

# **Group 8 :**

**agencyone**

**AgencyOne**

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## **I. Mission Statement:**

Our mission is to provide an efficient way for real estate agency Agency One to manage their existing properties and utilize their information, and eventually to enable home buyers to find the ideal house based on the property characteristics they want. Our proposal will give a quick view of the detailed information for potential clients who are searching through the website in which the companies will accurately forecast the clients' needs and make full use of information to help them find matched properties and deals, which is time-efficient and resource reasonably allocated.

## **II. Problem Statement:**

With the continuous development of network technology, real estate businesses will generate more and more data. At the same time, there are more opportunities to gain practical knowledge from this data. If it is possible to systematically aggregate and analyze all relevant data, then there will be new applications for operations, leasing, financing and buying real estate. However, in this data-driven age, there have been too much unstructured data and fragmentized information that cannot be utilized. Disconnected information and data cannot provide the accurate overview of clients' expectations.

In our database model, we have created multiple tables for Agency One to better manage their existing data of properties, staff/agents, clients, transactions, and marketing activities. We created separate tables to keep track of different branches that Agency One has, so managers in each branch are able to focus on managing their staff or agents, clients and properties, and at the same time, search for other available properties from other branches if needed. Furthermore, managers are able to keep track of the marketing activities to analyze the location that they should put the housing advertisement. In order to do so, we gather information of different types of advertisement (for example: official website, newspaper, references) for managers to decide. Also, in regard to maximize utilization of the current available data, our model could help managers to better predict revenue and cost based on the transparent information of different transactions, like selling price, sales commissions or marketing cost. Moreover, the database model helps agencies to match properties based on buyers' request on property characteristics, including property types, location, year of renovation, etc. After collecting and reallocating information, our model will help branches contacting their potential buyers to provide them the information of the matched properties as well as come up with contracts agreement.

After creating and implementing the database model, our team will be ready to further optimize business operation for Agency One by developing front-end applications to better serve their clients (buyers and sellers). While sellers would be

able to provide detailed information of their properties, how they want their property to be advertised and what their ideal selling prices are, potential buyers can filter the characteristics of properties they intend to buy and their buying prices range. Our database model then collects all the information provided by the clients, analyzes current available data of AgencyOne, and provides either reports or list of properties to both clients and managers for their decision making.

### III. Relevant Queries (with Views)

#### 1. Performance of all branches over the past years

This query shows branches name, branches region and their total sales, rank from the highest to the lowest.

```
CREATE VIEW BRANCH_SALES AS
SELECT
    br.BranchName,
    br.BranchRegion,
    concat('$', format(sum(t.SalesPrice), 2)) TotalSales
FROM
    Branch br,
    Agents a,
    Seller s,
    Transactions t
WHERE
    br.BranchID = a.BranchID
    AND a.AgentID = s.AgentID
    AND s.SellerID = t.SellerID
GROUP BY br.BranchName , br.BranchRegion
ORDER BY sum(t.SalesPrice) DESC;

SELECT
    *
FROM
    BRANCH_SALES
```

BranchName	BranchRegion	TotalSales
Ren	Renton	\$21,561,180.00
Bel	Bellevue	\$18,316,700.00
Red	Redmond	\$14,093,340.00
Sea	Seattle	\$12,351,774.00
Bot	Bothell	\$3,383,185.00

## 2. Evaluate the performance of all agents by the number of transactions and sales revenue

This query shows the agent's first and last name who has more than 2 transactions, ranks from the highest.

```
CREATE VIEW AGENT_PERFORMANCE AS
SELECT
    a.AgentID,
    a.AgentFirstName,
    a.AgentsLastName,
    COUNT(t.TransactionID) NumberofSales,
    concat('$', format(sum(t.SalesPrice), 2)) SalesRevenue
FROM
    Agents a,
    Transactions t,
    Seller s
WHERE
    a.AgentID = s.AgentID
    AND s.SellerID = t.SellerID
GROUP BY a.AgentID , a.AgentFirstName , a.AgentsLastName
HAVING COUNT(NumberofSales) > 2
ORDER BY NumberofSales DESC;

SELECT
    *
FROM
    AGENT_PERFORMANCE
```

AgentID	AgentFirstName	AgentsLastName	NumberofSales	SalesRevenue
9	Justin	Lee	12	\$14,495,672.00
2	Miguel	Tennyson	7	\$9,238,839.00
3	Crystal	Xu	6	\$7,540,711.00
13	Siqi	Ham	5	\$3,863,981.00
6	Renato	Nguyen	5	\$5,349,910.00
1	April	Setio	4	\$4,709,652.00
7	Freeland	Phan	4	\$5,070,506.00
4	Jenna	Yang	3	\$3,374,374.00
14	Chenyi	Ko	3	\$3,691,134.00
12	Cici	Fardi	3	\$4,007,355.00

### 3. Overview the buyers who purchase the specific property

This query shows the latest buyers who purchased townhouses, and shows the transaction price and date.

```
CREATE VIEW TOWNHOUSE_BUYERS AS
SELECT
    b.BuyerFirstName,
    b.BuyerLastName,
    concat('$', format(t.SalesPrice, 2)) SalesPrice,
    t.TransactionDate
FROM
    Buyer b,
    Transactions t,
    Property p
WHERE
    b.BuyerID = t.BuyerID
    AND t.PropertyID = p.PropertyID
    AND p.PropertyType = 'Townhouse';

SELECT
    *
FROM
    TOWNHOUSE_BUYERS
```

BuyerFirstName	BuyerLastName	SalesPrice	TransactionDate
Lexi	Bush	\$1,010,094.00	1/16/2019
Lexi	Bush	\$1,239,096.00	3/26/2018
Michael	Richards	\$1,971,901.00	4/19/2019
Michael	Jackson	\$587,759.00	5/20/2020
Sue	Lee	\$303,972.00	5/16/2018
Lucas	Toro	\$487,234.00	3/20/2017
Gladys	Yurus	\$1,555,188.00	1/1/2018
Gladys	Yurus	\$850,188.00	3/3/2020
Gladys	Yurus	\$1,208,801.00	12/27/2018
Michael	Richards	\$747,103.00	3/20/2017
Roger	Nixon	\$1,429,628.00	10/17/2017
Michael	Jackson	\$430,019.00	8/2/2019
Luis	Rodriguez	\$1,390,000.00	10/17/2017
Michael	Richards	\$387,753.00	2/14/2020

#### 4. Overview the active marketing campaign

This query shows the marketing campaign name that was chosen more than 3 times. As you can see here, all listings have an even distributed amount of campaigns for their property listings.

```
CREATE VIEW MKTG AS
SELECT
    m.CampaignName, COUNT(I.CampaignID) CountofCampaign
FROM
    MarketingChannel m,
    Listings I
WHERE
    m.CampaignID = I.CampaignID
GROUP BY I.CampaignID
HAVING CountofCampaign > 3;

SELECT
    *
FROM
    MKTG
```

CampaignName	CountofCampaign
Go For it	5
Best Time	5
Good to Know	5
Fighting	5
Green Property	5
Keep it up	5

#### 5. Overview the active marketing campaign

This query shows all the properties that have been sold with the campaign 'Go For it'.

```
CREATE VIEW SOLD_GOFORIT AS
SELECT
    p.PropertyType,
    concat('$', format(t.SalesPrice, 2)) SalesPrice,
    I.Status,
    m.CampaignName
FROM
```

```

    Transactions t,
    Listings l,
    Property p,
    MarketingChannel m
WHERE
    t.PropertyID = p.PropertyID
    AND p.PropertyID = l.PropertyID
    AND l.CampaignID = m.CampaignID
    AND l.Status = 'Inactive'
    AND m.CampaignName = 'Go for it';

```

```

SELECT
    *
FROM
    SOLD_GOFORIT

```

PropertyType	SalesPrice	Status	CampaignName
Condominium	\$1,024,629.00	Inactive	Go For it
Townhouse	\$1,208,801.00	Inactive	Go For it
Townhouse	\$747,103.00	Inactive	Go For it
Townhouse	\$1,429,628.00	Inactive	Go For it

## 6. Overview the agents who have 2 buyers or less

This query shows a list of agents that have 2 buyers or less, and their sales revenue.

```

CREATE VIEW 2BUYERS AS
SELECT
    a.AgentFirstName, a.AgentsLastName
FROM
    Agents a,
    Buyer b
WHERE
    a.AgentID = b.AgentID
GROUP BY a.AgentID
HAVING COUNT(b.BuyerID) <= 2;

```

```

SELECT
    *
FROM
    2BUYERS

```

AgentFirstName	AgentsLastName
April	Setio
Miguel	Tennyson
Crystal	Xu
Jenna	Yang
Renato	Nguyen
Freeland	Phan
Gloria	Pricila
Justin	Lee
Cici	Fardi
Jodie	Albolea

## 7. Present information of sellers with specific characteristic

This query shows a list of sellers that have more than one property.

```

CREATE VIEW ONE_PROPERTY_SELLER AS
SELECT
    s.SellerID,
    s.SellerFirstName,
    s.SellerLastName,
    COUNT(p.PropertyID) AS NumberOfProperties
FROM
    Seller s,
    Property p
WHERE
    s.SellerID = p.SellerID
GROUP BY s.SellerID
HAVING COUNT(p.PropertyID) > 1;

SELECT
    *
FROM
    ONE_PROPERTY_SELLER

```



SellerID	SellerFirstName	SellerLastName	NumberOfProperties
6	Obidiah	Rafaelia	4
10	Samantha	Morrie	2
13	Cori	Emmery	2
15	Bellina	Addy	2
19	Emmalynne	Ev	2

## 8. Detailed information of sold houses associated with marketing

This query shows the average price of sold houses on listings for each advertisement type. Branches or agents can decide to use which advertising type according to the following results.

```
CREATE VIEW ADS_AVG_SALES AS
SELECT
    m.AdID,
    a.AdType,
    concat('$', format(ROUND(AVG(l.price), 2), 2)) AvgListingPrice
FROM
    Listings l,
    MarketingChannel m,
    Advertisement a
WHERE
    l.CampaignID = m.CampaignID
    AND m.AdID = a.AdID
    AND l.Status = 'Inactive'
GROUP BY m.AdID
ORDER BY AVG(l.price) DESC;
```

```
SELECT
    *
FROM
    ADS_AVG_SALES
```

AdID	AdType	AvgListingPrice
1	Newspaper	\$1,401,861.60
4	Social Media	\$1,002,180.00
2	Website	\$921,929.00
3	Poster	\$903,199.50
5	Road Show	\$653,174.00

### 9. Overview the information of sellers who sell specific property.

This query shows a list of sellers first and last names that sell 2-bedroom condominiums.

```
CREATE VIEW 2BEDCONDO_SELLERS AS
SELECT
    s.SellerFirstName, s.SellerLastName, p.PropertyType
FROM
    Seller s,
    Property p
WHERE
    s.SellerID = p.SellerID
    AND p.PropertyType = 'Condominium'
    AND p.Bedrooms = 2;

SELECT
    *
FROM
    2BEDCONDO_SELLERS
```

SellerFirstName	SellerLastName	PropertyType
Marylou	Georgeanna	Condominium
Obidiah	Rafaelia	Condominium
Fin	Adolph	Condominium
Boyd	Dorine	Condominium

### 10. Presents the characteristics of specific property

This query shows a list of properties whose sqft is larger than 800, has at least 2 bedrooms, at least 2 bathrooms, sales price less or equal to \$700,000 and the year of renovation no later than 2019.

```
CREATE VIEW PROPERTY_LIST AS
SELECT
    p.PropertyID,
    p.Sqft,
    concat('$', format(t.SalesPrice, 2)) SalesPrice,
    t.TransactionDate
FROM
    Property p,
```

```

    Transactions t
WHERE
    t.PropertyID = p.PropertyID
    AND p.sqft > 800
    AND Bedrooms >= 2
    AND Bathrooms >= 2
    AND t.SalesPrice <= 700000
    AND p.YearRenovated >= 2019;

SELECT
    *
FROM
    PROPERTY_LIST

```

PropertyID	Sqft	SalesPrice	TransactionDate
4	1690	\$587,759.00	5/20/2020
10	1500	\$487,234.00	3/20/2017
16	2333	\$487,228.00	3/4/2020
22	1006	\$588,912.00	1/2/2020
23	1702	\$436,646.00	6/19/2018

### 11. Highest Transaction with different branches

This query shows the highest transaction that each branch has. Branches and agents can take references from the following information when doing future transactions.

```

CREATE VIEW MAX_SALES AS
SELECT
    br.BranchRegion,
    concat('$', format(MAX(t.SalesPrice), 2)) HighestSale
FROM
    Branch br,
    Agents a,
    Seller s,
    Transactions t,
    Property p
WHERE
    br.BranchID = a.BranchID
    AND a.AgentID = s.AgentID
    AND s.SellerID = t.SellerID
    AND t.PropertyID = p.PropertyID
GROUP BY br.BranchRegion

```

```

ORDER BY MAX(t.SalesPrice) DESC;

SELECT
*
FROM
MAX_SALES

```

BranchRegion	HighestSale
Renton	\$1,995,099.00
Redmond	\$1,971,901.00
Bellevue	\$1,870,628.00
Seattle	\$1,768,908.00
Bothell	\$1,239,096.00

## 12. Evaluate the pricing information of properties over years.

This query shows the average sales price of properties based on the year built after 1980. Buyers and sellers can take it for reference when getting involved in the transaction.

```

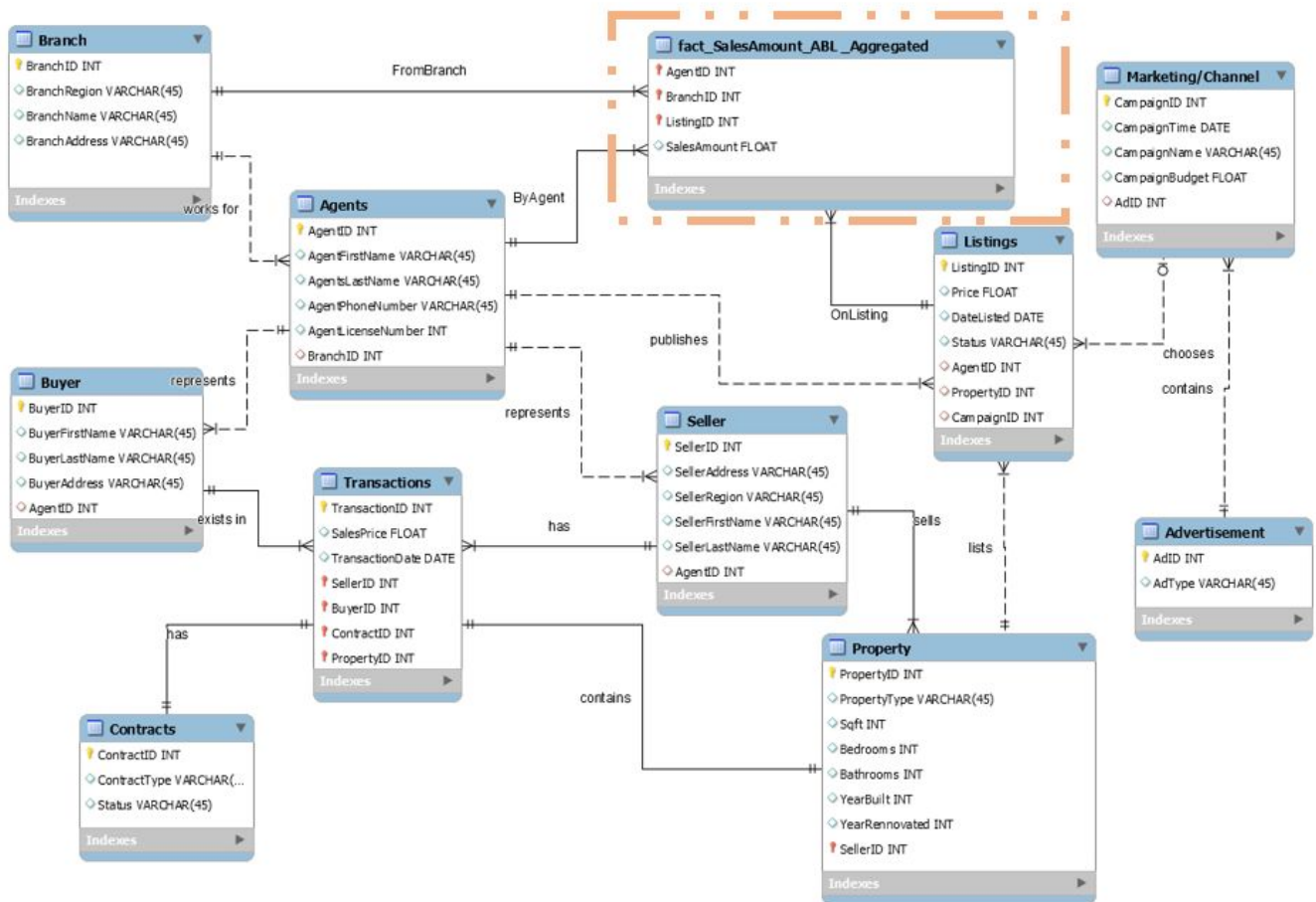
CREATE VIEW PRICE_EVAL AS
SELECT
    p.YearBuilt,
    concat('$',
        format(ROUND(AVG(t.SalesPrice), 2), 2)) AvgSalesPrice
FROM
    Transactions t,
    Property p
WHERE
    t.PropertyID = p.PropertyID
    AND p.YearBuilt > 1980
GROUP BY p.YearBuilt
ORDER BY p.YearBuilt ASC;

SELECT
*
FROM
PRICE_EVAL

```

YearBuilt	AvgSalesPrice
1990	\$1,076,971.60
1991	\$1,024,629.00
1992	\$1,150,998.00
1993	\$615,581.50
1995	\$1,391,299.62
1999	\$1,202,212.50

## IV. Physical Diagram



### Aggregated Fact table SalesAmount\_ABL:

It provides a summary of sales amount by a particular agent from a particular branch on a particular listing.

## V. STORE PROCEDURES:

### 1. What's the latest view on transactions over a specific amount?

Calling the latest transactions and setting the minimum amount. This enables the user to know the transactions that have been completed over a specific amount, ranking from latest to oldest.

```
Delimiter //  
CREATE PROCEDURE LatestPrice(  
IN input1 int )  
BEGIN  
SELECT t.TrnsactionID, concat('$', format(t.SalesPrice, 2)) SalesPrice,  
       t.TransactionDate FROM Transactions t  
WHERE t.SalesPrice >= input1  
ORDER BY t.TransactionID desc;  
END  
//  
Delimiter ;
```

**Example:** To display the latest transactions over \$1,900,000

Call Latest Price(1900000)

TransactionID	SalesPrice	TransactionDate
54	\$1,956,582.00	12/1/2017
40	\$1,971,901.00	4/19/2019
2	\$1,995,099.00	10/17/2017

## 2. What is the Status of Marketing Campaigns?

This stored procedure allows the user to know how many marketing campaigns are active and inactive for a specific Campaign Name.

Delimiter //

```
CREATE PROCEDURE Channels(
```

```
  In input1 VARCHAR(50)
```

```
)
```

```
BEGIN
```

```
  SELECT m.CampaignName,
```

```
  COUNT(*) AS Total,
```

```
  COUNT(IF(l.Status='Inactive',1, NULL)) AS Inactive, Count(IF(l.Status='Active',1,
  NULL)) AS Active
```

```
  FROM Listings l, MarketingChannel m WHERE l.CampaignID = m.CampaignID AND
  m.CampaignName = input1 GROUP BY m.CampaignName;
```

```
END
```

```
// Delimiter ;
```

**Example:** Calling the status of the Marketing Campaign called “ Go For It ”

Call Channels("Go For It")

CampaignName	Total	Inactive	Active
Go For it	5	2	3



## **VI. Business Rules**

### **Agency-One Overview**

Project management provides an efficient way for real estate agencies to manage their existing properties in order to assist home buyers in finding the ideal house based on the property characteristics they want.

### **Branches (Organizations)**

Each real estate branch has their own users, projects, and clients. Each branch can have one or more administrators who can add and remove users, contracts and payroll based on their particular needs as a company. Branches can only access the information about status of properties, deliverables, and users related to their organization.

### **Common Users**

Users can have many roles in the organization, as a user might be a branch lead and a user. Any agent that is included in contacts to a client should also be listed as an employee so that their information can be posted on it.

### **Technician Users**

When a technician is done with his work and closes a checklist, this information has to be transferred to ERP systems or other clients in a readable form for any application.

### **Agents**

Each real estate agent must hold a license by the housing authority. Each real estate agent must update the license by proof required. Applicants for renewal of a firm license shall furnish proof of current master business license renewed by authority of the secretary of state. Always propose and sign an agency agreement with buyers. By law, agents are required to give buyers an agency disclosure. This document varies across state lines.

### **Clients (Sellers + Buyers)**

A client may have multiple choices of property, but each of these properties should be based on scopes of work outlined in individual real estate contracts or purchase agreement. The client will be billed based on contracts associated with the final real estate contracts.

## **Sellers**

Each housing seller needs to keep his emotions in check and stay focused on the business aspect of selling his home at the first step. Hiring an agent can be considered. Hiring an agent may cost more in commission, but it can take a lot of the guesswork out of selling. If the seller decides to sell on his own, set a reasonable sale price and keep the time of year in mind. Prepare for the sale, don't skimp on the visuals in the buyer listing, and disclose any issues with the property.

## **Buyers**

Before purchasing the property, each buyer needs to clarify his/her requirement, which means the buyer needs to investigate the property itself and the general environment first. In addition, the buyer should evaluate the ability to manage particular property and examine the financial aspect. Home buyers need to know agents work for commission, and agents are not public servants and do not work for free. Do not ask an agent to work for you if the buyer intends to cut the agent out of your deal. Importantly, keep in mind, listing agents work for the sellers, not the buyers. If the buyer hires the listing agent to represent him, that agent will now be working under a dual agency. Conflicts of interest may occur.

## **Marketers**

Sales and marketing must agree on which demographic attributes and behavior activity need to be included on prospect records. Sales must share the realities and insights they learn from buyers with marketing on a regular basis. Data is the blessing and the curse of marketing automation, and closing the loop on everything you do is necessary for analytics and tracking.

## **Contracts**

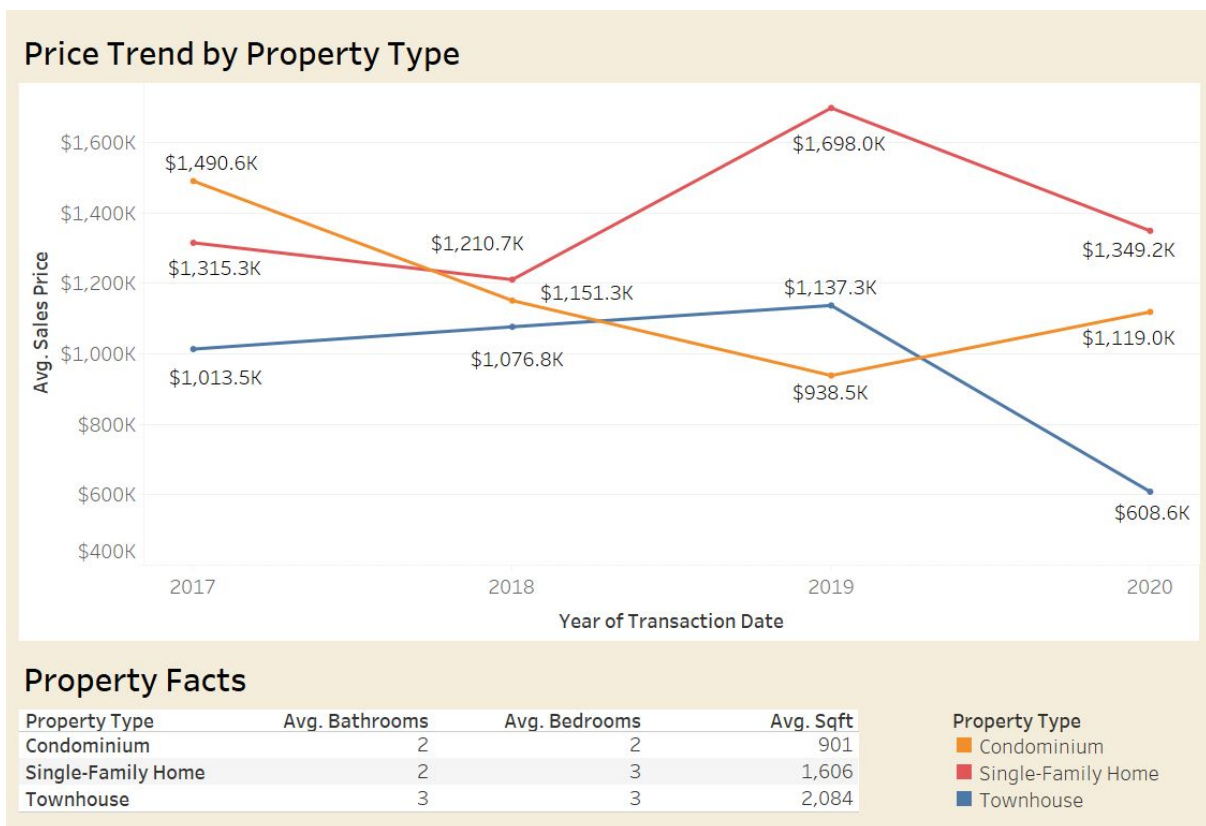
A purchase and sale agreement/contract protects the rights for both the buyer and seller.

Each real estate contract meets several requirements to be valid: A valid home purchase agreement must be in writing. The contract must contain an offer and an acceptance. The purpose of the agreement must be legal. There must be an exchange of things of value (usually, it's money for property).

## VII. Tableau Application & Analysis

### 1. Property Anlysis

The manager at Agencyone can use our database management system to manage property by filtering property facts, and they also can use the system to predict housing price for future years. The graph shows the average housing price from 2017 to 2020 by house type.

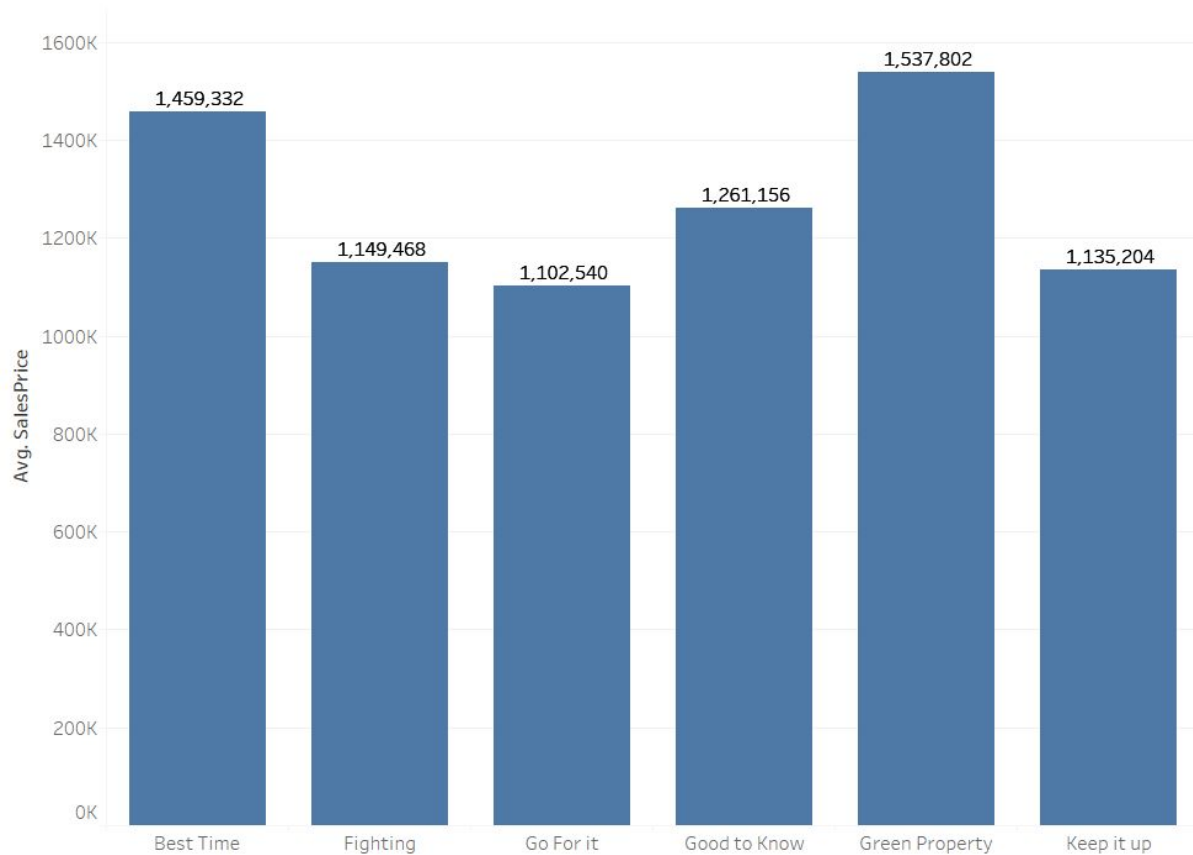


## 2. Advertising Campaign Analysis

The manager at Agencyone can use our database management system to do more analysis on sales prices spent on campaigns for future years. They can use related information to control the budget. This bar chart shows the top performing branches in 2018 in each area.

### Average Sale Price Per Campaign

Green Property & Best Time are the most effective

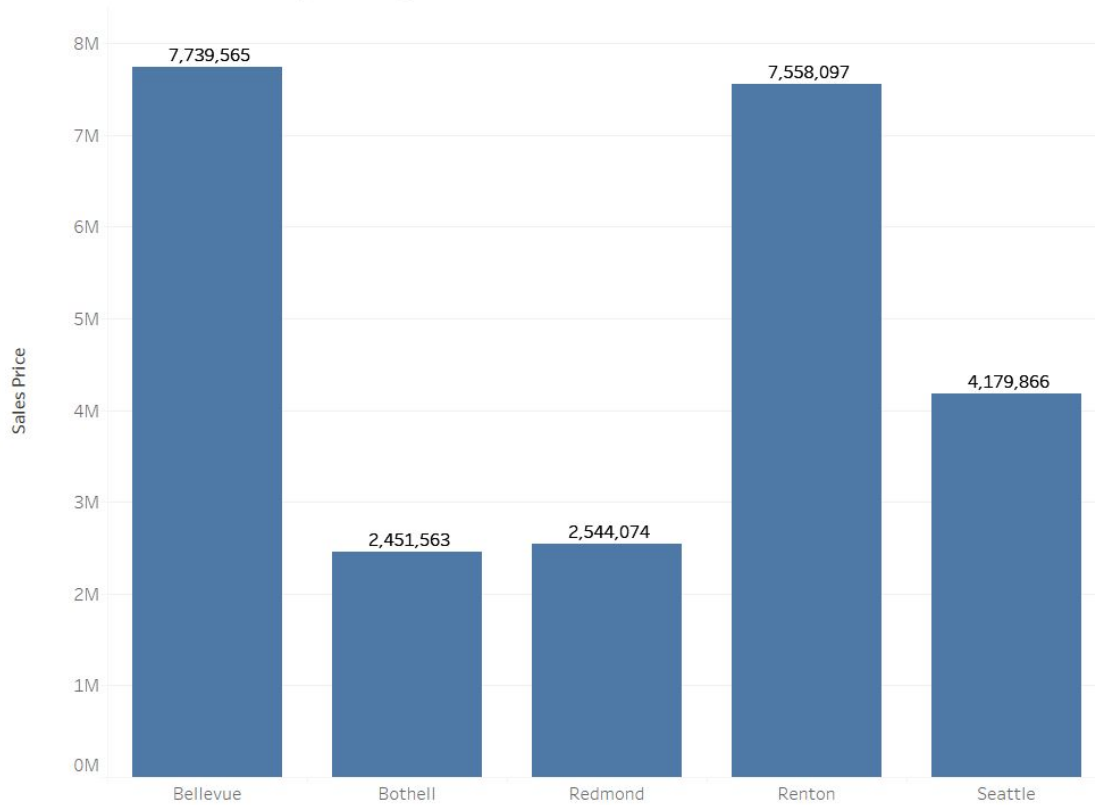


### 3. Branches Performance Analysis

The manager at Agencyone can do analysis on branches' performance by year or location to find the root causes of good or bad performance. The bar chart shows the sales amount in 2018 for 5 branches.

#### Top performing Branches in 2018

Renton & Bellevue are our best performing branches



## VIII. Summary

During the process of creating a database for our project, we learned a lot from various aspects. We understood how to access databases from MySQL and set the connection via AWS. In addition, we developed and optimized the GUI using SQL queries. It helped us gain experience and learn quite a few fundamental skills. We also practiced tableau application and cloud, which was also combined with database setup and manipulation on MySQL Workbench.

For the implementation of new database, there are several benefits as followed: Firstly, faster and more accurate processing for the new database. Secondly, it is helpful for the users to have a deeper understanding of the new business. Security concerned will be solved. Last but not least. redundancy is removed. All aboved benefits will lead to the profit of the project.

## *Appendix:*

### **Access to Cloud Database:**

Hostname: database-2.c7gskkbcajdp.us-east-1.rds.amazonaws.com

Username: admin

Password: admin123

### **Links to Tableau Public:**

1. [https://public.tableau.com/views/try1\\_15840629867050/Dashboard1?:display\\_count=y&:origin=viz\\_share\\_link](https://public.tableau.com/views/try1_15840629867050/Dashboard1?:display_count=y&:origin=viz_share_link)
2. [https://public.tableau.com/views/Top\\_Campaigns/Sheet2?:display\\_count=y&publish=yes&:origin=viz\\_share\\_link](https://public.tableau.com/views/Top_Campaigns/Sheet2?:display_count=y&publish=yes&:origin=viz_share_link)
3. [https://public.tableau.com/views/Top\\_Branches/Dashboard1?:display\\_count=y&publish=yes&:origin=viz\\_share\\_link](https://public.tableau.com/views/Top_Branches/Dashboard1?:display_count=y&publish=yes&:origin=viz_share_link)

### **GitHub:**

<https://github.com/CPSC5910Group8/DataArchProject>