UtahRealEstate.com Project Summary Report

Group 5

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Executive Summary

In recent years, online real estate companies have transformed the way people buy, sell, and rent properties. These platforms, including Utah Real Estate, have become necessary tools for both buyers and sellers. These tools provide a wide array of services, from property listings and virtual tours to mortgage calculators and neighborhood insights, empowering users with comprehensive information to make informed decisions. These platforms facilitate seamless communication between buyers, sellers, and agents, fostering a transparent and streamlined transaction process.

In addition to its user-focused approach, Utah Real Estate leverages advanced technologies to ensure a seamless and secure experience. Robust search algorithms and filters enable users to narrow down their options efficiently, saving time and effort. The platform offers valuable resources and information to empower both buyers and sellers. Detailed guides, market insights, and expert advice are readily available, equipping users with the knowledge they need to make informed decisions in the ever-changing real estate market. Whether someone is a first-time homebuyer or an experienced investor, Utah Real Estate provides the necessary tools to navigate the complexities of real estate transactions successfully.

Our team aimed to explore the capabilities of Utahrealestate.com in linking prospective homeowners with reliable realtors, precise information, and suitable properties.

In this report, we provided data generated by Mockaroo - Random Data Generator and API Mocking Tool | JSON / CSV / SQL / Excel. In doing so, we could simulate what it would be like if we were actual database engineers for Utah Real Estate.

General Description

History

Utah Real Estate has been helping customers and sellers alike since 1994. URE enables the distribution of real estate listings to more than 18,500 real estate experts through their multiple listing services. Each year, it is estimated that they facilitate information for over 50,000 real estate transactions.

Vision & Objectives

Utah Real Estate is dedicated to assisting buyers and renters by offering precise and reliable information about properties in their areas of interest. For sellers and landlords, the platform provides an opportunity to showcase their homes to potentially interested parties by reaching a wide audience of millions of viewers.

Products and Services

Utah Real Estate provides its website to anyone who is curious about the housing market in Utah, as well as buyers and sellers. URE also provides RapidStats to its members. Rapid Stats is a user-friendly platform that helps real estate professionals analyze market data easily and communicate insights effectively to their clients.

Transactional Databases

Utah Real Estate uses transactional databases to create users for both buyers and sellers, store key details about houses, manage communication between buyers and sellers, and keep track of transaction history.

In creating our database, we focused on the customer, the realtor, the property, and everything in between.

Prioritized Requirements Summary

Given the company's primary objective and its business model, the company aims to provide users with fast, clear, and up-to-date information about real estate properties while facilitating an affordable and reliable connection with real estate agents. To achieve this, its platform offers various features, with the key ones being:

- The Advanced Search Tool simplifies the process of finding properties of interest.
- Find a REALTOR® offers a sense of security for interested parties, bringing reliable information about the realtors and their skills.
- Mortgage Calculator assists buyers in estimating their payments for the property they're interested in.

Based on these tools, we have decided to create the following tables:

- Brokerage
- Realtor
- Realtor contact details
- Customer
- Customer contact details
- Customer term agreement
- Customer terms of use
- Scheduler

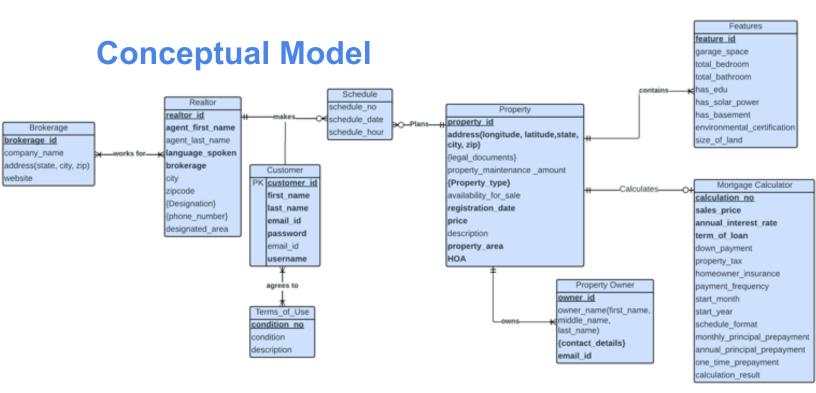
- Property
- Property owner
- Property owner details
- Property class
- Property type
- Property features
- Mortgage calculator

These tables enable us to establish the fundamental structure for the process operation among the parties involved, allowing for the insertion, storage, and maintenance of the necessary information. Using SQL, we have successfully developed this structure and inserted simulated data for 20 properties, clients, and brokers.

New Venture

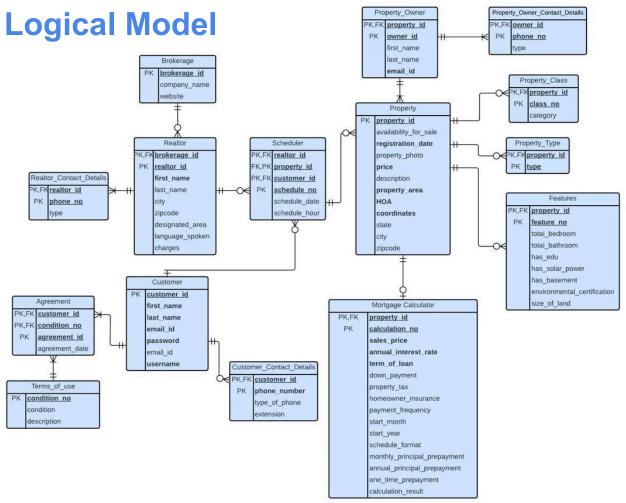
Following conversations with realtors using Utahrealestate.com, it became apparent that their revenue is solely derived from charging realtors a modest annual fee for site usage. While this approach is acceptable, we propose a strategy to enhance revenue. Utahrealestate.com could introduce a premium package offering limited features. The free version would include basic features such as the search tool that they offer but exclude crucial tools like the mortgage calculator and the Find a Realtor® tool, enticing users to opt into the premium version for access to the complete set of tools and features. We propose that Utahrealestate.com charges a modest monthly fee of approximately \$5, ensuring affordability for users while generating additional revenue for URE.

An additional idea to enhance the URE business involves partnering with a bank and assigning a loan officer from the bank to manage a live chat service accessible to clients. Implementing this service would provide instant value to UtahRealEstate.com users. The loan officer could promptly offer clients a preliminary estimate of their monthly payments by evaluating a few essential credentials. Furthermore, having a dedicated loan officer available through live chat not only simplifies the mortgage estimation process but also fosters trust and confidence among clients. This personalized assistance can significantly enhance the overall user experience, making UtahRealEstate.com a go-to platform for potential homebuyers.



A realtor works for the brokerage. Every brokerage will have multiple realtors working for it. A realtor is a primary source of contact for the customer. A customer can schedule an appointment with the realtor to visit the property. We have showcased a ternary relationship between the entity's realtor, customer, and schedule. A customer may or may not schedule an appointment with the realtor to plan the property visit. Therefore, there is a one-to-one to optional many relationship between the realtor, the customer, and the schedule. A user can create an account on UtahRealEstate.com with a username, email, and password. Those fields will be unique to that particular user.

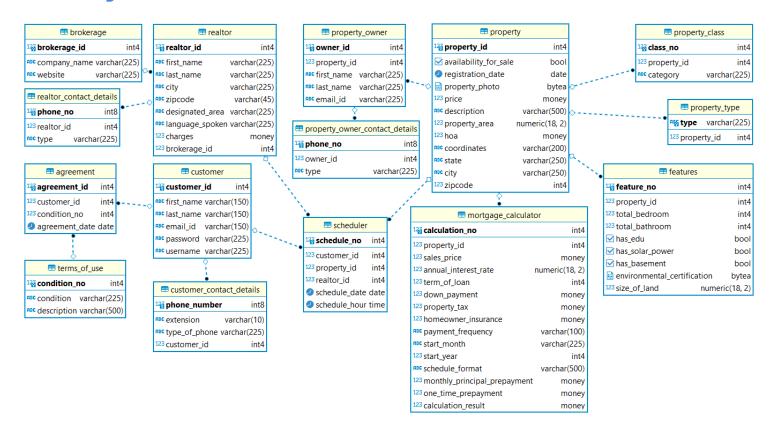
A property can get multiple visits from customers. If a property is new in the market, it may or may not have received any visits from the customers, Therefore, the type of relationship between the property and the schedule is 'one to optional many'. A customer can calculate the Mortgage using a Mortgage Calculator. The annual interest rate, sales price, and term of the loan are some of the mandatory inputs that the system takes to calculate the possible mortgage on the property. You can view the calculated mortgage on the description page of each property for the logged-in customer.



In the conceptual model, we have modeled the multi-valued attributes. The contact details of the realtor are modeled as a separate entity. Every realtor will have a phone number and the type of phone number — for example, a fax number, personal mobile number, etc. As every realtor must have a phone number to contact, the type of relationship between the realtor and the contact details is a 'mandatory one to mandatory many' kind of relationship. A customer agrees to the Terms of Use. Therefore, we have modeled the agreement entity as a bridge between the customer and the Terms of Use. Again, the multi-valued attribute, contact details, is modeled as a separate entity. Similarly, for the other entities such as property owner and property, we modeled the multi-valued attributes into separate individual entities for each. For example, for the property entity, we have modeled property type and property class as separate individual attributes, and for the property owner, contact details is modeled as separate entities. The relationship between the property owner and contact details is of

the 'Mandatory One to Mandatory Many' type of relationship. The relationship between property and property class is a mandatory one to optional many relationship. A property can have multiple classes such as 1 bedroom & 1 bathroom, 2 bedrooms & 1 bathroom with a guest house, etc. A property can be of multiple types such as commercial, residential, land, etc. Also, a property may optionally have one mortgage calculator, to help calculate the mortgage on that particular property. A property has mandatory attributes such as coordinates, registration date, the area of the given property, and the HOA.

Physical Model



Our Approach

When we initially selected UtahRealEstate.com for our research, most of our group members lacked a profound understanding of the online real estate market. However, through extensive research and dedicated efforts, we not only grasped the intricacies of UtahRealEstate.com but also developed a database that correctly mirrors the platform's offerings. Our journey involved a steep learning curve, but with time and persistence, we transformed our initial uncertainties into a deep understanding of URE, resulting in the creation of an accurate and comprehensive database.

"As a collaborative team, we engaged in extensive discussions concerning the incorporation and exclusion of different entities within both the logical and relational databases. There were numerous rounds of discussions and considerations. Ultimately, after a thorough analysis, we are convinced that our final physical model effectively encapsulates the essence of UtahRealEstate.com as a company.

Sample Data

As mentioned above, in this report, we provided data generated by Mockaroo - Random Data Generator and API Mocking Tool | JSON / CSV / SQL / Excel. In doing so, we could simulate what it would be like if we were actual database engineers for Utah Real Estate.

Our data was broken into the following:

- 20 Properties
- 20 Realtors
- 20 Terms of use
- 20 Brokerages
- 20 Property Owners
- 20 Customers

Keeping the data set small, and all the same number helped us gain a better understanding of the physical model.

Requirements Review

We successfully executed and integrated the prioritized features, rendering them fully functional within our database system. Below is an elaborate breakdown of the specific features that were created:

- Customers and realtors can complete their profiles.
- Properties and their features can be stored and accessed effectively.
- Customers can arrange property visits with realtors.
- The mortgage calculator provides property information for calculations

To implement these features, we've identified the following specific tables to be established:

- Brokerage
- Realtor
- Realtor contact details
- Customer
- Customer contact details
- Customer term agreement
- Customer terms of use
- Scheduler
- Property
- Property owner
- Property owner details
- Property class
- Property type
- Property Features
- Mortgage calculator

At the end of the process, we filled those tables. With the data mentioned above.

Ethical Considerations

Even when using randomly generated data, ethical considerations and security measures are still essential. While the data might not be directly tied to real individuals, it's crucial to maintain ethical standards to ensure the integrity of the research process. To be completely transparent about the data we have used, we mentioned the following in the general description, on page 3 of this report. "In this report, we provided data generated by Mockaroo - Random Data Generator and API Mocking Tool | JSON / CSV / SQL / Excel."

It is also crucial to prioritize security measures when dealing with generated data. While our project didn't have a formal security system, our team actively ensured that the generated data was limited to those directly involved. Preventing unauthorized access was a collective effort, acknowledging the potential fallout if a breach were to occur. Maintaining the confidentiality of even synthetic data was paramount, as any compromise could lead to significant trust issues within our organization.

Conclusion and Next Steps

In conclusion, it has been a rewarding and educational experience for us to investigate UtahRealEstate.com and then create the database structure through in-depth study and teamwork. We effectively analyzed the platform's offerings by diving into the nuances of the online real estate market and pinpointing important features and functionalities that are essential to the platform's operation.

We created an effective database system by carefully designing and considering the key details, which reflect the core values of UtahRealEstate.com. The foundation of a smooth and effective real estate platform is made up of the tables we created, which include everything from realtor and consumer profiles to property information and mortgage calculators. Our strategy included extensive talks, continuous improvement, and a strong emphasis on user experience to make sure the system meets the various needs of real estate agents, buyers, and sellers.

The effective integration of prioritized features, which allowed users and realtors to fill out profiles, save and retrieve property information, schedule property visits, and use the mortgage calculator to make well-informed decisions, was one of our project's major accomplishments.

All things considered, our path from designing the database architecture to actually putting it into practice has been characterized by commitment, teamwork, and ongoing education. We are certain that the thorough and well-considered database we have created would work in perfect harmony with UtahRealEstate.com's mission to link buyers, sellers, and real estate brokers with dependable information quickly, clearly, and up-to-date.

We are proud of our collective achievements as a team and think that UtahRealEstate.com would be happy and impressed with the solid foundation our effort has laid. With a thorough grasp of the platform and an efficient database system in place, UtahRealEstate.com would be well-positioned to carry on changing the real estate market in Utah, for years to come, empowering consumers and enabling easy and transparent transactions.

References

https://www.utahrealestate.com/index/public.index?gclid=CjwKCAjws9ipBhB1EiwAccEi1

IBtIleIGwECpunHYBMhpoDtEw0-dfMLfCrqiqKOS5UVmpa0EOvs9hoCAfUQAvD_BwE

https://why.utahrealestate.com/

https://www.mockaroo.com/

https://chat.openai.com/

https://growjo.com/company/UtahRealEstate.com

https://play.google.com/store/apps/details?id=com.eur android&hl=en_US&gl=US

Appendix

Team member	Hours Spent	Description of Work
Kleyton Polzonoff	25	Company understanding: 2 hours Group meetings: 10 hours Conceptual & Logical Models: 4 Hours Database and SQL: 3 Hour Written report: 2 hours Presentation preparation: 3 hours
Apoorva Dharadhar	27	Group Meetings:10 Hours Company Research: 4 Hours Conceptual & Logical Modeling: 8 Hours SQL Coding: 3 Hours Written Report: 2 hours
Faraaz Mohammed	25	Group Meetings:10 hours Conceptual & Logical Modeling: 3 Hours SQL Coding: 10 Hours Written Report: 2
Joshua Dunn	26	Group Meetings:10 Company Research: 2 Slide Deck: 4 Written Report: 10

Create table statements

```
condition no int primary key,
            condition varchar (225),
            description varchar (500)
);
--Agreement Table
drop table if exists Agreement;
create table Agreement(
            customer id int,
            condition no int ,
            agreement id int primary key,
            agreement date date,
            constraint fk customer agreement foreign key (customer id)
            references Customer(customer id),
            constraint fk termsofuse agreement foreign key (condition no)
            references Terms of Use (condition no)
);
--Table Customer Contact Details
drop table if exists Customer Contact Details;
create table Customer Contact Details(
            phone number bigint primary key,
            extension varchar(10),
            type of phone varchar(225),
            customer id int,
            constraint fk customer customercontactdetails
            foreign key(customer id) references Customer(customer id)
);
--Table Brokerage
drop table if exists Brokerage;
create table Brokerage(
            brokerage id int primary key,
            company name varchar (225),
            website varchar (225)
);
--Table Realtor
```

```
drop table if exists Realtor;
create table Realtor(
            realtor id int primary key,
            first name varchar(225) not null,
            last name varchar(225), city varchar(225),
            zip code varchar(45), designated area varchar(225),
            language spoken varchar(225), charges money,
            brokerage id int,
            constraint fk brokerage realtor realtorid
            foreign key(brokerage id) references Brokerage(brokerage id)
);
--Table Realtor Contact Details
drop table if exists Realtor Contact Details;
create table Realtor Contact Details(
            phone no bigint primary key,
            realtor id int,
            type varchar (225),
            constraint fk realtor contactdetails brokerageid
            foreign key(realtor id) references Realtor(realtor id)
);
--Table Property
drop table if exists Property;
create table Property(
            property id int primary key,
            availability for sale boolean,
            registration date date not null,
            property photo bytea,
            price money not null,
            description varchar (500),
            property area decimal(18,2) not null,
            HOA money not null,
            coordinates varchar(200) not null,
            state varchar(250),
            city varchar (250),
            zip code int
```

```
);
--Table Property Owner
drop table if exists Property Owner;
create table Property Owner(
            property id int,
            owner id int primary key,
            first name varchar(225),
            last name varchar(225),
            email id varchar(225) not null,
            constraint fk property owner propertyid foreign key(property id)
            references Property (property id)
);
-- Table Property Owner Contact Details
drop table if exists Property Owner Contact Details;
create table Property Owner Contact Details(
            phone no bigint primary key,
            owner id int,
            type varchar(225),
            constraint fk owner contactdetails ownerid foreign key(owner id)
            references Property Owner(owner id)
);
-- Table Property Type
drop table if exists Property Type;
create table Property Type(
            type varchar(225) primary key,
            property id int,
      constraint fk_property_type_propertyid
      foreign key(property id) references Property(property id)
);
--Table Features
drop table if exists Features;
create table Features(
```

```
feature no int primary key,
            property id int,
            total bedroom int,
            total bathroom int,
            has edu boolean,
            has solar power boolean,
            has basement boolean,
            environmental certification bytea,
            size of land decimal(18,2),
      CONSTRAINT fk features property id
      FOREIGN KEY (property id) REFERENCES Property (property id)
);
-- Table Mortgage Calculator
drop table if exists Mortgage Calculator;
create table Mortgage Calculator(
            property id int,
            calculation no int primary key,
            sales price money not null,
            annual interest rate decimal(18,2) not null,
            term of loan int not null,
            down payment money,
            property tax money,
            homeowner insurance money,
            payment frequency varchar (100),
            start month varchar (225),
            start year int,
            schedule format varchar(500),
            monthly principal prepayment money,
            one time prepayment money,
            calculation result money,
      CONSTRAINT fk_mortgage_calculator_property_id
      FOREIGN KEY (property id) REFERENCES Property(property id)
);
```

```
--Table Scheduler
drop table if exists Scheduler;
create table Scheduler(
            schedule_no int primary key,
            customer id int,
            property_id int,
            realtor_id int,
            schedule date date,
            schedule hour time,
constraint fk realtor scheduler realtorid
      foreign key(realtor id)references Realtor(realtor id),
constraint fk customer scheduler customerid
      foreign key(customer id)references Customer(customer id),
constraint fk property scheduler schedulerid
      foreign key(property id) references Property(property id)
);
--Table Property Class
drop table if exists Property Class;
create table Property Class(
            class no int primary key,
            property id int,
            category varchar (225),
            constraint fk propertyclass property id foreign key(property id)
            references Property (property id)
);
```

Data:

Table 1: Customer

[™] select * from customer c [™] Enter a SQL expression to filter results (use Ctrl+Space)

rid		¹²₫ customer_id ▼	ABC first_name	ast_name	^{ABC} email_id ▼	password •	asc username 🔻
III	1	111	John	Doe	johndoe@email.com	password123	johnDoe123
	2	112	Jane	Smith	janesmith@email.com	password456	janeSmith456
ext	3	113	Robert	Johnson	robertjohnson@email.com	robertpass789	robertJohnson789
\$	4	114	Michael	Brown	michaelbrown@email.com	michaelPass101	michaelBrown101
	5	115	Emily	Davis	emilydavis@email.com	emilyPass202	emilyDavis202

Table 2: Realtor

oT select * from Realtor; -- | 50 Enter a SQL expression to filter results (use Ctrl+Space)

Grid		¹2₫ realtor_id ▼	ABC first_name	^{ABC} last_name ▼	^{ABC} city ▼	^{ABC} zipcode ▼	^{ABC} designated_area ▼	ABC language_spoken	123 charges 🔻	123 brokerage_id The state of
=	1	211	John	Doe	Los Angeles	90001	Downtown LA	English	500.00	10,111 🗹
	2	212	Jane	Smith	San Francisco	94105	SoMa	English, Mandarin	600.00	10,112 🗹
Fext	3	213	Robert	Johnson	New York	10001	Manhattan	English, Spanish	700.00	10,113 🗹
Ė	4	214	Lucia	Martinez	Houston	77002	Downtown	Spanish	450.00	10,114 🗹
	5	215	Elena	Kuznetsov	Seattle	98101	Belltown	English, Russian	550.00	10,115 🗹

Table 3: Property

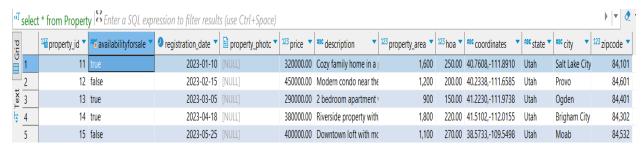


Table 4: Scheduler

o[™] select * from Scheduler;-- Enter a SQL expression to filter results (use Ctrl+Space)

Grid		¹⅔ schedule_no ▼	123 customer_id	123 property_id	123 realtor_id	② schedule_date ▼	schedule_hour
<u> </u>	1	151	111 ☑	11 ♂	211 🗹	2023-11-05	09:00:00
	2	152	112 🗹	11 ♂	211 🗹	2023-11-05	11:00:00
ext	3	153	113 🗹	12 ☑	212 🗹	2023-11-06	14:00:00
Ė	4	154	114 🗹	13 ☑	213 🗹	2023-11-06	16:00:00
	5	155	115 🗹	14 ♂	214 🗹	2023-11-07	10:00:00

Table 5: Features

oT S	o [™] select * from Features r [™] Enter a SQL expression to filter results (use Ctrl+Space)										
<u>5</u>		¹ã feature_no ▼	123 property_id	▼ 123 total_bedroom	▼ 123 total_bathro	oom 🔻	** hasedu	hassolar_power	* hasbasement	environmental_certification	▼ 123 size_of_land ▼
<u>.</u>	1	501		11	2	2	true	false	true	[NULL]	0.05
	2	502		12	3	2	false	true	false	[NULL]	0.1
Text	3	503		13	1	1	true	false	false	[NULL]	0.03
Ė	4	504		14	4	3	true	true	true	[NULL]	0.25
	5	505		15	2	2	false	true	false	[NULL]	0.08

Table: Terms of Use

oT select * from Terms_of_Use;-- | K → Enter a SQL expression to filter results (use Ctrl+Space)

rid		128 condition_no	•	^{ABC} condition ▼	ABC description	•
#	1		1	Account Responsibility	Users are responsible for all activity that occurs under their account.	
	2		2	Prohibited Uses	Users may not engage in any activity that violates local, state, national, or international law.	
Text	3		3	Content Ownership	All content posted by users belongs to the respective user.	
Ė	4		4	Platform Changes	We reserve the right to modify, suspend or terminate any service without prior notice.	
	5		5	Data Privacy	User data will be collected, processed, and stored in accordance with our privacy policy.	

Table: Property owner contact details

oT select * from Property_Owner | Enter a SQL expression to filter results (use Ctrl+Space)

Grid		¹²³ property_id	¹²₫ owner_id ▼	^{ABC} first_name ▼	ABC last_name	^{ABC} email_id ▼
=	1	11 ♂	10,011	John	Doe	johndoe@example.com
	2	12 ♂	10,012	Jane	Smith	janesmith@example.com
lext	3	13 ♂	10,013	Michael	Johnson	michaelj@example.com
Ė	4	14 ♂	10,014	Emily	Davis	emilydavis@example.com
	5	15 ♂	10,015	Robert	Brown	robertbrown@example.com

Table: Agreement

*T select * from Agreement;-- | Enter a SQL expression to filter results (use Ctrl+Space

Grid		¹²³ customer_id	123 condition_no	¹⁴₫ agreement_id ▼	agreement_date
<u></u>	1	111 ♂	1 ♂	1,001	2023-01-01
	2	112 ☑	2 ♂	1,002	2023-01-02
Ē	3	113 ♂	3 ♂	1,003	2023-01-03
Ė	4	114 ♂	4 ♂	1,004	2023-01-04
	5	115 ♂	5 ♂	1,005	2023-01-05

Table: Customer contact details

*T select * from Customer_Contact_Details; -- | * Enter a SQL expression to filter resu

	¹⅔ phone_number ▼	extension •	type_of_phone	¹²³ customer_id
1	1,234,567,890	101	Mobile	111 ☑
2	1,234,567,891	[NULL]	Home	112 ☑
3	1,234,567,892	102	Work	113 ☑
4	1,234,567,893	[NULL]	Mobile	114 ☑
5	1,234,567,894	103	Home	115 ♂
		1 1,234,567,890 2 1,234,567,891 3 1,234,567,892 4 1,234,567,893	1 1,234,567,890 101 2 1,234,567,891 [NULL] 3 1,234,567,892 102	1 1,234,567,890 101 Mobile 2 1,234,567,891 [NULL] Home 3 1,234,567,892 102 Work 4 1,234,567,893 [NULL] Mobile

Table: Brokerage

oT select * from Brokerage;-- | Enter a SQL expression to filter results (us

Grid		¹²₫ brokerage_id ▼	ABC company_name	^{ABC} website ▼
=	1	10,111	AlphaTrades	www.alphatrades.com
	2	10,112	BetaInvestments	www.betainvestments.com
Text	3	10,113	GammaCapital	www.gammacapital.com
Ė	4	10,114	DeltaSecurities	www.deltasecurities.com
	5	10,115	EpsilonFunds	www.epsilonfunds.com

Table: Realtor contact details

ூr select * from Realtor_Contact_Details;-- । Enter ப

P.		¹⅔ phone_no ▼	¹²³ realtor_id ▼	^{ABC} type ▼
⊞ Grid	1	3,014,567,890	211 🗹	Mobile
	2	3,014,567,891	212 🗹	Home
ĕ	3	3,014,567,892	213 🗹	Work
Ė	4	3,014,567,893	214 🗹	Mobile
	5	3,014,567,894	215 ☑	Home

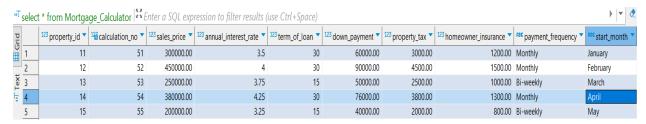
Table: Property Type

select * from Property_Type | 25 Enter a SQL ex

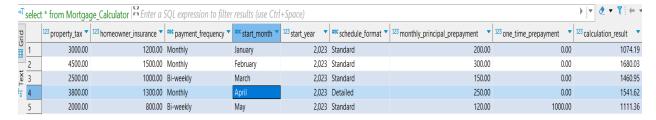
1 7-71						
	^{AN} type ▼	123 property_id				
1	Condo	11 ☑				
2	Family Home	12 ☑				
3	Apartment	13 ☑				
4	Riverside Property	14 ☑				
5	Downtown Loft	15 ☑				

Table: Mortgage calculator

Part_1:



Part 2:



We have split the diagram into two screenshots as all the columns could not be captured in one screenshot.

Table: Property owner

oT select * from Property Owner | Enter a SQL expression to filter results (use Ctrl+Space)

↔! Text		¹²³ property_id	¹⅔ owner_id ▼	ABC first_name	ABC last_name	^{ABC} email_id ▼
	1	11 ♂	10,011	John	Doe	johndoe@example.com
	2	12 ♂	10,012	Jane	Smith	janesmith@example.com
	3	13 ♂	10,013	Michael	Johnson	michaelj@example.com
	4	14 ♂	10,014	Emily	Davis	emilydavis@example.com
	5	15 ♂	10,015	Robert	Brown	robertbrown@example.com

Table: Property class

