

CPSC 304 Project Cover Page

Milestone #: 4

Date: 01-December-2023

Group Number: 116

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Emilyn Sim	11895182	f3y2z	emmysim16@gmail.com
Singh, Malkeet	85436434	z4g9l	msbahia17@gmail.com
Justin Burden	28771038	g3s2t	jburden1@student.ubc.ca

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

1. Project Description

The Community Garden Database is a database that aims to make gardening more accessible to people living in cities. With high rent prices and dense population, city residents have less space available to grow their own food at their living places. The lack of space coupled with rising grocery prices increases the demand for community gardens.

Our project is a tool directed towards city planners, providing the organization needed to track and optimize garden space. Users can create and delete gardens, catalog organizations which support or sponsor community gardens, and search for plots based on various attributes such as size and availability. The database facilitates the identification of gardens with openings for new gardeners, allowing for strategic planning. The database also highlights gardens and plots growing specific plant species, allowing for the potential to collaborate with local restaurants seeking fresh local produce. Additionally, users can identify engaged gardeners through event attendance, promoting a sense of community within the gardening network. Overall, our project aims to improve access to green spaces and connect communities through gardening.

Repository link:

Main:

https://github.students.cs.ubc.ca/CPSC304-2023W-T1/project_f3y2z_g3s2t_z4g9l/tree/main

Milestone 4:

https://github.students.cs.ubc.ca/CPSC304-2023W-T1/project_f3y2z_g3s2t_z4g9l/tree/main/milestone4

2. SQL Initialization Script

The SQL initialization script, 'gardenSQLinit.sql' is located in the milestone4 folder in the project repository (link provided below). Executing this script will create all necessary tables and populate the project's database. To facilitate multiple executions and resetting of the database, the script begins with DROP TABLE statements.

Within the script, we've incorporated Foreign Key, NOT NULL, and UNIQUE constraints to model various participation and key constraints outlined in the ER diagram from Milestone 2.

It's important to note that while the script successfully addresses many constraints, enforcement of total participation constraints involving the relations CommunityGarden and Has, DeliveryRequest and Contains, Plant and GrowsIn, and Event and Attends, would require the use of assertions which have not been implemented in this project.

Link:

https://github.students.cs.ubc.ca/CPSC304-2023W-T1/project_f3y2z_g3s2t_z4g9I/blob/main/milestone4/gardenSQLinit.sql

3. Relational Schema and Data

The following schema and screenshots show what data is present in each relation after the SQL initialization script, 'gardenSQLinit.sql', is run. For the schema, primary keys are underlined and foreign keys are **bolded**. Additional constraints are listed explicitly (i.e., UNIQUE and NOT NULL). Tables not involved in the query implementations were sparsely populated to limit the size of the database.

CommunityGarden(GardenID: int, Name: varchar, Address: varchar, TotalPlots: int, AvailablePlots: int, DailySunExposure: int, MonthlyPrecipitation: int, **OrganizationId**: int)

- Address NOT NULL UNIQUE
- TotalPlots NOT NULL
- OrganizationId NOT NULL

GARDENID	NAME	ADDRESS	TOTALPLOTS	AVAILABLEPLOTS	DAILYSEXPOSURE	MONTHLYPRECIPITATION	ORGANIZATIONID
101	East Boulevard Allotment Plots	11879 Gilmore Crescent, Vancouver	7	2	5	50	5001
102	Copley Community Orchards	14173 68 Avenue, Vancouver	6	2	5	60	5002
103	John McBride Community Garden	7324 55 Avenue, Vancouver	5	1	3	60	5003
104	Maple Community Garden	87911 Kings Boulevard, Vancouver	5	3	8	45	5004
105	Ladybug Garden	45 Steam Clock Street, Vancouver	4	0	4	25	5005

Organization(OrganizationId: int, Name: varchar, Address: varchar, Budget: int, PhoneNumber: varchar)

- PhoneNumber UNIQUE

ORGANIZATIONID	NAME	ADDRESS	BUDGET	PHONENUMBER
5001	Vancouver Park Board	2099 Beach Avenue, Vancouver	100	604-311-1111
5002	Compley Park Board	13 Queens Street, Beach Avenue, Vancouver	100	604-123-4567
5003	McBride Park Board	45 Marine Drive, Vancouver	50	604-113-3333
5004	Maple Park Board	453 Cambie Street, Vancouver	30	604-585-1245
5005	LadyBug Park Board	150 Rosewat Street, Vancouver	34	604-788-6565
5006	Trout Lake Community Centre	1234 Victoria Drive, Vancouver	500	604-111-1111

DeliveryRequest1(DeliveryId: int, Status: varchar, **Quantity**: int, **AvgCostPerUnit**: float, DateCreated: date, DateFulfilled: date, **OrganizationId**: int, **SupplierId**: int)

- Status NOT NULL
- Quantity NOT NULL
- AvgCostPerUnit NOT NULL
- DateCreated NOT NULL
- OrganizationId NOT NULL
- SupplierID NOT NULL

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DELIVERYID	STATUS	QUANTITY	AVGCOSTPERUNIT	DATECREATED	DATEFULFILLED	ORGANIZATIONID	SUPPLIERID
3526	complete	10	20	22-JUL-23	20-AUG-23	5005	25
3529	complete	10	25	21-JUL-23	23-AUG-23	5005	25
3530	complete	10	50	20-JUL-23	23-AUG-23	5005	25
3531	complete	11	20	19-JUL-23	23-AUG-23	5005	25
4567	complete	3	10	12-JUN-23	22-JUN-23	5001	21
6432	in process	5	30.25	16-FEB-23		5002	22
6435	in process	5	30	18-FEB-23		5002	22
8975	in process	2	23.5	23-FEB-23		5004	24
8977	in process	2	23	25-FEB-23		5004	24
8979	in process	2	29	27-FEB-23		5004	24
9072	delayed	7	30	19-AUG-23		5003	23
9079	delayed	5	38	19-AUG-23		5003	23

DeliveryRequest2(Quantity: int, AvgCostPerUnit: float, TotalCost: float)

- TotalCost NOT NULL

QUANTITY	AVGCOSTPERUNIT	TOTALCOST
2	29	58
2	23	46
2	23.5	57
3	10	30
5	30.25	151.25
5	30	150
5	38	190
7	30	210
10	25	250
10	50	500
10	20	200
11	20	220

Supplier1(SupplierId: int, **Name**: varchar, **Address**: varchar)

- Name NOT NULL
- Address NOT NULL

SUPPLIERID	NAME	ADDRESS
21	Home Depot	120 Burnaby
22	JYSK	122 Delta
23	Walmart	56 Surrey
24	Costco	78 Richmond
25	Staples	12 Coquitlam

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Supplier2(Name: varchar, Address: varchar, PhoneNumber: varchar)

- PhoneNumber NOT NULL

NAME	ADDRESS	PHONENUMBER
Costco	78 Richmond	232 783 7777
Home Depot	120 Burnaby	675 483 6633
JYSK	122 Delta	345 341 8888
Staples	12 Coquitlam	344 532 444
Walmart	56 Surrey	783 783 9999

Contains(DeliveryId: int, MaterialId: int)

DELIVERYID	MATERIALID
3526	1005
4567	1001
6432	1002
8975	1004
9072	1003

Material(MaterialId: int, Name: varchar)

- Name UNIQUE NOT NULL

MATERIALID	NAME
1001	Top Soil
1002	Mulch
1003	Seeds
1004	Trowel
1005	Shovel

Soil(MaterialId: int, Coverage: int, Composition: varchar)

MATERIALID	COVERAGE	COMPOSITION
1001	50	Organic
1002	25	Cedar

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Seed(**MaterialId**: int, Species: varchar)

MATERIALID SPECIES

1003	lettuce
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Tool(**MaterialId**: int, Function: varchar)

MATERIALID FUNCTION

1004	planting
1005	digging

Plot(**GardenId**: int, **PlotNumber**: int, PlotSize: int, Status: varchar)

GARDENID	PLOTNUMBER	PLOTSIZE	STATUS
101	1	15	occupied
101	2	20	occupied
101	3	12	occupied
101	4	12	available
101	5	12	available
101	6	16	closed for renovation
101	7	25	under development
102	1	9	available
102	2	21	occupied
102	3	15	available
102	4	12	occupied
102	5	24	under development
102	6	36	under development
103	1	25	available
103	5	25	closed for renovation
103	4	25	closed for renovation
103	3	25	occupied
103	2	25	occupied
104	5	24	under development
104	3	16	available
104	2	16	available
104	4	24	under development
104	1	16	available
105	1	24	occupied
105	2	36	occupied
105	4	36	under development
105	3	24	closed for renovation

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UsedIn(GardenId: int, PlotNumber: int, MaterialId: int, Quantity: Int)

GARDENID	PLOTNUMBER	MATERIALID	QUANTITY
101	1	1001	5
101	1	1002	4
101	1	1003	4
104	1	1004	3
105	1	1004	2

Plant(PlantId: int, Species: varchar, DailySunRequirements: int, MonthlyWaterRequirements: int)

- Species NOT NULL UNIQUE

PLANTID	SPECIES	DAILY SUN REQUIREMENTS	MONTHLY WATER REQUIREMENTS
500	spinach	4	25
501	raddish	5	30
502	kale	3	50
503	lettuce	7	20
504	carrot	1	35
505	tomato	6	30

GrowsIn(PlantId: int, GardenId: int, PlotNumber: int, Quantity: int)

- Quantity NOT NULL

PLANTID	GARDENID	PLOTNUMBER	QUANTITY
500	103	3	6
500	101	2	12
501	103	3	4
501	101	2	8
501	101	1	60
502	101	2	44
502	102	2	5
502	105	1	18
502	103	3	22
503	101	2	20
503	101	1	81
503	103	3	10
504	103	3	15
504	105	1	18
504	101	2	25
505	103	3	18
505	101	2	36

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Gardener1(GardenerId: int, **Name**: varchar, **Address**: varchar)

- Name NOT NULL
- Address NOT NULL

GARDENERID	NAME	ADDRESS
7	Malkeet S	123 2nd Street, Vancouver
8	Justin B	345 4th Street, Vancouver
9	Emilyn S	786 8th Street, Vancouver
10	Gregor Burger	707 3rd Street, Vancouver
11	Gregor Burger	503 7th Street, Vancouver

Gardener2(Name: varchar, Address: varchar, PhoneNumber: varchar)

- PhoneNumber NOT NULL

NAME	ADDRESS	PHONENUMBER
Emilyn S	786 8th Street, Vancouver	604-111-1111
Gregor Burger	503 7th Street, Vancouver	604-888-8888
Gregor Burger	707 3rd Street, Vancouver	604-555-5555
Justin B	345 4th Street, Vancouver	604-999-9999
Malkeet S	123 2nd Street, Vancouver	604-777-7777

TendsTo(GardenerId: int, GardenId: int, PlotNumber: int)

GARDENERID	GARDENID	PLOTNUMBER
7	101	1
8	101	1
9	104	2
9	105	1
9	105	2

MemberOf(GardenerId: int, GardenId: int, Since: date)

GARDENERID	GARDENID	SINCE
7	101	23-JAN-20
7	105	27-MAY-14
7	104	16-MAY-16
8	101	22-JAN-17
9	101	23-JAN-20

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Event1(EventId: int, Name: varchar, Type: varchar, EventDate: date, **MaxCapacity**: int, **Registered**: int, **GardenId**: int)

- MaxCapacity NOT NULL
- Registered NOT NULL

EVENTID	NAME	TYPE	EVENTDATE	MAXCAPACITY	REGISTERED	GARDENID
1001	Spring garden festival	festival	11-JAN-23	40	35	101
1002	Yoga in the garden	fitness	23-MAR-22	30	15	101
1003	Gardening for beginners	educational	17-MAY-21	40	32	103
1004	Gardening workshop	educational	17-MAY-23	15	5	104
1005	Garden tour	tour	27-JAN-22	50	47	105

Event2(MaxCapacity: int, Registered: int, SpaceAvailable: int)

MAXCAPACITY	REGISTERED	SPACEAVAILABLE
15	5	10
30	15	15
40	35	5
40	32	8
50	47	3

Attends(EventId: int, GardenerId: int)

EVENTID	GARDENERID
1001	7
1001	10
1002	7
1002	8
1002	10
1003	7
1003	9
1003	10
1004	7
1004	10
1005	7
1005	10

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Task(TaskId: int, DateAssigned: date, DateCompleted: date, Status: varchar)

- DateAssigned NOT NULL
- Status NOT NULL

TASKID	DATEASSIGNED	DATECOMPLETED	STATUS
1	20-JAN-23	22-JAN-23	completed
2	20-JAN-23	22-JAN-23	completed
3	22-MAR-23		ongoing
4	23-APR-23	21-MAY-23	completed
5	24-MAY-23		ongoing

Water(TaskId: int, Duration: int)

TASKID	DURATION
1	3
2	4

Weed(TaskId: int, Method: varchar)

TASKID	METHOD
3	chemical

Sow(TaskId: int, Species: varchar, Season: varchar)

TASKID	SPECIES	SEASON
4	lettuce	spring

Harvest(TaskId: int, Species: varchar, Season: varchar)

TASKID	SPECIES	SEASON
5	broccoli	fall

Performs(GardenerId: int, TaskId: int)

GARDENERID	TASKID
------------	--------

7	1
---	---

7	2
---	---

8	1
---	---

8	2
---	---

9	3
---	---

4. Schema Modifications

The following table summarizes the modifications made to the relational schema from the version submitted in Milestone 2.

Entity/Relationship Set	Modification(s)	Rationale
CommunityGarden2	<ul style="list-style-type: none">• Removed	<ul style="list-style-type: none">• Adds no value to the project. All information can be derived from CommunityGarden.
CommunityGarden1	<ul style="list-style-type: none">• Renamed to CommunityGarden• Added FK OrganizationId• Changed one-to-one relationship with Organization to one-to-many• Changed attribute 'OccupiedPlots' to 'AvailablePlots'	<ul style="list-style-type: none">• Simplified naming following removal of CommunityGarden2.• FK added to represent the one-to-many relationship constraint with Organization.• One-to-many relationship with Organization better represents real world semantics.• AvailablePlots attribute provides more flexibility for managing and adapting to the dynamic nature of plot statuses.
Organization2	<ul style="list-style-type: none">• Removed	<ul style="list-style-type: none">• Adds no value to the project. All information can be derived from Organization.
Organization1	<ul style="list-style-type: none">• Renamed to Organization• Removed FK GardenId• Changed one-to-one relationship with CommunityGarden to many-to-one• Removed total participation constraint with Manages relationship	<ul style="list-style-type: none">• Simplified naming following removal of Organization2.• FK removed to reflect the many-to-one relationship constraint with CommunityGarden.• Many-to-one relationship with CommunityGarden better represents real world semantics.• Removal of total participation constraint with Manages relationship better represents real world semantics (i.e., not reasonable that every Organization must manage a CommunityGarden).

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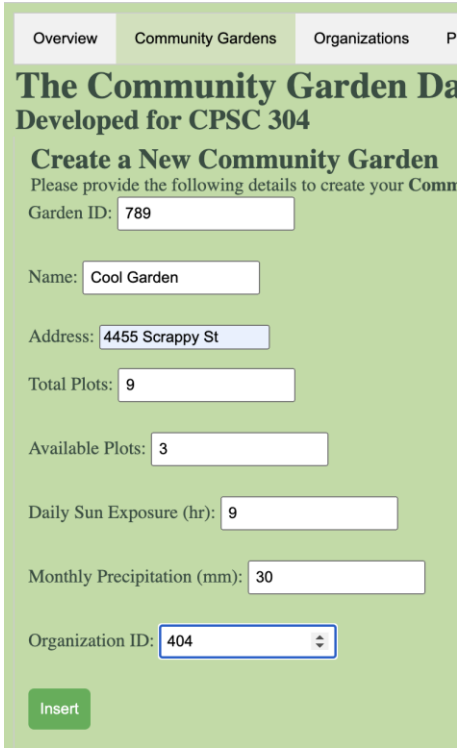


Plot	• Changed Plot attribute 'Size' to 'PlotSize'	• Resolved conflict with SQL*Plus a reserved name.
Event1	• Changed Event1 attribute 'Date' to 'EventDate'	• Resolved conflict with SQL*Plus a reserved name.

5. SQL Queries

All queries are implemented in the file 'garden.php'.

Query: INSERT																																																									
Code Lines	775 - 796																																																								
SQL	<div>“INSERT INTO CommunityGarden(GardenId, Name, Address, TotalPlots, AvailablePlots, DailySunExposure, MonthlyPrecipitation, OrganizationId) VALUES(:gardenId, :name, :address, :totalPlots, :availablePlots, :dailySun, :monthlyPrecip, :orgId)”;</div>																																																								
Before Screenshot(s)	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h3>The Community Garden Database Project</h3><p>Developed for CPSC 304</p><p>Retrieved data from table COMMUNITYGARDEN:</p><table><tr><th>GARDENID</th><th>NAME</th><th>ADDRESS</th><th>TOTALPLOTS</th><th>AVAILABLEPLOTS</th><th>DAILYSUNEXPOSURE</th><th>MONTHLYPRECIPITATION</th><th>ORGANIZATIONID</th></tr><tr><td>101</td><td>East Boulevard Allotment Plots</td><td>11879 Gilmore Crescent, Vancouver</td><td>7</td><td>2</td><td>5</td><td>50</td><td>5001</td></tr><tr><td>102</td><td>Copley Community Orchards</td><td>14173 68 Avenue, Vancouver</td><td>6</td><td>2</td><td>5</td><td>60</td><td>5002</td></tr><tr><td>103</td><td>John McBride Community Garden</td><td>7324 55 Avenue, Vancouver</td><td>5</td><td>1</td><td>3</td><td>60</td><td>5003</td></tr><tr><td>104</td><td>Maple Community Garden</td><td>87911 Kings Boulevard, Vancouver</td><td>5</td><td>3</td><td>8</td><td>45</td><td>5004</td></tr><tr><td>105</td><td>Ladybug Garden</td><td>45 Steam Clock Street, Vancouver</td><td>4</td><td>0</td><td>4</td><td>25</td><td>5005</td></tr><tr><td>777</td><td>Spring Way</td><td>123 Fountain Road, Vancouver</td><td>67</td><td>34</td><td>87</td><td>35</td><td>3333</td></tr></table></div></div>	GARDENID	NAME	ADDRESS	TOTALPLOTS	AVAILABLEPLOTS	DAILYSUNEXPOSURE	MONTHLYPRECIPITATION	ORGANIZATIONID	101	East Boulevard Allotment Plots	11879 Gilmore Crescent, Vancouver	7	2	5	50	5001	102	Copley Community Orchards	14173 68 Avenue, Vancouver	6	2	5	60	5002	103	John McBride Community Garden	7324 55 Avenue, Vancouver	5	1	3	60	5003	104	Maple Community Garden	87911 Kings Boulevard, Vancouver	5	3	8	45	5004	105	Ladybug Garden	45 Steam Clock Street, Vancouver	4	0	4	25	5005	777	Spring Way	123 Fountain Road, Vancouver	67	34	87	35	3333
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<p>During Screenshot(s)</p>	
<p>After Screenshot(s)</p>	
<p>Query: DELETE</p>	
<p>Code Lines</p>	<p>829 - 831</p>
<p>SQL</p>	<p>“DELETE FROM CommunityGarden WHERE GardenId = :gardenId”;</p>
<p>Before Screenshot(s)</p>	

OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information

The Community Garden Database Project

Developed for CPSC 304

Retrieved data from table PLOT:

GARDENID	PLOTNUMBER	PLOTSIZE	STATUS
101	1	15	occupied
101	2	20	occupied
101	3	12	occupied
101	4	12	available
101	5	12	available
101	6	16	closed for renovation
101	7	25	under development
102	1	9	available
102	2	21	occupied
102	3	15	available
102	4	12	occupied
102	5	24	under development
102	6	36	under development
103	1	25	available
103	5	25	closed for renovation
103	4	25	closed for renovation
103	3	25	occupied
103	2	25	occupied
104	5	24	under development
104	3	16	available
104	2	16	available
104	4	24	under development
104	1	16	available
105	1	24	occupied
105	2	36	occupied
105	4	36	under development
105	3	24	closed for renovation

DuringScreenshot(s)

Delete a Garden

Provide the garden ID to permanently delete a Community Garden

Garden ID:

Delete

AfterScreenshot(s)

OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information

The Community Garden Database Project

Developed for CPSC 304

Retrieved data from table COMMUNITYGARDEN:

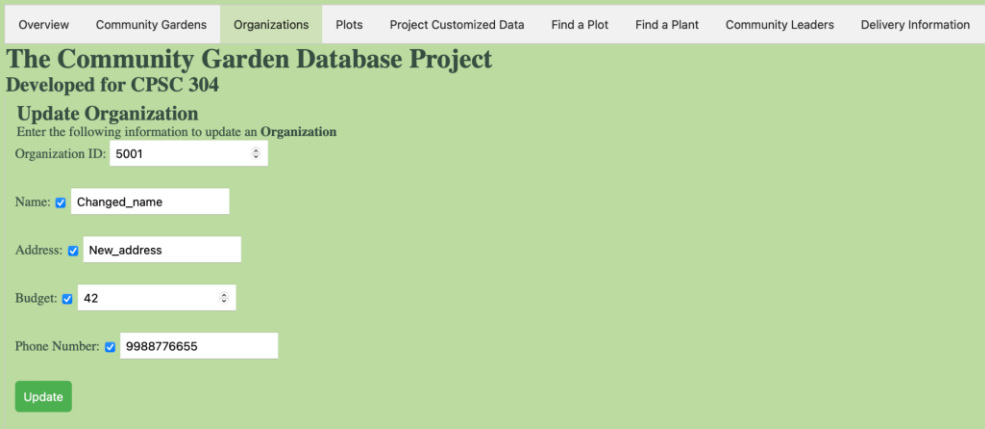
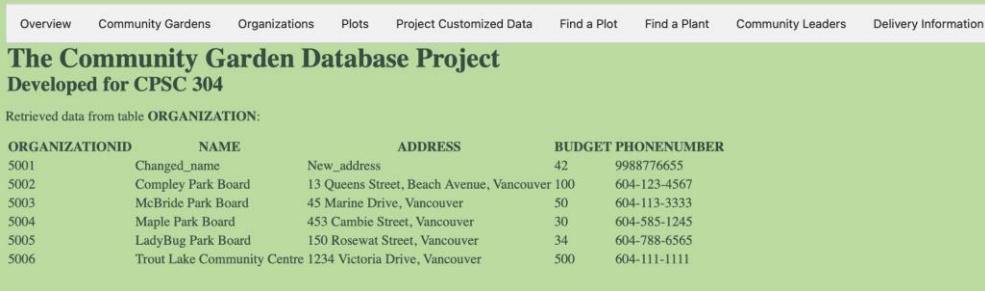
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105	Ladybug Garden	45 Stearn Clock Street, Vancouver	4	0	4	25	5005	

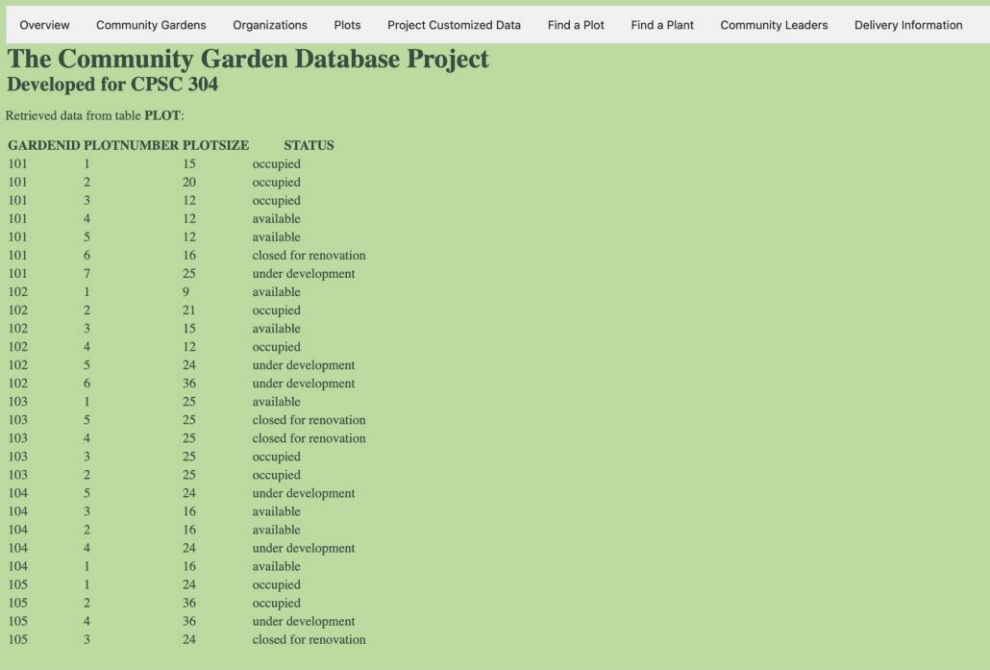
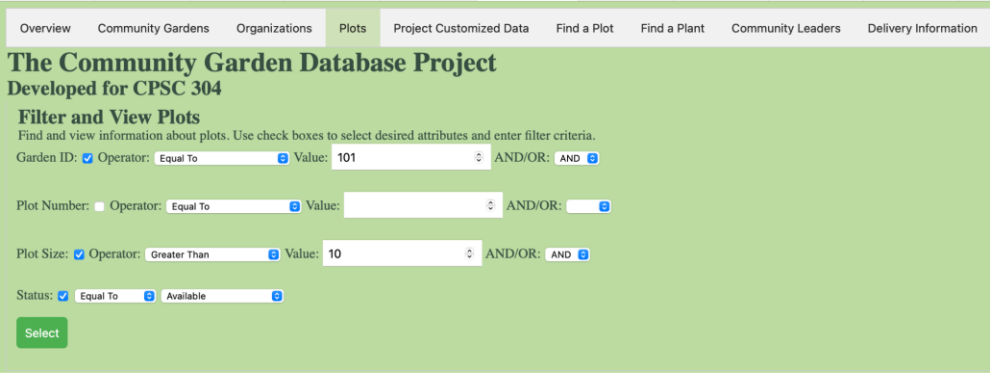

ON DELETE CASCADE

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	<div><div><div><div><div>Overview</div><div>Community Gardens</div><div>Organizations</div><div>Plots</div><div>Project Customized Data</div><div>Find a Plot</div><div>Find a Plant</div><div>Community Leaders</div><div>Delivery Information</div></div></div><div><div><div><div>The Community Garden Database Project</div><div>Developed for CPSC 304</div></div><div>Retrieved data from table PLOT:</div><table><tr><th>GARDENID</th><th>PLOTNUMBER</th><th>PLOTSIZE</th><th>STATUS</th></tr><tr><td>102</td><td>3</td><td>15</td><td>available</td></tr><tr><td>102</td><td>2</td><td>21</td><td>occupied</td></tr><tr><td>102</td><td>1</td><td>9</td><td>available</td></tr><tr><td>102</td><td>4</td><td>12</td><td>occupied</td></tr><tr><td>102</td><td>5</td><td>24</td><td>under development</td></tr><tr><td>102</td><td>6</td><td>36</td><td>under development</td></tr><tr><td>103</td><td>3</td><td>25</td><td>occupied</td></tr><tr><td>103</td><td>2</td><td>25</td><td>occupied</td></tr><tr><td>103</td><td>1</td><td>25</td><td>available</td></tr><tr><td>103</td><td>4</td><td>25</td><td>closed for renovation</td></tr><tr><td>103</td><td>5</td><td>25</td><td>closed for renovation</td></tr><tr><td>104</td><td>1</td><td>16</td><td>available</td></tr><tr><td>104</td><td>2</td><td>16</td><td>available</td></tr><tr><td>104</td><td>3</td><td>16</td><td>available</td></tr><tr><td>104</td><td>4</td><td>24</td><td>under development</td></tr><tr><td>104</td><td>5</td><td>24</td><td>under development</td></tr><tr><td>105</td><td>1</td><td>24</td><td>occupied</td></tr><tr><td>105</td><td>2</td><td>36</td><td>occupied</td></tr><tr><td>105</td><td>3</td><td>24</td><td>closed for renovation</td></tr><tr><td>105</td><td>4</td><td>36</td><td>under development</td></tr></table></div></div></div></div>	GARDENID	PLOTNUMBER	PLOTSIZE	STATUS	102	3	15	available	102	2	21	occupied	102	1	9	available	102	4	12	occupied	102	5	24	under development	102	6	36	under development	103	3	25	occupied	103	2	25	occupied	103	1	25	available	103	4	25	closed for renovation	103	5	25	closed for renovation	104	1	16	available	104	2	16	available	104	3	16	available	104	4	24	under development	104	5	24	under development	105	1	24	occupied	105	2	36	occupied	105	3	24	closed for renovation	105	4	36	under development
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Query: UPDATE																																																																																					
Code Lines	569, 587, 605, 635, 648																																																																																				
SQL	<div>“UPDATE Organization SET Name = :updateName WHERE OrganizationId = :updateId”;</div> <div>“UPDATE Organization SET Address = :updateAddress WHERE OrganizationId = :updateId”;</div> <div>“UPDATE Organization SET Budget = :updateBudget WHERE OrganizationId = :updateId”;</div> <div>“UPDATE Organization SET PhoneNumber = :updatePhone WHERE OrganizationId = :updateId”;</div>																																																																																				
Before Screenshot(s)	<div><div><div><div><div>Overview</div><div>Community Gardens</div><div>Organizations</div><div>Plots</div><div>Project Customized Data</div><div>Find a Plot</div><div>Find a Plant</div><div>Comm</div></div></div><div><div><div><div>The Community Garden Database Project</div><div>Developed for CPSC 304</div></div><div>Retrieved data from table ORGANIZATION:</div><table><tr><th>ORGANIZATIONID</th><th>NAME</th><th>ADDRESS</th><th>BUDGET</th><th>PHONENUMBER</th></tr><tr><td>5001</td><td>Vancouver Park Board</td><td>2099 Beach Avenue, Vancouver</td><td>100</td><td>604-311-1111</td></tr><tr><td>5002</td><td>Compley Park Board</td><td>13 Queens Street, Beach Avenue, Vancouver</td><td>100</td><td>604-123-4567</td></tr><tr><td>5003</td><td>McBride Park Board</td><td>45 Marine Drive, Vancouver</td><td>50</td><td>604-113-3333</td></tr><tr><td>5004</td><td>Maple Park Board</td><td>453 Cambie Street, Vancouver</td><td>30</td><td>604-585-1245</td></tr><tr><td>5005</td><td>LadyBug Park Board</td><td>150 Rosewat Street, Vancouver</td><td>34</td><td>604-788-6565</td></tr><tr><td>5006</td><td>Trout Lake Community Centre</td><td>1234 Victoria Drive, Vancouver</td><td>500</td><td>604-111-1111</td></tr></table></div></div></div></div>	ORGANIZATIONID	NAME	ADDRESS	BUDGET	PHONENUMBER	5001	Vancouver Park Board	2099 Beach Avenue, Vancouver	100	604-311-1111	5002	Compley Park Board	13 Queens Street, Beach Avenue, Vancouver	100	604-123-4567	5003	McBride Park Board	45 Marine Drive, Vancouver	50	604-113-3333	5004	Maple Park Board	453 Cambie Street, Vancouver	30	604-585-1245	5005	LadyBug Park Board	150 Rosewat Street, Vancouver	34	604-788-6565	5006	Trout Lake Community Centre	1234 Victoria Drive, Vancouver	500	604-111-1111																																																	
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<p>During Screenshot(s)</p>	
<p>After Screenshot(s)</p>	
<p>Query: SELECTION</p>	
<p>Code Lines</p>	<p>895</p>
<p>SQL</p>	<pre>“SELECT * FROM Plot WHERE “ . \$whereString;</pre>

<p>Before Screenshot(s)</p>	
<p>During Screenshot(s)</p>	
<p>After Screenshot(s)</p>	
<p>Query: PROJECTION</p>	
<p>Code Lines</p>	<p>948 - 950</p>
<p>SQL</p>	<p>"SELECT " . \$selectString . " FROM " . \$tableName;</p>

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<p>Before Screenshot(s)</p>	
<p>During Screenshot(s)</p>	
<p>After Screenshot(s)</p>	
<p>Query: JOIN</p>	
<p>Code Lines</p>	<p>970 - 975</p>
<p>SQL</p>	<pre>SELECT g.Name, g.Address, p.PlotNumber FROM CommunityGarden g, Plot p, GrowsIn gi, Plant pl WHERE g.GardenId = p.GardenId AND p.GardenId = gi.GardenId AND</pre>

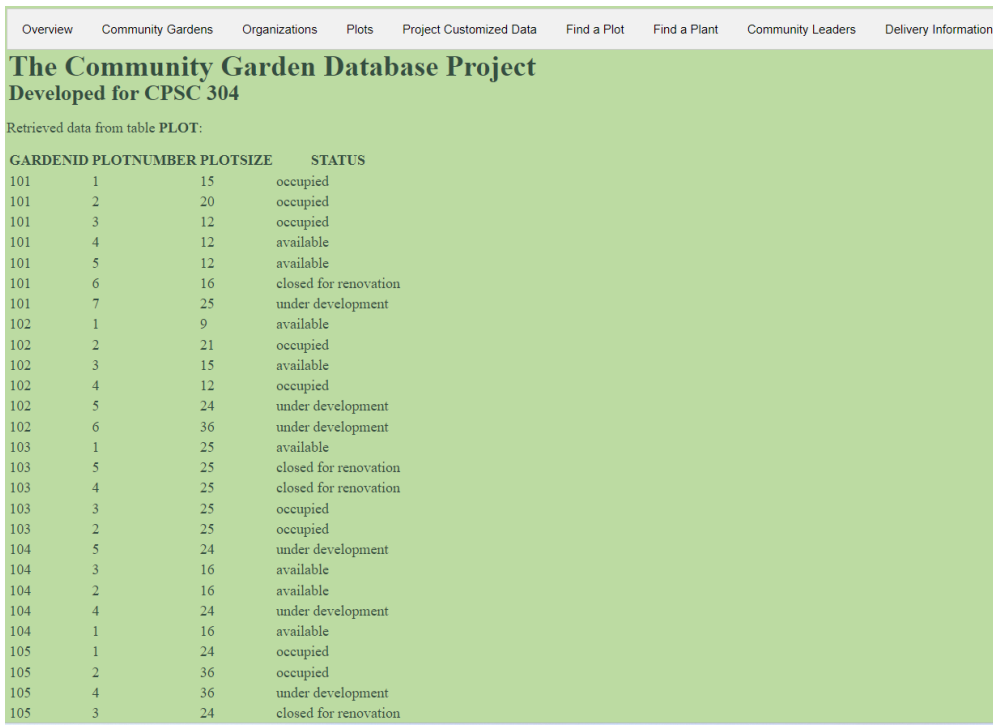

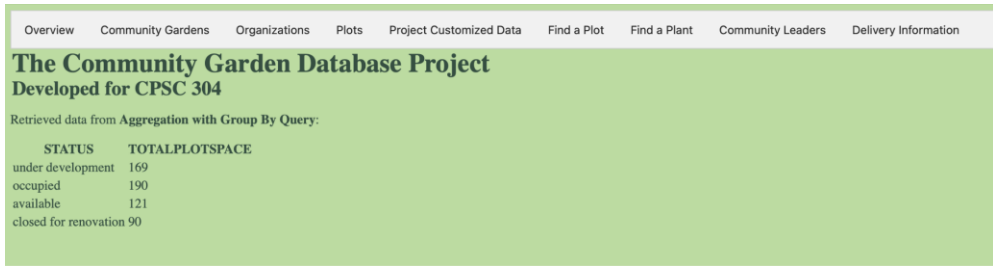
p.PlotNumber = gi.PlotNumber AND
gi.PlantID = pl.PlantID AND
pl.Species = :plantSpecies;

Before
Screenshot(s)

Overview	Community Gardens	Organizations	Plots	Project Customized Data	Find a Plot	Find a Plant	Community Leaders	Delivery Information
The Community Garden Database Project Developed for CPSC 304								
Retrieved data from table COMMUNITYGARDEN:								
GARDENID	NAME	ADDRESS	TOTALPLOTS AVAILABLE	PLOTS DAILY	SUNEXPOSURE	MONTHLYPRECIPITATION	ORGANIZATIONID	
101	East Boulevard Allotment Plots	11879 Gilmore Crescent, Vancouver	7	2	5	50	5001	
102	Copley Community Orchards	14173 68 Avenue, Vancouver	6	2	5	60	5002	
103	Johan McBride Community Garden	7324 55 Avenue, Vancouver	5	1	3	60	5003	
104	Maple Community Garden	87911 Kings Boulevard, Vancouver	5	3	8	45	5004	
105	Ladybug Garden	45 Steam Clock Street, Vancouver	4	0	4	25	5005	
Overview	Community Gardens	Organizations	Plots	Project Customized Data	Find a Plot	Find a Plant	Community Leaders	Delivery Information
The Community Garden Database Project Developed for CPSC 304								
Retrieved data from table PLOT:								
GARDENID	PLOTNUMBER	PLOTSIZE	STATUS					
101	1	15	occupied					
101	2	20	occupied					
101	3	12	occupied					
101	4	12	available					
101	5	12	available					
101	6	16	closed for renovation					
101	7	25	under development					
102	1	9	available					
102	2	21	occupied					
102	3	15	available					
102	4	12	occupied					
102	5	24	under development					
102	6	36	under development					
103	1	25	available					
103	5	25	closed for renovation					
103	4	25	closed for renovation					
103	3	25	occupied					
103	2	25	occupied					
104	5	24	under development					
104	3	16	available					
104	2	16	available					
104	4	24	under development					
104	1	16	available					
105	1	24	occupied					
105	2	36	occupied					
105	4	36	under development					
105	3	24	closed for renovation					
Overview	Community Gardens	Organizations	Plots	Project Customized Data	Find a Plot	Find a Plant	Community Leaders	Delivery Information
The Community Garden Database Project Developed for CPSC 304								
Retrieved data from table GROWSIN:								
PLANTID	GARDENID	PLOTNUMBER	QUANTITY					
500	103	3	6					
500	101	2	12					
501	103	3	4					
501	101	2	8					
501	101	1	60					
502	101	2	44					
502	102	2	5					
502	105	1	18					
502	103	3	22					
503	101	2	20					
503	101	1	81					
503	103	3	10					
504	103	3	15					
504	105	1	18					
504	101	2	25					
505	103	3	18					
505	101	2	36					

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	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h2>The Community Garden Database Project</h2><h3>Developed for CPSC 304</h3><p>Retrieved data from table PLANT:</p><table><tr><th>PLANTID</th><th>SPECIES</th><th>DAILY</th><th>SUN</th><th>REQUIREMENTS</th><th>MONTHLY</th><th>WATER</th><th>REQUIREMENTS</th></tr><tr><td>500</td><td>spinach</td><td>4</td><td></td><td></td><td>25</td><td></td><td></td></tr><tr><td>501</td><td>raddish</td><td>5</td><td></td><td></td><td>30</td><td></td><td></td></tr><tr><td>502</td><td>kale</td><td>3</td><td></td><td></td><td>50</td><td></td><td></td></tr><tr><td>503</td><td>lettuce</td><td>7</td><td></td><td></td><td>20</td><td></td><td></td></tr><tr><td>504</td><td>carrot</td><td>1</td><td></td><td></td><td>35</td><td></td><td></td></tr><tr><td>505</td><td>tomato</td><td>6</td><td></td><td></td><td>30</td><td></td><td></td></tr></table></div></div>	PLANTID	SPECIES	DAILY	SUN	REQUIREMENTS	MONTHLY	WATER	REQUIREMENTS	500	spinach	4			25			501	raddish	5			30			502	kale	3			50			503	lettuce	7			20			504	carrot	1			35			505	tomato	6			30		
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During Screenshot(s)	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h2>The Community Garden Database Project</h2><h3>Developed for CPSC 304</h3><h4>Find a Plant</h4><p>Find the names, addresses and plot numbers of community gardens that contain a specified plant species.</p><p>Plant Species: <input type="text" value="Kale"/></p><div>Join</div></div></div>																																																								
After Screenshot(s)	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h2>The Community Garden Database Project</h2><h3>Developed for CPSC 304</h3><p>Retrieved data from Join Query:</p><table><tr><th>NAME</th><th>ADDRESS</th><th>PLOTNUMBER</th></tr><tr><td>East Boulevard Allotment Plots</td><td>11879 Gilmore Crescent, Vancouver</td><td>2</td></tr><tr><td>Copley Community Orchards</td><td>14173 68 Avenue, Vancouver</td><td>2</td></tr><tr><td>John McBride Community Garden</td><td>7324 55 Avenue, Vancouver</td><td>3</td></tr><tr><td>Ladybug Garden</td><td>45 Steam Clock Street, Vancouver</td><td>1</td></tr></table></div></div>	NAME	ADDRESS	PLOTNUMBER	East Boulevard Allotment Plots	11879 Gilmore Crescent, Vancouver	2	Copley Community Orchards	14173 68 Avenue, Vancouver	2	John McBride Community Garden	7324 55 Avenue, Vancouver	3	Ladybug Garden	45 Steam Clock Street, Vancouver	1																																									
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Ladybug Garden	45 Steam Clock Street, Vancouver	1																																																							
Query: AGGREGATION WITH GROUP BY																																																									
Code Lines	985 - 989																																																								
SQL	SELECT Status, SUM(PlotSize) as TotalPlotSpace FROM Plot GROUP BY Status;																																																								

<p>Before Screenshot(s)</p>	
<p>During Screenshot(s)</p>	
<p>After Screenshot(s)</p>	
<p>Query: AGGREGATION WITH HAVING</p>	
<p>Code Lines</p>	<p>996 - 1010</p>
<p>SQL</p>	<p>CREATE View Aggregated(GardenId, LargePlotsAvailable) AS SELECT p.GardenId, COUNT(P.PlotNumber) as NumberOfPlots</p>

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FROM Plot p
WHERE p.Status = 'available' AND p.PlotSize > 10
GROUP BY p.GardenId
HAVING count(*) > 1
ORDER BY p.GardenId asc;

SELECT g.Name, g.Address, a.LargePlotsAvailable
FROM CommunityGarden g, Aggregated a
WHERE g.GardenId = a.GardenId;

Before
Screenshot(s)

OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information

The Community Garden Database Project

Developed for CPSC 304

Retrieved data from table COMMUNITYGARDEN:

GARDENID	NAME	ADDRESS	TOTALPLOTS AVAILABLE	PLOTS DAILY	SUNEXPOSURE	MONTHLYPRECIPITATION	ORGANIZATIONID
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OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information



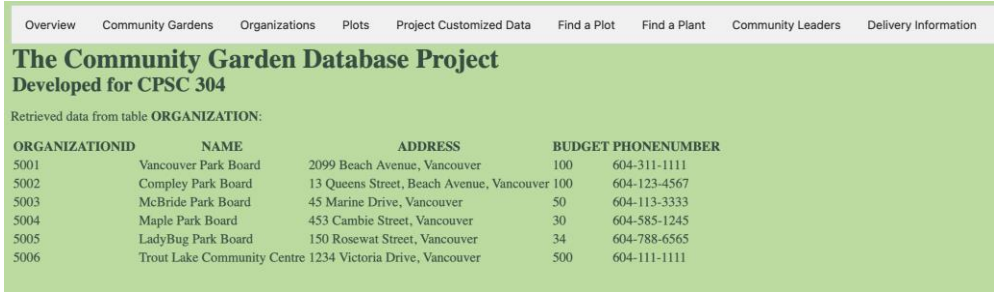
The Community Garden Database Project

Developed for CPSC 304

Retrieved data from table PLOT:

GARDENID	PLOTNUMBER	PLOTSIZE	STATUS
101	1	15	occupied
101	2	20	occupied
101	3	12	occupied
101	4	12	available
101	5	12	available
101	6	16	closed for renovation
101	7	25	under development
102	1	9	available
102	2	21	occupied
102	3	15	available
102	4	12	occupied
102	5	24	under development
102	6	36	under development
103	1	25	available
103	5	25	closed for renovation
103	4	25	closed for renovation
103	3	25	occupied
103	2	25	occupied
104	5	24	under development
104	3	16	available
104	2	16	available
104	4	24	under development
104	1	16	available
105	1	24	occupied
105	2	36	occupied
105	4	36	under development
105	3	24	closed for renovation

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During Screenshot(s)	
After Screenshot(s)	
Query: NESTED AGGREGATION WITH GROUP BY	
Code Lines	1021 - 1036
SQL	<pre>CREATE VIEW nestAgg(OrgID, NumOfOrders) AS SELECT d1.OrganizationID, count(d2.TotalCost) FROM DeliveryRequest1 d1, DeliveryRequest2 d2 WHERE d1.quantity = d2.quantity AND d1.AvgCostPerUnit = d2.AvgCostPerUnit AND d2.totalCost > (SELECT AVG(d2.TotalCost) FROM DeliveryRequest2 d2) GROUP BY d1.OrganizationID; SELECT o.name, na.NumOfOrders FROM nestAgg na, Organization o WHERE na.OrgID = o.OrganizationID;</pre>
Before Screenshot(s)	

	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h2>The Community Garden Database Project</h2><h3>Developed for CPSC 304</h3><p>Retrieved data from table DELIVERYREQUEST1:</p><table><tr><th>DELIVERYID</th><th>STATUS</th><th>QUANTITY</th><th>AVGCOSTPERUNIT</th><th>DATECREATED</th><th>DATEFULFILLED</th><th>ORGANIZATIONID</th><th>SUPPLIERID</th></tr><tr><td>3526</td><td>complete</td><td>10</td><td>20</td><td>22-JUL-23</td><td>20-AUG-23</td><td>5005</td><td>25</td></tr><tr><td>3529</td><td>complete</td><td>10</td><td>25</td><td>21-JUL-23</td><td>23-AUG-23</td><td>5005</td><td>25</td></tr><tr><td>3530</td><td>complete</td><td>10</td><td>50</td><td>20-JUL-23</td><td>23-AUG-23</td><td>5005</td><td>25</td></tr><tr><td>3531</td><td>complete</td><td>11</td><td>20</td><td>19-JUL-23</td><td>23-AUG-23</td><td>5005</td><td>25</td></tr><tr><td>4567</td><td>complete</td><td>3</td><td>10</td><td>12-JUN-23</td><td>22-JUN-23</td><td>5001</td><td>21</td></tr><tr><td>6432</td><td>in process</td><td>5</td><td>30.25</td><td>16-FEB-23</td><td></td><td>5002</td><td>22</td></tr><tr><td>6435</td><td>in process</td><td>5</td><td>30</td><td>18-FEB-23</td><td></td><td>5002</td><td>22</td></tr><tr><td>8975</td><td>in process</td><td>2</td><td>23.5</td><td>23-FEB-23</td><td></td><td>5004</td><td>24</td></tr><tr><td>8977</td><td>in process</td><td>2</td><td>23</td><td>25-FEB-23</td><td></td><td>5004</td><td>24</td></tr><tr><td>8979</td><td>in process</td><td>2</td><td>29</td><td>27-FEB-23</td><td></td><td>5004</td><td>24</td></tr><tr><td>9072</td><td>delayed</td><td>7</td><td>30</td><td>19-AUG-23</td><td></td><td>5003</td><td>23</td></tr><tr><td>9079</td><td>delayed</td><td>5</td><td>38</td><td>19-AUG-23</td><td></td><td>5003</td><td>23</td></tr></table></div><div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h2>The Community Garden Database Project</h2><h3>Developed for CPSC 304</h3><p>Retrieved data from table DELIVERYREQUEST2:</p><table><tr><th>QUANTITY</th><th>AVGCOSTPERUNIT</th><th>TOTALCOST</th></tr><tr><td>2</td><td>29</td><td>58</td></tr><tr><td>2</td><td>23</td><td>46</td></tr><tr><td>2</td><td>23.5</td><td>57</td></tr><tr><td>3</td><td>10</td><td>30</td></tr><tr><td>5</td><td>30.25</td><td>151.25</td></tr><tr><td>5</td><td>30</td><td>150</td></tr><tr><td>5</td><td>38</td><td>190</td></tr><tr><td>7</td><td>30</td><td>210</td></tr><tr><td>10</td><td>25</td><td>250</td></tr><tr><td>10</td><td>50</td><td>500</td></tr><tr><td>10</td><td>20</td><td>200</td></tr><tr><td>11</td><td>20</td><td>220</td></tr></table></div></div></div>	DELIVERYID	STATUS	QUANTITY	AVGCOSTPERUNIT	DATECREATED	DATEFULFILLED	ORGANIZATIONID	SUPPLIERID	3526	complete	10	20	22-JUL-23	20-AUG-23	5005	25	3529	complete	10	25	21-JUL-23	23-AUG-23	5005	25	3530	complete	10	50	20-JUL-23	23-AUG-23	5005	25	3531	complete	11	20	19-JUL-23	23-AUG-23	5005	25	4567	complete	3	10	12-JUN-23	22-JUN-23	5001	21	6432	in process	5	30.25	16-FEB-23		5002	22	6435	in process	5	30	18-FEB-23		5002	22	8975	in process	2	23.5	23-FEB-23		5004	24	8977	in process	2	23	25-FEB-23		5004	24	8979	in process	2	29	27-FEB-23		5004	24	9072	delayed	7	30	19-AUG-23		5003	23	9079	delayed	5	38	19-AUG-23		5003	23	QUANTITY	AVGCOSTPERUNIT	TOTALCOST	2	29	58	2	23	46	2	23.5	57	3	10	30	5	30.25	151.25	5	30	150	5	38	190	7	30	210	10	25	250	10	50	500	10	20	200	11	20	220
DELIVERYID	STATUS	QUANTITY	AVGCOSTPERUNIT	DATECREATED	DATEFULFILLED	ORGANIZATIONID	SUPPLIERID																																																																																																																																									
3526	complete	10	20	22-JUL-23	20-AUG-23	5005	25																																																																																																																																									
3529	complete	10	25	21-JUL-23	23-AUG-23	5005	25																																																																																																																																									
3530	complete	10	50	20-JUL-23	23-AUG-23	5005	25																																																																																																																																									
3531	complete	11	20	19-JUL-23	23-AUG-23	5005	25																																																																																																																																									
4567	complete	3	10	12-JUN-23	22-JUN-23	5001	21																																																																																																																																									
6432	in process	5	30.25	16-FEB-23		5002	22																																																																																																																																									
6435	in process	5	30	18-FEB-23		5002	22																																																																																																																																									
8975	in process	2	23.5	23-FEB-23		5004	24																																																																																																																																									
8977	in process	2	23	25-FEB-23		5004	24																																																																																																																																									
8979	in process	2	29	27-FEB-23		5004	24																																																																																																																																									
9072	delayed	7	30	19-AUG-23		5003	23																																																																																																																																									
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7	30	210																																																																																																																																														
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11	20	220																																																																																																																																														
During Screenshot(s)	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity Leaders</div><div><h2>The Community Garden Database Project</h2><h3>Developed for CPSC 304</h3><h4>Find Organizations with High-Cost Deliveries</h4><p>Find organizations which have placed orders with a total higher than the average cost of all other orders.</p><div>Nested Aggregate with Group By</div></div></div>																																																																																																																																															
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Code Lines	1047 - 1064																																																																																																																																															

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SQL	<pre>CREATE View Div(GardenerID) AS SELECT g.GardenerId FROM Gardener1 g WHERE NOT EXISTS ((SELECT a1.EventId FROM Attends a1) MINUS (SELECT a2.EventId FROM Attends a2 WHERE g.GardenerId = a2.GardenerId)); SELECT g2.Name, g2.Address, g2.PhoneNumber FROM Gardener1 g1, Gardener2 g2, Div d WHERE d.GardenerId = g1.GardenerId AND g1.Name = g2.Name AND g1.Address = g2.Address;</pre>																																												
Before Screenshot(s)	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h3>The Community Garden Database Project</h3><h4>Developed for CPSC 304</h4><p>Retrieved data from table GARDENER1:</p><table><tr><th>GARDENERID</th><th>NAME</th><th>ADDRESS</th></tr><tr><td>7</td><td>Malkeet S</td><td>123 2nd Street, Vancouver</td></tr><tr><td>8</td><td>Justin B</td><td>345 4th Street, Vancouver</td></tr><tr><td>9</td><td>Emilyn S</td><td>786 8th Street, Vancouver</td></tr><tr><td>10</td><td>Gregor Burger</td><td>707 3rd Street, Vancouver</td></tr><tr><td>11</td><td>Gregor Burger</td><td>503 7th Street, Vancouver</td></tr></table></div></div> <div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h3>The Community Garden Database Project</h3><h4>Developed for CPSC 304</h4><p>Retrieved data from table ATTENDS:</p><table><tr><th>EVENTID</th><th>GARDENERID</th></tr><tr><td>1001</td><td>7</td></tr><tr><td>1001</td><td>10</td></tr><tr><td>1002</td><td>7</td></tr><tr><td>1002</td><td>8</td></tr><tr><td>1002</td><td>10</td></tr><tr><td>1003</td><td>7</td></tr><tr><td>1003</td><td>9</td></tr><tr><td>1003</td><td>10</td></tr><tr><td>1004</td><td>7</td></tr><tr><td>1004</td><td>10</td></tr><tr><td>1005</td><td>7</td></tr><tr><td>1005</td><td>10</td></tr></table></div></div>	GARDENERID	NAME	ADDRESS	7	Malkeet S	123 2nd Street, Vancouver	8	Justin B	345 4th Street, Vancouver	9	Emilyn S	786 8th Street, Vancouver	10	Gregor Burger	707 3rd Street, Vancouver	11	Gregor Burger	503 7th Street, Vancouver	EVENTID	GARDENERID	1001	7	1001	10	1002	7	1002	8	1002	10	1003	7	1003	9	1003	10	1004	7	1004	10	1005	7	1005	10
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During Screenshot(s)	<div><div>OverviewCommunity GardensOrganizationsPlotsProject Customized DataFind a PlotFind a PlantCommunity LeadersDelivery Information</div><div><h3>The Community Garden Database Project</h3><h4>Developed for CPSC 304</h4><h4>Display Contact Information of Community Leaders</h4><p>Find the names, addresses and phone numbers of gardeners that have attended all events.</p><div>Divide</div></div></div>																																												

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After
Screenshot(s)

Overview	Community Gardens	Organizations	Plots	Project Customized Data	Find a Plot	Find a Plant	Community Leaders	Delivery Information
The Community Garden Database Project Developed for CPSC 304								
Retrieved data from Division Query :								
NAME	ADDRESS	PHONENUMBER						
Malkeet S	123 2nd Street, Vancouver	604-777-7777						
Gregor Burger	707 3rd Street, Vancouver	604-555-5555						