University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 4

Date: 04/05/2023

Group Number: 55

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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

SQL Script
Located in GitHub repository folder src/sql/init.sql

A: Project Summary:

This application will model a zoo management system to include care of animals, maintenance of habitats, logistics of its workers and also the zoo's shops and their associated merchandise. This application aims to aid a zoo in the management of its workers, property and animals. The application will organize animals, habitats, workers and vendors.

This project was implemented using Java/JDBC for the backend, Oracle for the database, and Java Swing for the GUI.

Accomplishments

The features that have actually been accomplished include:

- User can view all tables as if unnormalised, can select columns to view for all tables
- Insert veterinarians into the database
- Delete animals from the database, which also delete their associated relations
- Search the Computers table by manufacturer
- Update the fields of a worker
- Get the names of food for a species
- Find the total weight of all food orders in each of the storage units
- Find the storage units with total order weight less than a certain threshold so that users can find storages with enough space
- Find veterinarians that are paid less than or equal to the average pay for their specialization to keep track of who is underpaid
- Find the amazing zookeepers that feed all the animals in the zoo

B: Changes to Schema

- Removed the "Have" relation and put the foreign key w_id in Computers1. This reduces the number of tables.
- Added on delete cascade to all references to Animals1 so that deleting it will not violate foreign key constraints.

C: Copy of Schema with Screenshots:

Computers1(c-id: string, **model**: string)

	C_ID	W_ID	MODEL
1	1	1	Macbook Air 2020
2	2	2	Macbook Air 2019
3	3	3	Macbook Air 2018
4	4	4	Macbook Air 2017
5	5	5	Macbook Air 2016
6	6	<null>	Dell XPS 13
7	7	<null>	Dell XPS 13

Computers2(<u>model</u>: string, manufacturer: string, type: string)

	MODEL	MANUFACTURER	TYPE
1	Macbook Air 2020	Apple	Laptop
2	Macbook Air 2019	Apple	Laptop
3	Macbook Air 2018	Apple	Laptop
4	Macbook Air 2017	Apple	Laptop
5	Macbook Air 2016	Apple	Laptop
6	Dell XPS 13	Dell	Desktop

model, manufacture, type is not null

Workers(<u>w-id</u>: string, name: string, pay_rate: float, email: string, phone: string, address: string)
name, pay_rate, email, phone, address is not null
email, phone is unique
email is a CK
phone is a CK

	W_ID	NAME	PAY_RATE	ADDRESS	EMAIL	PHONE
1	1	Clive Yong	15.4	1234 noname street	cliveyong@domain.com	6041231234
2	2	Mana Longhenry	16	4321 thisthing street	manalong@domain.com	6042468100
3	3	Skye Joe	12.34	2468 somewhere way	SkyeJoe@domain.com	5852111212
4	4	Bob Way	15.4	1234 noname street	bobway@domain.com	6041231233
5	5	Richard Han	15.4	3579 somewhere place	richardh@domain.com	6043215678
6	6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999
7	7	Daniel Yuan	18	3579 somewhere place	daniel@domain.com	6049876543
8	8	Mia Park	17.5	2468 new street	miapark@domain.com	6042345678
9	9	Lisa Kim	14	2468 Elm St	lisa.kim@domain.com	5551234567
10	10	Daniel Park	14.5	blah St	danielpark@domain.com	6043216543
11	11	Alex Kim	15	789 3rd Ave	alex.kim@domain.com	6047891234

Zookeepers(**<u>w-id</u>**: string)

	W_ID
1	1
2	2
3	3
4	4
5	5
6	6

Vendors(**<u>w-id</u>**: string)

	W_ID
1	1
2	2
3	3
4	4
5	5

Veterinarians(**w-id**: string, specialization: string)

	W_ID	SPECIALIZATION
1	1	large felines
2	2	small felines
3	3	birds
4	4	reptiles
5	5	bears
6	7	large felines
7	8	small felines
8	9	birds
9	10	reptiles
10	11	bears

Habitats1(p-id: string, name: string, **biome**: string, area: integer)

	P_ID	NAME	BIOME	AREA
1	001	Tiger Habitat	Asian Taiga	37
2	002	Lion Habitat	African Savanna	27
3	003	Penguin Habitat	Antarctic Tundra	20
4	004	Giraffe Habitat	African Grasslands	40
5	005	Grizzly Bear Habitat	North American Woodlands	40

Habitats2(biome: string, temperature: integer, humidity: integer)

	BIOME	TEMPERATURE	HUMIDITY
1	Asian Taiga	32	70
2	African Savanna	30	20
3	Antarctic Tundra	-20	1
4	African Grasslands	28	25
5	North American Woodlands	25	70

biome, area is not null

Shops(p-id: string, name: string, type: string)
type is not null

	P_ID	NAME	TYPE
1	101	Clothing Store	Clothing
2	102	Drinks Store	Drinks
3	103	Plushy Store	Stuffed Animals
4	104	Balloon Store	Balloons
5	105	Food Store	Food

Storage_Units(p-id: string, name: string, temperature: integer)
temperature is not null

	P_ID	NAME	TEMPERATURE
1	201	Unit 1	2
2	202	Unit 2	-20
3	203	Unit 3	15
4	204	Unit 4	15
5	205	Unit 5	5

Items(i-id: string, **p-id**: string, name: string, stock: integer, price: float)
name, stock, price, p-id not null

	I_ID	P_ID	NAME	STOCK	PRICE
1	0001	101	T-Shirt	50	24.99
2	0002	102	Soda Bottle	20	3.5
3	0003	103	Penguin Stuffie	10	14.99
4	0004	104	Bear Balloon	30	4.99
5	0005	105	Hamburger	40	6.99

Animals1(a-id: string, **p-id**: string, name: string, **species**: string)

	A_ID	P_ID	NAME	SPECIES
1	1001	001	Stripe	Tiger
2	1002	002	Fluffy	Lion
3	1003	003	Slippy	Emperor Penguin
4	1004	004	Spots	Northern Giraffe
5	1005	003	Cuddles	Grizzly Bear

Animals2(species:string, genus: string)
species is not null, genus is not null, p-id is not null

	SPECIES	GENUS
1	Tiger	panthera
2	Lion	panthera
3	Emperor Penguin	Pinguinus
4	Northern Giraffe	Giraffa
5	Grizzly Bear	Ursus

Prepped_Food(**a-id**: string, name: string, weight: float)

	A_ID	NAME	WEIGHT
		Deer meat	20.1
2	1002	Raw beef	10
3	1003	Mashed sardines	15.7
4	1004	Prepared hay	25
5	1005	Cooked moose	30.2
6	1001	Raw beef	20.1
7	1002	Deer meat	10
8	1003	Tuna	15.7
9	1004	Vegetables	25
10	1005	Cooked elk	30.2

Raw_Food_Orders(o-id: string, contents: string, weight: integer, date_recieved: date, expiry_date: date)
contents, weight, date_received, expiry_date is not null

	O_ID	CONTENTS	WEIGHT	DATE_RECEIVED	EXPIRY_DATE
1	1	Deer and Moose meat	50	2023-01-27	2023-02-05
2	2	Sardines	30	2023-01-15	2023-02-01
3	3	Hay and fruits	32	2023-01-15	2023-02-10
4	4	Raw beef and chicken	10	2023-02-25	2023-03-09
5	5	Pellet food for Giraffes	100	2023-01-08	2023-06-08
6	6	Deer and Moose meat	12	2023-01-27	2023-02-05
7	7	Sardines	8	2023-01-15	2023-02-01
8	8	Hay and fruits	10	2023-01-15	2023-02-10
9	9	Raw beef and chicken	10	2023-02-25	2023-03-09
10	10	Pellet food for Giraffes	100	2023-01-08	2023-06-08

Works_at(**w-id**: string, **p-id**: string)

	W_ID	P_ID
1	1	101
2	2	102
3	3	103
4	4	104
5	5	105

Assigned_to(**w-id**: string, **p-id**: string)

	W_ID	P_ID
1	1	001
2	2	002
3	3	003
4	4	004
5	5	005

Feeds(**w-id**: string, **a-id**: string)

	W_ID	A_ID
1	1	1001
2	2	1002
3	3	1003
4	4	1004
5	5	1005
6	6	1001
7	6	1002
8	6	1003
9	6	1004
10	6	1005

Maintains_Health_of(**w-id**: string, **a-id**: string)

	W_ID	A_ID
1	1	1001
2	2	1002
3	3	1003
4	4	1004
5	5	1005

Cohabitates_with(**a-id1**: string, **a-id2**: string)

	A_ID1	A_ID2
1	1001	1002
2	1001	1003
3	1001	1004
4	1001	1005
5	1003	1004

Made_from(**a-id**: string, **name**: string, **o-id**: string)

	A_ID	NAME	O_ID
1	1001	Deer meat	1
2	1002	Raw beef	4
3	1003	Mashed sardines	2
4	1004	Prepared hay	3
5	1005	Cooked moose	1

Stored_at(**a-id**: string, **name**: string, **p-id**: string)

	A_ID	NAME	P_ID
1	1001	Deer meat	201
2	1002	Raw beef	201
3	1003	Mashed sardines	201
4	1004	Prepared hay	201
5	1005	Cooked moose	201

Located_at(**o-id**: string, **p-id**: string)

	O_ID	P_ID
	Select All	201
2	10	204
3	2	205
4	3	203
5	4	201
6	5	204
7	6	201
8	7	205
9	8	203
10	9	201

D: SQL Query Locations

Projection

src/database/DatabaseConectionHandler
Line 220, in getTableInfo(), helper function for projection queries
src/database/DatabaseConectionHandler
Line 825, in getAnimalInfo(), calls getTableInfo() with query parameters

Insert

src/database/DatabaseConectionHandler
Line 162, in insertVeterinarian(), inserts veterinarian, changes veterinarian and worker table

Delete

src/database/DatabaseConectionHandler
Line 125, in deleteAnimal(), deletes an animal and cascades over prepped food, and others

Update

src/database/DatabaseConectionHandler
Line 1092, in updateWorker(), updates worker

Selection

src/database/DatabaseConectionHandler
Line 56, in selectManufacturer(), Searches computers by manufacturer

Join

src/database/DatabaseConectionHandler
Line 96, in getSpeciesPreppedFood(), Get the names of the prepped food for a chosen species

Aggregation with GROUP BY

src/database/DatabaseConectionHandler
Line 1056, in getSumWeights(), Get the total weight inside a storage unit

Aggregation with HAVING

src/database/DatabaseConectionHandler
Line 1016, in getFreeStorage(), Get the storage units that aren't filled to a high weight (weight < 50)

Nested aggregation with GROUP BY

src/database/DatabaseConectionHandler
Line 962, in getCheapVeterinarians(), Get veterinarians that are paid less than or equal to average compared to other veterinarians in their same specialization

Division
src/database/DatabaseConectionHandler
Line 902, in getSuperZookeepers(), Get zookeepers who feed every animal in the zoo

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E: Screenshots Demonstrating Query Functionality:

Insert Veterinarian

Before

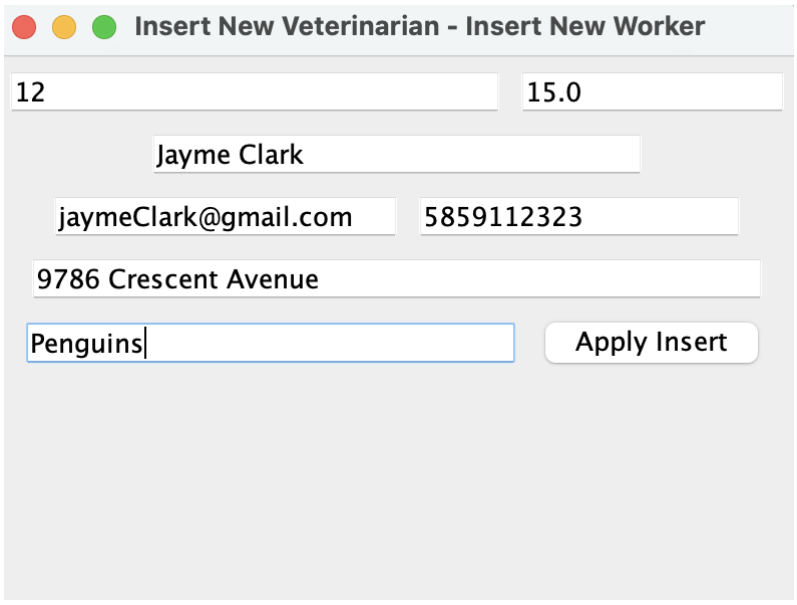
Veterinarian Table

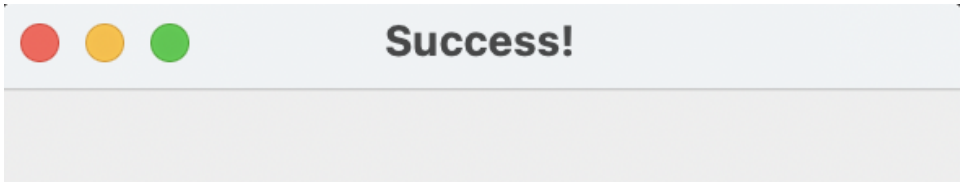
ID	Name	Pay Rate	Address	Email	Phone	Specialization
1	Clive Yong	15.4	1234 noname...	cliveyong@do...	6041231234	large felines
2	Mana Longhenry	16.0	4321 thisthing...	manalong@do...	6042468100	small felines
3	Skye Joe	12.34	2468 somewh...	SkyeJoe@dom...	5852111212	birds
4	Bob Way	15.4	1234 noname...	bobway@dom...	6041231233	reptiles
5	Richard Han	15.4	3579 somewh...	richardh@dom...	6043215678	bears
7	Daniel Yuan	18.0	3579 somewh...	daniel@domai...	6049876543	large felines
8	Mia Park	17.5	2468 new street	miapark@dom...	6042345678	small felines
9	Lisa Kim	14.0	2468 Elm St	lisa.kim@dom...	5551234567	birds
10	Daniel Park	14.5	blah St	danielpark@d...	6043216543	reptiles
11	Alex Kim	15.0	789 3rd Ave	alex.kim@do...	6047891234	bears

Workers Table

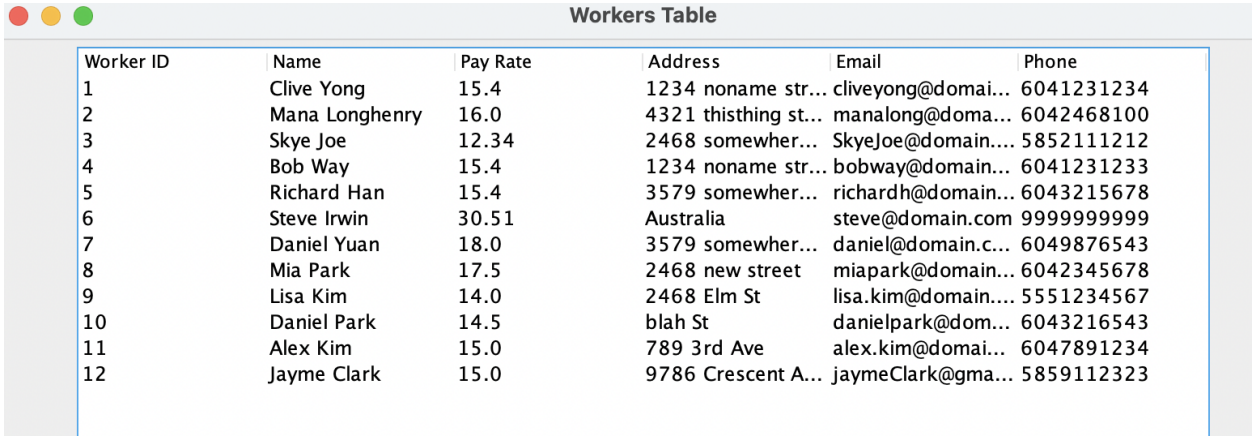
Worker ID	Name	Pay Rate	Address	Email	Phone
1	Clive Yong	15.4	1234 noname str...	cliveyong@domai...	6041231234
2	Mana Longhenry	16.0	4321 thisthing st...	manalong@doma...	6042468100
3	Skye Joe	12.34	2468 somewher...	SkyeJoe@domain....	5852111212
4	Bob Way	15.4	1234 noname str...	bobway@domain...	6041231233
5	Richard Han	15.4	3579 somewher...	richardh@domain...	6043215678
6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999
7	Daniel Yuan	18.0	3579 somewher...	daniel@domain.c...	6049876543
8	Mia Park	17.5	2468 new street	miapark@domain...	6042345678
9	Lisa Kim	14.0	2468 Elm St	lisa.kim@domain....	5551234567
10	Daniel Park	14.5	blah St	danielpark@dom...	6043216543
11	Alex Kim	15.0	789 3rd Ave	alex.kim@domai...	6047891234

During





After



Worker ID	Name	Pay Rate	Address	Email	Phone
1	Clive Yong	15.4	1234 noname str...	cliveyong@domai...	6041231234
2	Mana Longhenry	16.0	4321 thisthing st...	manalong@doma...	6042468100
3	Skye Joe	12.34	2468 somewher...	SkyeJoe@domain....	5852111212
4	Bob Way	15.4	1234 noname str...	bobway@domain...	6041231233
5	Richard Han	15.4	3579 somewher...	richardh@domain...	6043215678
6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999
7	Daniel Yuan	18.0	3579 somewher...	daniel@domain.c...	6049876543
8	Mia Park	17.5	2468 new street	miapark@domain...	6042345678
9	Lisa Kim	14.0	2468 Elm St	lisa.kim@domain....	5551234567
10	Daniel Park	14.5	blah St	danielpark@dom...	6043216543
11	Alex Kim	15.0	789 3rd Ave	alex.kim@domai...	6047891234
12	Jayme Clark	15.0	9786 Crescent A...	jaymeClark@gma...	5859112323

Delete Animal

Before

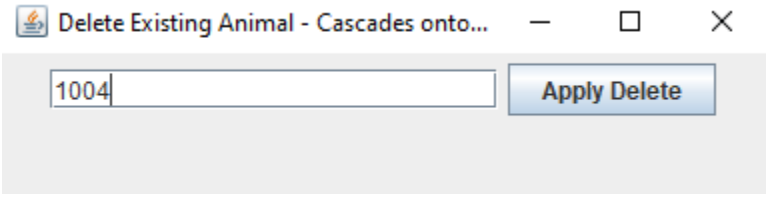
Animals Table

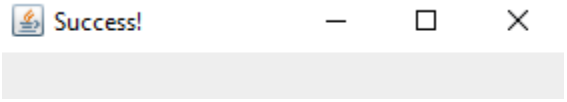
Animal ID	Habitat ID	Animal Name	Species	Genus
1001	001	Stripe	Tiger	panthera
1002	002	Fluffy	Lion	panthera
1003	003	Slippy	Emperor Penguin	Pinguinus
1004	004	Spots	Northern Giraffe	Giraffa
1005	003	Cuddles	Grizzly Bear	Ursus

Prepped Food Table

Animal ID	Food Name	Food Weight
1001	Deer meat	20.1
1002	Raw beef	10.0
1003	Mashed sardines	15.7
1004	Prepared hay	25.0
1005	Cooked moose	30.2

During





After

Animals Table

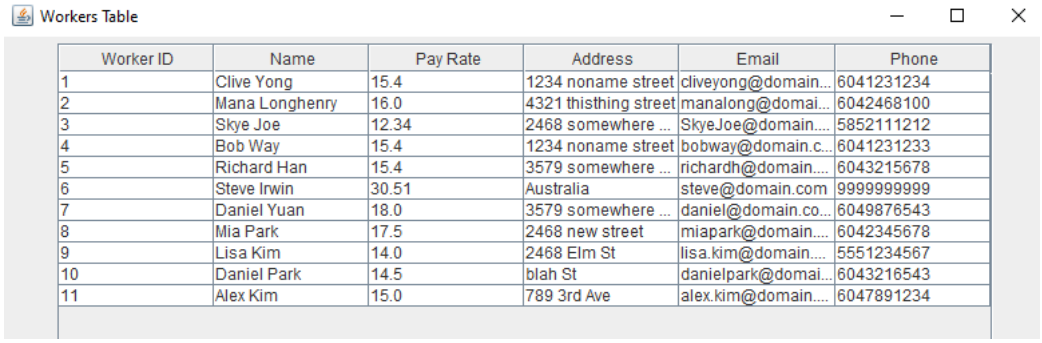
Animal ID	Habitat ID	Animal Name	Species	Genus
1001	001	Stripe	Tiger	panthera
1002	002	Fluffy	Lion	panthera
1003	003	Slippy	Emperor Penguin	Pinguinus
1005	003	Cuddles	Grizzly Bear	Ursus

Prepped Food Table

Animal ID	Food Name	Food Weight
1001	Deer meat	20.1
1002	Raw beef	10.0
1003	Mashed sardines	15.7
1005	Cooked moose	30.2

Update Worker

Before



Worker ID	Name	Pay Rate	Address	Email	Phone
1	Clive Yong	15.4	1234 noname street	cliveyong@domain...	6041231234
2	Mana Longhenry	16.0	4321 thisthing street	manalong@domai...	6042468100
3	Skye Joe	12.34	2468 somewhere ...	SkyeJoe@domain....	5852111212
4	Bob Way	15.4	1234 noname street	bobway@domain.c...	6041231233
5	Richard Han	15.4	3579 somewhere ...	richardh@domain....	6043215678
6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999
7	Daniel Yuan	18.0	3579 somewhere ...	daniel@domain.co...	6049876543
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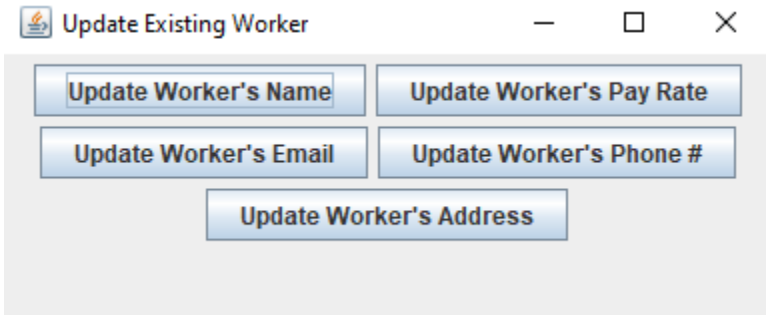
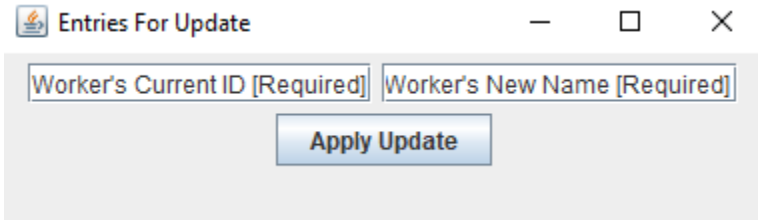
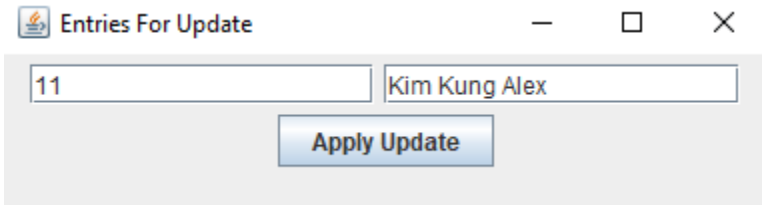
10	Daniel Park	14.5	blah St	danielpark@domai...	6043216543
11	Alex Kim	15.0	789 3rd Ave	alex.kim@domain....	6047891234

During







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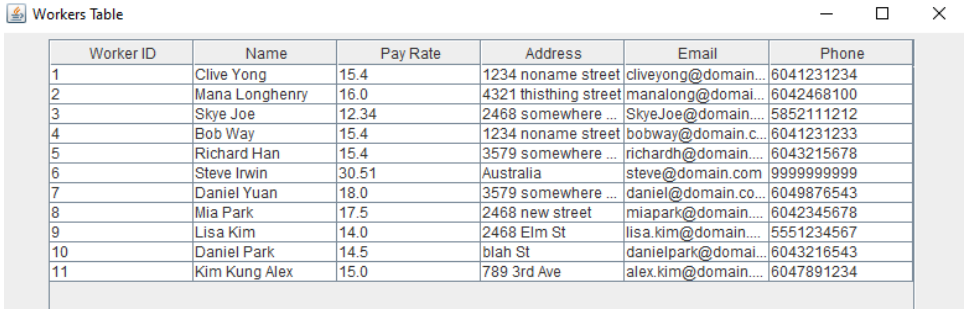
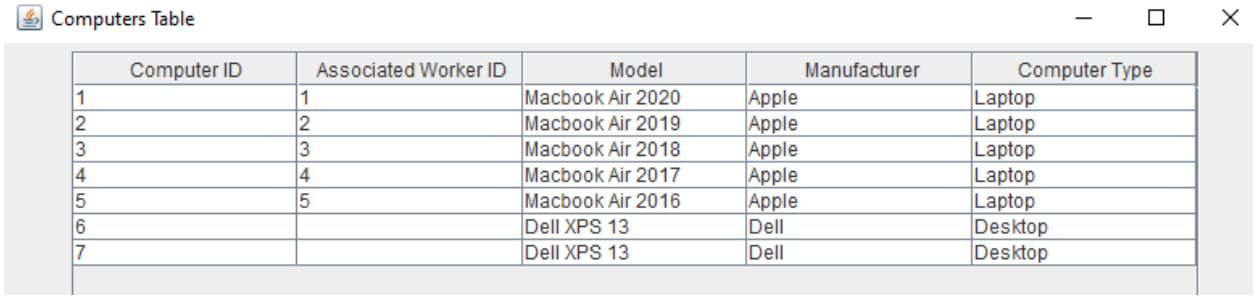


Worker ID	Name	Pay Rate	Address	Email	Phone
1	Clive Yong	15.4	1234 noname street	cliveyong@domain...	6041231234
2	Mana Longhenry	16.0	4321 thisthing street	manalong@domai...	6042468100
3	Skye Joe	12.34	2468 somewhere ...	SkyeJoe@domain....	5852111212
4	Bob Way	15.4	1234 noname street	bobway@domain.c...	6041231233
5	Richard Han	15.4	3579 somewhere ...	richardh@domain....	6043215678
6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999
7	Daniel Yuan	18.0	3579 somewhere ...	daniel@domain.co...	6049876543
8	Mia Park	17.5	2468 new street	miapark@domain....	6042345678
9	Lisa Kim	14.0	2468 Elm St	lisa.kim@domain....	5551234567
10	Daniel Park	14.5	blah St	danielpark@domai...	6043216543
11	Kim Kung Alex	15.0	789 3rd Ave	alex.kim@domain....	6047891234

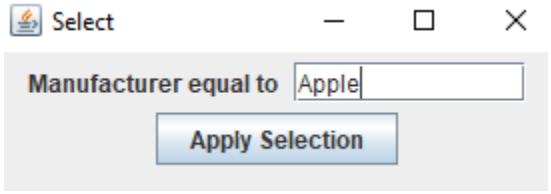
Selection: Computers From Specified Manufacturer

Before

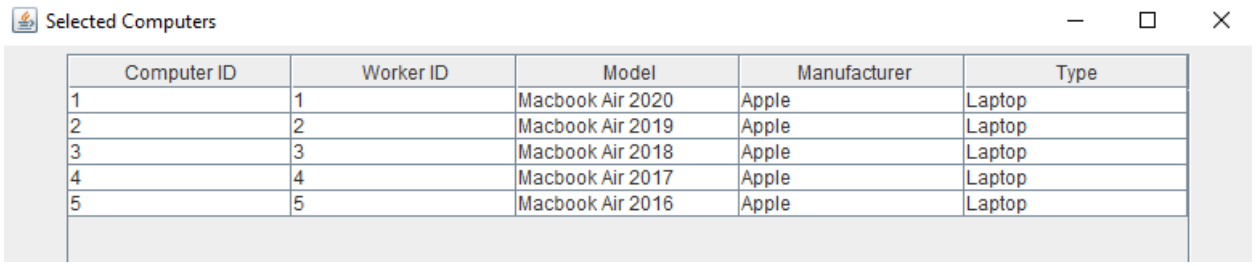


Computer ID	Associated Worker ID	Model	Manufacturer	Computer Type
1	1	Macbook Air 2020	Apple	Laptop
2	2	Macbook Air 2019	Apple	Laptop
3	3	Macbook Air 2018	Apple	Laptop
4	4	Macbook Air 2017	Apple	Laptop
5	5	Macbook Air 2016	Apple	Laptop
6		Dell XPS 13	Dell	Desktop
7		Dell XPS 13	Dell	Desktop

During



After



Computer ID	Worker ID	Model	Manufacturer	Type
1	1	Macbook Air 2020	Apple	Laptop
2	2	Macbook Air 2019	Apple	Laptop
3	3	Macbook Air 2018	Apple	Laptop
4	4	Macbook Air 2017	Apple	Laptop
5	5	Macbook Air 2016	Apple	Laptop

Projection For Any Entity/Relationship (ex. is on Animals)

Before

Animals Table

Animal ID	Habitat ID	Animal Name	Species	Genus
1001	001	Stripe	Tiger	panthera
1002	002	Fluffy	Lion	panthera
1003	003	Slippy	Emperor Penguin	Pinguinus
1004	004	Spots	Northern Giraffe	Giraffa
1005	003	Cuddles	Grizzly Bear	Ursus

During

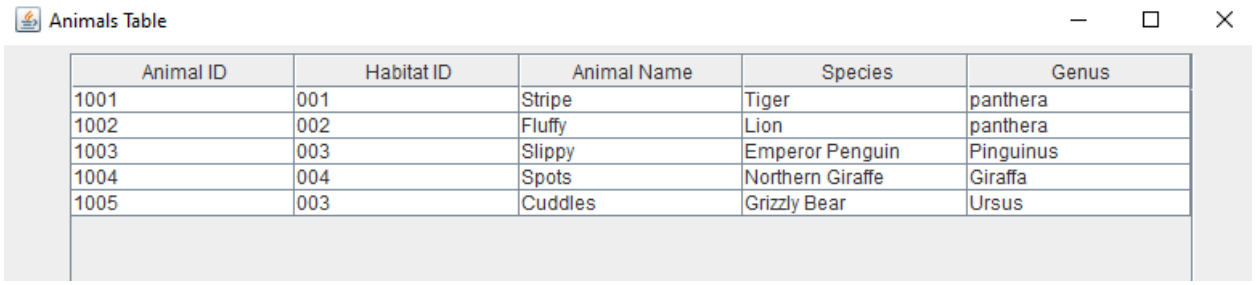
After

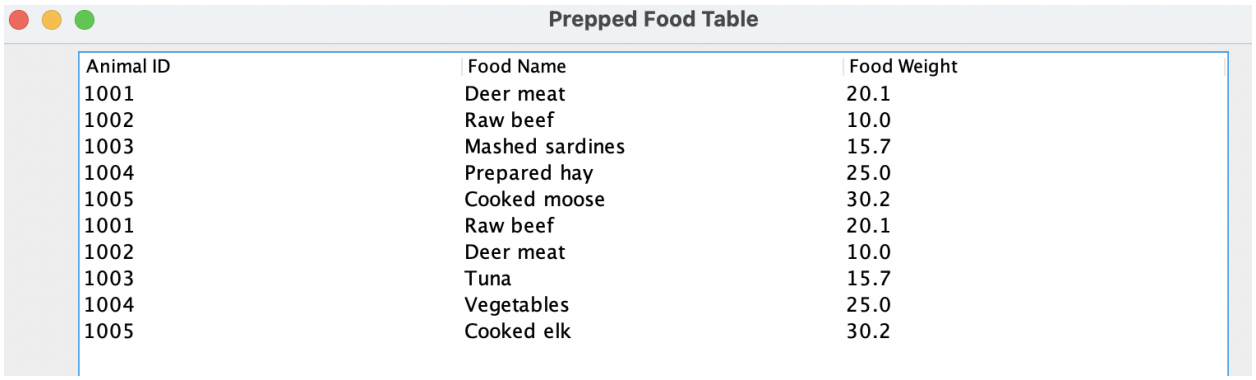
Projected Table

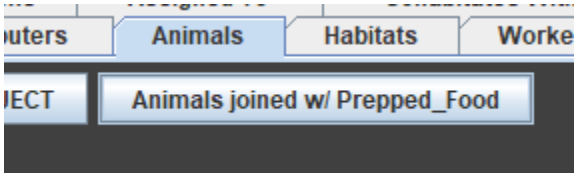
Name	Species	Genus
Stripe	Tiger	panthera
Fluffy	Lion	panthera
Slippy	Emperor Penguin	Pinguinus
Spots	Northern Giraffe	Giraffa
Cuddles	Grizzly Bear	Ursus

Join Animal(s) With Their Prepped Food

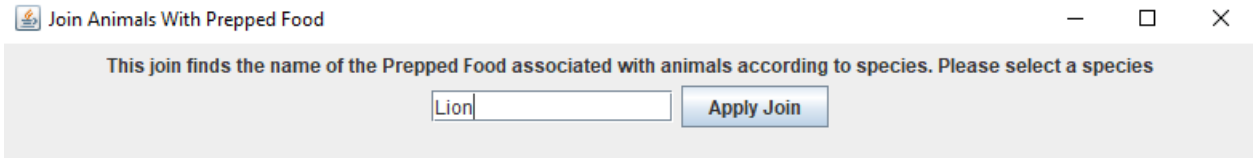
Before



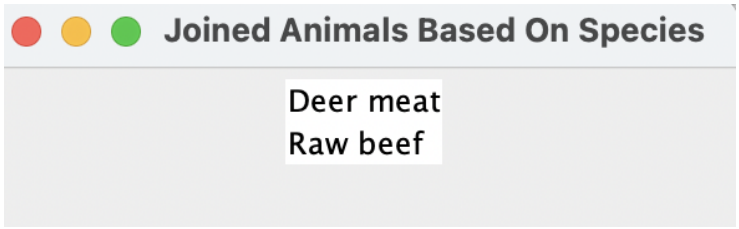




During



After



Aggregation By Group By: Find Total Weight of All Food Orders In Each Of The Storage Units

```
SELECT p_id, name, SUM(weight)
FROM Raw_Food_Orders o, StorageUnit s
GROUP BY p_id, name
```

Before

Raw Food Orders Table

Order ID	Contents	Weight	Date Received	Expiry Date
1	Deer and Moose meat	50	Fri Jan 27 00:00:00 ...	Sun Feb 05 00:00:0...
2	Sardines	30	Sun Jan 15 00:00:00...	Wed Feb 01 00:00:0...
3	Hay and fruits	32	Sun Jan 15 00:00:00...	Fri Feb 10 00:00:00 ...
4	Raw beef and chicken	10	Sat Feb 25 00:00:00...	Thu Mar 09 00:00:0...
5	Pellet food for Giraffes	100	Sun Jan 08 00:00:00...	Thu Jun 08 00:00:00...
6	Deer and Moose meat	12	Fri Jan 27 00:00:00 ...	Sun Feb 05 00:00:0...
7	Sardines	8	Sun Jan 15 00:00:00...	Wed Feb 01 00:00:0...
8	Hay and fruits	10	Sun Jan 15 00:00:00...	Fri Feb 10 00:00:00 ...
9	Raw beef and chicken	10	Sat Feb 25 00:00:00...	Thu Mar 09 00:00:0...
10	Pellet food for Giraffes	100	Sun Jan 08 00:00:00...	Thu Jun 08 00:00:00...

Storage Table

Place ID	Name	Temperature
201	Unit 1	2
202	Unit 2	-20
203	Unit 3	15
204	Unit 4	15
205	Unit 5	5

During

After

Aggregation With Group By

Sum the weights of raw food orders grouped by their storage unit.

Place ID	Name	Weight Sum
204	Unit 4	200
203	Unit 3	42
201	Unit 1	82
205	Unit 5	38

Aggregation By Having: Find The Storage Units With Total Order Weight Less Than A Certain Threshold (<50):

```
SELECT p_id, name, SUM(weight)
FROM Raw_Food_Orders o, StorageUnit s
GROUP BY p_id, name
HAVING SUM(weight) < 50
```

Before

Raw Food Orders Table

Order ID	Contents	Weight	Date Received	Expiry Date
1	Deer and Moose meat	50	Fri Jan 27 00:00:00 ...	Sun Feb 05 00:00:0...
2	Sardines	30	Sun Jan 15 00:00:00...	Wed Feb 01 00:00:0...
3	Hay and fruits	32	Sun Jan 15 00:00:00...	Fri Feb 10 00:00:00 ...
4	Raw beef and chicken	10	Sat Feb 25 00:00:00...	Thu Mar 09 00:00:0...
5	Pellet food for Giraffes	100	Sun Jan 08 00:00:00...	Thu Jun 08 00:00:00...
6	Deer and Moose meat	12	Fri Jan 27 00:00:00 ...	Sun Feb 05 00:00:0...
7	Sardines	8	Sun Jan 15 00:00:00...	Wed Feb 01 00:00:0...
8	Hay and fruits	10	Sun Jan 15 00:00:00...	Fri Feb 10 00:00:00 ...
9	Raw beef and chicken	10	Sat Feb 25 00:00:00...	Thu Mar 09 00:00:0...
10	Pellet food for Giraffes	100	Sun Jan 08 00:00:00...	Thu Jun 08 00:00:00...

Storage Table

Place ID	Name	Temperature
201	Unit 1	2
202	Unit 2	-20
203	Unit 3	15
204	Unit 4	15
205	Unit 5	5

During

After

Aggregation With Having

Storage units found that meets restriction of weight < 50.

Place ID	Name	Weight Sum
203	Unit 3	42
205	Unit 5	38

Nested Aggregation: Find Veterinarians That Are Paid Less Than Or Equal To The Average Pay For Their Specialization

```
SELECT w_id, pay_rate
FROM Workers w, Veterinarian v
WHERE w.w_id = v.w_id AND
 pay_rate <= (SELECT AVG(w2.pay_rate) FROM Workers w2, Veterinarian v2
WHERE w2.w_id = v2.w_id
GROUP BY w2.specialization)
```

Before

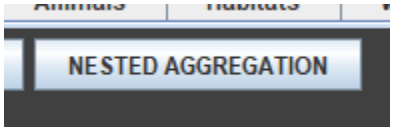
Workers Table

Worker ID	Name	Pay Rate	Address	Email	Phone
1	Clive Yong	15.4	1234 noname street	cliveyong@domain...	6041231234
2	Mana Longhenry	16.0	4321 thisthing street	manalong@domai...	6042468100
3	Skye Joe	12.34	2468 somewhere ...	SkyeJoe@domain....	5852111212
4	Bob Way	15.4	1234 noname street	bobway@domain.c...	6041231233
5	Richard Han	15.4	3579 somewhere ...	richardh@domain....	6043215678
6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999
7	Daniel Yuan	18.0	3579 somewhere ...	daniel@domain.co...	6049876543
8	Mia Park	17.5	2468 new street	miapark@domain....	6042345678
9	Lisa Kim	14.0	2468 Elm St	lisa.kim@domain....	5551234567
10	Daniel Park	14.5	blah St	danielpark@domai...	6043216543
11	Alex Kim	15.0	789 3rd Ave	alex.kim@domain....	6047891234

Veterinarian Table

ID	Name	Pay Rate	Address	Email	Phone	Specialization
1	Clive Yong	15.4	1234 noname s...	cliveyong@dom...	6041231234	large felines
2	Mana Longhenry	16.0	4321 thisthing s...	manalong@do...	6042468100	small felines
3	Skye Joe	12.34	2468 somewhe...	SkyeJoe@dom...	5852111212	birds
4	Bob Way	15.4	1234 noname s...	bobway@doma...	6041231233	reptiles
5	Richard Han	15.4	3579 somewhe...	richardh@dom...	6043215678	bears
7	Daniel Yuan	18.0	3579 somewhe...	daniel@domai...	6049876543	large felines
8	Mia Park	17.5	2468 new street	miapark@dom...	6042345678	small felines
9	Lisa Kim	14.0	2468 Elm St	lisa.kim@doma...	5551234567	birds
10	Daniel Park	14.5	blah St	danielpark@do...	6043216543	reptiles
11	Alex Kim	15.0	789 3rd Ave	alex.kim@dom...	6047891234	bears

During



After

Get Veterinarians With Lower Than Average Pay

Find all Veterinarians That Have Lower Than Average Worker Pay

Worker ID	Name	Pay Rate	Address	Email	Phone	Specialization
1	Clive Yong	15.4	1234 noname s...	cliveyong@dom...	6041231234	large felines
2	Mana Longhenry	16.0	4321 thisthing s...	manalong@do...	6042468100	small felines
3	Skye Joe	12.34	2468 somewhe...	SkyeJoe@dom...	5852111212	birds
10	Daniel Park	14.5	blah St	danielpark@do...	6043216543	reptiles
11	Alex Kim	15.0	789 3rd Ave	alex.kim@dom...	6047891234	bears

Division: All Zookeepers That Feed All Animals

Before

Zookeepers Table

Worker ID	Name	Pay Rate	Address	Email	Phone
1	Clive Yong	15.4	1234 noname street	cliveyong@domain...	6041231234
2	Mana Longhenry	16.0	4321 thisthing street	manalong@domai...	6042468100
3	Skye Joe	12.34	2468 somewhere ...	SkyeJoe@domain....	5852111212
4	Bob Way	15.4	1234 noname street	bobway@domain.c...	6041231233
5	Richard Han	15.4	3579 somewhere ...	richardh@domain....	6043215678
6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999

Feeds Table

Worker ID	Animal ID
1	1001
2	1002
3	1003
4	1004
5	1005
6	1001
6	1002
6	1003
6	1004
6	1005

During

After

Get Zookeeper That Feeds All The Animals

Find super zookeepers that feed every animal in the zoo.

ID	Name	Pay Rate	Address	Email	Phone
6	Steve Irwin	30.51	Australia	steve@domain.com	9999999999