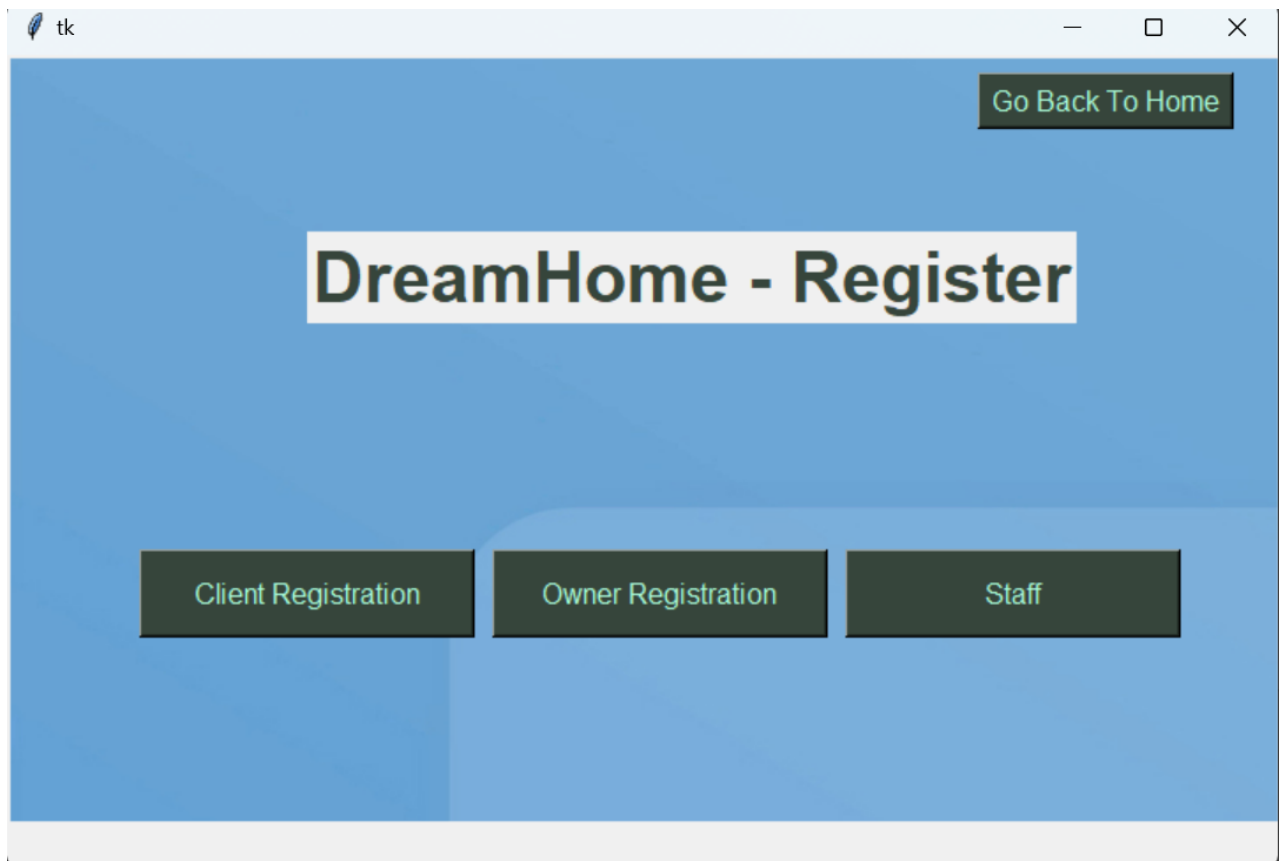
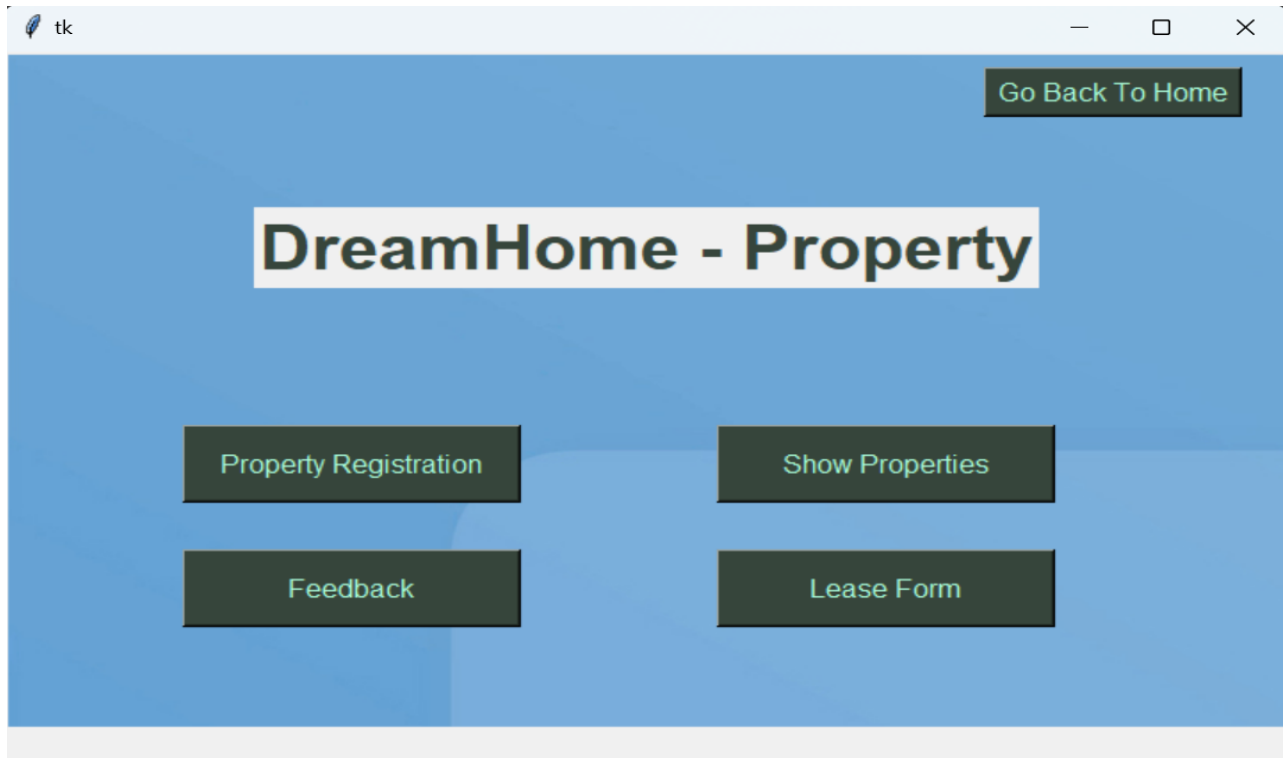
staffNo	fName	position	supervisorNo	sex	DOB	salary	branchNo	managerStartDate
50001	John Doe	Manager	NULL	M	1985-01-15	70000	1001	2019-01-01
50002	Jane Smith	Assistant	50001	F	1990-06-22	40000	1001	NULL
50003	Tom Wilson	Assistant	50001	M	1992-09-05	45000	1001	NULL
50004	Emily Chen	Manager	NULL	F	1982-04-18	75000	1002	2018-03-01
50005	Peter Lee	Assistant	50004	M	1993-11-09	42000	1002	NULL
50006	Maggie Johnson	Assistant	50004	F	1991-02-28	47000	1002	NULL
50007	James Brown	Manager	NULL	M	1978-07-13	80000	1003	2017-06-01
50008	Sarah Davis	Assistant	50007	F	1994-12-04	43000	1003	NULL
50009	Chris Taylor	Assistant	50007	M	1989-03-20	48000	1003	NULL
50010	Anna Kim	Manager	NULL	F	1980-11-12	90000	1004	2016-05-01
50011	Kevin Wong	Assistant	50010	M	1995-08-07	44000	1004	NULL
50012	Olivia Lee	Assistant	50010	F	1990-01-25	49000	1004	NULL
50013	David Lee	Manager	NULL	M	1981-06-09	85000	1005	2015-01-01
50014	Samantha Brown	Assistant	50013	F	1992-04-02	46000	1005	NULL
50015	Alex Johnson	Assistant	50013	M	1987-09-18	51000	1005	NULL

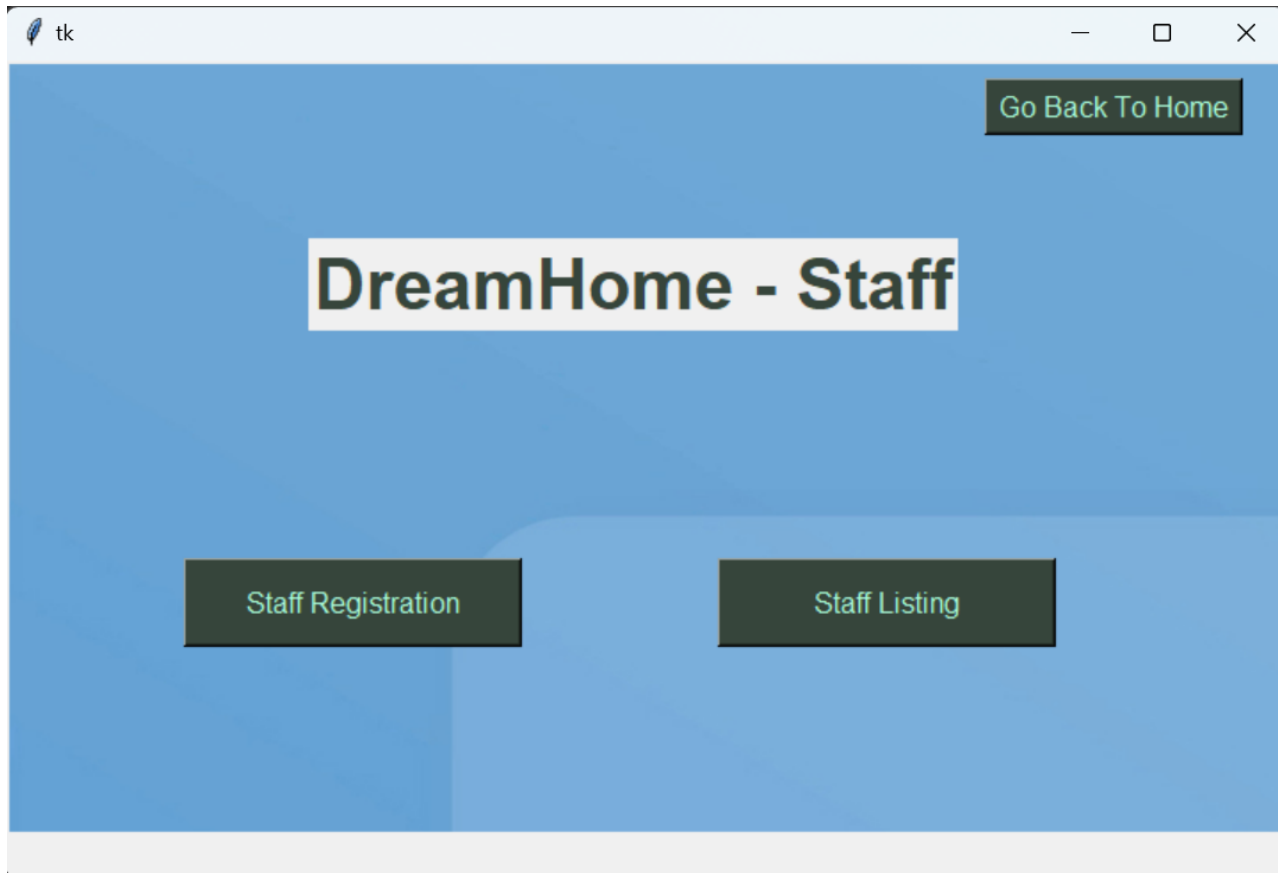
	clientNo	fName	prefType	maxRent	branchNo	staffNo	regDate
►	40001	John Smith	House	2000	1001	50001	2022-01-01
	40002	Sarah Johnson	Apartment	1500	1002	50002	2022-01-02
	40003	Michael Brown	Condo	1800	1003	50003	2022-01-03
	40004	Jennifer Lee	Duplex	2200	1001	50001	2022-01-04
	40005	David Garcia	Townhouse	1900	1002	50002	2022-01-05
	40006	Maria Hernandez	House	2500	1003	50003	2022-01-06
	40007	James Wilson	Apartment	1300	1001	50001	2022-01-07
	40008	Laura Martinez	Condo	1700	1002	50002	2022-01-08
	40009	Robert Taylor	Duplex	2400	1003	50003	2022-01-09
	40010	Karen Anderson	Townhouse	2100	1001	50001	2022-01-10
	40011	William Davis	House	1800	1002	50002	2022-01-11
	40012	Emma Rodriguez	Apartment	1400	1003	50003	2022-01-12
	40013	Daniel Martinez	Condo	2000	1001	50001	2022-01-13
	40014	Jessica Wilson	Duplex	2200	1002	50002	2022-01-14
	40015	Christopher Clark	Townhouse	1900	1003	50003	2022-01-15

	ownerNo	fName	address	telNo	email
►	60001	John Smith	123 Main St	555-1234	jsmith@email.com
	60002	Mary Johnson	456 Maple Ave	555-5678	mjohnson@email.com
	60003	James Brown	789 Oak St	555-9012	jbrown@email.com
	60004	Emily Davis	234 Elm St	555-3456	edavis@email.com
	60005	David Wilson	567 Pine St	555-7890	dwilson@email.com
	60006	Susan Lee	890 Cedar St	555-1234	slee@email.com
	60007	Robert Johnson	123 Main St	555-5678	rjohnson@email.com
	60008	Jessica Garcia	456 Maple Ave	555-9012	jgarcia@email.com
	60009	William Davis	789 Oak St	555-3456	wdavis@email.com
	60010	Amanda Perez	234 Elm St	555-7890	aperez@email.com
	60011	Michael Wilson	567 Pine St	555-1234	mwilson@email.com
	60012	Jennifer Martinez	890 Cedar St	555-5678	jmartinez@email.com
	60013	Christopher Th...	123 Main St	555-9012	cthompson@email.com
	60014	Ashley Hernan...	456 Maple Ave	555-3456	ahernandez@email.c...
	60015	Daniel Brown	789 Oak St	555-7890	dbrown@email.com

DEMONSTRATION :







Staff Registration

Staff registration Form

Staff Number

Branch Number

Full Name

Position

Sex DOB

Salary

Enter details where applicable

Supervisor No

Manager Start Date

Submit

Back

Staff Listing

Back

Branch No

Submit

Staff Number	Name	Position
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Property Registration

PROPERTY REGISTRATION FORM

Enter Property Requirements

Owner details

Property Number :

Owner Number :

Property type :

Managed By

Address :

Staff Number :

Property rent :

Registered at

Rooms required :

Branch Number :

Postcode :

City :

Submit

Back

Owner Registration

OWNER REGISTRATION FORM

Owner Number :

Full Name :

Address :

Tel No :

Email :

Submit

Back

Give Comments

Give Feedback

Client No

Property No

Visit Date

2023-05-05

Feedback

Submit

View Feedback

Back

View Comments

—

□

×

View Feedback

Property No

Submit

Client Number	Property Number	Date	Comment

Back

Lease Form

—

□

×

Lease Form

Client Number

Property Number

Branch Number

Staff Number

Enter payment details

Monthly Rent

Rent Start

Payment Method

Duration

Submit

Back

QUERIES IMPLEMENTATION :

FIRST SET OF QUERIES

a. select * from branch where city='New York';

	branchNo	address	city	postcode	teleNo
▶	1001	123 Main St	New York	10001	555-1234
	1003	789 Broadway	New York	10003	555-9012
•	NULL	NULL	NULL	NULL	NULL

b. select city,count(*) as totalBranch from branch group by city;

	city	totalBranch
▶	New York	2
	San Francisco	1
	Seattle	1
	Los Angeles	1

c. select fName,position,salary from staff where branchNo=1003 order by fName;

	fName	position	salary
▶	Chris Taylor	Assistant	48000
	James Brown	Manager	80000
	Sarah Davis	Assistant	47000

d. SELECT COUNT(*) AS totalStaff, SUM(salary) AS totalSalary FROM staff;

	totalStaff	totalSalary
▶	15	855000

- e. select position,count(*) as totalStaff from staff, branch where staff.branchNo=branch.branchNo and branch.city = 'New York' group by position;

	position	totalStaff
▶	Manager	2
	Assistant	4

- f. select branch.address,branch.city,staff.fName as managerName from staff,branch where staff.branchNo=branch.branchNo and staff.position='Manager' order by branch.address;

	address	city	managerName
▶	123 Main St	New York	John Doe
	321 Pine St	Seattle	Anna Kim
	456 Market St	San Francisco	Emily Chen
	654 Oak St	Los Angeles	David Lee
	789 Broadway	New York	James Brown

- g. select fName from staff where supervisorNo=(select staffNo from staff where fName="John Doe");

	fName
▶	Jane Smith
	Tom Wilson

- h. select propertyNo, address, city, type, rent from propertyforrent where city='New York' order by rent;

	propertyNo	address	city	type	rent
▶	3016	888 Birch St	New York	Apartment	1000
	3006	987 Birch St	New York	Apartment	1200
	3001	123 Main St	New York	Apartment	2000
	3011	222 Birch St	New York	Apartment	2200
*	NULL	NULL	NULL	NULL	NULL

- i. select * from propertyforrent where staffNo=(select staffNo from staff where fname='Peter Lee');

	propertyNo	address	city	postcode	type	rooms	rent	currentStatus	ownerNo	staffNo	branchNo
▶	3005	321 Maple Ave	Chicago	60601	House	4	4000	Y	60005	50005	1005
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

- j. select staff.fName, count(*) as propertyCount from staff, propertyforrent where staff.staffNo=propertyforrent.staffNo and staff.branchNo=1003 group by staff.staffNo;

	fName	propertyCount
▶	James Brown	1
	Sarah Davis	1
	Chris Taylor	1

- k. select b.branchNo, b.city, p.type, count(*) as totalProperties from branch b, propertyforrent p where p.branchNo=B.branchNo group by b.branchNo,b.city,p.type;

	branchNo	city	type	totalProperties
▶	1001	New York	Apartment	4
	1002	San Francisco	House	3
	1003	New York	Apartment	3
	1004	Seattle	Condo	3
	1005	Los Angeles	House	3

- l.

m. select p.ownerNo,o.fName,count(*) as propertyCount from propertyforrent p ,privateowner o where p.ownerNo=o.ownerNo group by p.ownerNo having count(*)>1;

	ownerNo	fName	propertyCount
▶	60001	John Smith	2

n. select * from propertyforrent where type='Apartment' and city='New York' and rooms>=2 and rent<=2000;

	propertyNo	address	city	postcode	type	rooms	rent	currentStatus	ownerNo	staffNo	branchNo
▶	3001	123 Main St	New York	10001	Apartment	2	2000	Y	60001	50001	1001
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

o. select distinct c.clientNo, c.fName ,c.prefType from client c, propertyforrent p where c.prefType=p.type and c.maxRent>=p.rent and p.branchNo=1003;

	clientNo	fName	prefType
▶	40002	Sarah Johnson	Apartment
	40007	James Wilson	Apartment
	40012	Emma Rodriguez	Apartment

p. select propertyNo, count(*) as advertisingCount from viewing group by propertyNo having count()>(select avg(advertisingCount) from(select count() as advertisingCount from viewing group by propertyNo)as advertisingCount);

	fName	propertyCount
▶	James Brown	1
	Sarah Davis	1
	Chris Taylor	1

q.

- r. select registration.branchNo,count(*) as totalWithLessThanAYear
from registration,propertyforrent where rentalPeriod<12 group by
branchNo;

	branchNo	totalWithLessThanAYear
▶	1003	16
	1004	16
	1002	16

- s. select branchNo,sum(rentPaid/30) as dailyRental from registration
group by branchNo;

	branchNo	dailyRental
	1001	40.0000
	1002	140.0000
	1003	90.0000
	1004	66.6667
	1005	73.3333

SECOND SET OF QUERIES

- a. select fName from staff where supervisorNo= (select staffNo from
staff where fName="James Brown") and branchNo=1003;

	fName
▶	Sarah Davis
	Chris Taylor

- b. select * from staff where position="Assistant" and branchNo=1003 order by fName;

	staffNo	fName	position	supervisorNo	sex	DOB	salary	branchNo	managerStartDate
▶	50009	Chris Taylor	Assistant	50007	M	1989-03-20	48000	1003	NULL
	50008	Sarah Davis	Assistant	50007	F	1994-12-04	43000	1003	NULL
▲	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

- c. select p.propertyNo, p.rent, o.ownerNo, o.fName, o.email from propertyForRent p inner join privateowner o on p.ownerNo=o.ownerNo where currentStatus="N";

	propertyNo	rent	ownerNo	fName	email
▶	3002	3000	60002	Mary Johnson	mjohnson@email.com
	3004	2500	60004	Emily Davis	edavis@email.com
	3006	1200	60006	Susan Lee	slee@email.com
	3008	1800	60008	Jessica Garcia	jgarcia@email.com
	3010	4500	60010	Amanda Perez	aperez@email.com
	3012	3500	60012	Jennifer Martinez	jmartinez@email.com
	3014	2700	60014	Ashley Hernandez	ahernandez@email.com
	3016	1000	60001	John Smith	jsmith@email.com

- d. SELECT p.propertyNo, o.*, s.staffNo FROM propertyForRent p JOIN privateOwner o ON p.ownerNo= o.ownerNo JOIN staff s ON p.staffNo= s.staffNo WHERE s.fName = 'John Doe';

Result Grid		Filter Rows:		Export:		Wrap Cell Content:	
	propertyNo	ownerNo	fName	address	telNo	email	staffNo
▶	3001	60001	John Smith	123 Main St	555-1234	jsmith@email.com	50001
	3016	60001	John Smith	123 Main St	555-1234	jsmith@email.com	50001

e. SELECT c.clientNo,c.Fname,c.staffNo, s.fName AS
staffName,s.branchNo FROM client c JOIN staff s ON c.staffNo =
s.staffNo;


	clientNo	Fname	staffNo	staffName	branchNo
▶	40001	John Smith	50001	John Doe	1001
	40002	Sarah Johnson	50002	Jane Smith	1001
	40003	Michael Brown	50003	Tom Wilson	1001
	40004	Jennifer Lee	50001	John Doe	1001
	40005	David Garcia	50002	Jane Smith	1001
	40006	Maria Hernandez	50003	Tom Wilson	1001
	40007	James Wilson	50001	John Doe	1001
	40008	Laura Martinez	50002	Jane Smith	1001
	40009	Robert Taylor	50003	Tom Wilson	1001
	40010	Karen Anderson	50001	John Doe	1001
	40011	William Davis	50002	Jane Smith	1001
	40012	Emma Rodriguez	50003	Tom Wilson	1001
	40013	Daniel Martinez	50001	John Doe	1001
	40014	Jessica Wilson	50002	Jane Smith	1001
	40015	Christopher Clark	50003	Tom Wilson	1001


f. select propertyNo,address,city,postcode,rent from propertyforrent
where city="New York" and rent<2000;


	propertyNo	address	city	postcode	rent
▶	3006	987 Birch St	New York	10002	1200
	3016	888 Birch St	New York	10004	1000
	NULL	NULL	NULL	NULL	NULL

g. select p.propertyNo,p.address,p.city,p.ownerNo,o.fname as
ownerName,o.telNo from propertyforrent p,privateowner o where
p.ownerNo=o.ownerNo;

Result Grid

 Filter Rows:

Export: 

Wrap Cell Content: 

	propertyNo	address	city	ownerNo	ownerName	telNo
	3016	888 Birch St	New York	60001	John Smith	555-1234
	3002	456 Oak Ave	Los Angeles	60002	Mary Johnson	555-5678
	3003	789 Pine St	San Francisco	60003	James Brown	555-9012
	3004	456 Elm St	Boston	60004	Emily Davis	555-3456
	3005	321 Maple Ave	Chicago	60005	David Wilson	555-7890
	3006	987 Birch St	New York	60006	Susan Lee	555-1234
	3007	654 Oak Ave	Los Angeles	60007	Robert Johnson	555-5678
	3008	321 Pine St	San Francisco	60008	Jessica Garcia	555-9012
	3009	888 Elm St	Boston	60009	William Davis	555-3456
	3010	555 Maple Ave	Chicago	60010	Amanda Perez	555-7890
	3011	222 Birch St	New York	60011	Michael Wilson	555-1234
	3012	777 Oak Ave	Los Angeles	60012	Jennifer Martinez	555-5678
	3013	444 Pine St	San Francisco	60013	Christopher Th...	555-9012
	3014	111 Elm St	Boston	60014	Ashley Hernan...	555-3456
	3015	444 Maple Ave	Chicago	60015	Daniel Brown	555-7890

h. select * from viewing where propertyNo=3001;

clientNo	propertyNo	viewDate	comment
40001	3001	2023-05-01	Nice property, but needs some maintenance work.
40006	3001	2023-04-21	The property is in a convenient location.
NULL	NULL	NULL	NULL

- i. `select c.clientNo,c.fName from client c join viewing v on c.clientNo=v.clientNo where v.comment IS NULL;`

clientNo	fName
40001	John Smith
40006	Maria Hernandez
40002	Sarah Johnson
40007	James Wilson
40003	Michael Brown
40008	Laura Martinez
40004	Jennifer Lee
40009	Robert Taylor
40005	David Garcia
40010	Karen Anderson

- j. `Select r.clientNo,c.fName,r.propertyNo,concat(p.address,"",p.city) as propertyAddress,r.rentPaid,r.dateJoined,r.rentalPeriod,r.paymentMethod,(select date_add(r.dateJoined,interval r.rentalPeriod month)) as expiryDate from registration r,client c,propertyforrent p where r.clientNo=c.clientNo and p.propertyNo=r.propertyNo;`

clientNo	fName	propertyNo	propertyAddress	rentPaid	dateJoined	rentalPeriod	paymentMethod	expiryDate
40001	John Smith	3001	123 Main St,New York	1200	2022-03-01	12	Cheque	2023-03-01
40002	Sarah Johnson	3002	456 Oak Ave,Los Angeles	1800	2022-04-01	6	Cash	2022-10-01
40003	Michael Brown	3003	789 Pine St,San Francisco	1500	2022-05-01	12	Cheque	2023-05-01
40004	Jennifer Lee	3004	456 Elm St,Boston	2000	2022-06-01	9	Cash	2023-03-01
40005	David Garcia	3005	321 Maple Ave,Chicago	2200	2022-07-01	12	Cash	2023-07-01
40006	Maria Hernandez	3002	456 Oak Ave,Los Angeles	2400	2022-08-01	12	Cheque	2023-08-01
40007	James Wilson	3003	789 Pine St,San Francisco	1200	2022-09-01	6	Cash	2023-03-01

k.

l. `SELECT p.propertyNo, p.type, p.rooms, p.rent, p.ownerNo FROM propertyForRent p LEFT JOIN viewing v ON p.propertyNo = v.propertyNo WHERE v.viewDate IS NULL OR v.viewDate < DATE_SUB(NOW(), INTERVAL 3 MONTH);`

	propertyNo	type	rooms	rent	ownerNo
▶	3006	Apartment	1	1200	60006
	3007	House	2	2500	60007
	3008	Apartment	3	1800	60008
	3009	Condo	1	2000	60009
	3010	House	5	4500	60010
	3011	Apartment	2	2200	60011
	3012	House	3	3500	60012
	3013	Apartment	1	1300	60013
	3014	Condo	2	2700	60014
	3015	House	4	4200	60015
	3016	Apartment	1	1000	60001

m. `SELECT * FROM client c WHERE c.prefType = (SELECT type FROM propertyForRent WHERE propertyNo = 3001);`

	clientNo	fName	prefType	maxRent	branchNo	staffNo	regDate
▶	40002	Sarah Johnson	Apartment	1500	1002	50002	2022-01-02
	40007	James Wilson	Apartment	1300	1001	50001	2022-01-07
	40012	Emma Rodriguez	Apartment	1400	1003	50003	2022-01-12