

# CPSC 304 Project Cover Page

Milestone #: 4

Date: November 24th, 2022

Group Number: 10

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Sarah Li	21849476	j9z2b	Sarahli2001@gmail.com
Raifah Rahman	29435245	b2r8v	raifahbooks19@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

Link to the repository with all Milestone 4 deliverables: [Group 10 Repository](#)

### Project Description:

Our project is a Real Estate management application using Oracle and PHP. It models the Greater Vancouver region's listings, real estate agents, and purchases made. In the application, you have the ability to add, update and delete property listings and property types. You can also select for a property listing or real estate agent based on attributes you choose and set values for. You can also filter square footage price by different attributes such as city, address, and listing date. You can also find the average square footage or listing prices in each city and be able to filter on that data. If you want to find an apartment with certain amenities you can choose, there is also a page for that. Also, the application is helpful if you want to find all the real estate agents who were involved in three purchases.

### Final Schema:

#### Copy of Schema + SQL Table Screenshots:

- GreaterVancouverRegion(City Name, ListingCount)

CITYNAME	LISTINGCOUNT
Surrey	430
Burnaby	276
Richmond	198
Vancouver	382
Coquitlam	221

- Seller(SellerID, Name)

SELLERID	NAME
10	Alex
11	Bob
12	Selena
13	Mary
14	Jane

- RealEstateAgent(AgentID, REAName, Phone, Email, Rate, Brokerage)

AGENTID	REANAME	PHONE	EMAIL	RATE	BROKERAGE
11	Ria	7785409888	riaeaton@gmail.com	20	Westcoast Rentals
64	Sam	6042122232	sambates@gmail.com	36	ABC Housing
615	Leo	7789906770	leo245@gmail.com	43	Downtown Suites
190	Nick	6045119541	nick13@gmail.com	30	Garys Housing
19	Dina	2267093340	dinawakes15@gmail.com	28	Lionel Estates
10	Russell	7785679008	russell12@gmail.com	25	Westcoast Rentals
2	Sarah	6043309821	notsarahli@gmail.com	32	ABC Housing
56	Liam	2267860121	liamhawking@gmail.com	40	Downtown Suites
34	Nicholas	6042314436	nicholasdames@gmail.com	36	Garys Housing
249	Amanda	2260035621	amandabailey15@gmail.com	27	Lionel Estates

- PropertyListing(ListingID, City Name, SellerID, AgentID, PropertyAddress, ListingPrice, PropertyStatus, SquareFootage, Listing Date)

LISTINGID	CITYNAME	SELLERID	AGENTID	PROPERTYADDRESS	LISTINGPRICE	PROPERTYST	SQUAREFOOTAGE	LISTINGDA
1	Surrey	10	11	1234 Johnson	1234567	on market	3000	09-DEC-20
2	Burnaby	11	615	1234 Applefarm	200000	on market	10000	09-DEC-22
3	Richmond	12	19	2912 Fitzgerald	5300000	sold	1000	02-JAN-22
4	Vancouver	13	64	6745 Cornell	2400000	on market	10000	03-OCT-22
5	Coquitlam	14	190	7845 Newton	6300000	sold	1000	17-AUG-19
6	Surrey	10	190	1098 Stewart	1500000	on market	3500	09-NOV-21
7	Burnaby	11	64	8541 Crescent	2300000	sold	10000	09-DEC-22
8	Richmond	12	11	2765 Shining	347000	sold	1000	02-JAN-22
9	Vancouver	13	615	5329 Dunbar	3000	on market	10000	03-OCT-22
10	Coquitlam	14	19	3325 Lion	2500	sold	1000	17-AUG-19
11	Surrey	10	10	1128 Aberdeen	123200	sold	3000	23-OCT-18
12	Burnaby	11	2	8723 Victoria	2500000	sold	10000	14-OCT-22
13	Richmond	12	56	4521 Smith	53000000	sold	1000	02-JUL-21
14	Vancouver	13	34	9500 Abbott	2700000	on market	10000	08-AUG-20
15	Coquitlam	14	249	3219 Essex	63000000	on market	1000	11-APR-19
16	Surrey	10	34	6925 Hope	800000	on market	3000	09-JAN-18
17	Burnaby	11	10	2012 Boulevard	2000000	sold	10000	25-DEC-21
18	Richmond	12	2	7652 Deer	53000000	sold	1000	14-FEB-19
19	Vancouver	13	56	5070 Hastings	2400000	on market	10000	15-JUL-20
20	Coquitlam	14	249	3211 Cardell	63000000	sold	1000	17-NOV-22
21	Surrey	10	11	6301 Bains	1700	on market	3000	09-JAN-18
22	Burnaby	11	190	2022 Hell	1100	sold	10000	25-DEC-21
23	Richmond	12	19	7096 Prima	5000000	sold	1000	14-FEB-19
24	Vancouver	13	2	5112 Hornby	2400000	on market	10000	15-JUL-20
25	Coquitlam	14	10	0078 Plaza	645000	sold	1000	17-NOV-22

- PropertyType(PropertyTypeID, ListingID, BedroomCount, BathroomCount)

PROPERTYTYPEID	LISTINGID	BEDROOMCOUNT	BATHROOMCOUNT
1	1	2	3
2	2	1	2
3	3	4	4
4	4	3	2
5	5	2	1
6	6	2	3
7	7	1	2
8	8	4	4
9	9	3	2
10	10	2	1
11	11	2	3
12	12	1	2
13	13	4	4
14	14	3	2
15	15	2	1
16	16	2	3
17	17	1	2
18	18	4	4
19	19	3	2
20	20	4	1
21	21	2	1
22	22	1	1
23	23	2	4
24	24	3	1
25	25	6	1

- House(PropertyTypeID, RentalSuite)

PROPERTYTYPEID	R
1	y
2	n
3	y
4	n
5	n

- Apartment(PropertyTypeID, HasPool, HasGym)

PROPERTYTYPEID	H	H
6	y	n
7	n	y
8	n	y
9	y	n
10	y	y
21	y	n
22	n	n
23	n	y
24	y	n
25	y	y

- Land(PropertyTypeID, Potential BuildingsCount)

PROPERTYTYPEID	POTENTIALBUILDINGSCOUNT
11	2
12	10
13	5
14	1
15	3

- Townhouse(PropertyTypeID, HOAFee)

PROPERTYTYPEID	HOAFEE
16	706
17	167
18	131
19	713
20	804

- Client(ClientID, ClientName, Phone, Email)

CLIENTID	CLIENTNAME	PHONE	EMAIL
10	Claire	6045467654	claire13@gmail.com
24	John	7783452134	johndoe@yahoo.com
31	Melissa	7780945614	melissabridges13@gmail.com
4	David	2265412110	david1222@yahoo.com
52	Diana	2260987760	dianafields14@gmail.com

- Purchase(PurchaseID, ClientID, SellingPrice, PurchaseDate)

PURCHASEID	CLIENTID	SELLINGPRICE	PURCHASED
12	10	34000	09-OCT-20
10	24	1200	16-SEP-21
91	31	1200000	10-MAR-19
123	4	50000	20-APR-20
200	52	3000	17-JAN-21

- PurchaseWithRealEstateAgent(AgentID, PurchaseID)

AGENTID	PURCHASEID
11	12
19	10
19	12
19	91
19	123
19	200
64	10
64	12
64	91
190	123
615	91

### Updates:

- We changed our many to many relationship between PropertyListing and PropertyType because you can not represent these in Oracle. Having foreign keys of the ids in both of relations causes errors in the SQL, so we decided to remove the foreign key PropertyTypeID from PropertyListing. Additionally, we could not use Assertions since we were using Oracle, which further limited our many to many relationship so we also did not make use of our PropertyListingHasPropertyTable many to many table from our original schema.
- We decided to denormalize RealEstateAgent\_1 and RealEstateAgent\_2 back to RealEstateAgent and PropertyListing\_1 and PropertyListing\_2 back to PropertyListing. This helped us to simplify the queries into each of these relations.
- Some UI updates: the Division query was updated to find all the real estate agents who have been in certain purchases instead of finding all purchases a real estate agent had made. We felt the new query more accurately represented a division query than the one we had chosen before.
- We also had some accommodations to the rubric because we became a group of two.

## **Queries Used:**

### **Insert:**

File: propertyListing.php

```
insert into PropertyListing values (:bind1, :bind2 , :bind3, :bind4, :bind5, :bind6, :bind7, TO_DATE(:bind8,'YYYY-MM-DD'))", $alltuples
```

### **Delete on Cascade:**

File: propertyListing.php

```
DELETE FROM PropertyListing WHERE ListingID=" . $listing_id
```

### **Update:**

File: propertyType.php

```
UPDATE PropertyType SET ". $attribute . "=" . $newvalue . " WHERE PropertyTypeId=" . $propertyTypeID
```

### **Selection:**

File: findAProperty.php

```
'SELECT $attribute1, $attribute2  
FROM $attributeTable  
WHERE $attribute1 $op1 '$value1' AND $attribute2 $op2 '$value2''
```

### **Projection:**

File: findAProperty.php

```
"SELECT CityName, SquareFootage, ListingPrice FROM PropertyListing "  
"SELECT PropertyAddress, SquareFootage, ListingPrice FROM PropertyListing "  
"SELECT PropertyAddress, SquareFootage, ListingPrice FROM PropertyListing "
```

### **Aggregation with Group By:**

File: averageInEachCity.php

If \$attribute == "SquareFootage"

```
SELECT CityName, AVG(SquareFootage) FROM PropertyListing GROUP BY CityName
```

If \$attribute == "ListingPrice"

```
SELECT CityName, AVG(ListingPrice) FROM PropertyListing GROUP BY CityName
```

### **Aggregation with Having:**

File: averageInEachCity.php

```
SELECT CityName, AVG(ListingPrice) FROM PropertyListing GROUP BY CityName HAVING  
AVG(ListingPrice) <=" . $listing_price
```

### **Join:**

File: findAnApartment.php

```
'SELECT CityName, PropertyAddress, ListingPrice  
FROM PropertyListing pl, PropertyType pt, Apartment a  
WHERE a.PropertyTypeID = pt.PropertyTypeID AND  
pl.ListingID = pt.ListingID AND HasPool = '$gym' AND HasGym = '$pool''
```

### **Division:**

File: findAllRealEstateSales.php

Outside query uses AgentIDs from inner query to show the real estate agent attributes.

```
select distinct *  
  
from RealEstateAgent a, (select distinct r.AgentID from  
PurchaseWithRealEstateAgent r  
  
where not exists (select p.PurchaseID from Purchase p where p.PurchaseID  
= " . $pid_1 . " or p.PurchaseID = " . $pid_2 . " or p.PurchaseID = " . $pid_3 . "  
minus  
  
select ra.PurchaseID from PurchaseWithRealEstateAgent ra where ra.AgentID  
= r.AgentID)) b  
  
where a.AgentID = b.AgentID
```

## GUI Screenshots:

### Insert :

[https://www.students.cs.ubc.ca/~sli62/project\\_b2r8v\\_i9z2b\\_p0d0a/propertyListing.php](https://www.students.cs.ubc.ca/~sli62/project_b2r8v_i9z2b_p0d0a/propertyListing.php)

### ***Before Insert into PropertyListing:***

Retrieved data from table PropertyListing:

Listing ID	City	Seller ID	Address	Listing Price	Property Status	Square Footage	Listing Date
1	Surrey	10	11	1234 Johnson	1234567	on market	3000
2	Burnaby	11	615	1234 Applefarm	200000	on market	10000
3	Richmond	12	19	2912 Fitzgerald	5300000	sold	1000
4	Vancouver	13	64	6745 Cornell	2400000	on market	10000
5	Coquitlam	14	190	7845 Newton	6300000	sold	1000
6	Surrey	10	190	1098 Stewart	1500000	on market	3500
7	Burnaby	11	64	8541 Crescent	2300000	sold	10000
8	Richmond	12	11	2765 Shining	347000	sold	1000
9	Vancouver	13	615	5329 Dunbar	3000	on market	10000
10	Coquitlam	14	19	3325 Lion	2500	sold	1000
11	Surrey	10	10	1128 Aberdeen	123200	sold	3000
12	Burnaby	11	2	8723 Victoria	2500000	sold	10000
13	Richmond	12	56	4521 Smith	53000000	sold	1000
14	Vancouver	13	34	9500 Abbott	2700000	on market	10000
15	Coquitlam	14	249	3219 Essex	63000000	on market	1000
16	Surrey	10	34	6925 Hope	800000	on market	3000
17	Burnaby	11	10	2012 Boulevard	2000000	sold	10000
18	Richmond	12	2	7652 Deer	53000000	sold	1000
19	Vancouver	13	56	5070 Hastings	2400000	on market	10000
20	Coquitlam	14	249	3211 Cardell	63000000	sold	1000
21	Surrey	10	11	6301 Bains	1700	on market	3000
22	Burnaby	11	190	2022 Hell	1100	sold	10000
23	Richmond	12	19	7096 Prima	5000000	sold	1000
24	Vancouver	13	2	5112 Hornby	2400000	on market	10000
25	Coquitlam	14	10	0078 Plaza	645000	sold	1000



## Add a Property Listing

Listing ID:

City:

Seller ID:

Address:

ListingPrice:

PropertyStatus:

SquareFootage:

ListingDate:

### After Insert into PropertyListing:

Listing ID	City	Seller ID	Address	Listing Price	Property Status	Square Footage	Listing Date
1	Surrey	10	1234 Johnson	1234567	on market	3000	09-DEC-20
2	Burnaby	11	1234 Applefarm	2000000	on market	10000	09-DEC-22
3	Richmond	12	2912 Fitzgerald	53000000	sold	1000	02-JAN-22
4	Vancouver	13	6745 Cornell	2400000	on market	10000	03-OCT-22
5	Coquitlam	14	7845 Newton	63000000	sold	1000	17-AUG-19
6	Surrey	10	1098 Stewart	1234567	on market	3500	09-NOV-21
7	Burnaby	11	8541 Crescent	2000000	sold	10000	09-DEC-22
8	Richmond	12	2765 Shining	53000000	sold	1000	02-JAN-22
9	Vancouver	13	5329 Dunbar	2400000	on market	10000	03-OCT-22
10	Coquitlam	14	3325 Lion	63000000	sold	1000	17-AUG-19
11	Surrey	10	1128 Aberdeen	124567	sold	3000	23-OCT-18
12	Burnaby	11	8723 Victoria	2000000	sold	10000	14-OCT-22
13	Richmond	12	4521 Smith	53000000	sold	1000	02-JUL-21
14	Vancouver	13	9500 Abbott	2400000	on market	10000	08-AUG-20
15	Coquitlam	14	3219 Essex	63000000	on market	1000	11-APR-19
16	Surrey	10	6925 Hope	1234567	on market	3000	09-JAN-18
17	Burnaby	11	2012 Boulevard	2000000	sold	10000	25-DEC-21
18	Richmond	12	7652 Deer	53000000	sold	1000	14-FEB-19
19	Vancouver	13	5070 Hastings	2400000	on market	10000	15-JUL-20
20	Coquitlam	14	3241 Cambie	63000000	sold	1000	17-NOV-22
100	Burnaby	10	1234 Insert	100000	on market	10000	11-NOV-01

### **Delete on Cascade:**

[https://www.students.cs.ubc.ca/~sli62/project\\_b2r8v\\_j9z2b\\_p0d0a/propertyListing.php](https://www.students.cs.ubc.ca/~sli62/project_b2r8v_j9z2b_p0d0a/propertyListing.php)

### **Before the Delete from PropertyType**

Retrieved data from table Property Type:

**Property Type ID Listing ID Number of Bedrooms Number of Bathrooms**

1	1	2	3
2	14	1	2
3	12	4	4
4	8	3	2
5	8	2	1
6	8	2	3
7	7	1	2
8	7	4	4
9	6	3	2
10	3	2	1
11	15	2	3
12	13	1	2
13	18	4	4
14	20	3	2
15	10	2	1
16	11	2	3
17	11	1	2
18	11	4	4

## **Delete a Property Listing**

Listing ID:

Delete Property

**After the Delete from PropertyType**

Retrieved data from table Property Type:

Property Type ID	Listing ID	Number of Bedrooms	Number of Bathrooms
2	14	1	2
3	12	4	4
4	8	3	2
5	8	2	1
6	8	2	3
7	7	1	2
8	7	4	4
9	6	3	2
10	3	2	1
11	15	2	3
12	13	1	2
13	18	4	4
14	20	3	2
15	10	2	1
16	11	2	3
17	11	1	2
18	11	4	4

**Update:**

[https://www.students.cs.ubc.ca/~sli62/project\\_b2r8v\\_j9z2b\\_p0d0a/propertyType.php](https://www.students.cs.ubc.ca/~sli62/project_b2r8v_j9z2b_p0d0a/propertyType.php)

**Before the Update of PropertyType with PropertyTypeID = 8**

Retrieved data from table Property Type:

Property Type ID	Listing ID	Number of Bedrooms	Number of Bathrooms
1	1	1	3
2	14	1	2
3	12	4	4
4	8	3	2
5	8	2	1
6	8	2	3
7	7	1	2
8	7	4	4
9	6	3	2
10	3	2	1
11	15	2	3
12	13	1	2

**Update PropertyType with PropertyTypeID = 8 to have 2 bedrooms instead of 4**

## Update Bedrooms and Bathrooms of Property Type

The values are case sensitive and if you enter in the wrong case, the update statement will not do anything.

Property Type ID:

Number of Bedrooms  New Value:

**After the Update in PropertyType**

Retrieved data from table Property Type:

Property Type ID	Listing ID	Number of Bedrooms	Number of Bathrooms
1	1	1	3
2	14	1	2
3	12	4	4
4	8	3	2
5	8	2	1
6	8	2	3
7	7	1	2
8	7	2	4
9	6	3	2
10	3	2	1
11	15	2	3
12	13	1	2

## Selection:

[https://www.students.cs.ubc.ca/~raifahr/project\\_b2r8v\\_j9z2b\\_p0d0a/findAProperty.php](https://www.students.cs.ubc.ca/~raifahr/project_b2r8v_j9z2b_p0d0a/findAProperty.php)

## Find a Property/Real Estate Agent With...

Remember to type appropriate values for attribute types!

A:

With:  =

With:  <=

## University of British Columbia, Vancouver

Department of Computer Science

---

Your Search Results:

**CityName ListingPrice**

Surrey 1234567

Surrey 1500000

Surrey 123200

Surrey 800000

Surrey 1700

### Projection:

[https://www.students.cs.ubc.ca/~raifahr/project\\_b2r8v\\_j9z2b\\_p0d0a/findAProperty.php](https://www.students.cs.ubc.ca/~raifahr/project_b2r8v_j9z2b_p0d0a/findAProperty.php)

### Filter Square Footage and Listing Price by...

CityName	Search
----------	--------

Your Search Results:

**City Square Footage Listing Price**

Surrey 3000 1234567

Burnaby 10000 200000

Richmond 1000 5300000

Vancouver 10000 2400000

Coquitlam 1000 6300000

Surrey 3500 1500000

Burnaby 10000 2300000

Richmond 1000 347000

Vancouver 10000 3000

Coquitlam 1000 2500

Surrey 3000 123200

Burnaby 10000 2500000

Richmond 1000 53000000

Vancouver 10000 2700000

Coquitlam 1000 63000000

Surrey 3000 800000

Burnaby 10000 2000000

Richmond 1000 53000000

Vancouver 10000 2400000

Coquitlam 1000 63000000

Surrey 3000 1700

Burnaby 10000 1100

Richmond 1000 5000000

Vancouver 10000 2400000

Coquitlam 1000 645000

**Join:**

[https://www.students.cs.ubc.ca/~raifahr/project\\_b2r8v\\_j9z2b\\_p0d0a/findAnApartment.php](https://www.students.cs.ubc.ca/~raifahr/project_b2r8v_j9z2b_p0d0a/findAnApartment.php)

## Find the Location and Price of Apartments with Amenities...

Pool?

Gym?

### Your Search Results

City	Address	Listing Price
Surrey	1098 Stewart	1500000
Vancouver	5329 Dunbar	3000
Surrey	6301 Bains	1700
Vancouver	5112 Hornby	2400000

**Aggregation with Group By:**

[https://www.students.cs.ubc.ca/~sli62/project\\_b2r8v\\_j9z2b\\_p0d0a/averageInEachCity.php](https://www.students.cs.ubc.ca/~sli62/project_b2r8v_j9z2b_p0d0a/averageInEachCity.php)

## Average in Each City

### Average Square Footage in Each City

City	Square Footage
Richmond	1000
Surrey	3125
Vancouver	10000
Coquitlam	1000
Burnaby	10000

### **Aggregation With Having:**

[https://www.students.cs.ubc.ca/~sli62/project\\_b2r8v\\_j9z2b\\_p0d0a/averageInEachCity.php](https://www.students.cs.ubc.ca/~sli62/project_b2r8v_j9z2b_p0d0a/averageInEachCity.php)

### **Filter For Cities with Average Listing Prices at most...**

Listing Price:

Average Listing Price in Each City:

City	Listing Price
Surrey	957067
Vancouver	2400000
Burnaby	2000000

### **Division:**

[https://www.students.cs.ubc.ca/~sli62/project\\_b2r8v\\_j9z2b\\_p0d0a/findAllRealEstateSales.php](https://www.students.cs.ubc.ca/~sli62/project_b2r8v_j9z2b_p0d0a/findAllRealEstateSales.php)

### **Get Real Estate Agents Involved in These Three Purchases**

Purchase ID 1:

Purchase ID 2:

Purchase ID 3:

Real Estate Agent:

Agent ID	Name	Phone	Email	Rate	Brokerage
2	Sarah	6043309821	notsarahli@gmail.com	32	ABC Housing
11	Ria	7785409888	riaeaton@gmail.com	20	Westcoast Rentals
19	Dina	2267093340	dinawakes15@gmail.com	28	Lionel Estates