



# Real Estate Project

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## Executive Summary

A system (SaaS) to predict fair prices for real estate, primarily homes in the Dallas area to provide fair market value for buyers and sellers. Can also assist buyers in finding the perfect home for their needs. The Dallas market and other real estate markets have homes that are very overpriced so our goal is to help buyers get a fair price, as well as to assist sellers to price their homes more competitively.

## Functional Requirements

1. Provide fair market value of real estate for buyers and sellers
2. Help buyers find the perfect home for their needs, as well as to assist in coordinating the selling of their current home to get their dream home
3. Connect with realtors to use our service to provide quotes to their clients
4. Provide perks for using our service such as discounts for moving, etc.

## Business Processes

### **Requirement 1: Providing fair market value**

1. Gathering sales data from public records
2. Data is stored into database
3. User enters their specifications (the property information that they are looking for)
4. The data compares their information with data stored
5. Averages are computed and returned to the user in the form of a report
6. Then if user is looking to sell house, they will be redirected to the business process of finding the perfect home for their needs

#### *Data Requirements*

- User First and Last Name
- Listing Address
- Listing Price
- Listing Details
- Seller Name

### **Requirement 2: Help buyers find the perfect home for their needs**

1. Users enter needs
2. Listings will be filtered and displayed by adherence to user's parameters
3. User finds the perfect listing
4. User makes an account
5. User has the ability to reach out to realtor for follow up meetings or walk throughs

#### *Data Requirements*

- User email
- User Password
- Listing details
- Seller Information

### **Requirement 3: Connecting with realtors**

1. Realtor signs up for service
2. They enter multiple homes of all of their clients

3. The system does the same steps as the first business process, and provides fair market value for all of the homes and gives it in the format of a report
4. Realtors are provided additional tools to help with marketing, as well as to connect with our users who have signed up with the service

*Data Requirements*

- User email
- User Password
- Listing details

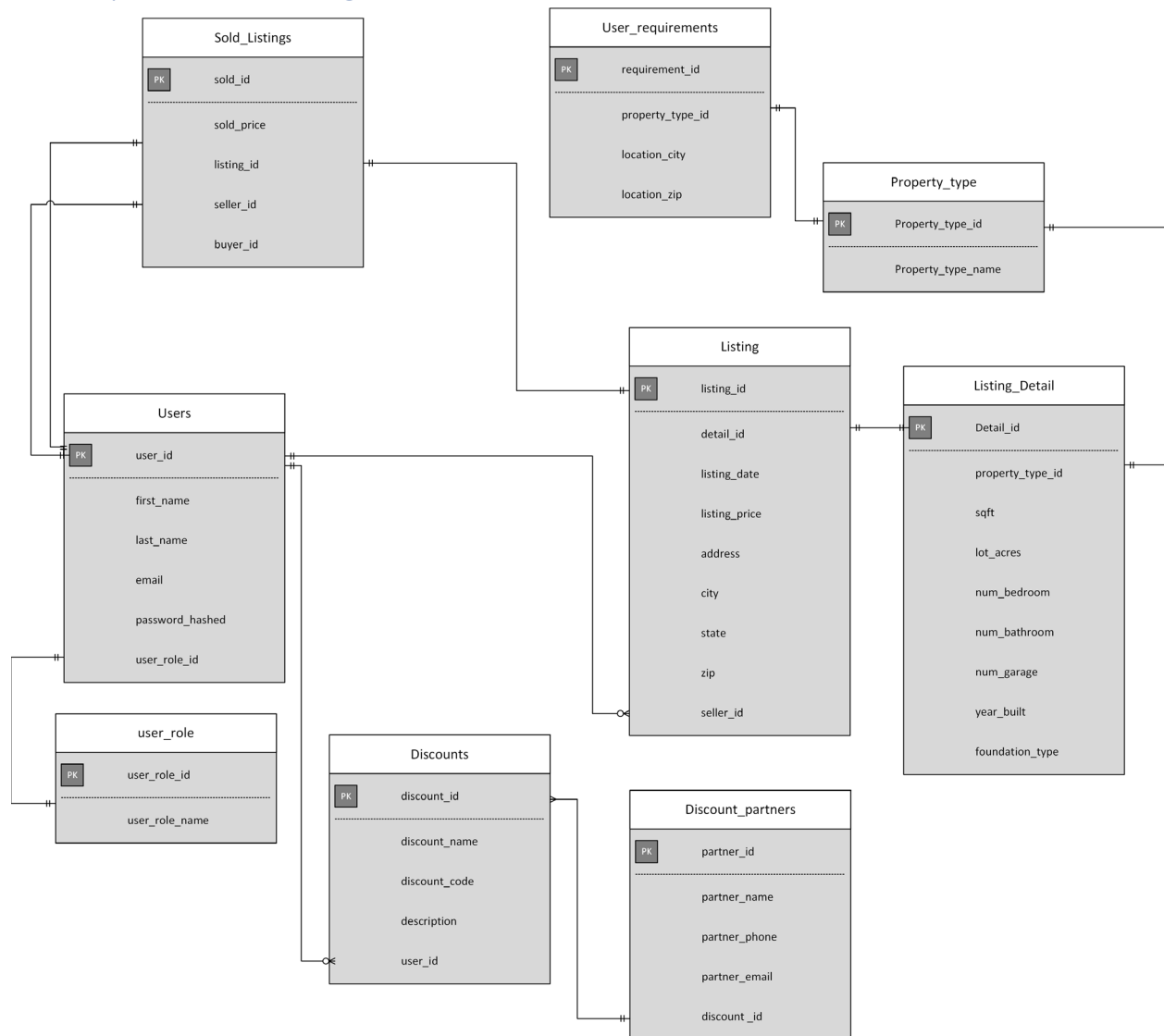
**Requirement 4: Providing Perks for using our Service**

1. Contact third party moving, storage, renovation, or landscaping services and make agreements to provide discounts for our customers. An example is 10% off your first landscaping job, storage fees waived, etc.
2. When our clients use our service, they will come across these benefits and will give them more of an incentive to use both our service and the others
3. Initially, we will not be charging third parties to advertise services.
4. Once customer base grows, charge third parties to advertise services.

*Data Requirements*

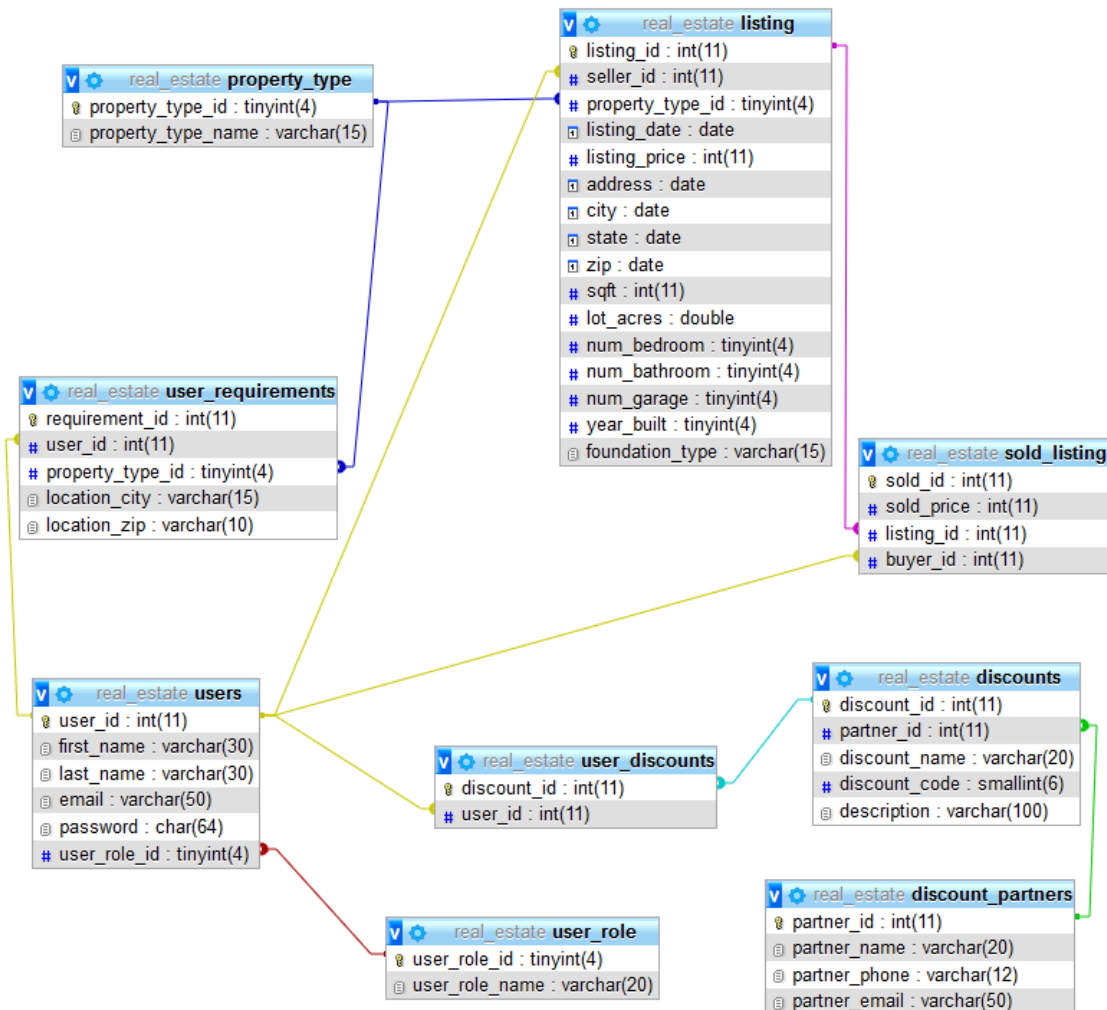
- Discount Code
- Discount Partners

## Conceptual Modelling – ERD



## Logical Database Design

### Auto generated table



### SQL Script to Create Database

```
CREATE DATABASE `real_estate`;  
USE DATABASE `real_estate`;  
  
CREATE TABLE `user_role` (  
  `user_role_id` tinyint NOT NULL,  
  `user_role_name` varchar(20) NOT NULL,
```

```
PRIMARY KEY(`user_role_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
CREATE TABLE `users` (  
  `user_id` int NOT NULL AUTO_INCREMENT,  
  `first_name` varchar(30) NOT NULL,  
  `last_name` varchar(30) NOT NULL,  
  `email` varchar(50) NOT NULL,  
  `password` char(64) NOT NULL,  
  `user_role_id` tinyint NOT NULL,  
  PRIMARY KEY(`user_id`),  
  CONSTRAINT `user_role_id_ibfk_1` FOREIGN KEY (`user_role_id`)  
REFERENCES `user_role` (`user_role_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
CREATE TABLE `property_type` (  
  `property_type_id` tinyint NOT NULL,  
  `property_type_name` varchar(15) NOT NULL,  
  PRIMARY KEY(`property_type_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
CREATE TABLE `listing` (  
  `listing_id` int NOT NULL AUTO_INCREMENT,  
  `property_type_id` tinyint NOT NULL,  
  `seller_id` int NOT NULL,  
  `listing_date` date NOT NULL,  
  `listing_price` int NOT NULL,  
  `address` varchar(100) NOT NULL,  
  `city` varchar(20) NOT NULL,  
  `state` varchar(2) NOT NULL,  
  `zip` varchar(10) NOT NULL,  
  `sqft` varchar(10) NOT NULL,
```

```

`lot_acres` double DEFAULT NULL,
`num_bedroom` tinyint DEFAULT NULL,
`num_bathroom` tinyint DEFAULT NULL,
`num_garage` tinyint DEFAULT NULL,
`year_built` smallint DEFAULT NULL,
`foundation_type` varchar(15) DEFAULT NULL,
PRIMARY KEY(`listing_id`),
CONSTRAINT `seller_id_ibfk_1` FOREIGN KEY (`seller_id`) REFERENCES
`users` (`user_id`),
CONSTRAINT `property_type_id_ibfk_1` FOREIGN KEY (`property_type_id`)
REFERENCES `property_type` (`property_type_id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

```

```

CREATE TABLE `sold_listing` (
`sold_id` int NOT NULL AUTO_INCREMENT,
`sold_price` int NOT NULL,
`listing_id` int NOT NULL,
`buyer_id` int NOT NULL,
PRIMARY KEY(`sold_id`),
CONSTRAINT `listing_id_ibfk_1` FOREIGN KEY (`listing_id`) REFERENCES
`listing` (`listing_id`),
CONSTRAINT `buyer_id_ibfk_1` FOREIGN KEY (`buyer_id`) REFERENCES
`users` (`user_id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

```

```

CREATE TABLE `discount_partners` (
`partner_id` int NOT NULL AUTO_INCREMENT,
`partner_name` varchar(20) NOT NULL,
`partner_phone` varchar(12) NOT NULL,
`partner_email` varchar(50) NOT NULL,
PRIMARY KEY(`partner_id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

```



```
CREATE TABLE `discounts` (
  `discount_id` int NOT NULL AUTO_INCREMENT,
  `partner_id` int NOT NULL,
  `discount_name` varchar(20) NOT NULL,
  `discount_code` smallint NOT NULL,
  `description` varchar(100) NOT NULL,
  CONSTRAINT `discount_id_ibfk_1` FOREIGN KEY (`discount_id`) REFERENCES `discount_partners` (`discount_id`),
  CONSTRAINT `partner_id_ibfk_1` FOREIGN KEY (`partner_id`) REFERENCES `discount_partners` (`partner_id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
CREATE TABLE `user_discounts` (
  `discount_id` int NOT NULL,
  `user_id` int NOT NULL,
  PRIMARY KEY(`discount_id`),
  CONSTRAINT `user_id_ibfk_1` FOREIGN KEY (`user_id`) REFERENCES `users` (`user_id`),
  CONSTRAINT `discount_id_ibfk_1` FOREIGN KEY (`discount_id`) REFERENCES `discounts` (`discount_id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
CREATE TABLE `user_requirements` (
  `requirement_id` int NOT NULL AUTO_INCREMENT,
  `user_id` int NOT NULL,
  `property_type_id` tinyint NOT NULL,
  `location_city` varchar(15) NOT NULL,
  `location_zip` varchar(10) NOT NULL,
  PRIMARY KEY(`requirement_id`),
  CONSTRAINT `user_id_ibfk_2` FOREIGN KEY (`user_id`) REFERENCES `users` (`user_id`),
  CONSTRAINT `property_type_id_ibfk_2` FOREIGN KEY (`property_type_id`) REFERENCES `property_type` (`property_type_id`)
)
```

```
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

## Database Tables

### User\_role

user_role_id	user_role_name
0	buyer/seller
1	realtor/broker

### Users

user_id	first_name	last_name	email	password	user_role_id
1	Henry	Hager	HenryMHager@gmail.com	ECEF231965F517E2FBE53CBB29186E3D95AACFC311E241AF51...	0
2	Zora	Linton	ZoraGLinton@mail.com	201EF08B4C84E8FCCDED254599BE0A38BEDC1292599EBA8FD7...	0
3	David	Schoenberger	DavidRSchoenberger@realmail.com	4C2581D2A4889B650820325ED0BCEB2B1C87F3CDE689F96CC9...	0
4	Kathryn	Guzman	KathrynLGuzman@gmail.com	3C4AFE2FCAF18B1E5AD235512A3FEE561019C64FF3CB51B47C...	0
5	Mabel	Espinosa	MabelOEspinosa@outlook.com	18EC6067CEF9D0A243C4CF75F877166E80F46B933A967E5327...	0
6	Kimberly	Cantu	KimberlyJCantu@yahoo.com	193000A29C7FA44E6BD5FCEF39D04D435117F36CD2795C53AF...	0
7	Sandra	Coffee	SandraDCoffee@yahoo.com	9C487277E80199E8BA6FB0A7AB3B04DD848065DB623AE2D52A...	0
8	Jacqueline	Wingate	JacquelineMWingate@gmail.com	6C3AD57322189D899868E391CAE8BCEBF4C8C951300B8644FC...	0
9	Wallace	Grabill	WallaceRGrabill@gmail.com	5F689B49B1B042563A96B672042C728C2E6543883020050206...	0
10	Michael	Johnson	MichaelKJohnson@protonmail.com	3D2AF75A79FCBCBA135D1200AFA6D5F56B98203A6CDD40E148...	0
11	David	Fortes	DavidDFortes@realtor.com	981D8841FC56B020558A8F8644656D18A5B1F79C71812E6BE5...	1

### Property\_type

property_type_id	property_type_name
0	single-family
1	duplex
2	multi-family
3	condominium
4	townhome

## Listings

listing_id	property_type_id	seller_id	listing_date	listing_price	address	city	state	zip	sqft	lot_acres	num_bec	num_bathr	num_gz	year_built	foundation_type
1	0	2	2018-10-16	499000	13514 Peyton Dr	Dallas	TX	75240	3141	0.24104683	4	3	2	122	slab
2	0	2	2018-10-16	277842	11232 Peyton Dr	Dallas	TX	75240	2222	0.24104683	4	3	2	122	slab
105	0	1	2018-12-13	1675	Magnolia Dne	Richardson	TX	75080	1268	0	3	2	2	1950	NULL
106	0	3	2018-11-29	225000	1207 Wisteria Way	Richardson	TX	75080	1354	0.25	3	2	2	1961	Pier
107	0	4	2018-11-29	250000	1805 Nantucket Dr	Richardson	TX	75080	1379	0.2	3	2	2	1961	NULL
108	0	5	2018-12-07	434500	425 Valley Cove Dr	Richardson	TX	75080	2229	0.25	4	3	2	1970	Slab
109	3	6	2018-10-03	141900	919 Weathered Dne Apt. 203	Richardson	TX	75080	1303	0	3	2	1	1976	Slab
110	0	7	2018-12-05	375000	100 N Gentle Dr	Richardson	TX	75080	3148	0.58	3	4	0	1960	Pier
111	0	8	2018-11-23	369800	807 James Dr	Richardson	TX	75080	1737	0.35	3	2	1	1956	Pier
112	0	9	2018-12-05	293500	1224 Cypress Dr	Richardson	TX	75080	1368	0.2	3	2	1	1962	Slab
113	0	10	2018-11-26	579000	15 Vista Cliff Pl	Richardson	TX	75080	2626	0.28	4	3	4	1972	Slab
114	0	1	2018-11-27	218115	814 Wisteria Way	Richardson	TX	75080	1147	0.18	3	2	2	1960	Slab
115	0	3	2018-08-08	215000	1245 Donna Dr	Richardson	TX	75080	1700	0.17	3	2	2	1959	Pier
116	0	4	2018-11-02	399000	421 Ridgewood Dr	Richardson	TX	75080	2240	0.22	4	3	2	1968	NULL
117	3	5	2018-08-27	185000	821 Dublin Dr	Richardson	TX	75080	1365	0	3	2	2	1981	NULL
118	0	6	2018-06-02	345000	325 Canyon Valley Dr	Richardson	TX	75080	2631	0	4	3	2	1971	Slab
119	3	7	2018-10-19	127000	336 Melrose Dr Apt 8A	Richardson	TX	75080	860	5.42	1	2	1	1983	Slab
120	0	8	2018-06-21	259000	1231 Ridgeway Dr	Richardson	TX	75080	1734	0.2	5	2	2	1959	Slab
121	0	9	2018-07-19	319900	800 Greenhaven Dr	Richardson	TX	75080	2325	0.21	4	2	2	1962	Slab
122	0	10	2018-09-27	399000	510 Waterview Dr	Richardson	TX	75080	2511	0.21	4	3	0	1963	NULL
123	0	1	2018-11-16	210000	429 Vernet St	Richardson	TX	75080	985	0.21	3	1	1	1955	NULL
124	0	3	2018-10-27	598500	1131 Bull Run	Richardson	TX	75080	2831	0.21	5	3	2	1976	Slab
125	0	4	2018-12-09	329000	902 Dunbarton Dr	Richardson	TX	75081	2063	0.36	4	3	1	1973	Slab

## Sold\_listings

sold_id	sold_price	listing_id	buyer_id
1	399000	108	7
2	222000	120	4
3	419000	125	11
4	454555	121	5

## User\_requirements

requirement_id	user_id	property_type_id	location_city	location_zip
1	8	0	Dallas	75252
2	9	1	Dallas	75241

## Discount\_partners

partner_id	partner_name	partner_phone	partner_email
0	Bob's Moving	2145522222	contact@bobsmoving.com
1	Easy Window Cleaning	2140004412	contact@windowcleaningdallas.com
2	InteriorDesignDallas	9721212223	design@interiordesigndallas.com

## Discounts

discount_id	partner_id	discount_name	discount_code	description
0	0	10% off first move	12213	10% off first move with Bob's moving
1	1	20% off	4421	20% off window cleaning
2	2	FreeConsulation	7342	Free consultation for interior design
3	0	BobsFreeStorage	2214	Free 1 month storage with purchase of move

## User\_discounts

discount_id	user_id
1	1
3	4
1	3
3	4
2	5

## SQL Queries

### Requirement 1: Providing fair market value

A customer is looking for a home and wants to know the average price of a 3 bedroom home. The query will average the sold listings price to give customers an average price of sold listings to help them make a decision.

```
SELECT listing.num_bedroom, AVG(sold_listing.sold_price) FROM  
sold_listing LEFT JOIN listing ON listing.listing_id =  
sold_listing.listing_id WHERE listing.num_bedroom = 4;
```

num_bedroom	AVG(sold_listing.sold_price)
4	424185.0000

Note: This is an example of how fair market value could be provided. It is not limited to the number of bedrooms, but many other factors will be used in the final product.

### Requirement 2: Help buyers find the perfect home for their needs

Search query for 3 bedroom home under \$300,000.

```
SELECT listing.listing_price, listing.address, listing.num_bedroom,  
listing.num_bathroom, users.first_name, users.last_name, users.email  
FROM listing
```

```
LEFT JOIN users ON users.user_id = listing.seller_id
WHERE listing.num_bedroom = 3 AND listing.listing_price < 300000;
```

listing_price	address	num_bedroom	num_bathroom	first_name	last_name	email
1675	Magnolia Drive	3	2	Henry	Hager	HenryMHager@gmail.com
225000	1207 Wisteria Way	3	2	David	Schoenberger	DavidRSchoenberger@realmail.com
250000	1805 Nantucket Dr	3	2	Kathryn	Guzman	KathrynLGuzman@gmail.com
141900	919 Weathered Drive Apt. 203	3	2	Kimberly	Cantu	KimberlyJCantu@yahoo.com
293500	1224 Cypress Dr	3	2	Wallace	Grabill	WallaceRGrabill@gmail.com
218115	814 Wisteria Way	3	2	Henry	Hager	HenryMHager@gmail.com
215000	1245 Donna Dr	3	2	David	Schoenberger	DavidRSchoenberger@realmail.com
185000	821 Dublin Dr	3	2	Mabel	Espinosa	MabelOEspinoza@outlook.com
210000	429 Vernet St	3	1	Henry	Hager	HenryMHager@gmail.com
225000	1207 Wisteria Way	3	2	Mabel	Espinosa	MabelOEspinoza@outlook.com
223900	1222 Briar Cove Dr	3	2	Kimberly	Cantu	KimberlyJCantu@yahoo.com
279000	112 N Spring Creek Dr	3	2	David	Schoenberger	DavidRSchoenberger@realmail.com
239900	2126 Blossom Ln	3	2	Kathryn	Guzman	KathrynLGuzman@gmail.com
218115	814 Wisteria Way	3	2	Mabel	Espinosa	MabelOEspinoza@outlook.com
234853	715 Cambridge Dr	3	2	David	Schoenberger	DavidRSchoenberger@realmail.com
272900	1713 Serenade Ln	3	2	Kathryn	Guzman	KathrynLGuzman@gmail.com
247900	777 Custer Rd APT 20-1	3	3	Sandra	Coffee	SandraDCoffee@yahoo.com
141900	919 S Weathered Dr APT 203	3	2	Michael	Johnson	MichaelKJohnson@protonmail.com
215000	1245 Donna Dr	3	2	Kimberly	Cantu	KimberlyJCantu@yahoo.com
224700	3027 Silver Springs Ln	3	2	Sandra	Coffee	SandraDCoffee@yahoo.com
299900	3001 N Spring Dr	3	3	Jacqueline	Wingate	JacquelineMVWingate@gmail.com
269000	613 Northhill Dr	3	2	Jacqueline	Wingate	JacquelineMVWingate@gmail.com
265000	435 Melrose Dr	3	2	Henry	Hager	HenryMHager@gmail.com
285000	407 Beverly Dr	3	2	Sandra	Coffee	SandraDCoffee@yahoo.com
284900	606 Northhill Dr	3	2	Jacqueline	Wingate	JacquelineMVWingate@gmail.com

### Requirement 3: Connecting with realtors

```
SELECT first_name, last_name, email FROM users WHERE user_role_id = 1;
```

first_name	last_name	email
David	Fortes	DavidDFortes@realtor.com

### Requirement 4: Providing Perks for using our Service

Users would like to search for a certain discount, for example, looking for a moving company. The query below searches for discount codes that have the word move in the description.

```
SELECT discount_name, discount_code, description
FROM discounts
WHERE description LIKE '%move%';
```

discount_name	discount_code	description
10% off first move	12213	10% off first move with Bob's moving
BobsFreeStorage	2214	Free 1 month storage with purchase of move

## SQL Database File

<https://cloud.sneerz.com/s/x4zjr4ky2aAKrLT>

Also, it is available in the zipped file that we have submitted this document in.

## Appendices

### Journal – interactions with partner user group

We worked with Group 11 during the last portion of our project to ensure the database design was good and aligned with the business requirements. Their evaluation is listed below this section with their feedback. Because the members in the review group expressed that our document was sufficient and appropriate, we kept most of our document the same.

## User Group Review and Recommendations

Parts Covered	Details of Each Part	Evaluator's Comments
Executive summary	<p>Data Description</p> <p>Steps of the project</p>	<p>- The description of the project goal is clear and in detail .</p> <p>- Breakdown of the project into various steps is appropriate</p>
Requirements	<p>Providing fair market value</p> <p>Help buyers find the perfect home for their needs</p> <p>Connecting with realtors</p> <p>Providing Perks for Using Our Service</p>	<p>- The functional requirements capture the various features of the project</p> <p>- The breakdown of the various processes details the steps involve for each process</p> <p>- The users and the flow description of the project is accurate</p>

Requirements	Logical Database Design- Normalized Tables	<ul style="list-style-type: none"> <li>- The logical database design gives an account of all the entities involved in the process</li> <li>- The tables required for the project are accurately described</li> <li>- The tables mapping is accurate and the foreign key and primary key mapping is appropriate</li> </ul>
Database security	physical and table design of the database so created	<ul style="list-style-type: none"> <li>-To ensure the integrity of the database the security is of paramount importance.</li> <li>-The project details the various imp steps taken to prevent data breach and how to guard it from future attacks</li> </ul>