

1) π model (σ speed ≥ 3.00 (PC))

2) τ price desc (π price σ hd >100 PC)

3) π maker (Product \bowtie σ hd ≥ 100 (Laptop))

4) π maker (Product \bowtie Laptop) - π maker (Product \bowtie PC)

5) π X.model, Y.model ((ρ X (PC)) \bowtie X.model $>$ Y.model \wedge X.ram = Y.ram \wedge X.speed = Y.speed (ρ Y (PC)))

6) π PC.model, PC.price, equivlaptop \leftarrow coalesce(Laptop.model,'none'), laptopprice \leftarrow coalesce(Laptop.price,'none') (PC \bowtie PC.speed=Laptop.speed Laptop)

7)

π maker, model (Product \bowtie PC \bowtie (π speed PC - π speed Laptop))

Εναλλακτικά: π maker, model (Product \bowtie (π model PC - π PC.model (PC \bowtie PC.speed=Laptop.speed Laptop))) ή

8) γ type;avg(price) \rightarrow total(Product \bowtie (π model,price(PC) \cup π model,price(Laptop) \cup π model,price(Printer)))

9) A = π speed,model (PC) \cup π speed,model (Laptop)
 π maker (γ max(speed) \rightarrow speed (A) \bowtie A \bowtie Product)

10) π maker, type (Product) \div π type (Product)

Εναλλακτικά: $(\pi \text{ maker } (\sigma \text{ type}='pc' \text{ (Product)})) \cap$
 $(\pi \text{ maker } (\sigma \text{ type}='laptop' \text{ (Product)})) \cap$
 $(\pi \text{ maker } (\sigma \text{ type}='printer' \text{ (Product)}))$

Ωστόσο, η εναλλακτική αυτή έχει το μειονέκτημα ότι χρειάζεται τροποποίηση η έκφραση κάθε φορά που αλλάζουν τα δεδομένα της σχέσης Product όσον αφορά τους τύπους των προϊόντων. Για παράδειγμα, αν προστεθούν προϊόντα ενός νέου τύπου (π.χ. 'scanner') θα χρειαστεί η έκφραση να επεκταθεί με: $\cap (\pi \text{ maker } (\sigma \text{ type}='printer' \text{ (Product)}))$

11) $PC_Prices = \pi \text{ maker, price (Product} \bowtie PC)$
 $Laptop_Prices = \pi \text{ maker, price (Product} \bowtie Laptop)$
 $PC_Avg_Prices = \gamma \text{ maker; avg(price)} \rightarrow pc_price(PC_Prices)$
 $Laptop_Avg_Prices = \gamma \text{ maker; avg(price)} \rightarrow lp_price(Laptop_Prices)$
 $PC_Avg_Prices \bowtie Laptop_Avg_Prices$

12) $Fast_PC_Makers = (\pi \text{ maker } (\sigma \text{ speed} > 2.5 \text{ (Product} \bowtie PC)))$
 $MAXRAM = (\gamma \text{ maker; max(ram)} \rightarrow \text{maxram}(\text{Product} \bowtie PC))$
 $AvgPrice = (\gamma \text{ maker; avg(price)} \rightarrow \text{avgprice}(\text{Product} \bowtie PC))$
 $\pi \text{ maker, maxram, avgprice}(\text{MAXRAM} \bowtie \text{AvgPrice} \bowtie \text{Fast_PC_Makers})$

Εναλλακτικά:

$Fast_PC_Makers = (\pi \text{ maker } (\sigma \text{ speed} > 2.5 \text{ (Product} \bowtie PC)))$
 $\gamma \text{ maker; avg(price)} \rightarrow \text{avgprice, max(ram)} \rightarrow \text{maxram} (PC \bowtie \text{Product} \bowtie \text{Fast_PC_Makers})$