CPSC 304 Project Cover Page

Milestone #: 2

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Group Number: 23

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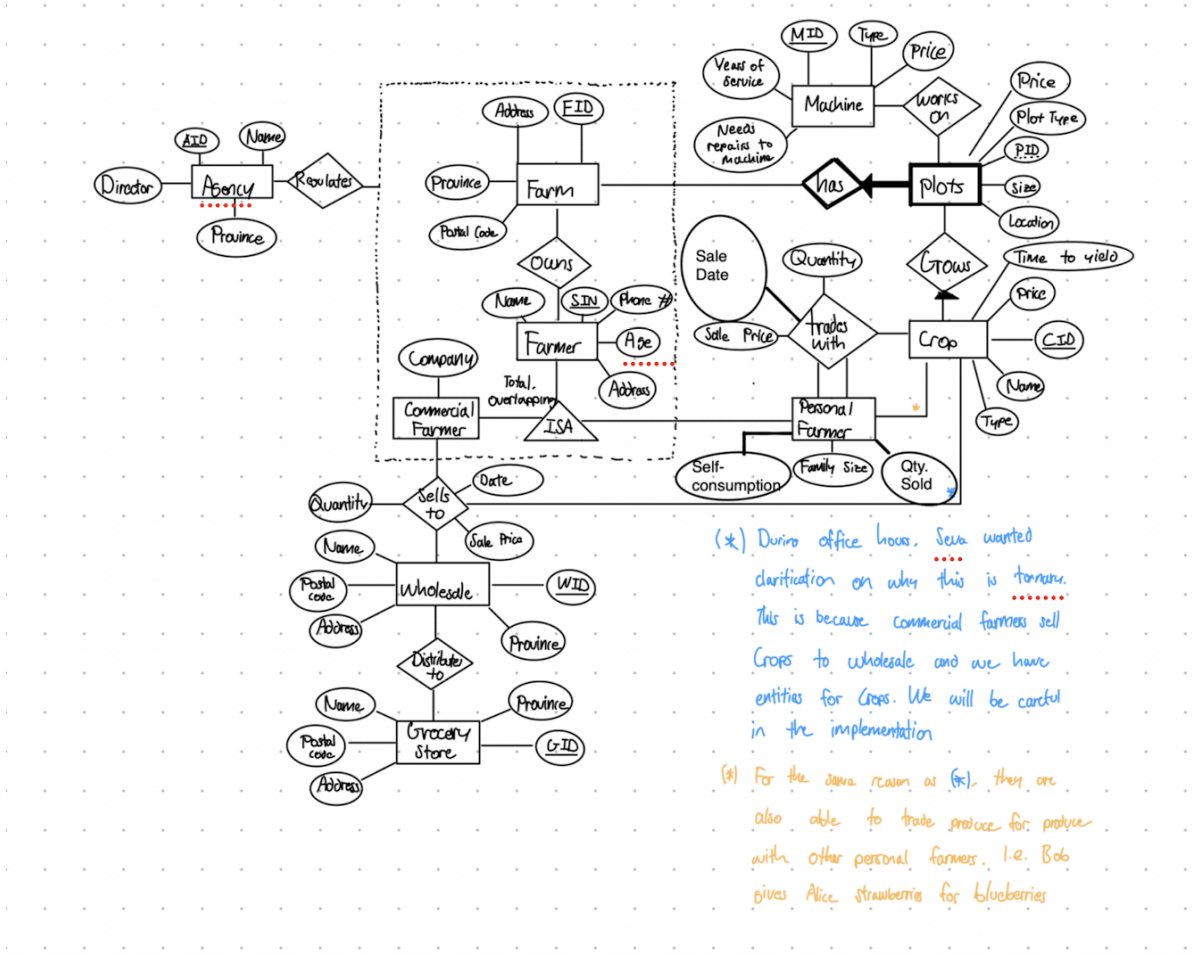
By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, 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

Summary(Part 2)

2a. The domain of this project is agricultural farming. This database can be used to keep track of the produce distribution in a country. The farmer and their holdings (farms, plots, machines etc.) will be captured by the database. Furthermore, whom the farmers sell to (i.e., other personal/subsistence farmers or wholesales) and the overseeing regulatory agencies will also be included. The main motivation/purpose of the project is to model the agricultural industry in a way that the Ministry of Agriculture (the parent regulatory body) can keep record of farming for a given country.

Summary(Part 3)



Note: We have added ISA constraints (which we forgot before) + more attributes so that we can make FDs

I.e. self consumption is arbitrary units consumed by personal farmer (+ family)

Relational Model Schema(Part 4a & 4b)

farm(id: VARCHARCHAR(20), address: CHAR(20), province: CHAR(2), postal_code: CHAR(6))

owns(**id: CHAR(20)**, **sin: CHAR(20)**)

farmer(sin: CHAR(9), name: CHAR(20), phone#: INTEGER, age: INTEGER, address: CHAR(20))

commercial_farmer(**sin: VARCHAR(20)**, name: CHAR(20), phone#: INTEGER, age: INTEGER, address: CHAR(20), company: CHAR(20))

has_plots(**fid: CHAR(20)**, p_l_o_t__i_d: CHAR(20) (WER dash-underline), size: VARCHAR(20), location: VARCHAR(20), plot_type: VARCHAR(20), price: REAL)

sells_to(quantity: INTEGER, sale_price: REAL, sale_date: DATE, **wid: VARCHAR(20)**, **sin: VARCHARCHAR(20)**, **cid: VARCHAR(20)**)

Agency (aid VARCHAR(20), name VARCHAR(20), province CHAR(2), director, VARCHAR(20))

Regulates (aid VARCHAR(20), **fid VARCHAR(20), sin VARCHAR(20)**)

Wholesale (wid VARCHAR(20), province CHAR(2), Address VARCHAR(20), Name VARCHAR(20), postal_code CHAR(6))

Distributes (**wid VARCHAR(20), gid VARCHAR(20)**)

Grocery (gid VARCHAR(20), province CHAR(2),address VARCHAR(20), name VARCHAR(20), postal_code CHAR(6))

trades_with (sale_date DATE, quantity INTEGER, sale_price REAL, **cid VARCHAR(20), farm_trader_A_SIN CHAR(9), farm_trader_B_SIN CHAR(9)**)

grows_crop (cid: VARCHAR(20), price REAL, name VARCHAR(20), type: VARCHAR(20), Time to Yield: REAL, **pid VARCHAR(20) NOT NULL**, **fid VARCHAR(20) NOT NULL**)

personal_farmer(**sin: VARCHAR(20)**, name: CHAR(20), phone#: INTEGER, age: INTEGER, address: CHAR(20), family_size: INTEGER, quantity_sold: INTEGER, self_consumption: INTEGER)

works_on(**mid: VARCHAR(20), pid: VARCHAR(20), fid: VARCHAR(20)**, num_hours: REAL, fuel_consumption: REAL, electricity_consumption: REAL)

machine(mid: VARCHAR(20), type: VARCHAR(20), price: REAL, years_of_service: INTEGER, needs_repair: BOOL)

Functional Dependencies (Part 5)

Wholesale
WID → Province, Address, Postal Code, Name, Capacity
Postal Code → Province

Grocery
GID → Province, Address, Postal Code, Name, Capacity
Postal Code → Province

Agency
AID → Name, Province, Director
Name, Province → Director
Director, Province → Name

Regulates
SIN -> FID, AID
FID -> SIN, AID

Farmer
SIN → Name, Phone, Age, Address
Phone # → Name, Age, SIN, Address
Address → Phone #

Farm
FID -> Address, Province, Postal Code
Address -> Postal Code, Province
Postal Code -> Province

Commercial Farmer
SIN -> Name, Phone #, Age, Address, Company
Phone # -> Name, Age, Address, SIN, Company
Company, Name -> Phone #
Address -> Company

Has_plots
FID, PID -> Size, Location, Plot Type, Price
Plot Type -> Location
Location -> Size, Price

Sells_To
SIN, CID, WID -> Quantity, Sale Price, Sale Date
Quantity -> Sale Price
Sale Date -> Quantity, Sale Price

Machine
MID -> Type, Price, Years of service, Needs repair
Type -> Price
Years of service -> Needs repair

Works_On
MID, PID, FID -> Number of Hours, Fuel Consumption, Electricity Consumption
Number of hours -> Fuel Consumption
Number of hours -> Electricity Consumption

Grows_Crop
CID -> Name, Price, Type, Time to Yield
Type -> Price
Time to Yield -> Price

Trades_With
Farm Trader A SIN, Farm Trader B SIN, CID -> Quantity, Sale Price, Sale Date
Quantity -> Sale Price
Sale Date -> Quantity, Sale Price

Personal_Farmer
SIN -> Name, Phone #, Age, Address, Family Size, Self-consumption, Quantity Sold
Family Size -> Self-consumption
Family Size -> Quantity Sold

Normalization (Part 6)

farm(id: CHAR(20), address: CHAR(20), province: CHAR(2), postal_code: CHAR(6))

Denote the previous as F(ABCD). Then,
A -> BCD
B -> CD
D -> C

Not in BCNF. Decompose on B->CD
R_1(AB), R_2(BCD)

Decompose on R_2 with D->C
R_3(BD), R_4(DC)

Final tables
R_1(id: CHAR(20), address: CHAR(20))
R_3(address: CHAR(20), postal_code: CHAR(6))
R_4(province: CHAR(2), postal_code: CHAR(6))

---

farmer(sin: CHAR(9), name: CHAR(20), phone#: INTEGER, age: INTEGER, address: CHAR(20))

Denote the previous as F(ABCDE). Then,
A -> BCDE
C -> ABDE
E -> C

All keys are superkeys. No need to normalise

---

commercial_farmer(sin: VARCHAR(20) NOT NULL, name: CHAR(20), phone#: INTEGER, age: INTEGER, address: CHAR(20), company: CHAR(20))

Denote the previous as C(ABCDEF)
A -> BCDEF
C -> ABDEF
FB -> C
E -> F

Not in BCNF. Decompose on FB -> C
R_1(ABDEF) R_2(FBC)
Decompose R_1 on E -> F
R_3(ABDE) R_4(EF)

Final tables
R_2(name: CHAR(20), phone#: INTEGER, company: CHAR(20))
R_3(sin: VARCHAR(20), name: CHAR(20), age: INTEGER, address: CHAR(20))
R_4(address: CHAR(20), company: CHAR(20))

---

sells_to(**wid: VARCHAR(20)**, **sin: CHAR(9)**, **cid: VARCHAR(20)**, quantity: INTEGER, sale_price: REAL, sale_date: DATE)

Denote the previous as S(ABCDEF)
ABC -> DEF
D -> E
F -> DE

Not in BCNF. Decompose on F -> DE
R_1(ABCF), R_2(FED)
Decompose on R_2, D -> E
R_3(FD), R_4(DE)

Final tables
R_1(wid: VARCHAR(20), sin: CHAR(9), cid: VARCHAR(20), sale_date: DATE)
R_3(sale_price: REAL, sale_date: DATE)
R_4(quantity: INTEGER, sale_price: REAL)

Wholesale (wid VARCHAR(20), province CHAR(2), Address VARCHAR(20), Name VARCHAR(20), postal_code CHAR(6))

W -> P, A, N, C
C -> P

Not in BCNF
Decompose On C -> P

R_1(CP), R_2(CWAN)

Final Table
R_1(postal_code CHAR(6), province CHAR(2))
R_2(postal_code CHAR(6), wid VARCHAR(20), Address VARCHAR(20), Name VARCHAR(20))

Grocery (gid VARCHAR(20), province CHAR(2),address VARCHAR(20), name VARCHAR(20), quantity INTEGER, postal_code CHAR(6))

Grocery (gid VARCHAR(20), province CHAR(2), Address VARCHAR(20), Name VARCHAR(20), quantity INTEGER, postal_code CHAR(6))

G -> P, A, N, Q, C

C -> P

Decompose On C -> P

R_1(CP), R_2(CGANQ)

Final Table
R_1(postal_code CHAR(6), province CHAR(2))
R_2(postal_code CHAR(6), gid VARCHAR(20), province CHAR(2), Address VARCHAR(20), Name VARCHAR(20))

Agency (aid VARCHAR(20), name VARCHAR(20), province CHAR(2), director VARCHAR(20))

A -> N, P, D
N, P -> D
D, P -> N

Not in BCNF

Decompose on N, P -> D
R_1(NPD), R_2(NPA)

Final Table
R_1(name VARCHAR(20), province CHAR(2), director VARCHAR(20)),
R_2(name VARCHAR(20), province CHAR(2), aid VARCHAR(20))

---

has_plots (**fid: VARCHAR(20)**, p_l_o_t__i_d: VARCHAR(20) (WER dash-underline), size: INTEGER, location: VARCHAR(20), plot_type: VARCHAR(20), price: REAL)

F, P -> S, L, PT, PR
PT -> L
L -> S, PR

Not in BCNF

Decompose on L -> S, PR
R_1(L, S, PR), R_2(F, P, L, PT)

Decompose on PT -> L
R_3(PT, L), R4(F, P, PT)

Final Table
R_1(location VARCHAR(20), size: INTEGER, price: REAL)
R_3(plot_type VARCHAR(20), location: VARCHAR(20))
R_4(fid: VARCHAR(20), pid: VARCHAR(20), plot_type: VARCHAR(20))

--
trades_with (sale_date DATE, quantity INTEGER, sale_price REAL, **cid VARCHAR(20), farm_trader_A_SIN CHAR(9), farm_trader_B_SIN CHAR(9)**)

FTAS, FTBS, C -> Q, SP, SD
Q -> SP
SD -> Q, SP

Not in BCNF

Decompose on SD -> Q, SP
R_1(SD, Q, SP), R_2(FTAS, FTBS, C, SD)

Decompose on Q -> SP
R_3(Q, SP), R4(SD, Q)

Final Table
R_2(farm_trader_A_SIN CHAR(9), farm_trader_B_SIN CHAR(9), cid VARCHAR(20), sale_date DATE)
R_3(quantity INTEGER, sale_price REAL)
R_4(sale_date DATE, quantity INTEGER)

--

grows_crop (cid: VARCHAR(20), price REAL, name VARCHAR(20), type: VARCHAR(20), Time to Yield: REAL, **pid VARCHAR(20) NOT NULL**, **fid VARCHAR(20) NOT NULL**)

C -> N, PR, TY, T, P, F
TY -> PR
T -> PR

Not in BCNF

Decompose on TY -> PR
R_1(TY, PR), R_2(C, N, TY, T, P, F)

Cannot obtain BCNF (as we cannot decompose on T -> PR), so we add that relation and leave get 3NF

R_1(TY, PR), R_2(C, N, TY, T, P, F), R_3(T, PR)

Final Table
R_1(type: VARCHAR(20), price REAL)
R_2(cid: VARCHAR(20), name VARCHAR(20), type: VARCHAR(20), Time to Yield: REAL, pid VARCHAR(20), fid VARCHAR(20))
R_3(Time to Yield: REAL, price REAL)

---

personal_farmer (sin: VARCHAR(20), name: CHAR(20), phone#: INTEGER, age: INTEGER, address: CHAR(20), family_size: INTEGER, quantity_sold: INTEGER, self_consumption: INTEGER)

S -> N, P, A, AD, F, SC, Q
F -> SC
F -> Q

Not in BCNF

Decompose on F -> SC
R_1(F, SC), R_2(S, N, P, A, AD, F, Q)

Decompose on F -> Q
R_3(F, Q), R_4(S, N, P, A, AD, F)

Final Table
R_1(family_size: INTEGER, self_consumption: INTEGER)
R_3(family_size: INTEGER, quantity_sold: INTEGER)
R_4(sin: VARCHAR(20), name: CHAR(20), phone#: INTEGER, age: INTEGER, address: CHAR(20), family_size: INTEGER)

---

works_on (**mid: VARCHAR(20), pid: VARCHAR(20), fid: VARCHAR(20)**, num_hours: REAL, fuel_consumption: REAL, electricity_consumption: REAL)

M, P, F -> N, FC, EC
N -> FC
N -> EC

Not in BCNF

Decompose on N -> FC

R_1(N, FC), R_2(M, P, F, N, EC)

Decompose on N -> EC
R_3(N, EC), R_4(M, P, F, N)

Final Table
R_1(num_hours: REAL, fuel_consumption: REAL)
R_3(num_hours: REAL, electricity_consumption: REAL)
R_4(mid: VARCHAR(20), pid: VARCHAR(20), fid: VARCHAR(20), num_hours: REAL)

---

machine (mid: VARCHAR(20), type: VARCHAR(20), price: REAL, years_of_service: INTEGER, needs_repair: BOOL)

M -> T, P, YS, NR
T -> P
YS -> NR

Not in BCNF

Decompose on T -> P
R_1(T, P), R_2(M, T, YS, NR)

Decompose on YS -> NR
R_3(YS, NR), R_4(M, T, YS)

Final Table
R_1(type: VARCHAR(20), price: REAL)
R_3(years_of_service: INTEGER, needs_repair: BOOL)
R_4(mid: VARCHAR(20), type: VARCHAR(20), years_of_service: INTEGER)

SQL Tables (Part 7)

```
CREATE TABLE farm (
      id VARCHAR(20)
      address VARCHAR(20)
      PRIMARY KEY (id)
)
CREATE TABLE farmAddress (
      address VARCHAR(20)
      postal_code CHAR(6)
      PRIMARY KEY (address)
)
```

```
CREATE TABLE farmProvince (
      province CHAR(2)
      postal_code CHAR(6)
      PRIMARY KEY (postal_code)
)


CREATE TABLE owns (
      id VARCHAR(20)
      sin CHAR(9)
      PRIMARY KEY (id, sin)
      FOREIGN KEY (id) REFERENCES farm
      FOREIGN KEY (sin) REFERENCES farmer
)

CREATE TABLE farmer (
      sin CHAR(9)
      name VARCHAR(20)
      age INTEGER
      address VARCHAR(20)
      PRIMARY KEY (sin)
)

CREATE TABLE commercial_farmer (
      sin CHAR(9) REFERENCES farmer(sin)
      name: CHAR(20)
      age: INTEGER
      address: CHAR(20)
      PRIMARY KEY (sin)

)

CREATE TABLE commercial_farmer_nc (
      name: CHAR(20)
      phone#: INTEGER
      company VARCHAR(20)
      PRIMARY KEY (name, company)
)

CREATE TABLE commercial_farmer_a (
      address: CHAR(20)
      company VARCHAR(20)
      PRIMARY KEY (address)

)

CREATE TABLE sells_to (
```

```
      sale_date DATE
      wid VARCHAR(20)
      sin CHAR(9)
      cid VARCHAR(20)
      PRIMARY KEY (id, sin, cid)
      FOREIGN KEY (wid) REFERENCES wholesale
      FOREIGN KEY (sin) REFERENCES farmer
      FOREIGN KEY (cid) REFERENCES grows_crop
)

CREATE TABLE sells_to_sale_price (
      sale_price REAL
      sale_date DATE
      PRIMARY KEY (sale_price)
)

CREATE TABLE sells_to_sale_quantity (
      quantity INTEGER
      sale_price REAL
      PRIMARY KEY (sale_price)
)

CREATE TABLE trades_with (
      sale_date DATE
      cid VARCHAR(20)
      farm_trader_A_SIN CHAR(9)
      farm_trader_B_SIN CHAR(9)
      PRIMARY KEY (cid, farm_trader_A_SIN, farm_trader_B_SIN)
      FOREIGN KEY (cid) REFERENCES grows_crop
      FOREIGN KEY (farm_trader_A_SIN) REFERENCES
personal_farmer(sin)
      FOREIGN KEY (farm_trader_B_SIN) REFERENCES
personal_farmer(sin)
)

CREATE TABLE trades_with_sale_date (
      sale_date DATE
      quantity INTEGER
      PRIMARY KEY (sale_date)
)

CREATE TABLE trades_with_quantity (
      quantity INTEGER
      sale_price REAL
      PRIMARY KEY (quantity)
)

CREATE TABLE grows_crop (
```

```
      cid VARCHAR(20)
      name VARCHAR(20)
      type VARCHAR(20)
      time_to_yield REAL
      pid VARCHAR(20) NOT NULL
      fid VARCHAR(20) NOT NULL
      PRIMARY KEY (cid)
      FOREIGN KEY (pid, fid) REFERENCES has_plots
)

CREATE TABLE grows_crop_type (
      price REAL
      type VARCHAR(20)
      PRIMARY KEY (type)
)

CREATE TABLE grows_crop_time (
      price REAL
      time_to_yield REAL
      PRIMARY KEY (time_to_yield)
)

CREATE TABLE has_plots_location (
      size INTEGER
      price REAL
      location VARCHAR(20)
      PRIMARY KEY (location)
)

CREATE TABLE has_plots_type (
      plot_type VARCHAR(20)
      location VARCHAR(20)
      PRIMARY KEY (plot_type)
)

CREATE TABLE has_plots (
      pid VARCHAR(20)
      fid VARCHAR(20)
      plot_type VARCHAR(20)
      PRIMARY KEY (pid, fid)
      FOREIGN KEY (fid) REFERENCES farm
)


CREATE TABLE personal_farmer (
      sin CHAR(9) REFERENCES farmer(sin)
      name: CHAR(20)
      phone#: INTEGER
```

```
      age: INTEGER
      address: CHAR(20)
      family_size: INTEGER
      PRIMARY KEY (sin)
)

CREATE TABLE personal_farmer_family_size_sc (
      family_size INTEGER
      self_consumption INTEGER
      PRIMARY KEY (family_size)
)

CREATE TABLE personal_farmer_family_size_qs (
      family_size INTEGER
      quantity_sold INTEGER
      PRIMARY KEY (family_size)
)

CREATE TABLE works_on (
      mid VARCHAR(20)
      pid VARCHAR(20)
      fid VARCHAR(20)
      num_hours REAL
      PRIMARY KEY (mid, pid, fid)
      FOREIGN KEY (pid, fid) REFERENCES has_plots
      FOREIGN KEY (mid) REFERENCES machine
)

CREATE TABLE works_on_num_h_fc (
      num_hours REAL
      fuel_consumption REAL
      PRIMARY KEY (num_hours)
)

CREATE TABLE works_on_num_h_ec (
      num_hours REAL
      electricity_consumption REAL
      PRIMARY KEY (num_hours)
)

CREATE TABLE machine (
      mid VARCHAR(20)
      type VARCHAR(20)
      years_of_service INTEGER
      PRIMARY KEY (mid)
)

CREATE TABLE machine_type (
```

```
      type VARCHAR(20)
      price REAL
      PRIMARY KEY (type)
)

CREATE TABLE machine_yos (
      years_of_service INTEGER
      needs_repair BOOL
      PRIMARY KEY (years_of_service)
)

CREATE TABLE AgencyLocation (
      name VARCHAR(20)
      province char(2)
      director VARCHAR(20)
      PRIMARY KEY (director, name province)
)

CREATE TABLE Agency (
      aid VARCHAR(20)
      name VARCHAR(20)
      province char(2)
      PRIMARY KEY (aid)
)


CREATE TABLE Regulates (
      aid VARCHAR(20)
      fid VARCHAR(20)
      sin VARCHAR(20)
      PRIMARY KEY (aid, sin, fid)
      FOREIGN KEY (aid) REFERENCES Agency
      FOREIGN KEY (sin) REFERENCES Farmer
      FOREIGN KEY (fid) REFERENCES Farm
)

CREATE TABLE WholesaleLocation (
      province CHAR(2)
      postal_code CHAR(6)

      PRIMARY KEY (postal_code)
)

CREATE TABLE Wholesale (
      wid VARCHAR(20)
      Address VARCHAR(20)
      Name VARCHAR(20)
      postal_code CHAR(6)
```

```
      PRIMARY KEY (wid)
)

CREATE TABLE Distributes (
      wid VARCHAR(20)
      gid VARCHAR(20)
      PRIMARY KEY (wid, gid)
      FOREIGN KEY (wid) REFERENCES Wholesale
      FOREIGN KEY (gid) REFERENCES Grocery
)


CREATE TABLE GroceryLocation (
      province CHAR(2)
      postal_code CHAR(6)
      PRIMARY KEY (postal_code)
)

CREATE TABLE Grocery (
      gid VARCHAR(20)
      Address VARCHAR(20)
      Name VARCHAR(20)
      postal_code CHAR(6)
      PRIMARY KEY (wid)
)
```

Insert Into Examples (Part 8)

```
-- INSERT INTO farm examplest
INSERT INTO farm (id, address) VALUES ('FARM001', '123 Farm Road,
Toronto');
INSERT INTO farm (id, address) VALUES ('FARM002', '456 Farm Lane,
Vancouver');
INSERT INTO farm (id, address) VALUES ('FARM003', '789 Farm
Avenue, Montreal');
INSERT INTO farm (id, address) VALUES ('FARM004', '101 Farm
Street, Calgary');
INSERT INTO farm (id, address) VALUES ('FARM005', '202 Farm
Boulevard, Ottawa');
------------------------------------------------------------

-- INSERT INTO farmAddress examples
INSERT INTO farmAddress (address, postal_code) VALUES ('123 Farm
Road, Toronto', 'M1X2Y3');
INSERT INTO farmAddress (address, postal_code) VALUES ('456 Farm
Lane, Vancouver', 'V5X4Z6');
```

```
INSERT INTO farmAddress (address, postal_code) VALUES ('789 Farm
Avenue, Montreal', 'H2Y3T1');
INSERT INTO farmAddress (address, postal_code) VALUES ('101 Farm
Street, Calgary', 'T2P1B3');
INSERT INTO farmAddress (address, postal_code) VALUES ('202 Farm
Boulevard, Ottawa', 'K1P5P6');
-------------------------------------------------------------

-- INSERT INTO farmProvince examples
INSERT INTO farmProvince (province, postal_code) VALUES ('ON',
'M1X2Y3');
INSERT INTO farmProvince (province, postal_code) VALUES ('BC',
'V5X4Z6');
INSERT INTO farmProvince (province, postal_code) VALUES ('QC',
'H2Y3T1');
INSERT INTO farmProvince (province, postal_code) VALUES ('AB',
'T2P1B3');
INSERT INTO farmProvince (province, postal_code) VALUES ('ON',
'K1P5P6');
-------------------------------------------------------------

-- INSERT INTO owns examples
INSERT INTO owns (id, sin) VALUES ('FARM001', '123456789');
INSERT INTO owns (id, sin) VALUES ('FARM002', '234567890');
INSERT INTO owns (id, sin) VALUES ('FARM003', '345678901');
INSERT INTO owns (id, sin) VALUES ('FARM004', '456789012');
INSERT INTO owns (id, sin) VALUES ('FARM005', '567890123');
-------------------------------------------------------------

-- INSERT INTO farmer examples
INSERT INTO farmer (sin, name, age, address) VALUES ('123456789',
'John Smith', 35, '123 Main St, Toronto');
INSERT INTO farmer (sin, name, age, address) VALUES ('234567890',
'Emily Johnson', 28, '456 Elm St, Vancouver');
INSERT INTO farmer (sin, name, age, address) VALUES ('345678901',
'Michael Brown', 45, '789 Oak St, Montreal');
INSERT INTO farmer (sin, name, age, address) VALUES ('456789012',
'Jessica Lee', 40, '101 Pine St, Calgary');
INSERT INTO farmer (sin, name, age, address) VALUES ('567890123',
'David Wilson', 50, '202 Maple St, Ottawa');
-------------------------------------------------------------

-- INSERT INTO commercial_farmer examples
INSERT INTO commercial_farmer (sin, name, age, address) VALUES
('123456789', 'John Smith', 35, '123 Main St, Toronto');
INSERT INTO commercial_farmer (sin, name, age, address) VALUES
('234567890', 'Emily Johnson', 28, '456 Elm St, Vancouver');
```

```
INSERT INTO commercial_farmer (sin, name, age, address) VALUES
('345678901', 'Michael Brown', 45, '789 Oak St, Montreal');
INSERT INTO commercial_farmer (sin, name, age, address) VALUES
('456789012', 'Jessica Lee', 40, '101 Pine St, Calgary');
INSERT INTO commercial_farmer (sin, name, age, address) VALUES
('567890123', 'David Wilson', 50, '202 Maple St, Ottawa');
------------------------------------------------------------

-- INSERT INTO commercial_farmer_nc examples
INSERT INTO commercial_farmer_nc (name, phone#, company) VALUES
('John Smith', 1234567890, 'Smith Farms Inc.');
INSERT INTO commercial_farmer_nc (name, phone#, company) VALUES
('Emily Johnson', 2345678901, 'Johnson Farms Ltd.');
INSERT INTO commercial_farmer_nc (name, phone#, company) VALUES
('Michael Brown', 3456789012, 'Brown Enterprises');
INSERT INTO commercial_farmer_nc (name, phone#, company) VALUES
('Jessica Lee', 4567890123, 'Lee Agriculture Co.');
INSERT INTO commercial_farmer_nc (name, phone#, company) VALUES
('David Wilson', 5678901234, 'Wilson Farms Corporation');
------------------------------------------------------------

-- INSERT INTO commercial_farmer_a examples
INSERT INTO commercial_farmer_a (address, company) VALUES ('123
Main St, Toronto', 'Smith Farms Inc.');
INSERT INTO commercial_farmer_a (address, company) VALUES ('456
Elm St, Vancouver', 'Johnson Farms Ltd.');
INSERT INTO commercial_farmer_a (address, company) VALUES ('789
Oak St, Montreal', 'Brown Enterprises');
INSERT INTO commercial_farmer_a (address, company) VALUES ('101
Pine St, Calgary', 'Lee Agriculture Co.');
INSERT INTO commercial_farmer_a (address, company) VALUES ('202
Maple St, Ottawa', 'Wilson Farms Corporation');
------------------------------------------------------------

-- INSERT INTO sells_to examples
INSERT INTO sells_to (sale_date, wid, sin, cid) VALUES
('2024-02-28', 'WH001', '123456789', 'CROP001');
INSERT INTO sells_to (sale_date, wid, sin, cid) VALUES
('2024-02-29', 'WH002', '234567890', 'CROP002');
INSERT INTO sells_to (sale_date, wid, sin, cid) VALUES
('2024-03-01', 'WH003', '345678901', 'CROP003');
INSERT INTO sells_to (sale_date, wid, sin, cid) VALUES
('2024-03-02', 'WH004', '456789012', 'CROP004');
INSERT INTO sells_to (sale_date, wid, sin, cid) VALUES
('2024-03-03', 'WH005', '567890123', 'CROP005');
------------------------------------------------------------

-- INSERT INTO sells_to_sale_price examples
```

```
INSERT INTO sells_to_sale_price (sale_price, sale_date) VALUES
(10.99, '2024-02-28');
INSERT INTO sells_to_sale_price (sale_price, sale_date) VALUES
(12.49, '2024-02-29');
INSERT INTO sells_to_sale_price (sale_price, sale_date) VALUES
(8.99, '2024-03-01');
INSERT INTO sells_to_sale_price (sale_price, sale_date) VALUES
(15.99, '2024-03-02');
INSERT INTO sells_to_sale_price (sale_price, sale_date) VALUES
(9.99, '2024-03-03');
------------------------------------------------------------

-- INSERT INTO sells_to_sale_quantity examples
INSERT INTO sells_to_sale_quantity (quantity, sale_price) VALUES
(100, 10.99);
INSERT INTO sells_to_sale_quantity (quantity, sale_price) VALUES
(150, 12.49);
INSERT INTO sells_to_sale_quantity (quantity, sale_price) VALUES
(80, 8.99);
INSERT INTO sells_to_sale_quantity (quantity, sale_price) VALUES
(200, 15.99);
INSERT INTO sells_to_sale_quantity (quantity, sale_price) VALUES
(120, 9.99);
------------------------------------------------------------

-- INSERT INTO trades_with examples
INSERT INTO trades_with (sale_date, cid, farm_trader_A_SIN,
farm_trader_B_SIN) VALUES ('2024-02-28', 'CROP001', '123456789',
'234567890');
INSERT INTO trades_with (sale_date, cid, farm_trader_A_SIN,
farm_trader_B_SIN) VALUES ('2024-02-29', 'CROP002', '234567890',
'345678901');
INSERT INTO trades_with (sale_date, cid, farm_trader_A_SIN,
farm_trader_B_SIN) VALUES ('2024-03-01', 'CROP003', '345678901',
'456789012');
INSERT INTO trades_with (sale_date, cid, farm_trader_A_SIN,
farm_trader_B_SIN) VALUES ('2024-03-02', 'CROP004', '456789012',
'567890123');
INSERT INTO trades_with (sale_date, cid, farm_trader_A_SIN,
farm_trader_B_SIN) VALUES ('2024-03-03', 'CROP005', '567890123',
'123456789');
------------------------------------------------------------

-- INSERT INTO trades_with_sale_date examples
INSERT INTO trades_with_sale_date (sale_date, quantity) VALUES
('2024-02-28', 100);
INSERT INTO trades_with_sale_date (sale_date, quantity) VALUES
('2024-02-29', 150);
```

```
INSERT INTO trades_with_sale_date (sale_date, quantity) VALUES
('2024-03-01', 80);
INSERT INTO trades_with_sale_date (sale_date, quantity) VALUES
('2024-03-02', 200);
INSERT INTO trades_with_sale_date (sale_date, quantity) VALUES
('2024-03-03', 120);
-------------------------------------------------------------

-- INSERT INTO trades_with_quantity examples
INSERT INTO trades_with_quantity (quantity, sale_price) VALUES
(100, 10.99);
INSERT INTO trades_with_quantity (quantity, sale_price) VALUES
(150, 12.49);
INSERT INTO trades_with_quantity (quantity, sale_price) VALUES
(80, 8.99);
INSERT INTO trades_with_quantity (quantity, sale_price) VALUES
(200, 15.99);
INSERT INTO trades_with_quantity (quantity, sale_price) VALUES
(120, 9.99);
-------------------------------------------------------------

-- INSERT INTO grows_crop examples
INSERT INTO grows_crop (cid, name, type, time_to_yield, pid, fid)
VALUES ('CROP001', 'Potato', 'Vegetable', 3.5, 'PLOT001',
'FARM001');
INSERT INTO grows_crop (cid, name, type, time_to_yield, pid, fid)
VALUES ('CROP002', 'Apple', 'Fruit', 6.2, 'PLOT002', 'FARM002');
INSERT INTO grows_crop (cid, name, type, time_to_yield, pid, fid)
VALUES ('CROP003', 'Wheat', 'Grain', 4.8, 'PLOT003', 'FARM003');
INSERT INTO grows_crop (cid, name, type, time_to_yield, pid, fid)
VALUES ('CROP004', 'Grapes', 'Fruit', 7.5, 'PLOT004', 'FARM004');
INSERT INTO grows_crop (cid, name, type, time_to_yield, pid, fid)
VALUES ('CROP005', 'Tomato', 'Vegetable', 2.5, 'PLOT005',
'FARM005');
-------------------------------------------------------------

-- INSERT INTO grows_crop_type examples
INSERT INTO grows_crop_type (price, type) VALUES (2.99,
'Vegetable');
INSERT INTO grows_crop_type (price, type) VALUES (3.49, 'Fruit');
INSERT INTO grows_crop_type (price, type) VALUES (1.99, 'Grain');
INSERT INTO grows_crop_type (price, type) VALUES (4.99,
'Vegetable');
INSERT INTO grows_crop_type (price, type) VALUES (3.99, 'Fruit');
-------------------------------------------------------------

-- INSERT INTO grows_crop_time examples
```

```
INSERT INTO grows_crop_time (price, time_to_yield) VALUES (2.99,
3.5);
INSERT INTO grows_crop_time (price, time_to_yield) VALUES (3.49,
6.2);
INSERT INTO grows_crop_time (price, time_to_yield) VALUES (1.99,
4.8);
INSERT INTO grows_crop_time (price, time_to_yield) VALUES (4.99,
7.5);
INSERT INTO grows_crop_time (price, time_to_yield) VALUES (3.99,
2.5);
-------------------------------------------------------------

-- INSERT INTO has_plots_location examples
INSERT INTO has_plots_location (size, price, location) VALUES (50,
500.00, 'Plot A');
INSERT INTO has_plots_location (size, price, location) VALUES (70,
700.00, 'Plot B');
INSERT INTO has_plots_location (size, price, location) VALUES (60,
600.00, 'Plot C');
INSERT INTO has_plots_location (size, price, location) VALUES (80,
800.00, 'Plot D');
INSERT INTO has_plots_location (size, price, location) VALUES (90,
900.00, 'Plot E');
-------------------------------------------------------------

-- INSERT INTO has_plots_type examples
INSERT INTO has_plots_type (plot_type, location) VALUES
('Vegetable', 'Plot A');
INSERT INTO has_plots_type (plot_type, location) VALUES ('Fruit',
'Plot B');
INSERT INTO has_plots_type (plot_type, location) VALUES ('Grain',
'Plot C');
INSERT INTO has_plots_type (plot_type, location) VALUES
('Vegetable', 'Plot D');
INSERT INTO has_plots_type (plot_type, location) VALUES ('Fruit',
'Plot E');
-------------------------------------------------------------

-- INSERT INTO has_plots examples
INSERT INTO has_plots (pid, fid, plot_type) VALUES ('PLOT001',
'FARM001', 'Vegetable');
INSERT INTO has_plots (pid, fid, plot_type) VALUES ('PLOT002',
'FARM002', 'Fruit');
INSERT INTO has_plots (pid, fid, plot_type) VALUES ('PLOT003',
'FARM003', 'Grain');
INSERT INTO has_plots (pid, fid, plot_type) VALUES ('PLOT004',
'FARM004', 'Vegetable');
```

```
INSERT INTO has_plots (pid, fid, plot_type) VALUES ('PLOT005',
'FARM005', 'Fruit');
-------------------------------------------------------------

-- INSERT INTO personal_farmer examples
INSERT INTO personal_farmer (sin, name, phone#, age, address,
family_size) VALUES ('123456789', 'John Smith', 1234567890, 35,
'123 Main St, Toronto', 4);
INSERT INTO personal_farmer (sin, name, phone#, age, address,
family_size) VALUES ('234567890', 'Emily Johnson', 2345678901, 28,
'456 Elm St, Vancouver', 3);
INSERT INTO personal_farmer (sin, name, phone#, age, address,
family_size) VALUES ('345678901', 'Michael Brown', 3456789012, 45,
'789 Oak St, Montreal', 5);
INSERT INTO personal_farmer (sin, name, phone#, age, address,
family_size) VALUES ('456789012', 'Jessica Lee', 4567890123, 40,
'101 Pine St, Calgary', 2);
INSERT INTO personal_farmer (sin, name, phone#, age, address,
family_size) VALUES ('567890123', 'David Wilson', 5678901234, 50,
'202 Maple St, Ottawa', 6);
-------------------------------------------------------------

-- INSERT INTO personal_farmer_family_size_sc examples
INSERT INTO personal_farmer_family_size_sc (family_size,
self_consumption) VALUES (2, 30);
INSERT INTO personal_farmer_family_size_sc (family_size,
self_consumption) VALUES (3, 40);
INSERT INTO personal_farmer_family_size_sc (family_size,
self_consumption) VALUES (4, 50);
INSERT INTO personal_farmer_family_size_sc (family_size,
self_consumption) VALUES (5, 60);
INSERT INTO personal_farmer_family_size_sc (family_size,
self_consumption) VALUES (6, 70);
-------------------------------------------------------------

-- INSERT INTO personal_farmer_family_size_qs examples
INSERT INTO personal_farmer_family_size_qs (family_size,
quantity_sold) VALUES (2, 20);
INSERT INTO personal_farmer_family_size_qs (family_size,
quantity_sold) VALUES (3, 25);
INSERT INTO personal_farmer_family_size_qs (family_size,
quantity_sold) VALUES (4, 30);
INSERT INTO personal_farmer_family_size_qs (family_size,
quantity_sold) VALUES (5, 35);
INSERT INTO personal_farmer_family_size_qs (family_size,
quantity_sold) VALUES (6, 40);
-------------------------------------------------------------
```

```
-- INSERT INTO works_on examples
INSERT INTO works_on (mid, pid, fid, num_hours) VALUES ('MACH001',
'PLOT001', 'FARM001', 8.5);
INSERT INTO works_on (mid, pid, fid, num_hours) VALUES ('MACH002',
'PLOT002', 'FARM002', 7.2);
INSERT INTO works_on (mid, pid, fid, num_hours) VALUES ('MACH003',
'PLOT003', 'FARM003', 6.8);
INSERT INTO works_on (mid, pid, fid, num_hours) VALUES ('MACH004',
'PLOT004', 'FARM004', 9.3);
INSERT INTO works_on (mid, pid, fid, num_hours) VALUES ('MACH005',
'PLOT005', 'FARM005', 5.6);
-------------------------------------------------------------

-- INSERT INTO works_on_num_h_fc examples
INSERT INTO works_on_num_h_fc (num_hours, fuel_consumption) VALUES
(8.5, 2.1);
INSERT INTO works_on_num_h_fc (num_hours, fuel_consumption) VALUES
(7.2, 1.8);
INSERT INTO works_on_num_h_fc (num_hours, fuel_consumption) VALUES
(6.8, 1.5);
INSERT INTO works_on_num_h_fc (num_hours, fuel_consumption) VALUES
(9.3, 2.5);
INSERT INTO works_on_num_h_fc (num_hours, fuel_consumption) VALUES
(5.6, 1.3);
-------------------------------------------------------------

-- INSERT INTO works_on_num_h_ec examples
INSERT INTO works_on_num_h_ec (num_hours, electricity_consumption)
VALUES (8.5, 3.2);
INSERT INTO works_on_num_h_ec (num_hours, electricity_consumption)
VALUES (7.2, 2.9);
INSERT INTO works_on_num_h_ec (num_hours, electricity_consumption)
VALUES (6.8, 2.5);
INSERT INTO works_on_num_h_ec (num_hours, electricity_consumption)
VALUES (9.3, 3.5);
INSERT INTO works_on_num_h_ec (num_hours, electricity_consumption)
VALUES (5.6, 2.1);
-------------------------------------------------------------

-- INSERT INTO machine examples
INSERT INTO machine (mid, type, years_of_service) VALUES
('MACH001', 'Tractor', 5);
INSERT INTO machine (mid, type, years_of_service) VALUES
('MACH002', 'Harvester', 4);
INSERT INTO machine (mid, type, years_of_service) VALUES
('MACH003', 'Plow', 6);
INSERT INTO machine (mid, type, years_of_service) VALUES
('MACH004', 'Seeder', 3);
```

```
INSERT INTO machine (mid, type, years_of_service) VALUES
('MACH005', 'Sprayer', 2);
-------------------------------------------------------------

-- INSERT INTO machine_type examples
INSERT INTO machine_type (type, price) VALUES ('Tractor',
50000.00);
INSERT INTO machine_type (type, price) VALUES ('Harvester',
75000.00);
INSERT INTO machine_type (type, price) VALUES ('Plow', 30000.00);
INSERT INTO machine_type (type, price) VALUES ('Seeder',
25000.00);
INSERT INTO machine_type (type, price) VALUES ('Sprayer',
35000.00);
-------------------------------------------------------------

-- INSERT INTO machine_yos examples
INSERT INTO machine_yos (years_of_service, needs_repair) VALUES
(5, FALSE);
INSERT INTO machine_yos (years_of_service, needs_repair) VALUES
(4, FALSE);
INSERT INTO machine_yos (years_of_service, needs_repair) VALUES
(6, TRUE);
INSERT INTO machine_yos (years_of_service, needs_repair) VALUES
(3, FALSE);
INSERT INTO machine_yos (years_of_service, needs_repair) VALUES
(2, TRUE);
-------------------------------------------------------------

-- INSERT INTO AgencyLocation examples
INSERT INTO AgencyLocation (name, province, director) VALUES
('Agency A', 'ON', 'John Doe');
INSERT INTO AgencyLocation (name, province, director) VALUES
('Agency B', 'BC', 'Jane Smith');
INSERT INTO AgencyLocation (name, province, director) VALUES
('Agency C', 'QC', 'Michael Brown');
INSERT INTO AgencyLocation (name, province, director) VALUES
('Agency D', 'AB', 'Emily Johnson');
INSERT INTO AgencyLocation (name, province, director) VALUES
('Agency E', 'ON', 'David Wilson');
-------------------------------------------------------------

-- INSERT INTO Agency examples
INSERT INTO Agency (aid, name, province) VALUES ('AG001', 'Agency
A', 'ON');
INSERT INTO Agency (aid, name, province) VALUES ('AG002', 'Agency
B', 'BC');
```

```
INSERT INTO Agency (aid, name, province) VALUES ('AG003', 'Agency
C', 'QC');
INSERT INTO Agency (aid, name, province) VALUES ('AG004', 'Agency
D', 'AB');
INSERT INTO Agency (aid, name, province) VALUES ('AG005', 'Agency
E', 'ON');
-------------------------------------------------------------

-- INSERT INTO Regulates examples
INSERT INTO Regulates (aid, fid, sin) VALUES ('AG001', 'FARM001',
'123456789');
INSERT INTO Regulates (aid, fid, sin) VALUES ('AG002', 'FARM002',
'234567890');
INSERT INTO Regulates (aid, fid, sin) VALUES ('AG003', 'FARM003',
'345678901');
INSERT INTO Regulates (aid, fid, sin) VALUES ('AG004', 'FARM004',
'456789012');
INSERT INTO Regulates (aid, fid, sin) VALUES ('AG005', 'FARM005',
'567890123');
-------------------------------------------------------------

-- INSERT INTO WholesaleLocation examples
INSERT INTO WholesaleLocation (province, postal_code) VALUES
('ON', 'M1X2Y3');
INSERT INTO WholesaleLocation (province, postal_code) VALUES
('BC', 'V5X4Z6');
INSERT INTO WholesaleLocation (province, postal_code) VALUES
('QC', 'H2Y3T1');
INSERT INTO WholesaleLocation (province, postal_code) VALUES
('AB', 'T2P1B3');
INSERT INTO WholesaleLocation (province, postal_code) VALUES
('ON', 'K1P5P6');
-------------------------------------------------------------

-- INSERT INTO Wholesale examples
INSERT INTO Wholesale (wid, Address, Name, postal_code) VALUES
('WH001', '123 Wholesale St, Toronto', 'Toronto Wholesale',
'M1X2Y3');
INSERT INTO Wholesale (wid, Address, Name, postal_code) VALUES
('WH002', '456 Wholesale St, Vancouver', 'Vancouver Wholesale',
'V5X4Z6');
INSERT INTO Wholesale (wid, Address, Name, postal_code) VALUES
('WH003', '789 Wholesale St, Montreal', 'Montreal Wholesale',
'H2Y3T1');
INSERT INTO Wholesale (wid, Address, Name, postal_code) VALUES
('WH004', '101 Wholesale St, Calgary', 'Calgary Wholesale',
'T2P1B3');
```

```
INSERT INTO Wholesale (wid, Address, Name, postal_code) VALUES
('WH005', '202 Wholesale St, Ottawa', 'Ottawa Wholesale',
'K1P5P6');
-------------------------------------------------------------

-- INSERT INTO Distributes examples
INSERT INTO Distributes (wid, gid) VALUES ('WH001', 'GRO001');
INSERT INTO Distributes (wid, gid) VALUES ('WH002', 'GRO002');
INSERT INTO Distributes (wid, gid) VALUES ('WH003', 'GRO003');
INSERT INTO Distributes (wid, gid) VALUES ('WH004', 'GRO004');
INSERT INTO Distributes (wid, gid) VALUES ('WH005', 'GRO005');
-------------------------------------------------------------

-- INSERT INTO GroceryLocation examples
INSERT INTO GroceryLocation (province, postal_code) VALUES ('ON',
'M1X2Y3');
INSERT INTO GroceryLocation (province, postal_code) VALUES ('BC',
'V5X4Z6');
INSERT INTO GroceryLocation (province, postal_code) VALUES ('QC',
'H2Y3T1');
INSERT INTO GroceryLocation (province, postal_code) VALUES ('AB',
'T2P1B3');
INSERT INTO GroceryLocation (province, postal_code) VALUES ('ON',
'K1P5P6');
-------------------------------------------------------------

-- INSERT INTO Grocery examples
INSERT INTO Grocery (gid, Address, Name, postal_code) VALUES
('GRO001', '123 Grocery St, Toronto', 'Toronto Grocery',
'M1X2Y3');
INSERT INTO Grocery (gid, Address, Name, postal_code) VALUES
('GRO002', '456 Grocery St, Vancouver', 'Vancouver Grocery',
'V5X4Z6');
INSERT INTO Grocery (gid, Address, Name, postal_code) VALUES
('GRO003', '789 Grocery St, Montreal', 'Montreal Grocery',
'H2Y3T1');
INSERT INTO Grocery (gid, Address, Name, postal_code) VALUES
('GRO004', '101 Grocery St, Calgary', 'Calgary Grocery',
'T2P1B3');
INSERT INTO Grocery (gid, Address, Name, postal_code) VALUES
('GRO005', '202 Grocery St, Ottawa', 'Ottawa Grocery', 'K1P5P6');
```