

CPSC 304 Project Cover Page

Milestone #: ____4____

Date: ____Aug 9th, 2023 ____

Group Number: ____18____

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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 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

Repository Link:

https://github.students.cs.ubc.ca/CPSC304-2023S-T2/project_d7d4q_j8p7v_p8o6x

Link to demo webpage: <https://www.students.cs.ubc.ca/~jung/selecttest.php>

a. A short description of the final project

This application is the Sports Center Management System, it encompasses a comprehensive data management to the Sport Center. It focuses on the management of reservations, equipment and coaching classes process within a sports center.

Furthermore, this database-driven application efficiently manages members, employees, and equipment data. It seamlessly connects reservation and current equipment Stock data, enabling effortless identification of equipment reserved from members. Users also can evaluate each coach's performance by counting the registration of members and analyze each member's preference. In addition to that, this application supports advanced analysis through nested aggregation with group by such as displaying the average hourly rates from all employees, and aggregation with having such as finding the youngest student who has taken a specific class. This application features enable users to make informed decisions and improve the overall experience for both members and employees.

b. A description of how the final schema differed from our previous schema

Since most of our primary keys are Id of the entity, creating some queries was challenging. Therefore, we added the 'FacilityName' attribute as a primary key in the 'Facility' table to use for some queries such as "Nested Aggregation with Group by" and "Division". The 'Contains' table and Facilities (such as 'Swimming pool', 'Tennis court', and 'Ice Rink') related to the ISA relationship with 'Facility' will also contain the 'FacilityName' as a primary key. We modified the corresponding data as well.

c. A list of all SQL queries used

1. Insert

```
executePlainSQL("INSERT INTO MEMBER VALUES ('".$isMemberID."', '".$isAddress."', '".$isPhoneNumber."', '".$isMFirstName."',  
                                              '".$isMLastNName."', TO_DATE('".$isMBirthDate."', 'yyyy/mm/dd'), '".$isMEmail."')");
```

2. Delete

```
$result = executePlainSQL("DELETE FROM Member WHERE MemberID = '$memberID'");  
echo "<div class='container'><br><p>Deleted $memberID</p><br></div>";
```

3. Update

```
$updateString = "UPDATE member SET ";
$count = 0;

if (strcmp($newAddress, '') != 0) {
    $updateString .= "Address='" . $newAddress . "' ";
    $count++;
}

if (strcmp($newPhoneNumber, '') != 0) {
    if ($count > 0) {
        $updateString .= ", ";
    }
    $updateString .= "PhoneNumber='" . $newPhoneNumber . "' ";
    $count++;
}

if (strcmp($newFirstName, '') != 0) {
    if ($count > 0) {
        $updateString .= ", ";
    }
    $updateString .= "MFirstName='" . $newFirstName . "' ";
    $count++;
}

if (strcmp($newLastName, '') != 0) {
    if ($count > 0) {
        $updateString .= ", ";
    }
    $updateString .= "MLastName='" . $newLastName . "' ";
    $count++;
}
```

```

if (strcmp($newBirthDate, '') != 0) {
    if ($count > 0) {
        $updateString .= ", ";
    }
    $updateString .= "MBirthDate=TO_DATE('" . $newBirthDate . "', 'yyyy/mm/dd') ";
    $count++;
}
if (strcmp($newEmail, '') != 0) {
    if ($count > 0) {
        $updateString .= ", ";
    }
    $updateString .= "MEmail='" . $newEmail . "' ";
    $count++;
}
$updateString .= "WHERE MemberID='" . $memberID . "'";

executePlainSQL($updateString);

```

4. Selection

```

$query = "SELECT T." . $selectName .
" FROM " . $fromName . " T WHERE T." . $conditionAttribute . " " . $conditionName . " '" . $conditionInput . "'";

$result = executePlainSQL($query);
echo "<div class='container'><p>Retrieved $selectName from $fromName :</p><table>";
echo "<tr><th>$selectName</th></tr>";

```

5. Projection

```

$columns = implode(', ', $selectName); // Combining selected columns

$query = "SELECT $columns FROM Member";

$result = executePlainSQL($query);

```

6. Join

```
$result = executePlainSQL("SELECT HE.HasEquipmentID, HE.HasEquipmentType, M.MemberID, M.MLastName, M.MFirstName
FROM HasEquipment HE, Rents R, Reserves RSV, Member M
WHERE HE.HasEquipmentID = R.HasEquipmentID AND R.ReservationID = RSV.ReservationID AND RSV.MemberID = M.MemberID");
```

7. Aggregation with Group By

```
$query = "SELECT SC.SportsCenterLocation, AVG(EM.HourlyRate)
FROM SportsCenter SC, WorksFor WF, Employee EM
WHERE SC.SportsCenterLocation = WF.SportsCenterLocation AND WF.EmployeeID = EM.EmployeeID
GROUP BY SC.SportsCenterLocation";

$result = executePlainSQL($query);
```

8. Aggregation with Having

```
$query = "SELECT RGT.ClassName, MIN(ROUND((TO_DATE(CURRENT_DATE) - M.MBirthDate)/365, 0.1)), MAX(ROUND((TO_DATE(CURRENT_DATE) - M.MBirthDate)/365, 0.1))
FROM Member M, Registers RGT
WHERE M.MemberID = RGT.MemberID
GROUP BY RGT.ClassName
HAVING COUNT(*) > 1";

$result = executePlainSQL($query);
```

9. Nested Aggregation with Group By

```
$query = "SELECT F.FacilityName, MAX(F.Sqft), AVG(F.Sqft)
FROM Facility F
GROUP BY F.FacilityName
HAVING AVG (F.Sqft) > (SELECT AVG (Sqft) FROM Facility)";

$result = executePlainSQL($query);
```

10. Division

```
$result = executePlainSQL("SELECT S.SportsCenterLocation
FROM SportsCenter S
WHERE NOT EXISTS ((SELECT F.FacilityName
FROM Facility F)
MINUS (SELECT C.FacilityName
FROM Contains C
WHERE C.SportsCenterLocation = S.SportsCenterLocation))");
```

d. Screenshots of the sample output of the queries using the GUI

1. Insert

- Before Insert

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Michael | Jordan | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 5555 W 6th ave, Vancouver | 5555555555 | Spag | Moss | 13-JAN-15 | spag.moss@gmail.com |

- After Insert

Insert Values into Member

MemberID:

Address:

PhoneNumber:

MFirstName:

MLastName:

MBirthDate:

MEmail:

Insert

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Michael | Jordan | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 5555 W 6th ave, Vancouver | 5555555555 | Spag | Moss | 13-JAN-15 | spag.moss@gmail.com |
| M7777 | W 1st Ave | 7777777777 | Bob | Bacon | 09-SEP-99 | baconbob@gmail.com |

2. Delete

- Before Delete

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Michael | Jordan | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 5555 W 6th ave, Vancouver | 5555555555 | Spag | Moss | 13-JAN-15 | spag.moss@gmail.com |
| M0007 | 172 west 46th ave | 1234567 | chu | zhen | 01-JAN-90 | zheng@gmail.com |

- After delete

delete a specific member from Member

Member ID:

Submit

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Michael | Jordan | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 5555 W 6th ave, Vancouver | 5555555555 | Spag | Moss | 13-JAN-15 | spag.moss@gmail.com |

3. Update

- Before Update

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Michael | Jordan | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 5555 W 6th ave, Vancouver | 5555555555 | Spag | Moss | 13-JAN-15 | spag.moss@gmail.com |

- After update

Update information in Member

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

Must provide the memberID to update their attributes.

Member ID:

New Address:

New Phone Number:

New First Name:

New Last Name:

New Birth Date:

New Email:

Update

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Rain | Coast | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 5555 W 6th ave, Vancouver | 5555555555 | Spag | Moss | 13-JAN-15 | spag.moss@gmail.com |

4. Selection

- Before Selection

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Michael | Jordan | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 172 west 46th ave | 1234567 | chu | zhen | 01-JAN-99 | zheng@gmail.com |

- After Selection

Selection Tables

Choose a table: Choose a attribute:
 Choose a condition attribute: Choose a condition: condition input:

Submit

MLastName

Jordan

5. Projection

- Before Projection

| MemberID | Address | PhoneNumber | FirstName | LastName | BirthDate | Email |
|----------|---------------------------|-------------|-----------|----------|-----------|----------------------------|
| M0001 | 0000 W 1th ave, Vancouver | 0000000000 | Michael | Jordan | 17-FEB-63 | jordan.michael@gmail.com |
| M0002 | 1111 W 2th ave, Vancouver | 1111111111 | Lionel | Messi | 24-JUN-87 | messi.lionel@gmail.com |
| M0003 | 2222 W 3th ave, Vancouver | 2222222222 | Seri | Park | 28-SEP-77 | prak.seri@gmail.com |
| M0004 | 3333 W 4th ave, Vancouver | 3333333333 | Kathleen | Ledecky | 17-MAR-97 | ledecky.kethleen@gmail.com |
| M0005 | 4444 W 5th ave, Vancouver | 4444444444 | Conner | McDavid | 13-JAN-97 | mcdavid.conner@gmail.com |
| M0006 | 172 west 46th ave | 1234567 | chu | zhen | 01-JAN-99 | zheng@gmail.com |

- After Projection

Projection Member Table

Choose a attribute:

MemberID

PhoneNumber

MFirstName

MLastName

Submit

| MemberID | PhoneNumber | MFirstName | |
|----------|-------------|------------|--|
| M0001 | 0000000000 | Michael | |
| M0002 | 1111111111 | Lionel | |
| M0003 | 2222222222 | Seri | |
| M0004 | 3333333333 | Kathleen | |
| M0005 | 4444444444 | Conner | |
| M0006 | 1234567 | chu | |

6. Join

Join

Show equipment reservation history, Select all the reserved equipment id, type and the member name and ID who reserved the equipment

Submit

- Output of Join

| HasEquipmentID | HasEquipmentType | MemberID | MLastName | MFirstName |
|----------------|------------------|----------|-----------|------------|
| E0001 | Swimming Goggles | M0001 | Jordan | Michael |
| E0002 | Helmet | M0002 | Messi | Lionel |
| E0003 | Skates | M0003 | Park | Seri |
| E0004 | Racket | M0004 | Ledecky | Kathleen |
| E0005 | Tennis Ball | M0005 | McDavid | Conner |

7. Aggregation with Group By

Aggregation with Group By

For each sport center location, find the average hourly rates from all employees

Submit

- Output of Aggregation with Group By

SportsCenterLocation AVG HourlyRate

| | |
|-----------------|----|
| Richmond | 25 |
| Sunset | 20 |
| South Granville | 21 |
| Kitsilano | 11 |
| UBC | 50 |

8. Aggregation with having

Aggregation with Having

For each class with more than 1 enrollment, find the age of the youngest and oldest student who has taken this class

Submit

- Output of Aggregation with Having

ClassName youngest oldest

| | | |
|--------------|----|----|
| Intermediate | 26 | 46 |
| Beginner | 36 | 61 |

9. Nested Aggregation with Group By

Nested Aggregation with Group By

Find the largest area for each facility for which the average area of the facility is greater than the average area for all facilities

Submit

- Output of Nested Aggregation with Group By

| FacilityName | MAX Sqft | AVG Sqft |
|---------------|----------|----------|
| Swimming Pool | 6700 | 6020 |
| Tennis Court | 4800 | 4800 |

10. Division

Division

Find Sports Center Location contains all facilities

Submit

- Output of Division

Sports Center Location

UBC