Andrew Plum

Professor Jamil

CS 360

9/27/2023

Assignment #1

Answer a will be relational algebra and answer b will be SQL

* 1. Pets\_in\_Moscow\_Idaho := π(PetID AND Name AND TypeofPet)σ(Owns.PetID = Pets.PetID AND Pet.City='Moscow' AND Pet.State='Idaho')(Pets ⨝ (σ(Owners.OID = Owns.OID)(Owns ⨝ σ(Age < 18 AND AnnualIncome = 0)(Owners))
  2. Result := π(PetID, Name, TypeofPet)(Pets\_in\_Moscow\_Idaho)
  3. SELECT p.PetID, p.Name, p.TypeofPet

FROM Pets p

CROSS JOIN Owns ON p.PetID = Owns.PetID

CROSS JOIN Owners o ON Owns.OID = o.OID

WHERE o.AnnualIncome = 0

AND o.Age < 18

AND o.City = 'Moscow'

AND o.State = 'Idaho'

* 1. SELECT Pets.PetID, Pets.Name, Pets.TypeofPet

FROM Pets

NATURAL JOIN Owners

WHERE City = Moscow

AND State = Idaho

AND Pets.Age x < 18

SELECT Pets.PetID, Pets.Name, Pets.TypeofPet

FROM Pets

CROSS JOIN Owns ON Pets.PetID = Owns.PetID

CROSS JOIN Owners ON Owns.OID = Owners.OID

WHERE

Pets.City = 'Moscow'

 AND Pets.State = 'Idaho'

 AND Owners.Age < 18

 AND Owners.AnnualIncome = 0;

1. t
   1. t
   2. SELECT o.OID, o.LastName, p.PetID, p.Name
   3. FROM Pets p
   4. CROSS JOIN Owns ON p.PetID = Owns.PetID
   5. CROSS JOIN Owners o ON Owns.OID = o.OID
   6. WHERE "p.Street#" != "o.Street#"
   7. OR p.City != o.City
   8. OR p.State != o.State
   9. OR p.ZipCode != o.ZipCode

SELECT Owners.OID, Owners.LastName, Pets.PetID, Pets.Name

FROM Pets CROSS JOIN Owns ON Pets.PetID = Owns.PetID CROSS JOIN Owners Owners ON Owns.OID = Owners.OID

WHERE "Pets.`Street#`" != "Owners.`Street#`" OR Pets.City != Owners.City OR Pets.State != Owners.State OR Pets.ZipCode != Owners.ZipCode;

1. T

SELECT p.PetID, p.Name

FROM Pets p

LEFT JOIN Purchases pur

ON p.PetID = pur.PetID

LEFT JOIN Foods f

ON pur.FoodID = f.FoodID

LEFT JOIN Likes

ON p.PetID = Likes.PetID

AND f.TypeofFood = Likes.TypeofFood

WHERE

Likes.TypeofFood IS NULL;

* 1. t
  2. SELECT p.petID, p.Name
  3. FROM pets p
  4. INNER JOIN Likes ON p.PetID = Likes.PetID

1. INNER JOIN Purchases pur ON p.PetID = pur.PetID

SELECT Pets.PetID, Pets.Name  
FROM Pets  
JOIN Purchases ON Pets.PetID = Purchases.PetID  
JOIN Foods ON Purchases.FoodID = Foods.FoodID  
LEFT JOIN Likes ON Pets.PetID = Likes.PetID AND Foods.TypeofFood = Likes.TypeofFood  
WHERE Likes.TypeofFood IS NULL;

1. t
   1. t
   2. SELECT p.PetID, p.Name AS PetName, f.FoodID, f.Name AS FoodName, f.Brand

FROM Pets p JOIN Likes l ON p.PetID = l.PetID

JOIN Foods f ON l.TypeofFood = f.TypeofFood

JOIN Purchases pr ON pr.FoodID = f.FoodID

JOIN Owners o ON pr.OID = o.OID

WHERE p.TypeofPet = f.ClassofFood

SELECT Pets.PetID, Pets.Name AS "Pets.Name", Foods.FoodID, Foods.Name AS "Foods.Name", Foods.Brand

FROM Pets

JOIN Owns ON Pets.PetID = Owns.PetID

JOIN Purchases ON Owns.OID = Purchases.OID

JOIN Foods ON Purchases.FoodID = Foods.FoodID;

1. t
   1. t
   2. SELECT f1.FoodID, f1.Brand, f1.Price

FROM Foods f1

LEFT JOIN Foods f2 ON f1.Brand = f2.Brand AND f1.Price < f2.Price

WHERE f2.FoodID IS NULL;

SELECT f1.FoodID, f1.Brand, f1.Price

FROM Foods f1

LEFT JOIN Foods f2 ON f1.Brand = f2.Brand AND f1.Price < f2.Price

WHERE f2.FoodID IS NULL;

Diagram Code Link:

<https://dbdiagram.io/d>

Diagram Code:

Table Pets {

  PetID integer [primary key]

  Name varchar

  Age integer

  StreetNum integer

  City varchar

  ZipCode integer

  State varchar

  TypeofPet varchar

}

Table Owners {

  OID integer [primary key]

  LastName varchar

  StreetNum integer

  City varchar

  ZipCode integer

  State varchar

  Age integer

  AnnualIncome integer

}

Table Owns {

  PetID integer [primary key]

  Year integer [primary key]

  OID integer

  PetAgeatOwnership integer

  PricePaid integer

}

Table Likes {

  PetID integer [primary key]

  TypeofFood varchar [primary key]

}

Table Foods {

  FoodID integer [primary key]

  Name varchar

  Brand varchar

  TypeofFood varchar

  Price integer

  ItemWeight integer

  ClassofFood varchar

}

Table Purchases {

  OID integer [primary key]

  FoodID integer [primary key]

  PetID integer [primary key]

  Month varchar [primary key]

  Year integer [primary key]

  Quantity integer [primary key]

}