University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 4

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Group Number: 15

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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 email 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

Repository Link

a. Short Description

Our project is a movie theater management application. It has two parts: customer and owner, displayed on two separate pages. On the customer side, customers can see their personal information once they enter in their ID, update their personal information, see average star rating for movies, see which movies are shown at different theaters, and select movies based on age ratings.

On the manager side, the manager can add rooms to movie theaters, see all data stored in the application, show the total dollar sales per location, see the average number of things a customer buys at movie concession stands, find the customers who have eaten all food offered at the concession stands, and can delete theaters.

All in all, this project touched on customer accounts, reviews for movies, tickets for movies, theaters and their movie rooms, the movies themselves, and concession stands.

b. How Your Final Schema Differed

● We modified the primary key of Eats to include a timestamp, we named it "timeBought". The reason why is because if we didn't include timeBought, then all Eats would be is a record of who has ever eaten something, as opposed to a record of every time a person has eaten something. This now allows a person to eat an item at the same concession stand multiple times at different times. before, this would only record the fact that someone had eaten an item at a specific concession stand once.

● We also removed the ISA relation for child and senior customers. The reason why is that the Child and Senior had no attributes that the customer did not have. Therefore it made more sense and also saved more space to Simply make child and Senior an attribute. However, we then decided that adding child and senior distinctions was unnecessary for this project and it wouldn't add much. so we decided to get rid of the child and the Senior completely.

c. Schema and Data Present in Each Relation

Customer(ID: varchar[20], name: varchar[30], email: varchar[40], phone: varchar[15], dateOfBirth: date)

NAME	ID	EMAIL	DATEOFBIRTH	PHONE
Yuhei Arimoto	1	yuhei61627@icloud.com	20-DEC-02	6043652065
Sean Quan	2	seanpquan@gmail.com	31-DEC-02	6044961125
Tanmay Goyal	3	sancriuse75@gmail.com	20-JAN-03	2083891111
Jack Aaaa	4	jack1234@icloud.com	05-OCT-00	6041655235
Sam Bcde	5	samsam@gmail.com	05-JAN-00	1234561234

Movie(ID: varchar[20], duration: integer, rating: varchar[10], name: varchar[50])

NAME	ID	DURATION	RATING
Spider-Man: No Way Home	10	148	PG13
Spider-Man	53	121	PG13
Cocaine Bear	2345	95	18A
The Karate Kid	157982	126	G
Ant-Man and the Wasp: Quantumania	113	125	PG13

Review(ID: varchar[20], star: float, comment: varchar[1000], **customerID**: varchar[20], **movieID**: varchar[20])

ID	MOVIEID	STAR	CUSTOMERID	COMMENTTEXT
1	10	4	1	Great movie
2	10	4.5	2	Awesome plot
3	2345	1	5	Just boring
4	157982	3.2	3	Super Mid movie, not bad
10	113	4.1	4	Pretty good. Great actors
11	113	5	2	good
12	113	2	5	Pretty good. Great actors
13	113	4.1	1	Pretty good. Great actors
14	157982	3	2	Super Mid movie, not bad
15	157982	1	4	Super Mid movie, not bad
16	157982	2	5	Super Mid movie, not bad
17	157982	1	1	Super Mid movie, not bad

Theatre(address: varchar[50], phone: varchar[20])

ADDRESS	PHONE
1234 West Mall, Vancouver, BC	3251112682
5959 Student Union Bouldvard, Vancouver, BC	6041112222
2929 Main Mall, Victoria, BC	6049871234
104 58 Ave SE, Calgary, AB	4032555501
452 SW Marine Dr, Vancouver, BC	6046300414

Room(roomNum: integer, **address**: varchar[50], capacity: integer)

ROOMNUM	CAPACITY	ADDRESS
1	100	1234 West Mall, Vancouver, BC
2	150	1234 West Mall, Vancouver, BC
1	85	452 SW Marine Dr, Vancouver, BC
4	50	452 SW Marine Dr, Vancouver, BC
5	200	452 SW Marine Dr, Vancouver, BC

Shows(**address**: varchar[50], **roomNum**: integer, **movieID**: varchar[20])

ROOMNUM	MOVIEID	ADDRESS
1	10	1234 West Mall, Vancouver, BC
1	2345	1234 West Mall, Vancouver, BC
4	10	452 SW Marine Dr, Vancouver, BC
4	113	452 SW Marine Dr, Vancouver, BC
4	157982	452 SW Marine Dr, Vancouver, BC

MovieSchedule(time: timestamp, **roomNum**: integer, **address**: varchar[50], **movieID**: varchar[20])

ROOMNUM	MOVIEID	ADDRESS	TIME
4	10	452 SW Marine Dr, Vancouver, BC	01-APR-23 09.00.00.000000 AM
4	10	452 SW Marine Dr, Vancouver, BC	01-APR-23 03.00.00.000000 PM
4	10	452 SW Marine Dr, Vancouver, BC	01-APR-23 01.00.00.000000 PM
4	157982	452 SW Marine Dr, Vancouver, BC	01-APR-23 10.00.00.000000 AM
1	10	1234 West Mall, Vancouver, BC	01-APR-23 09.00.00.000000 AM

Ticket(ID: varchar[20], type: varchar[20], seatNum: varchar[4], **time**: timestamp, **customerID**: varchar[20], price: float, **address**: varchar[50], **roomNum**: integer)

PRICE	ID	ROOMNUM	ADDRESS	CUSTOMERID	TYPE	SEATNUM	TIME
19	1452	4	452 SW Marine Dr, Vancouver, BC	1	3D	D15	01-APR-23 09.00.00.000000 AM
20	1453	1	1234 West Mall, Vancouver, BC	2	3D Luxury	A05	01-APR-23 09.00.00.000000 AM
25	1500	4	452 SW Marine Dr, Vancouver, BC	4	4DX	C05	01-APR-23 10.00.00.000000 AM
17	173	4	452 SW Marine Dr, Vancouver, BC	1	Normal	C05	01-APR-23 01.00.00.000000 PM
17	782	4	452 SW Marine Dr, Vancouver, BC	5	Normal	D21	01-APR-23 03.00.00.000000 PM

ConcessionStand(ID: varchar[20], name: varchar[20], **address:** varchar[50])

NAME	ID	ADDRESS
McDonald	12	452 SW Marine Dr, Vancouver, BC
StarBucks	115	452 SW Marine Dr, Vancouver, BC
Subway	1	1234 West Mall, Vancouver, BC
StarBucks	1234	1234 West Mall, Vancouver, BC
Tim Hortons	602	104 58 Ave SE, Calgary, AB

Foodstuff (ID: varchar[20], name: varchar[20], price: float)

NAME	PRICE	ID
BigMac Meal	12	100
Fries	3.5	101
Iced Latte	5.5	102
Cheeseburger	5.5	103
Coca cola	5.5	104
Popcorn	5.5	105

Offers (**foodStuffID:** varchar[20], **concesssionStandID:** varchar[20])

FOODSTUFFID	CONCESSIONSTANDID
100	12
100	602
101	1
101	12
102	12
103	12
104	1
104	12
105	12
105	1234

Eats (**customerID:** varchar[20], **concessionStandID:** varchar[20] , **foodStuffID:** varchar[20],

timeBought: timestamp)

FOODSTUFFID	TIMEBOUGHT	CONCESSIONSTANDID	CUSTOMERID
101	01-APR-23 09.03.00.000000 AM	1	1
100	01-APR-23 09.00.00.000000 AM	12	1
101	01-APR-23 09.00.00.000000 AM	12	1
102	01-APR-23 09.00.00.000000 AM	12	1
103	01-APR-23 09.00.00.000000 AM	12	1
104	01-APR-23 09.00.00.000000 AM	12	1
105	01-APR-23 09.00.00.000000 AM	12	1
105	01-APR-23 09.02.00.000000 AM	12	1
105	03-APR-23 09.03.00.000000 AM	12	1
100	01-APR-23 02.00.00.000000 AM	12	2
100	01-APR-23 11.00.00.000000 AM	12	2
101	01-AUG-23 09.00.00.000000 AM	12	2
102	01-APR-23 09.00.00.000000 AM	12	2
103	01-APR-23 09.00.00.000000 AM	12	2
104	01-APR-23 09.00.00.000000 AM	12	2
105	01-APR-23 09.00.00.000000 AM	12	2
100	01-APR-23 10.00.00.000000 AM	12	3
100	01-APR-23 10.00.00.000000 AM	12	4

d. SQL queries

INSERT (owner.php; line 347)

```
executeBoundSQL("insert into Room values (:bind1, :bind2, :bind3)", $alltuples);
```

DELETE (owner.php; line 501)

```
executeBoundSQL("DELETE FROM Theatre WHERE address = :bind1", $alltuples);
```

UPDATE (project.php; line 355)

```
executeBoundSQL(
    "UPDATE Customer
    SET ID =:bind1, name=:bind2, email=:bind3, phone=:bind4, dateOfBirth=:bind5
    WHERE ID=:bind1"
    , $alltuples
);
```

Selection (project.php; line 419)

```php
$result = executePlainSQL(
    "SELECT *
    FROM Movie
    WHERE rating = '$rating'"
);
```

Projection (owner.php; line 403)

```php
$result = executePlainSQL("SELECT $select FROM $table");
```

Join (project.php; line 385)

```php
$result = executePlainSQL(
    "SELECT DISTINCT m.name, m.duration
    FROM Movie m, Shows s
    WHERE m.ID = s.movieID AND s.address = '$location'"
);
```

Aggregation with Group By (owner.php; line 428)

```php
"SELECT t.address, SUM(t.price) as sales
FROM Ticket t
GROUP BY t.address");
```

Aggregation with Having (project.php; line 440)

```php
"SELECT m.name, AVG(r.star) as rating
FROM Review r, Movie m
WHERE r.movieID = m.ID
GROUP BY m.name
HAVING COUNT(*) > 1");
```

Nested Aggregation with Group By (owner.php; line 450)

```php
"SELECT AVG(countPerCustomer) as averageFoodPerCustomer
FROM (SELECT customerID, COUNT(*) as countPerCustomer
    FROM Eats
    GROUP BY customerID)
");
```

Division (owner.php; line 473)

```php
"SELECT * FROM Customer C WHERE NOT EXISTS
((SELECT F.ID FROM FoodStuff F) MINUS
(SELECT E.foodStuffID FROM Eats E WHERE E.customerID = C.ID))");
```

e. Query Functionality Demonstration

INSERT

Before:

ROOMNUM	CAPACITY	ADDRESS
1	100	1234 West Mall, Vancouver, BC
2	150	1234 West Mall, Vancouver, BC
1	85	452 SW Marine Dr, Vancouver, BC
4	50	452 SW Marine Dr, Vancouver, BC
5	200	452 SW Marine Dr, Vancouver, BC

During:

Add Room

Room Number: 1

Location: 104 58 Ave SE, Calgary, AB

Capacity: 50

Insert

After:

ROOMNUM	CAPACITY	ADDRESS
1	50	104 58 Ave SE, Calgary, AB
1	100	1234 West Mall, Vancouver, BC
2	150	1234 West Mall, Vancouver, BC
1	85	452 SW Marine Dr, Vancouver, BC
4	50	452 SW Marine Dr, Vancouver, BC
5	200	452 SW Marine Dr, Vancouver, BC

DELETE

Before:

Theatre

ADDRESS	PHONE
1234 West Mall, Vancouver, BC	3251112682
5959 Student Union Bouldvard, Vancouver, BC	6041112222
2929 Main Mall, Victoria, BC	6049871234
104 58 Ave SE, Calgary, AB	4032555501
452 SW Marine Dr, Vancouver, BC	6046300414

Room

ROOMNUM	CAPACITY	ADDRESS
1	50	104 58 Ave SE, Calgary, AB
1	100	1234 West Mall, Vancouver, BC
2	150	1234 West Mall, Vancouver, BC
1	85	452 SW Marine Dr, Vancouver, BC
4	50	452 SW Marine Dr, Vancouver, BC
5	200	452 SW Marine Dr, Vancouver, BC

During:

Delete Theatre

Theatre address
- ✓ 104 58 Ave SE, Calgary, AB
- 1234 West Mall, Vancouver, BC
- 2929 Main Mall, Victoria, BC

Submit

After:

Theatre

ADDRESS	PHONE
1234 West Mall, Vancouver, BC	3251112682
5959 Student Union Bouldvard, Vancouver, BC	6041112222
2929 Main Mall, Victoria, BC	6049871234
452 SW Marine Dr, Vancouver, BC	6046300414

Room (on delete of theatre cascade)

ROOMNUM	CAPACITY	ADDRESS
1	100	1234 West Mall, Vancouver, BC
2	150	1234 West Mall, Vancouver, BC
1	85	452 SW Marine Dr, Vancouver, BC
4	50	452 SW Marine Dr, Vancouver, BC
5	200	452 SW Marine Dr, Vancouver, BC

UPDATE

Before:

NAME	ID	EMAIL	DATEOFBIRTH	PHONE
Yuhei Arimoto	1	yuhei61627@icloud.com	20-DEC-02	6043652065
Sean Quan	2	seanpquan@gmail.com	31-DEC-02	6044961125
Tanmay Goyal	3	sancriuse75@gmail.com	20-JAN-03	2083891111
Jack Aaaa	4	jack1234@icloud.com	05-OCT-00	6041655235
Sam Bcde	5	samsam@gmail.com	05-JAN-00	1234561234

During:

Update Personal Information

Put your ID to update your personal info. Leave the field empty for unchanged information.

Your ID: 1

Update Name:

Update Email: yuhei61627@gmail.com

Update Phone: 6043652275

Update Birthday: yyyy / mm / dd

Update

After:

NAME	ID	EMAIL	DATEOFBIRTH	PHONE
Yuhei Arimoto	1	yuhei61627@gmail.com	20-DEC-02	6043652275
Sean Quan	2	seanpquan@gmail.com	31-DEC-02	6044961125
Tanmay Goyal	3	sancriuse75@gmail.com	20-JAN-03	2083891111
Jack Aaaa	4	jack1234@icloud.com	05-OCT-00	6041655235
Sam Bcde	5	samsam@gmail.com	05-JAN-00	1234561234

Selection

Before:

NAME	ID	DURATION	RATING
Spider-Man: No Way Home	10	148	PG13
Spider-Man	53	121	PG13
Cocaine Bear	2345	95	18A
The Karate Kid	157982	126	G
Ant-Man and the Wasp: Quantumania	113	125	PG13

During:

Select movies based on rating

Rating:
- G
- ✓ PG13
- 18A
- All

Subm

After:

Select movies based on rating

Rating: [G ▽]

[Submit]

ID	Name	Duration	Rating
10	Spider-Man: No Way Home	148	PG13
53	Spider-Man	121	PG13
113	Ant-Man and the Wasp: Quantumania	125	PG13

Projection

Before:

NAME	ID	EMAIL	DATEOFBIRTH	PHONE
Yuhei Arimoto	1	yuhei61627@gmail.com	20-DEC-02	6043652275
Sean Quan	2	seanpquan@gmail.com	31-DEC-02	6044961125
Tanmay Goyal	3	sancriuse75@gmail.com	20-JAN-03	2083891111
Jack Aaaa	4	jack1234@icloud.com	05-OCT-00	6041655235
Sam Bcde	5	samsam@gmail.com	05-JAN-00	1234561234

During:

Display Data

Type: CUSTOMER ⌄

Select

Columns:
☑ NAME
☐ ID
☑ EMAIL
☑ DATEOFBIRTH
☑ PHONE

Submit

After:

Display Data

Type: CUSTOMER ⌄

Select

NAME	EMAIL	DATEOFBIRTH	PHONE
Yuhei Arimoto	yuhei61627@gmail.com	20-DEC-02	6043652275
Sean Quan	seanpquan@gmail.com	31-DEC-02	6044961125
Tanmay Goyal	sancriuse75@gmail.com	20-JAN-03	2083891111
Jack Aaaa	jack1234@icloud.com	05-OCT-00	6041655235
Sam Bcde	samsam@gmail.com	05-JAN-00	1234561234

Join

Before:

Movie

NAME	ID	DURATION	RATING
Spider-Man: No Way Home	10	148	PG13
Spider-Man	53	121	PG13
Cocaine Bear	2345	95	18A
The Karate Kid	157982	126	G
Ant-Man and the Wasp: Quantumania	113	125	PG13

Shows

ROOMNUM	MOVIEID	ADDRESS
1	10	1234 West Mall, Vancouver, BC
1	2345	1234 West Mall, Vancouver, BC
4	10	452 SW Marine Dr, Vancouver, BC
4	113	452 SW Marine Dr, Vancouver, BC
4	157982	452 SW Marine Dr, Vancouver, BC

During:

Movies Shown

Location ✓ 452 SW Marine Dr, Vancouver, BC
1234 West Mall, Vancouver, BC
All

Submit

After:

Movies Shown

Location: 452 SW Marine Dr, Vancouver, BC ⌄

Submit

Name	Duration (min)
Ant-Man and the Wasp: Quantumania	125
The Karate Kid	126
Spider-Man: No Way Home	148

Aggregation with Group By

Before:

PRICE	ID	ROOMNUM	ADDRESS	CUSTOMERID	TYPE	SEATNUM	TIME
19	1452	4	452 SW Marine Dr, Vancouver, BC	1	3D	D15	01-APR-23 09.00.00.000000 AM
20	1453	1	1234 West Mall, Vancouver, BC	2	3D Luxury	A05	01-APR-23 09.00.00.000000 AM
25	1500	4	452 SW Marine Dr, Vancouver, BC	4	4DX	C05	01-APR-23 10.00.00.000000 AM
17	173	4	452 SW Marine Dr, Vancouver, BC	1	Normal	C05	01-APR-23 01.00.00.000000 PM
17	782	4	452 SW Marine Dr, Vancouver, BC	5	Normal	D21	01-APR-23 03.00.00.000000 PM

During:

Sales by Location

Submit

After:

Sales by Location

Submit

Theatre	Total Sales
452 SW Marine Dr, Vancouver, BC	78
1234 West Mall, Vancouver, BC	20

Aggregation with Having

Before:

Movie

NAME	ID	DURATION	RATING
Spider-Man: No Way Home	10	148	PG13
Spider-Man	53	121	PG13
Cocaine Bear	2345	95	18A
The Karate Kid	157982	126	G
Ant-Man and the Wasp: Quantumania	113	125	PG13

Review

ID	MOVIEID	STAR	CUSTOMERID	COMMENTTEXT
1	10	4	1	Great movie
2	10	4.5	2	Awesome plot
3	2345	1	5	Just boring
4	157982	3.2	3	Super Mid movie, not bad
10	113	4.1	4	Pretty good. Great actors
11	113	5	2	good
12	113	2	5	Pretty good. Great actors
13	113	4.1	1	Pretty good. Great actors
14	157982	3	2	Super Mid movie, not bad
15	157982	1	4	Super Mid movie, not bad
16	157982	2	5	Super Mid movie, not bad
17	157982	1	1	Super Mid movie, not bad

During:

Movies Rating

Submit

After:

Movies Rating

Submit

Movie	Rating
Spider-Man: No Way Home	4.25
Ant-Man and the Wasp: Quantumania	3.8
The Karate Kid	2.04

Nested Aggregation with Group By

Before:

FOODSTUFFID	TIMEBOUGHT	CONCESSIONSTANDID	CUSTOMERID
101	01-APR-23 09.03.00.000000 AM	1	1
100	01-APR-23 09.00.00.000000 AM	12	1
101	01-APR-23 09.00.00.000000 AM	12	1
102	01-APR-23 09.00.00.000000 AM	12	1
103	01-APR-23 09.00.00.000000 AM	12	1
104	01-APR-23 09.00.00.000000 AM	12	1
105	01-APR-23 09.00.00.000000 AM	12	1
105	01-APR-23 09.02.00.000000 AM	12	1
105	03-APR-23 09.03.00.000000 AM	12	1
100	01-APR-23 02.00.00.000000 AM	12	2
100	01-APR-23 11.00.00.000000 AM	12	2
101	01-AUG-23 09.00.00.000000 AM	12	2
102	01-APR-23 09.00.00.000000 AM	12	2
103	01-APR-23 09.00.00.000000 AM	12	2
104	01-APR-23 09.00.00.000000 AM	12	2
105	01-APR-23 09.00.00.000000 AM	12	2
100	01-APR-23 10.00.00.000000 AM	12	3
100	01-APR-23 10.00.00.000000 AM	12	4

During:

Find the average number of foodstuff a customer eats

Submit

After:

Find the average number of foodstuff a customer eats

Submit

Average food items per customers
4.5

Division

Before:

Customer

NAME	ID	EMAIL	DATEOFBIRTH	PHONE
Yuhei Arimoto	1	yuhei61627@gmail.com	20-DEC-02	6043652275
Sean Quan	2	seanpquan@gmail.com	31-DEC-02	6044961125
Tanmay Goyal	3	sancriuse75@gmail.com	20-JAN-03	2083891111
Jack Aaaa	4	jack1234@icloud.com	05-OCT-00	6041655235
Sam Bcde	5	samsam@gmail.com	05-JAN-00	1234561234

Eat

FOODSTUFFID	TIMEBOUGHT	CONCESSIONSTANDID	CUSTOMERID
101	01-APR-23 09.03.00.000000 AM	1	1
100	01-APR-23 09.00.00.000000 AM	12	1
101	01-APR-23 09.00.00.000000 AM	12	1
102	01-APR-23 09.00.00.000000 AM	12	1
103	01-APR-23 09.00.00.000000 AM	12	1
104	01-APR-23 09.00.00.000000 AM	12	1
105	01-APR-23 09.00.00.000000 AM	12	1
105	01-APR-23 09.02.00.000000 AM	12	1
105	03-APR-23 09.03.00.000000 AM	12	1
100	01-APR-23 02.00.00.000000 AM	12	2
100	01-APR-23 11.00.00.000000 AM	12	2
101	01-AUG-23 09.00.00.000000 AM	12	2
102	01-APR-23 09.00.00.000000 AM	12	2
103	01-APR-23 09.00.00.000000 AM	12	2
104	01-APR-23 09.00.00.000000 AM	12	2
105	01-APR-23 09.00.00.000000 AM	12	2
100	01-APR-23 10.00.00.000000 AM	12	3
100	01-APR-23 10.00.00.000000 AM	12	4

Foodstuff

NAME	PRICE	ID
BigMac Meal	12	100
Fries	3.5	101
Iced Latte	5.5	102
Cheeseburger	5.5	103
Coca cola	5.5	104
Popcorn	5.5	105

During:

Find customers who have eaten all types of food offered

Submit

After:

Find customers who have eaten all types of food offered

Submit

ID	Name
1	Yuhei Arimoto
2	Sean Quan