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CSCI 3287

12/15/17

Homework 3

1) a) What PC models have a speed of at least 3.00?

δ = Selection

Π = Projection

X = Cartesian Product

U = Union

- = Difference

$\delta_{speed \geq 3.00}(PC)$ = SELECT * FROM PC WHERE speed $\geq$ 3.00

Need to remove duplicate entries…

$= \Pi_{model}(\delta_{speed \geq 3.00}(PC))$

Model
1005
1006
1013

e) Find those manufacturers that sell laptops, but not PC's

selectLaptop = $\delta_{type = laptop}$ (Product)

laptopManufacturer = Π_{maker} (selectLaptop)

selectPC = $\delta_{type = PC}$ (Product)

PCManufacturer = Π_{maker} (selectPC)

Answer = laptopManufacturer – PCManufacturer

Maker
F
G

h) Find those manufacturers of at least two different computers (PC's or laptops) with speeds of at least 2.80

PC with at least speed 2.80: $\delta_{speed \geq 2.80}(PC)$

Laptop with at least speed 2.80: $\delta_{speed \geq 2.80}(Laptop)$

Get rid of duplicate models for both:

$\Pi_{model}(\delta_{speed \geq 2.80}(PC))$

$\Pi_{model}(\delta_{speed \geq 2.80}(Laptop))$

All laptops and PCs with speed greater than or equal to 2.80:

Computers = $(\Pi_{model}(\delta_{speed \geq 2.80}(PC))) \cup (\Pi_{model}(\delta_{speed \geq 2.80}(Laptop)))$

Get data from product table using valid model numbers:

Computers (natural join) Products

Eliminate duplicate makers and models

currentResult = $\Pi_{model, maker}$ (Computers (natural join) Products)

Duplicate the current result for second possible computer

secondCurrent = $P_{(secondModel, secondMaker)}$(currentResult)

Join the first possible computers with second possible computers

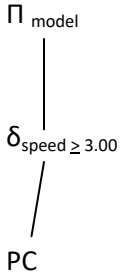
finalResult = currentResult (natural join) $_{(maker = secondMaker, model <> secondModel)}$ secondCurrent

Get rid of any duplicate makers from final result

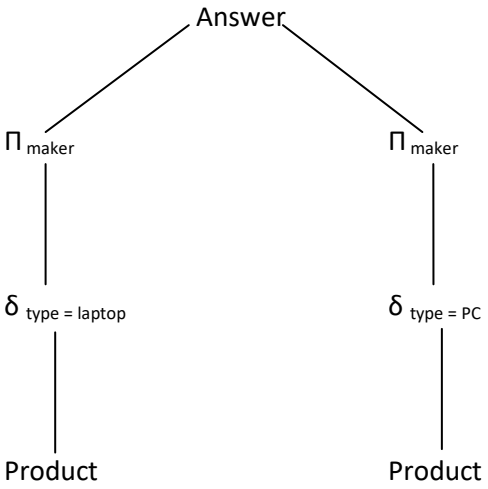
Π_{maker} (finalResult)

Maker
B
E

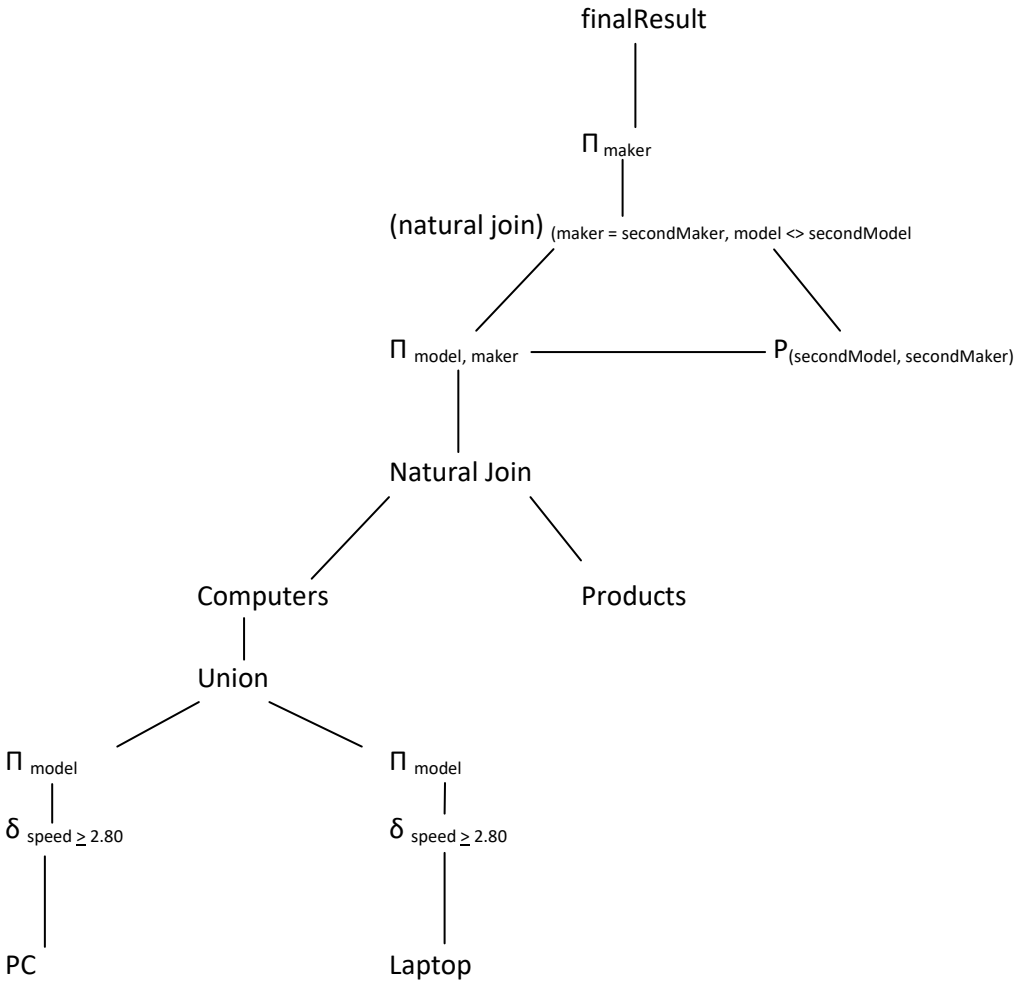
2) a) What PC models have a speed of at least 3.00?



e) Find those manufacturers that sell laptops, but not PC's



h) Find those manufacturers of at least two different computers (PC's or laptops) with speeds of at least 2.80



3) b) How many schedules of the eight actions are equivalent to the serial order (T_2,T_1)?

T_1: r1(A); w1(A); r1(B); w1(B);

T_2: r2(B); w2(B); r2(A); w2(A);

R2(B), W2(B) R2(A),W2(A)

R1(A), W1(A) R1(B), W1(B)

There are no schedules that are equivalent to the serial order, as there exists a conflict between R1,W1, R2, and W2 for the database element A. Since we cannot swap the order to provide distance between the writing and reading of the element A, we cannot schedule the eight actions to the serial order.