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CSCI 3287

Homework 1

2.4.1

1. *πmodel*(*σmodel*≥3*.*00(*PC*))  
     
   SELECT model FROM PC WHERE speed >= 3.00;  
     
   Result: 1005, 1006, 1013
2. *πmaker*(*Product* ⋈ *σhd*≥100(*Laptop*))  
     
   SELECT maker FROM Laptop WHERE hd >= 100;  
     
   Result: E, A, B, F, G
3. *πmodel,price*(*σmaker*=*B*(*Product*)) ⋈ (*πmodel,price*(*PC*) ∪ *πmodel,price*(*Laptop*) ∪ *πmodel,price*(*Printer*))  
     
   SELECT PC.model, price FROM PC, Product

WHERE maker='B' AND PC.model = Product.model

UNION ALL

SELECT Laptop.model, price FROM Laptop, Product WHERE maker='B' AND Laptop.model = Product.model

UNION ALL

SELECT Printer.model, price FROM Printer, Product WHERE maker='B' AND Printer.model = Product.model;  
  
Result: Model Price  
 1004 649  
 1005 630

1006 1049

2007 1429

1. *πmodel*(*σtype*=*laser*∧*color*=*true*(*Printer*))  
     
   SELECT model FROM Printer WHERE type=’laser’ AND color=’true’;  
     
   Result: 3003, 3007
2. *πmaker*(*σtype*=*Laptop*(*Product*)) − *πmaker*(*σtype*=*PC*(*Product*))  
     
   (SELECT maker FROM Product WHERE type='laptop') MINUS

(SELECT maker FROM Product WHERE type='pc');  
  
Result: F, G

1. R1 := ρR1(PC)

R2 := ρR2(PC)

R3 := R1 ⋈(R1.hd=R2.hd AND R1.model<>R2.model) R2

R4 ≔πR1.hd (R3)  
  
SELECT hd FROM PC GROUP BY hd HAVING COUNT(model) >= 2;  
  
Result: 250, 80, 160

2.4.5

Both joins have the same number of tuples, but the theta-join will have two copies of the attributes that both relations have in common. The theta-join will also be the cross product of R and S with all common attributes, but also two copies of each common attribute. The natural-join will have all the tuples of R and S, but the common attributes will be collapsed.

5.1.1

Set: {2.66, 2.1, 1.42, 2.8, 3.2, 2.2, 2.0, 1.86, 3.06}

Bag: {2.66, 2.1, 1.42, 2.8, 3.2, 3.2, 2.2, 2.2, 2.0, 2.8, 1.86, 2.8, 3.06}  
Average as a set = 2.37

Average as a bag = 2.49