INF3100: Databasesystemer

Oppgavesett 4

Oppgave 5.2.1: Here are two relations:

R (A, B): {(1,2), (3,4), (1,2), (3,5), (4,5)}

S (B, C): {(1,2), (3,5), (3,6), (4,5), (1,3), (4,5)}

Compute the following:

c) $\tau_{A,B}(R)$;

d) $\tau_{C,B}(S)$;

e) $\delta(R)$;

f) $\delta(S)$;

g) $\gamma_{A,\ AVG(B)}(R)$;

h) $\gamma_{B,\ SUM(C)}(S)$;

Oppgave 2.4.1: This exercise builds upon the products schema of Exercise 2.3.1. Recall that the database schema consists of four relations, whose schemas are:

Product (maker, model, type)

PC (model, speed, ram, hd, price)

Laptop (model, speed, ram, hd, screen, price)

Printer (model, color, type, price)

a) Find those manufactures that sell printers, but not PC's.

b) What PC models have a speed of at least 2.50?

c) Which manufactures make laptops with a hard disk of at least 120 GB?

Oppgave 2.4.2: Draw expression trees for each of your expressions of Exercise 2.4.1

Oppgave 3.x.2: Gitt relasjonen *R(A,B,C,D)* med FD-ene $AB \rightarrow CD$ og $B \rightarrow D$.

- Hvilke kandidatnøkler har R?
- Hvilken normalform har R?
- Hvordan skal R dekomponeres for å få en høyere normalform?
- Vis at dekomponeringen er tapsfri.
- Vi innfører så MVDen $A \twoheadrightarrow D$. Vis at da holder $A \rightarrow D$.

Oppgave 6.2.2: Write the following queries, based on the database schema:

Product(maker,model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)

of Exercise 2.4.1, and evaluate your queries using the data of that exercise.

a) Find this manufacturers that sell PC's but not laptops.
c) Find the model number and price of all products (but any type) made by manufacturer C.
f) Find those manufacturers of at least two different computers(PC's or laptops) with speeds of at least 2.0.

Oppgave 6.3.1: Write the following queries, based on the database schema:

Product(maker,model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)

of Exercise 2.4.1. You should use at least one subquery in each of your answers and write each query in two significantly different ways (e.g., using different sets of the operators EXISTS,IN,ALL,and ANY).

a) Find the makers of laptops with a speed of at least 2.0.
b) Find the printers with the highest price.
c) Find the laptops whose speed is slower than that of the fastest PC.