University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 4

Date: April 5th 2023

Group Number: 76

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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

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Project Description

This project is a gym management software that models various aspects of gym operations, such as staff coordination, member sessions, equipment management, and session management. The database allows gym staff to view and manage memberships, organize various staff members, schedule personal training sessions, and book gym areas for fitness classes. The application technology stack is a desktop application with a database connection with JDBC and Oracle as the backend, and a Swing framework for the frontend to display queried information from the database.

SQL Script to Create Tables and Insert Data: In Project Repository, project_d9e5c_p3c9u_q7x2b/M4 Submission/SQLScriptSubmission.sql

Final Schema Changes

- Added ANumber as an attribute & foreign key to Equipment2, as we forgot to add ANumber in for M2 as it is also part of the primary key for Area (as per M2 feedback).
- Removed FCType as part of primary key for Fitness class as it is unneeded (as per M2 feedback).
- Changed sessionDate, startTime and endTime attributes to all be of SQL type DATE instead of VARCHAR.
- Changed level attribute in Clearance to clearanceLevel because 'level' is a keyword in SQL.
- Added the following schemas/added create table and insert value SQL statements accordingly:
    - OccursIn
    - Utilizes
    - Leads
    - WorksOn
    - Trains
    - Uses
    - Requires
        - At the time of writing M2, we had not yet created/implemented schemas for the many-to-many relationships in our ER diagram.
- (SQL Script Change): changed "On delete set default" to "On delete set null" as we realized Oracle does not support the on delete set default option.

Final Schema

Member(MID: INTEGER, name: VARCHAR(20), phone: VARCHAR(14), email: VARCHAR(30), **clearanceLevel**: INTEGER)

Clearance(clearanceLevel: INTEGER)

Floor(FNumber: INTEGER, capacity: INTEGER)

Requires(**clearanceLevel**: INTEGER, **FNumber**: INTEGER)

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Staff(SID: INTEGER, workingHours: VARCHAR(10), name: VARCHAR(20), SType: VARCHAR(20))

WorksOn(**SID**: INTEGER, **FNumber**: INTEGER)

Equipment(EID: INTEGER, name: VARCHAR(20), conditions: VARCHAR(20), usages: VARCHAR(20), **AType**: VARCHAR(20))

Area(AType: VARCHAR(20), ANumber: INTEGER **FNumber**: INTEGER)

Uses(**MID**: INTEGER, **EID**: INTEGER)

FitnessClass(FCtype: VARCHAR(15), **startTime**: DATE, **sessionDate**: DATE)

Leads(**SID**: INTEGER, **sessionDate**: Date, **startTime**: DATE)

OccursIn(**AType**: VARCHAR(20), **ANumber:** INTEGER, **FCDate**: VARCHAR(10), **startTime**: VARCHAR(8))

Session(sessionDate: DATE, startTime: DATE, endTime: DATE, duration: INTEGER)

Attends(**MID**: INTEGER, **sessionDate**: DATE, **startTime**: DATE, locker: INTEGER)

Utilizes(**EID**: INTEGER, **sessionDate**: DATE, **startTime**: DATE)

PersonalTrainer(**SID**: INTEGER, program: VARCHAR(15))

Trains(**SID**: INTEGER, **MID**: INTEGER)

OccursIn(**startTime:** DATE, **sessionDate**: DATE, **AType**: VARCHAR(20), **ANumber**: INTEGER)

Utilizes(**EID**: INTEGER, **startTime**: DATE, **sessionDate:** DATE)

Leads(**SID**: INTEGER, **startTime**: DATE, **sessionDate**: DATE)

WorksOn(**SID**: INTEGER, **FNumber**: INTEGER)

Trains(**MID**: INTEGER, **SID**: INTEGER)

Uses(**MID**: INTEGER, **EID**: INTEGER)

Requires(**clearanceLevel**: INTEGER, **FNumber**: INTEGER)

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Screenshots of Data

Member:

MID:1	NAME:Kevin Dang	PHONE:(778) 123 1234	EMAIL:kevindang@gmail.com	CLEARANCELEVEL:1
MID:2	NAME:Carter Yam	PHONE:(778) 234 2345	EMAIL:carteryam@gmail.com	CLEARANCELEVEL:2
MID:3	NAME:Kushagra Sethi	PHONE:(778) 345 3456	EMAIL:kushagrasethi@gmail.com	CLEARANCELEVEL:3
MID:4	NAME:John Smith	PHONE:(778) 456 4567	EMAIL:johnsmith@gmail.com	CLEARANCELEVEL:3
MID:5	NAME:Jane Doe	PHONE:(778) 567 5678	EMAIL:janedoe@gmail.com	CLEARANCELEVEL:1
MID:6	NAME:Pascal Siakam	PHONE:(778) 678 6789	EMAIL:pascalsiakam@gmail.com	CLEARANCELEVEL:2

Floor:

FNUMBER:1	CAPACITY:75
FNUMBER:2	CAPACITY:70
FNUMBER:3	CAPACITY:65

Area:

ANUMBER:1	ATYPE:Body Building	FNUMBER:1
ANUMBER:2	ATYPE:Cardio	FNUMBER:2
ANUMBER:2	ATYPE:Free Weights	FNUMBER:1
ANUMBER:3	ATYPE:Turf	FNUMBER:2
ANUMBER:4	ATYPE:Squat Racks	FNUMBER:1
ANUMBER:5	ATYPE:Machines	FNUMBER:1
ANUMBER:3	ATYPE:Calisthenics	FNUMBER:3

Equipment1:

NAME:Lat pulldown	USAGES:Back muscle
NAME:Squat rack	USAGES:Legs
NAME:Bench Press Rack	USAGES:Chest
NAME:Treadmill	USAGES:Cardio
NAME:Elliptical	USAGES:Cardio
NAME:Yoga mats	USAGES:Yoga exercises
NAME:Calf raise machine	USAGES:Calves

Equipment2:

EID:1	NAME:Lat pulldown	CONDITION:Brand spankin new	ATYPE:Body Building	ANUMBER:1
EID:2	NAME:Squat rack	CONDITION:Brand spankin new	ATYPE:Body Building	ANUMBER:1
EID:3	NAME:Bench Press Rack	CONDITION:Used	ATYPE:Body Building	ANUMBER:1
EID:4	NAME:Treadmill	CONDITION:Rusty	ATYPE:Cardio	ANUMBER:2
EID:7	NAME:Elliptical	CONDITION:Like new	ATYPE:Cardio	ANUMBER:2
EID:5	NAME:Yoga mats	CONDITION:Brand spankin new	ATYPE:Calisthenics	ANUMBER:3
EID:6	NAME:Calf raise machine	CONDITION:Used	ATYPE:Body Building	ANUMBER:1

Session1:

DURATION:5597	STARTTIME:14:23:05	ENDTIME:15:56:22
DURATION:7805	STARTTIME:02:01:52	ENDTIME:04:11:57
DURATION:2515	STARTTIME:20:13:48	ENDTIME:20:55:43
DURATION:5901	STARTTIME:10:08:00	ENDTIME:11:46:21
DURATION:3670	STARTTIME:15:33:56	ENDTIME:16:35:06
DURATION:5251	STARTTIME:15:30:14	ENDTIME:16:57:45
DURATION:4361	STARTTIME:15:29:30	ENDTIME:16:42:11
DURATION:6634	STARTTIME:18:11:00	ENDTIME:20:01:34
DURATION:7200	STARTTIME:18:00:00	ENDTIME:20:00:00

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Session2:

STARTTIME:14:23:05	ENDTIME:15:56:22	SESSIONDATE:2022-09-22
STARTTIME:02:01:52	ENDTIME:04:11:57	SESSIONDATE:2022-10-21
STARTTIME:20:13:48	ENDTIME:20:55:43	SESSIONDATE:2022-11-20
STARTTIME:10:08:00	ENDTIME:11:46:21	SESSIONDATE:2022-12-19
STARTTIME:15:33:56	ENDTIME:16:35:06	SESSIONDATE:2023-01-18
STARTTIME:15:30:14	ENDTIME:16:57:45	SESSIONDATE:2023-01-19
STARTTIME:15:29:30	ENDTIME:16:42:11	SESSIONDATE:2023-01-20
STARTTIME:18:11:00	ENDTIME:20:01:34	SESSIONDATE:2023-01-20
STARTTIME:18:00:00	ENDTIME:20:00:00	SESSIONDATE:2023-01-22

FitnessClass1:

STARTTIME:15:23:05	ENDTIME:17:23:05	DURATION:2401
STARTTIME:16:23:05	ENDTIME:18:23:05	DURATION:2402
STARTTIME:17:23:05	ENDTIME:19:23:05	DURATION:2403
STARTTIME:18:23:05	ENDTIME:20:23:05	DURATION:2404
STARTTIME:19:23:05	ENDTIME:21:23:05	DURATION:2405

FitnessClass2:

SESSIONDATE:2022-08-14	STARTTIME:15:23:05	ENDTIME:17:23:05	FCTYPE:Cardio
SESSIONDATE:2022-08-15	STARTTIME:16:23:05	ENDTIME:18:23:05	FCTYPE:Zumba
SESSIONDATE:2022-08-16	STARTTIME:17:23:05	ENDTIME:19:23:05	FCTYPE:Yoga
SESSIONDATE:2022-08-17	STARTTIME:18:23:05	ENDTIME:20:23:05	FCTYPE:HIIT
SESSIONDATE:2022-08-18	STARTTIME:19:23:05	ENDTIME:21:23:05	FCTYPE:Flow

Staff1:

STYPE:Full-Time Trainer	WORKINGHOURS:9am-5pm
STYPE:Part-Time Trainer	WORKINGHOURS:1pm-5pm
STYPE:Auxiliary Trainer	WORKINGHOURS:1pm-5pm
STYPE:Yoga Master	WORKINGHOURS:7pm-9pm
STYPE:Celebrity Trainer	WORKINGHOURS:9am-5pm
STYPE:Receptionist	WORKINGHOURS:7pm-9pm
STYPE:Custodian	WORKINGHOURS:7pm-9pm

Staff2:

SID:1	STYPE:Full-Time Trainer	NAME:Ice Cube
SID:2	STYPE:Part-Time Trainer	NAME:Kevin Hart
SID:3	STYPE:Auxiliary Trainer	NAME:Rihanna
SID:4	STYPE:Yoga Master	NAME:The Rock
SID:5	STYPE:Celebrity Trainer	NAME:Ryan Gosling
SID:6	STYPE:Receptionist	NAME:Ice Spice
SID:7	STYPE:Custodian	NAME:Rebecca Black

PersonalTrainer1:

STYPE:Full-Time Trainer	WORKINGHOURS:9am-5pm
STYPE:Part-Time Trainer	WORKINGHOURS:1pm-5pm
STYPE:Auxiliary Trainer	WORKINGHOURS:1pm-5pm
STYPE:Yoga Master	WORKINGHOURS:7pm-9pm
STYPE:Celebrity Trainer	WORKINGHOURS:7pm-9pm

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PersonalTrainer2:

SID:1	NAME:Ice Cube	STYPE:Full-Time Trainer	PROGRAM:Cardio
SID:2	NAME:Kevin Hart	STYPE:Part-Time Trainer	PROGRAM:Free Weights
SID:3	NAME:Rihanna	STYPE:Auxiliary Trainer	PROGRAM:Free Weights
SID:4	NAME:The Rock	STYPE:Yoga Master	PROGRAM:Yoga
SID:5	NAME:Ryan Gosling	STYPE:Celebrity Trainer	PROGRAM:Spin

Attends:

MID:1	SESSIONDATE:2022-09-22	STARTTIME:14:23:05	LOCKER:23
MID:1	SESSIONDATE:2022-10-21	STARTTIME:02:01:52	LOCKER:24
MID:3	SESSIONDATE:2022-11-20	STARTTIME:20:13:48	LOCKER:25
MID:6	SESSIONDATE:2022-12-19	STARTTIME:10:08:00	LOCKER:26
MID:2	SESSIONDATE:2023-01-18	STARTTIME:15:33:56	LOCKER:27
MID:2	SESSIONDATE:2023-01-19	STARTTIME:15:30:14	LOCKER:41
MID:2	SESSIONDATE:2023-01-20	STARTTIME:15:29:30	LOCKER:53
MID:6	SESSIONDATE:2023-01-20	STARTTIME:18:11:00	LOCKER:14
MID:6	SESSIONDATE:2023-01-22	STARTTIME:18:00:00	LOCKER:5

OccursIn:

ANUMBER:2	SESSIONDATE:2022-08-14	STARTTIME:15:23:05	ATYPE:Cardio
ANUMBER:3	SESSIONDATE:2022-08-15	STARTTIME:16:23:05	ATYPE:Turf

Utilizes:

EID:4	SESSIONDATE:2022-08-17	STARTTIME:18:23:05
EID:5	SESSIONDATE:2022-08-16	STARTTIME:17:23:05

Leads:

SID:1	SESSIONDATE:2022-08-14	STARTTIME:15:23:05
SID:1	SESSIONDATE:2022-08-15	STARTTIME:16:23:05
SID:4	SESSIONDATE:2022-08-16	STARTTIME:17:23:05
SID:5	SESSIONDATE:2022-08-18	STARTTIME:19:23:05
SID:6	SESSIONDATE:2022-08-17	STARTTIME:18:23:05

WorksOn:

SID:1	FNUMBER:1
SID:1	FNUMBER:2
SID:1	FNUMBER:3
SID:2	FNUMBER:1
SID:3	FNUMBER:2
SID:3	FNUMBER:3
SID:4	FNUMBER:1
SID:5	FNUMBER:1
SID:6	FNUMBER:1
SID:7	FNUMBER:1
SID:7	FNUMBER:2
SID:7	FNUMBER:3

Trains:

MID:4	SID:2
MID:6	SID:1

Uses:

MID:1	EID:1
MID:2	EID:6
MID:3	EID:7
MID:6	EID:2

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All SQL Queries

A file with a list of all SQL queries used/implemented can be found in our repository, by following the path: project_d9e5c_p3c9u_q7x2b/src/gym/sql/scripts/SQL_script.sql

In the repository/code, the implementations of these queries can be found in project_d9e5c_p3c9u_q7x2b/src/gym/database/DatabaseConnectionHandler.java.

- INSERT operation begins at line 78: Insert a new member into the database
- DELETE operation begins at line 133: Delete a staff member from the database having a certain SType
- UPDATE operation begins at line 218: Update a Member's phone/email
- SELECT operation begins at line 105: Select all Members who have clearance level equal to input clearance level
- PROJECT operation is a method that builds the query - line 1550: Choose any number of columns from any table
- JOIN operation begins at line 1706: Find member info for members who were in the gym on a certain date
- AGGREGATION WITH GROUP BY operation begins at line 1747: Find number of equipment with each condition
- AGGREGATION WITH HAVING operation begins at line 1776: Find Members who have had more than one session past Jan. 1st 2023
- NESTED AGGREGATION WITH GROUP BY operation begins at line 1808: Find Members who have had more than one long session (long session = session with longer than average duration)
- DIVISION operation begins at line 1839: Find staff members who have worked on all floors

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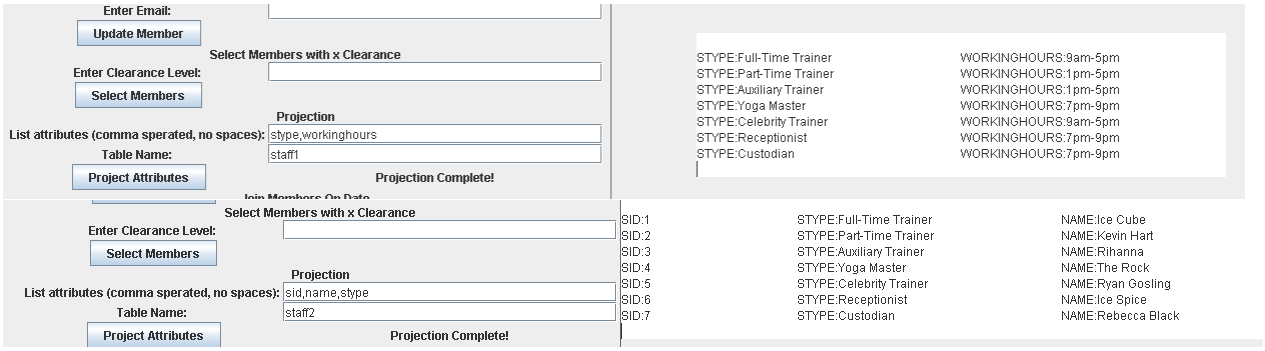
Screenshots Showing Query Functionality

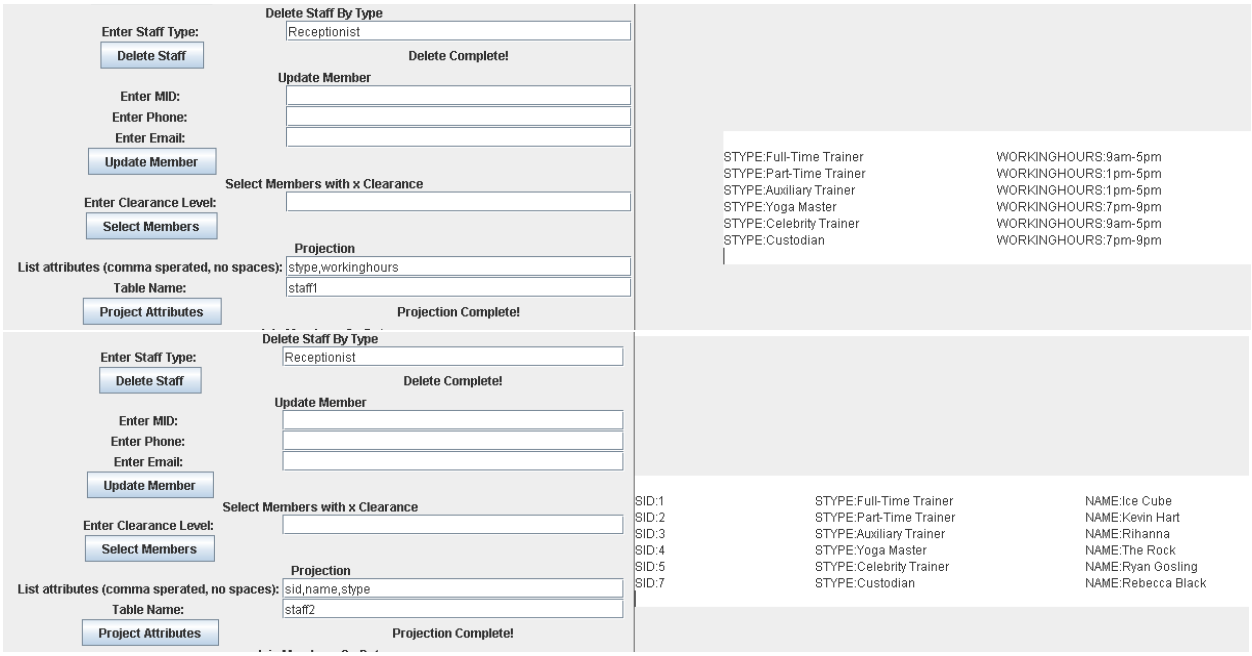
DELETE

Before:



During:

After:



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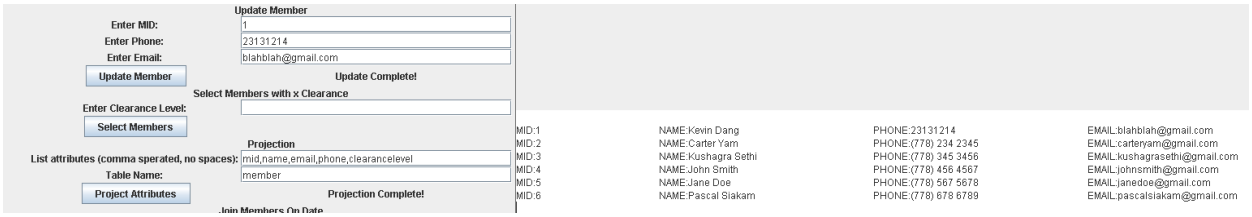
UPDATE

Before:

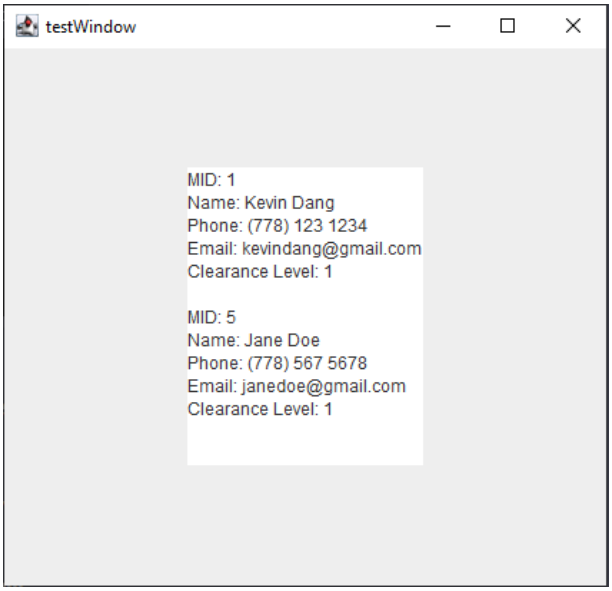
After:



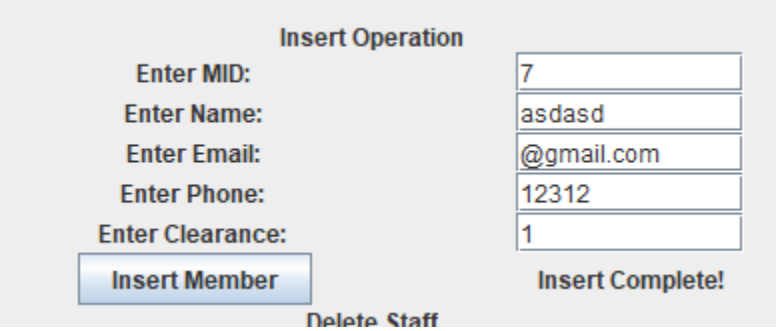
SELECT

Before/During:

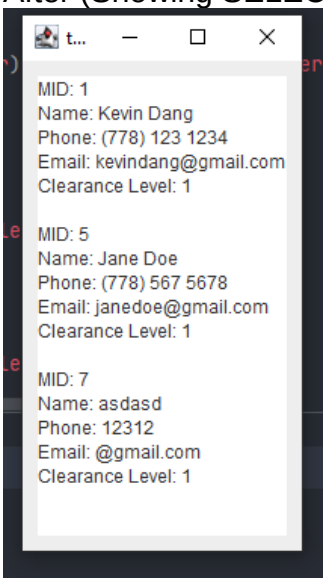
After:



INSERT (performed immediately after the above SELECT operation)
During (Inserting with Clearance = 1):



After (Showing SELECT Clearance = 1):



JOIN
During/After:

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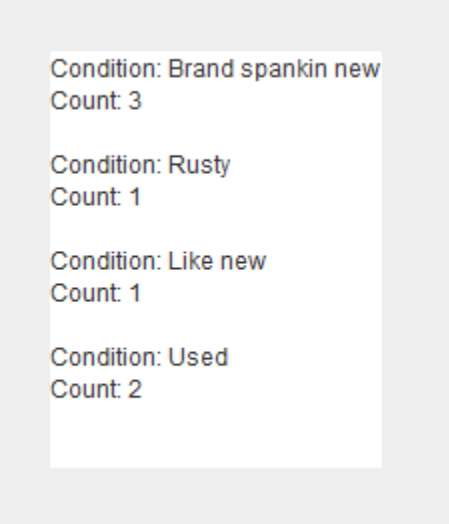
AGGREGATION WITH GROUP BY

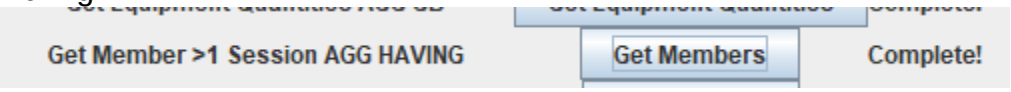
During:

After:

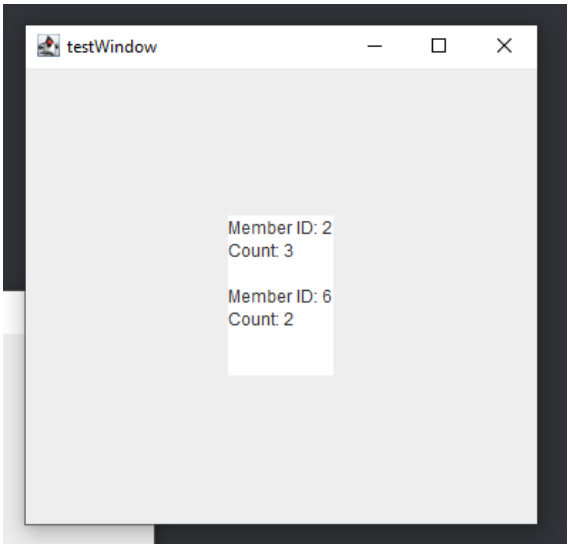


AGGREGATION WITH HAVING

During:



After:



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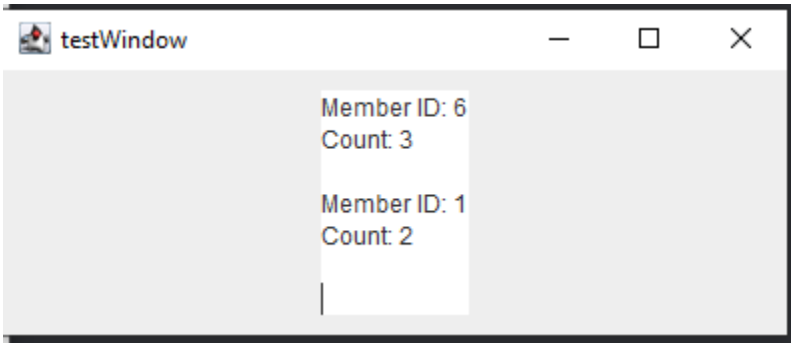
NESTED AGGREGATION WITH GROUP BY

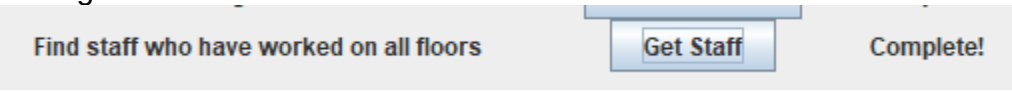
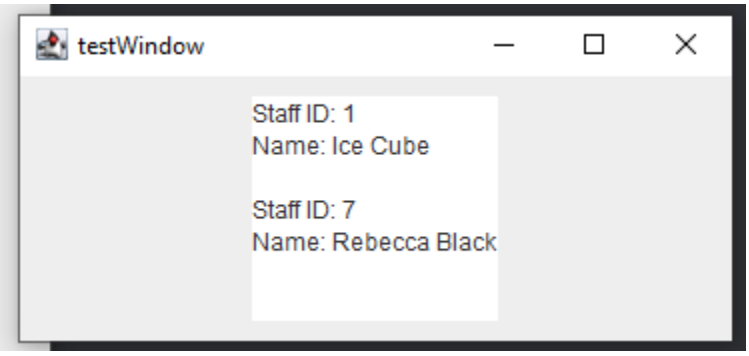
During:

After:



DIVISION

During:



After: