Last Name: Rachmat First Name: Anthony Student ID: 26339003

1. [10pts] Find the store_ids of all stores named ‘Hillcrest’.

a) [6pts] Relational Algebra

π store_id (σ name = 'Hillcrest' (Stores))

b) [1pt] Parse Tree

c) [3pts] Result

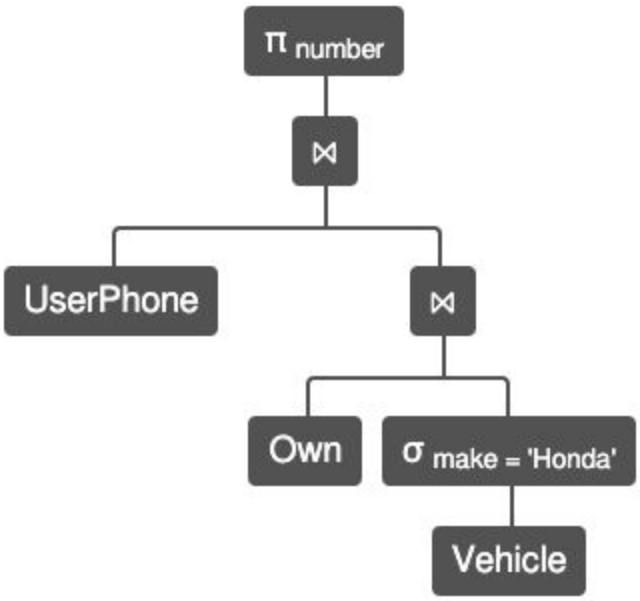
Stores.store_id
5f82283e-4d7a-4830-8950-724d7dbfd37f
c4b9ee85-2253-4fc5-8d9f-0dfa10e2e071
85a81960-0eab-45f6-966a-acac95d05ad6

2. [10pts] List the phone numbers of customers who own at least one Honda car.

a) [6pts] Relational Algebra

π number (UserPhone $\bowtie$ (Own $\bowtie$ (σ make = 'Honda' (Vehicle))))

b) [1pt] Parse Tree



π_{number} (UserPhone $\bowtie$ (Own $\bowtie$ ($\sigma_{make = 'Honda'}$ (Vehicle))))

c) [3pts] Result

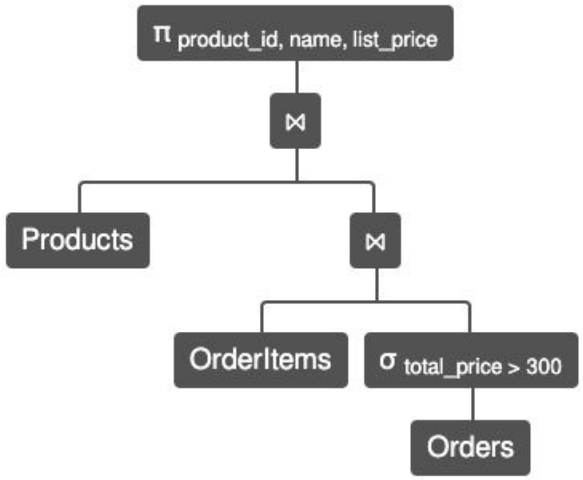
UserPhone.number
289.177.3295
001-658-589-8643
447.586.7548
+1-785-656-4037x4662

3. [10pts]List the product ID, name, and list_price of products that are associated with one or more orders with total_price greater than $300.

a) [6pts] Relational Algebra

π product_id, name, list_price (Products $\bowtie$ (OrderItems $\bowtie$ (σ total_price > 300 (Orders))))

b) [1pt] Parse Tree



$\pi_{product\_id, name, list\_price}$ (Products $\bowtie$ (OrderItems $\bowtie$ ($\sigma_{total\_price > 300}$ (Orders))))

c) [3pts] Result

Products.product_id	Products.name	Products.list_price
d9a0690f-6961-45fa-959a-1f5648757d87	Peets Coffee Coffee Ground Deep Roast Major Dickasons Blend - 20 Oz	14.99
2f167c5d-387f-4996-9d91-e4c07bd85802	Egglands Best Eggs Large - 12 Count	4.99
74cead4a-6e40-4152-8c16-567f264731d7	Ziploc Storage Bags Gallon 19 ct	4.59
d4e3d24c-834a-4646-9037-5023784ff7cf	Signature SELECT Beans Pinto Dry - 16 Oz	2.99
c95c2b40-81e3-41ba-88a0-4d54dd1d44e8	Cesar Classics Canine Cuisine 4 Assorted Flavors Box - 24-3.5 Oz	28.29

4. [15pts] List the first and last names of customer(s) who ordered ‘Lucerne Farms Eggs Large Grade AA Family Pack - 18 Count’

a) [9pts] Relational Algebra

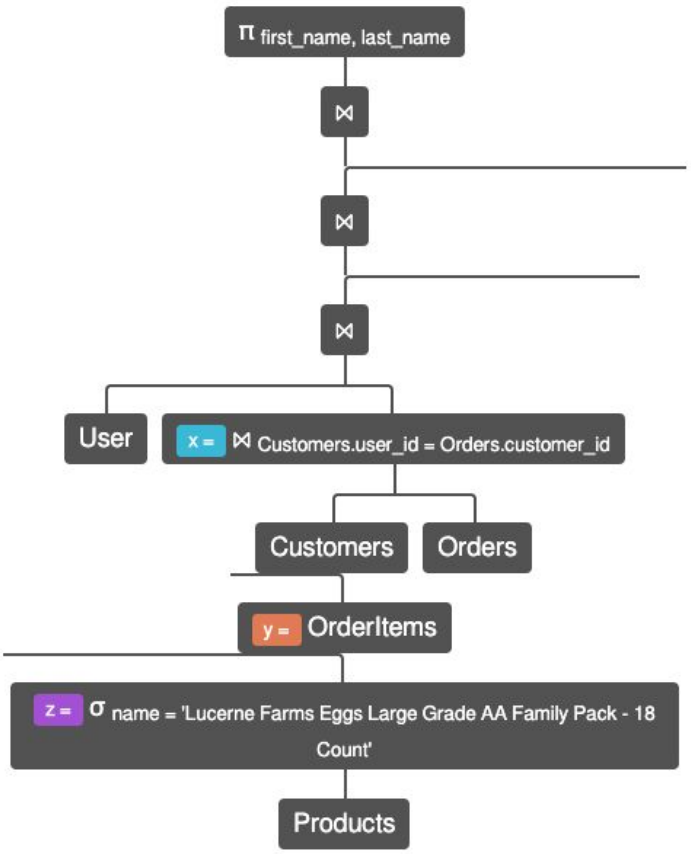
x = (Customers ⋈ Customers.user_id = Orders.customer_id (Orders))

y = (OrderItems)

z = (σ name = 'Lucerne Farms Eggs Large Grade AA Family Pack - 18 Count' (Products))

π first_name, last_name (User ⋈ x ⋈ y ⋈ z)

b) [3pt] Parse Tree



π first_name, last_name (User ⋈ (Customers ⋈ Customers.user_id = Orders.customer_id (Orders)) ⋈ (OrderItems) ⋈ (σ name = 'Lucerne Farms Eggs Large Grade AA Family Pack - 18 Count' (Products)))

c) [3pts] Result

User.first_name	User.last_name
Erin	Rich

5. [15pts] Find the ID's of all shoppers who have fulfilled at least one order with a total price greater than $150 and do not have a capacity.

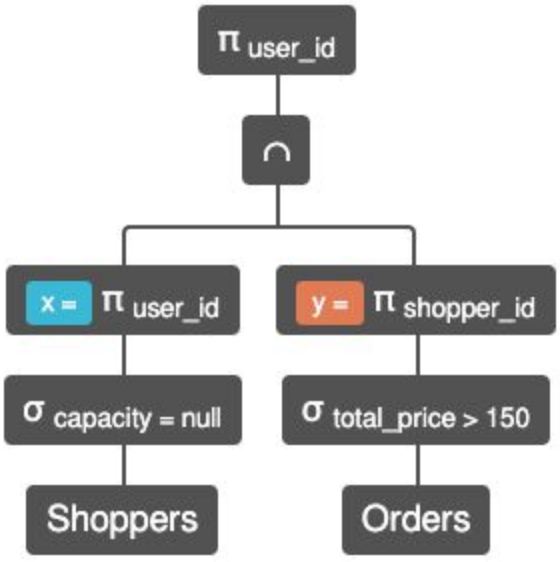
a) [9pts] Relational Algebra

x = π user_id (σ capacity = null (Shoppers))

y = π shopper_id (σ total_price > 150 (Orders))

π user_id (x $\cap$ y)

b) [3pt] Parse Tree



$\pi_{user\_id}((\pi_{user\_id}(\sigma_{capacity = null}(Shoppers))) \cap (\pi_{shopper\_id}(\sigma_{total\_price > 150}(Orders))))$

c) [3pts] Result

Shoppers.user_id
c14826b8-ab2a-4ee2-9bdd-3860c4cd6141
07afe1c5-1f37-40f4-9132-a7635a344fd7

6. [15pts] Find the email of all customers who ordered from both 'Golden Spike Travel Plaza' and 'Jackson Food Store'.

a) [9pts] Relational Algebra

A = (Orders ⋈ σ name = 'Golden Spike Travel Plaza' (Stores))

B = (Orders ⋈ σ name = 'Jackson Food Store' (Stores))

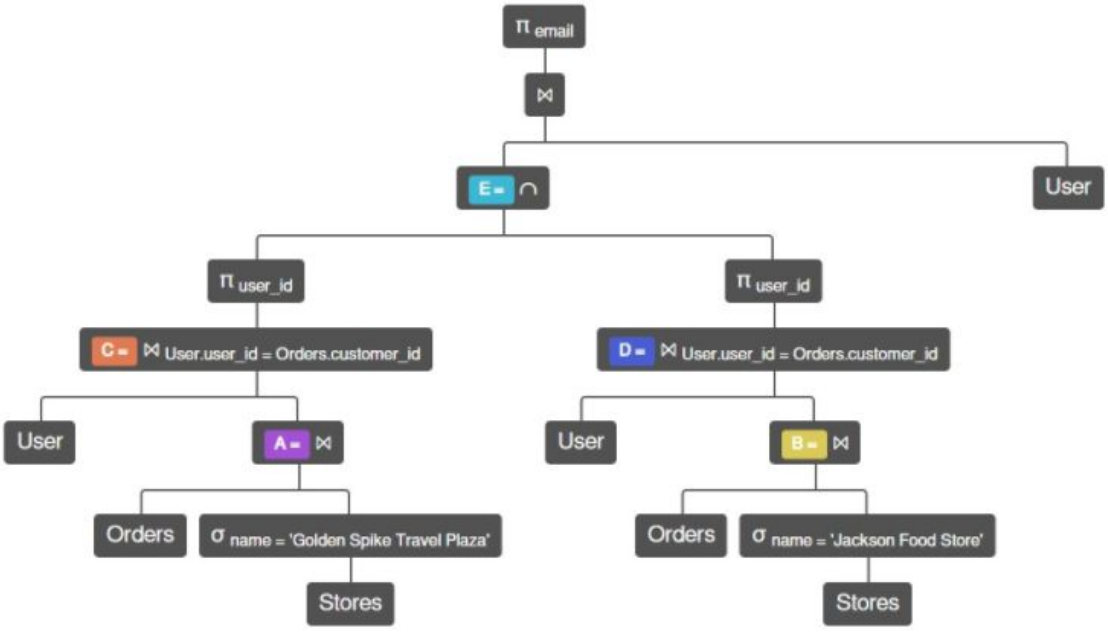
C = User ⋈ User.user_id = Orders.customer_id (A)

D = User ⋈ User.user_id = Orders.customer_id (B)

E = π user_id (C) ∩ π user_id (D)

π email (E ⋈ User)

b) [3pt] Parse Tree



c) [3pts] Result

User.email
stephen65@hotmail.com
knightmichael@gmail.com

7. [15pts] List the first names, last names, and emails of customers who have ordered from every 'Jackson Food Store'

a) [9pts] Relational Algebra

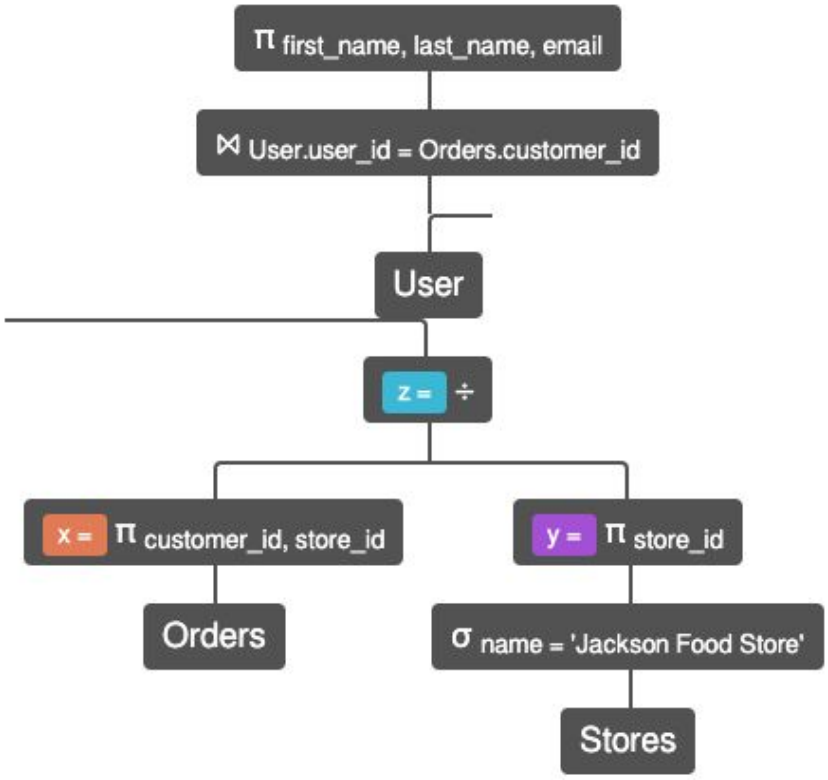
x = π customer_id, store_id (Orders)

y = π store_id (σ name = 'Jackson Food Store' (Stores))

z = x ÷ y

π first_name, last_name, email (User ⋈ User.user_id = Orders.customer_id (z))

b) [3pt] Parse Tree



π first_name, last_name, email (User ⋈ User.user_id = Orders.customer_id ((π customer_id, store_id (Orders)) ÷ (π store_id (σ name = 'Jackson Food Store' (Stores)))))

c) [3pts] Result

User.first_name	User.last_name	User.email
Elizabeth	Hammond	kkelley@yahoo.com

8. [10pts] List the emails of the hoarders, along with the hoarded item name(s), i.e. customers who ordered more than 25 of a particular item(e.g. toilet paper, kitchen towels) in a single order.

a) [6pts] Relational Algebra

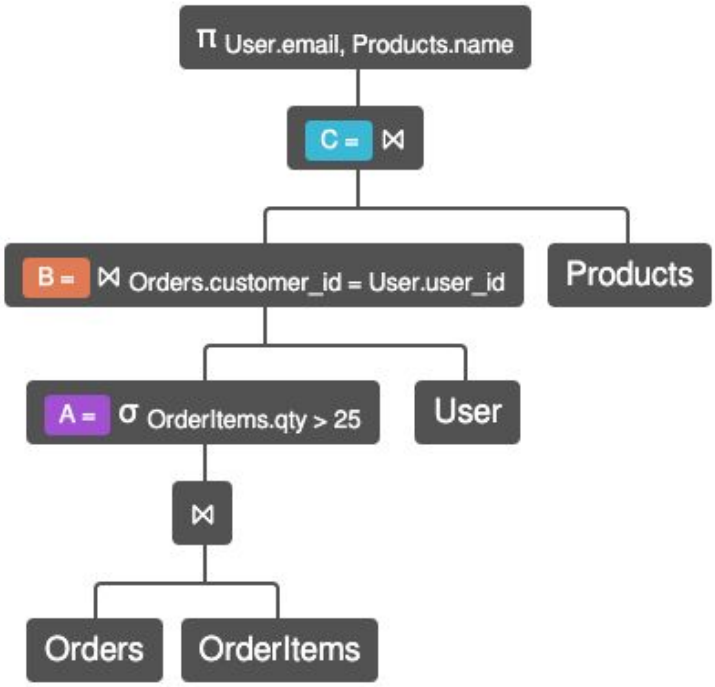
A = σ OrderItems.qty > 25 (Orders $\bowtie$ OrderItems)

B = A $\bowtie$ Orders.customer_id = User.user_id (User)

C = B $\bowtie$ Products

π User.email, Products.name (C)

b) [1pt] Parse Tree



π User.email, Products.name (((σ OrderItems.qty > 25 (Orders $\bowtie$ OrderItems)) $\bowtie$ Orders.customer_id = User.user_id (User)) $\bowtie$ Products)

c) [3pts] Result

User.email	Products.name
awade@hotmail.com	Applegate Natural Chicken & Maple Breakfast Sausage Frozen - 7oz
boylejoshua@hotmail.com	Hidden Valley The Original Ranch Topping & Dressing Squeeze Bottle - 20 Fl. Oz.
stephen65@hotmail.com	Entenmanns Minis Pound Cake 6 Count - 9.25 Oz
awade@hotmail.com	Rana Fettuccine - 9 Oz
garytaylor@yahoo.com	Signature SELECT/Kitchens Vegetables Mixed - 16 Oz