CPSC 304 Project Cover Page

Milestone #: _4__

Date: _05-04-2024__

Group Number: __45__

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Pranjali Lal Das	62309620	d7j0y	pranjalidas2201@gmail.com
Chen Tong	69184950	h8r8i	tc0822@student.ubc.ca
Chang Huanfei	26638593	a6k2b	changhuanfei@163.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

Repository Link

https://github.students.cs.ubc.ca/CPSC304-2023W-T2/project_a6k2b_d7j0y_h8r8i

Project Description

(a) A short description of the final project, and what it accomplished.

The project is based on the database management of an agricultural firm. The model can be used by agricultural companies for farm and farmer management, crop production and crop distribution. The application system is based on two types of users - one are the employees of the company and the other are not the employees. The employees - farmers and supervisors - have a system to login and see the data required for their role. Supervisors can see the crop production and management of farms while farmers can see their details associated with the company. The general users (the ones not working with the company) can see the non-confidential data such as the crops that the company produces, the farms that the company owns and the farms that produce all the crops.

(b)A description of how your final schema differed from the schema you turned in.

The following changes were made in the final schema

1. Change of data types of area in Monitored_Farms1 to Float from Varchar
   Reason - Area of a farm can be represented using float instead of varchar as it does not need character.
2. Change in Crop relation
   We merged the two crop relations Crops1 (crop_id, crop_name, crop_status) and Crops2 (crop_name, growth_duration) to Crops (crop_name, growth_duration_days). This change was made because we think we don't need a crop_id as the name of crops are always different and crop status depends upon farm and the day the crop was planted. The Crop relations shows the crops for all crops in the company and not specifically for one farm.
3. We can made two Produced relations -
   Produce(**crop_name,farm_id**,start_month_start_year,quantity) and ProduceStatus(**crop_name,farn_id**,start_month,start_date,status). We eliminated the Produced2 relation as we think that area is a significant attribute for the relationship between Farm and Crops and therefore can be removed by removing the Produce3 relation.
4. As there was a change in the primary key of Crop relation - the subsequent changes in Crop_Soil and Sold1 were applied when crop_name acts a foreign key.

(c)A copy of the schema and screenshots that show what data is present in each relation after the SQL script from item #2 is run.

The following is the final schema:

1. Monitored_Farms (farm_id, location, area, supervisior_id, phone_number, supervisior_name, salary)
2. Monitored_Farms2 (salary, bonus)
3. Monitored_Farms3 (area, budget)
4. Farming_Equipment1(tool_id, tool_name, manufacturer, **farm_id**)
5. Farming_Equipment2 (tool_name, manufacturer, price)
6. Farming_Equipment3 (tool_name, tool_usage)
7. Working_Farmers (farmer_id, farmer_name, farmer_phone_number, famer_type, **farm_id**, farmer_hours)
8. Working_Farmers2 (famer_type**, farm_id**, hourly_wage)

9. FruitBasket (fruit_name, **farm_id**, quantity)
10. Crop(crop_name, growth_duration_days)
11. Produce (**crop_name**, **farm_id**, startMonth, startYear ,quantity)
12. ProducedStatus(**crop_name, farm_id, startMonth, startYear**, crop_status)
13. Soil_Type1 (soil_id, soil_name, texture)
14. Soil_Type2 (texture, pH)
15. Farm_Soil(**farm_id, soil_id**)
16. Crop_Soil(**crop_name**, **soil_id**)
17. Sold1 (**channel_id,** crop_name, quantity, price)
18. Sold_Fruits(**channel_id, fruit_name, farm_id**, quantity, price)
19. Distribution_Channel(channel_id, channel_name)
20. Online(**channel_id**, url)
21. Offline (**channel_id**, address)

Monitored_Farms

farm_id	location	area	supervisior_id	phone_number	supervisior_name	salary
FARM001	1050 West 14th Ave	100	SUP001	555-0101	John Doe	70000
FARM002	2020 East 7th Ave	150	SUP002	555-0102	Jane Smith	75000
FARM003	3080 North 3rd St	120.2	SUP003	555-0103	Emily White	72000
FARM004	4500 South 12th St	200.5	SUP004	555-0104	Michael Brown	68000
FARM005	5190 West 20th Ave	180.88	SUP005	555-0105	Alex Johnson	71000

Monitored_Farms2

salary	bonus
68000	4800
70000	5000
71000	5100
72000	5200
75000	5500

Monitored_Farms3

area	budget
100	100000
150	150000
120	120000
200	200000
180	180000

Farming_Equipment1

tool_id	tool_name	manufacturer	farm_id
TOOL001	Tractor	John Deere	FARM001
TOOL002	Plough	Caterpillar	FARM002
TOOL003	Harvester	Kubota	FARM003
TOOL004	Sprayer	Case IH	FARM004
TOOL005	Seeder	New Holland	FARM005

Farming_Equipment2

tool_name	manufacturer	price
Tilling	John Deere	25000
Ploughing	Caterpillar	15000
Harvesting	Kubota	35000
Spraying	Case IH	20000
Seeding	New Holland	18000

Farming_Equipment3

tool_name	tool_usage
Tractor	Tilling
Plough	Ploughing
Harvester	Harvesting
Sprayer	Spraying
Seeder	Seeding

FruitBasket

fruit_name	farm_id	quantity
Apples	FARM001	500
Oranges	FARM002	300
Grapes	FARM003	450
Bananas	FARM004	600
Strawberries	FARM005	400

Working_Farmers

farmer_id	farmer_name	farmer_phone_number	farmer_type	farm_id	farmer_hours
FARMER001	Tom Hardy	555-0201	Junior Farmer	FARM001	40.2
FARMER002	Natalie Portman	555-0202	Senior Farmer	FARM002	45
FARMER003	Chris Evans	555-0203	Junior Farmer	FARM003	38
FARMER004	Scarlett Johansson	555-0204	Supervisor	FARM004	50.5
FARMER005	Mark Ruffalo	555-0205	Senior Farmer	FARM005	42

Working_Farmers2

farmer_type	farm_id	hourly_wage
Junior Farmer	FARM001	20
Senior Farmer	FARM002	25
Junior Farmer	FARM003	20
Supervisor	FARM004	30
Senior Farmer	FARM005	25

Crop

crop_name	growth_duration_days
Wheat	120
Corn	96
Soybeans	110
Rice	78
Barley	62

Produce

crop_name	farm_id	start_month	start_year	quantity
Wheat	FARM001	May	2023	200
Rice	FARM002	April	2024	170
Corn	FARM003	December	2023	93
Soybeans	FARM004	April	2022	72
Barley	FARM005	September	2023	220

ProduceStatus

crop_name	farm_id	start_month	start_year	status
Wheat	FARM001	May	2023	harvested
Rice	FARM002	April	2024	sowing
Corn	FARM003	December	2023	irrigation
Soybeans	FARM004	April	2022	sowing
Barley	FARM005	September	2023	fertilizer

Crop_Soil

crop_name	soil_id
Soybeans	SOIL001
Barley	SOIL001
Wheat	SOIL002
Rice	SOIL001
Corn	SOIL002

Distribution_Channel

channel_id	channel_name
CH001	Local Market
CH002	Export
CH003	Farmers Market
CH004	Online Sales
CH005	Direct to Consumer

Farm_Soil

farm_id	soil_id
FARM001	SOIL001
FARM002	SOIL002
FARM004	SOIL004
FARM003	SOIL003
FARM005	SOIL005

Soil_Type1

soil_id	soil_name	texture
SOIL001	Loamy	Smooth
SOIL002	Clay	Sticky
SOIL003	Sandy	Grainy
SOIL004	Peaty	Spongy
SOIL005	Silty	Silky

Soil_Type2

texture	pH
Smooth	6.5
Sticky	7
Grainy	5.5
Spongy	5.8
Silky	6.2

Sold_fruits

channel_id	fruit_name	farm_id	quantity	price
CH002	Apples	FARM001	20	6.5
CH005	Oranges	FARM002	30	9
CH001	Bananas	FARM004	40	8.5
CH003	Strawberries	FARM005	60	12.5
CH005	Grapes	FARM003	70	7.5

Sold1

channel_id	crop_name	quantity	price
CH001	Wheat	200	10.5
CH002	Corn	150	7.25
CH003	Soybeans	100	8.75
CH004	Rice	250	9
CH005	Barley	180	6.5

Offline

channel_id	address
CH001	123 Local Market St
CH002	456 Export Blvd
CH003	789 Farmers Market Ave
CH004	404 Harvest Home Rd
CH005	505 Tractor Trail

Online

channel_id	url
CH004	www.onlineshoes.com
CH005	www.directtoconsumer.com
CH001	www.agriweb.com
CH002	www.farmgoods.org
CH003	www.cropsonline.net

(d)A list of all SQL queries used and where it can be found in the code (i.e., file name and line number(s)).

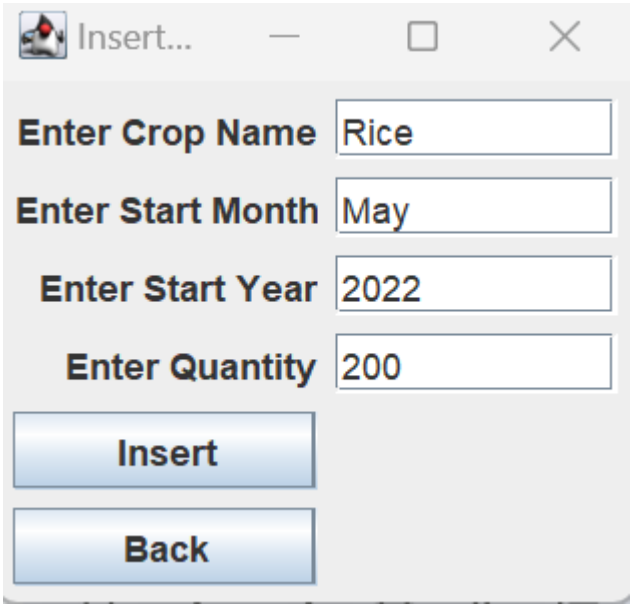
The queries can be found at - project_a6k2b_d7j0y_h8r8i/CPSC304-Java/src/ca/ubc/cs304/sql/scripts/queries.sql

The implementation of the queries can be found at project_a6k2b_d7j0y_h8r8i/CPSC304-Java/src/ca/ubc/cs304/database/DatabaseConnectionHandler.java

(e)Screenshots demonstrating the functionality of each query using the GUI.

INSERT QUERY

	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	QUANTITY
1	Corn	FARM003	January	2022	50
2	Corn	FARM003	September	2022	20
3	Corn	FARM003	May	2022	100

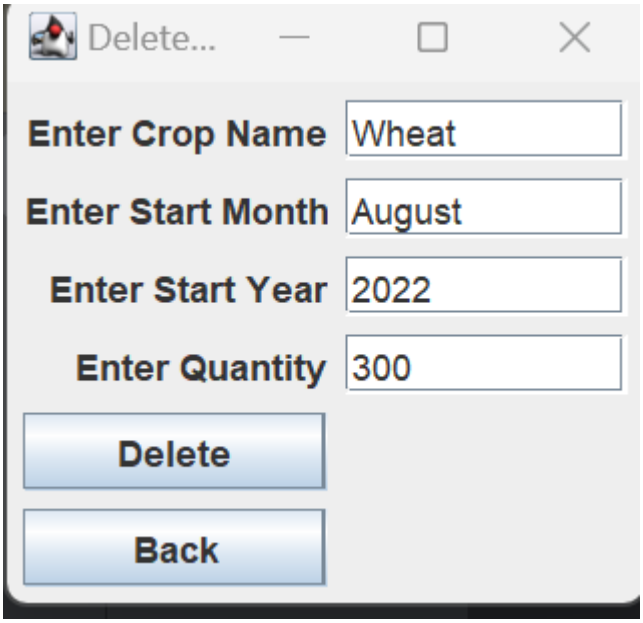


	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	QUANTITY
1	Corn	FARM003	January	2022	50
2	Corn	FARM003	September	2022	20
3	Corn	FARM003	May	2022	100
4	Rice	FARM003	May	2022	200

DELETE QUERY

11 rows | Tx: Manual | DDL | CSV

	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	QUANTITY
1	Corn	FARM002	May	2022	100
2	Corn	FARM002	September	2022	20
3	Corn	FARM002	January	2022	50
4	Wheat	FARM002	August	2021	320
5	Wheat	FARM002	April	2021	300
6	Wheat	FARM002	May	2021	200
7	Wheat	FARM002	August	2022	300
8	Wheat	FARM002	April	2022	240
9	Wheat	FARM002	August	2023	120
10	Wheat	FARM002	April	2023	120
11	Wheat	FARM002	May	2023	100



	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	QUANTITY
1	Corn	FARM002	May	2022	100
2	Corn	FARM002	September	2022	20
3	Corn	FARM002	January	2022	50
4	Wheat	FARM002	August	2021	320
5	Wheat	FARM002	April	2021	300
6	Wheat	FARM002	May	2021	200
7	Wheat	FARM002	April	2022	240
8	Wheat	FARM002	August	2023	120
9	Wheat	FARM002	April	2023	120
10	Wheat	FARM002	May	2023	100

UPDATE QUERY

	FARMER_ID	FARMER_NAME	FARMER_PHONE_NUMBER	FARMER_TYPE	FARM_ID	FARMER_HOURS
1	FARMER001	Tom Hardy	555-0201	Junior Farmer	FARM001	40.2

	FARMER_ID	FARMER_NAME	FARMER_PHONE_NUMBER	FARMER_TYPE	FARM_ID	FARMER_HOURS
1	FARMER001	Micheal Jardy	236-500-990	Junior Farmer	FARM001	333

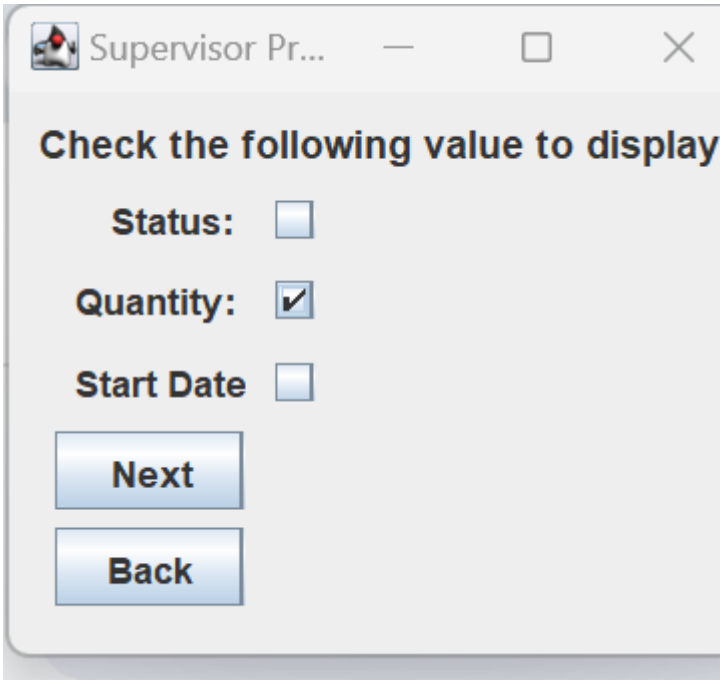
SELECTION QUERY

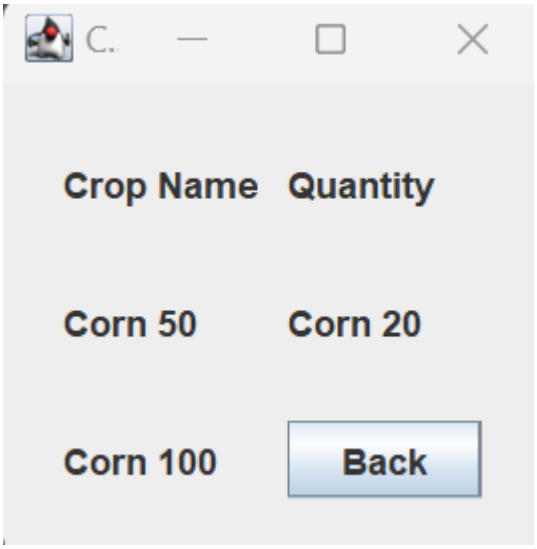
	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	STATUS
1	Corn	FARM003	January	2022	harvested
2	Corn	FARM003	September	2022	harvested
3	Corn	FARM003	May	2022	harvested

	CROP_NAME	START_MONTH	START_YEAR
1	Corn	January	2022
2	Corn	September	2022
3	Corn	May	2022

PROJECTION

	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	QUANTITY
1	Corn	FARM003	January	2022	50
2	Corn	FARM003	September	2022	20
3	Corn	FARM003	May	2022	100





	CROP_NAME	QUANTITY
1	Corn	50
2	Corn	20
3	Corn	100

JOIN

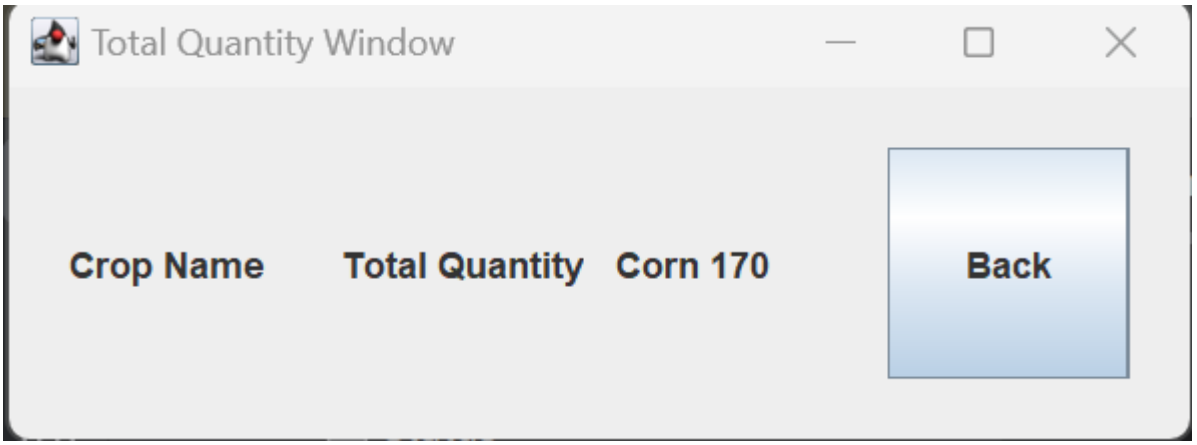
	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	STATUS
1	Wheat	FARM001	May	2021	sowing
2	Wheat	FARM001	April	2021	sowing
3	Wheat	FARM001	August	2021	harvested
4	Wheat	FARM001	April	2022	harvested
5	Wheat	FARM001	August	2022	harvested
6	Wheat	FARM001	May	2023	harvested
7	Wheat	FARM001	April	2023	harvested
8	Wheat	FARM001	August	2023	harvested
9	Rice	FARM001	April	2024	harvested
10	Rice	FARM001	May	2024	harvested
11	Rice	FARM001	June	2023	harvested
12	Rice	FARM001	August	2023	harvested
13	Corn	FARM001	January	2022	harvested
14	Corn	FARM001	September	2022	sowing
15	Corn	FARM001	May	2022	harvested

Crop Name	Quantity
Corn 50	Corn 20
Wheat 100	Wheat 240
Corn 100	Wheat 320
Wheat 300	Wheat 120
Wheat 200	

	CROP_NAME	QUANTITY
1	Corn	50
2	Corn	20
3	Wheat	100
4	Wheat	240
5	Corn	100
6	Wheat	320
7	Wheat	300
8	Wheat	120
9	Wheat	200

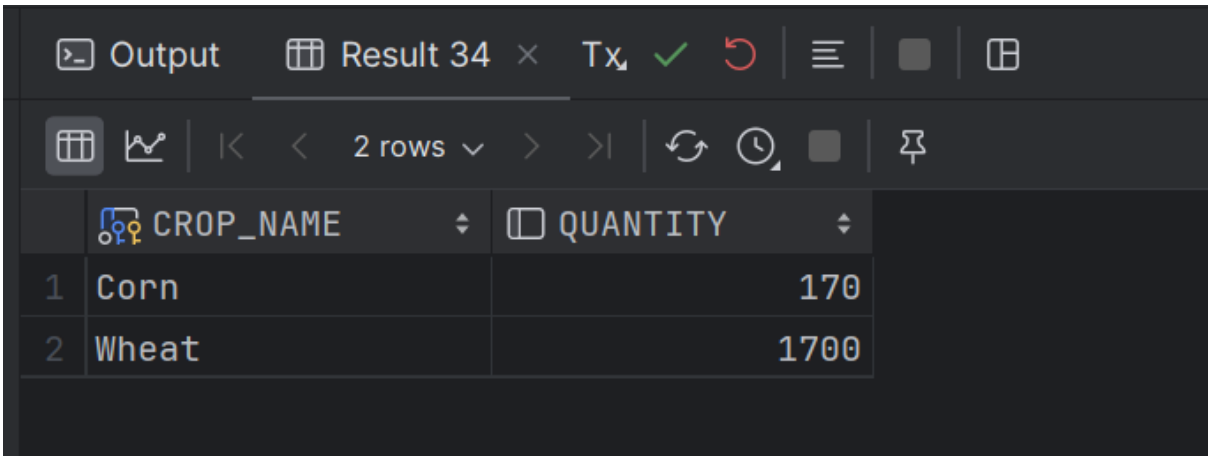
AGGREGATION BY GROUP BY

	CROP_NAME	FARM_ID	START_MONTH	START_YEAR	QUANTITY
1	Corn	FARM003	January	2022	50
2	Corn	FARM003	September	2022	20
3	Corn	FARM003	May	2022	100

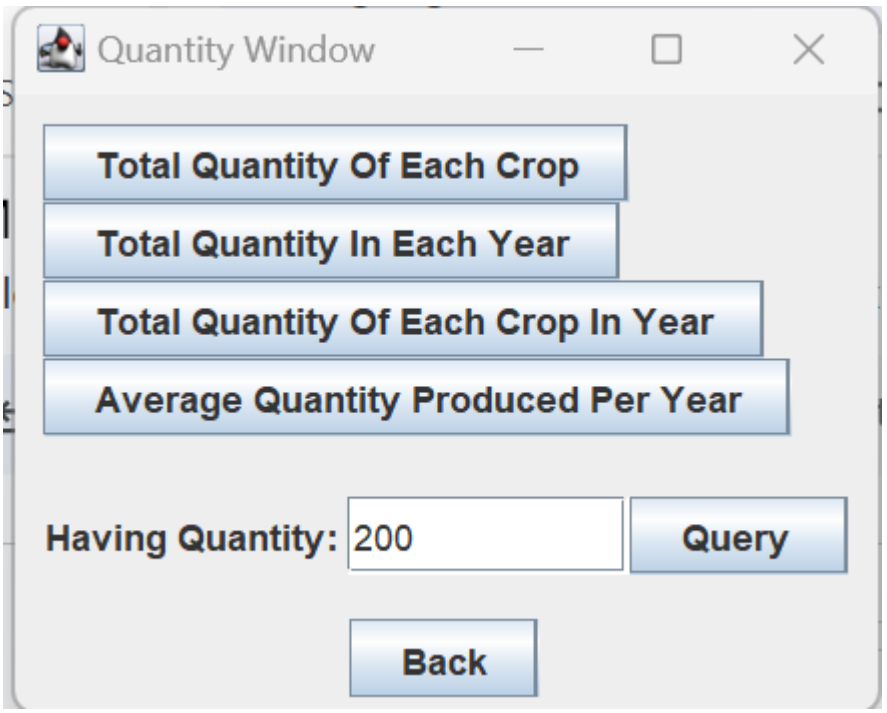


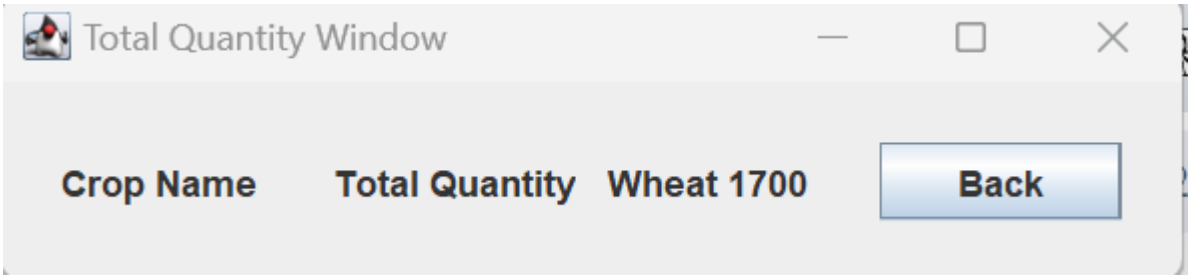
	CROP_NAME	"SUM(QUANTITY)"
1	Corn	170

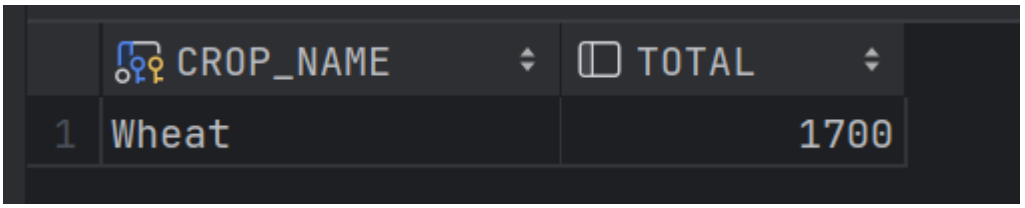
AGGREGATION BY GROUP BY HAVING



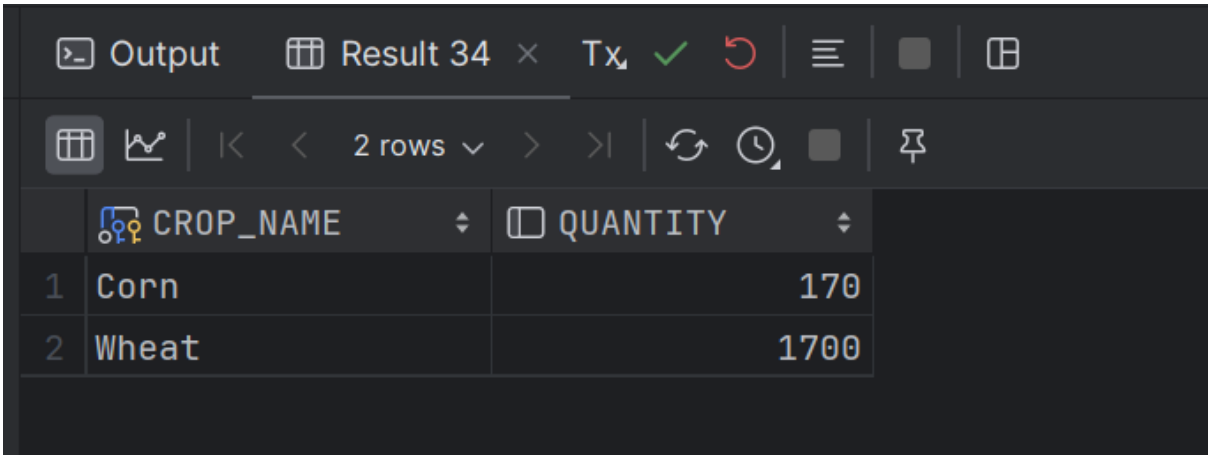
	CROP_NAME	QUANTITY
1	Corn	170
2	Wheat	1700

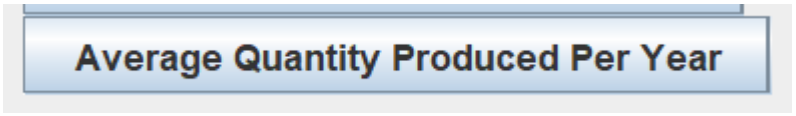


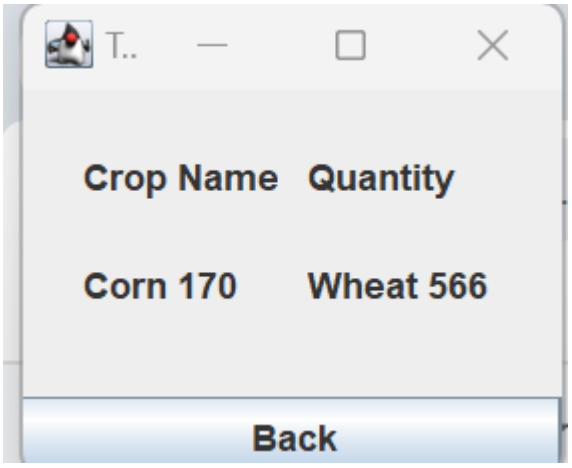


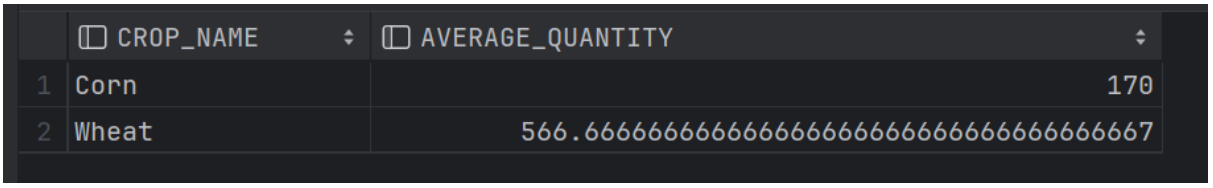


NESTED AGGREGATION


Output
Result 34
Tx
2 rows
CROP_NAME
QUANTITY
1 Corn 170
2 Wheat 1700

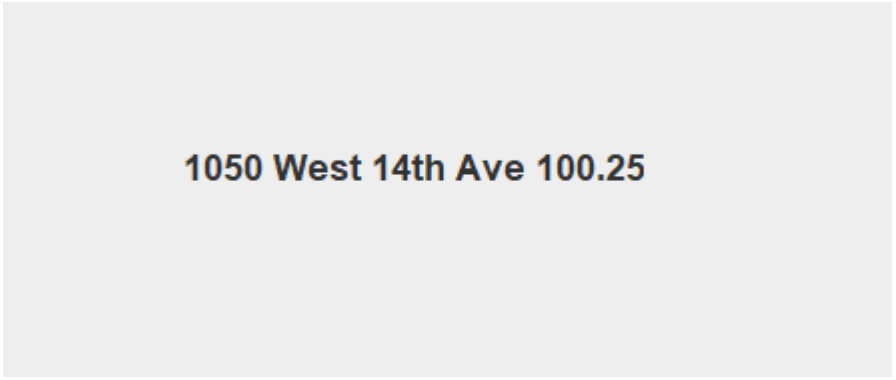

Average Quantity Produced Per Year


T..
Crop Name Quantity
Corn 170 Wheat 566
Back


CROP_NAME
AVERAGE_QUANTITY
1 Corn 170
2 Wheat 566.6666666666666666666666666666666667

DIVISION

	FARM_ID	CROP_NAME
1	FARM003	Corn
2	FARM001	Corn
3	FARM001	Wheat
4	FARM002	Corn
5	FARM001	Rice
6	FARM002	Wheat



	LOCATION	AREA
1	1050 West 14th Ave	100.25

Needed Assertions

1. Check that every farm has a soil type. There is a total participation between Farm and Soil but they are in many-to-many relationship.
2. Check that every crop has a soil type. There is a total participation between Crop and Soil but they are in many-to-many relationships.
3. Check that every Crop is sold. There is a total participation between Crop and Distribution_Channel but they are in many-to-many relationships.
4. Check that every Fruit is sold. There is a total participation between Fruit and Distribution_Channel but they are in many-to-many relationships.