

# Solutions for PSI

CS347 FA12

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2.4.1 (a)  $\pi_{\text{model}} (\sigma_{\text{speed} \geq 3.00} (\text{PC}))$

Model

1005

1006

1013

$\pi_{\text{model}}$

$\sigma_{\text{speed} \geq 3.00}$

PC

(b)  $\pi_{\text{model, price}} (\sigma_{\text{maker} = 'B'} (\text{Product} \bowtie \{ \pi_{\text{model, price}} (\text{PC})$

$\cup \pi_{\text{model, price}} (\text{Laptop}) \cup \pi_{\text{model, price}} (\text{Printer}) \} )$

Model | Price

1004 | 649

1005 | 630

1006 | 1049

2007 | 1429

$\pi_{\text{model, price}}$

$\sigma_{\text{maker} = 'B'}$

Product

$\cup$

$\pi_{\text{model, price}}$

PC

$\cup$

$\pi_{\text{model, price}}$

Laptop

$\pi_{\text{model, price}}$

Printer

→ Common Mistake :

....  $\pi_{\text{model, price}} (\text{PC} \cup \text{Laptop} \cup \text{Printer})$

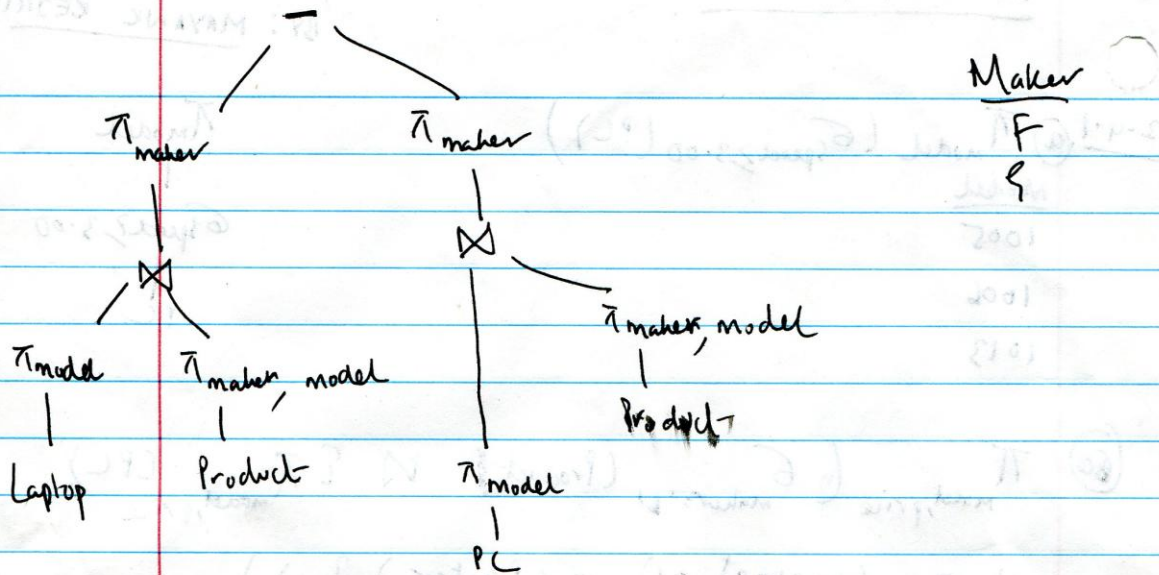
The Union is invalid because of  
Schema mismatch.

(c)  $\{ \pi_{\text{maker}} (\pi_{\text{model}} (\text{Laptop}) \bowtie \pi_{\text{maker, model}} (\text{Product})) \}$

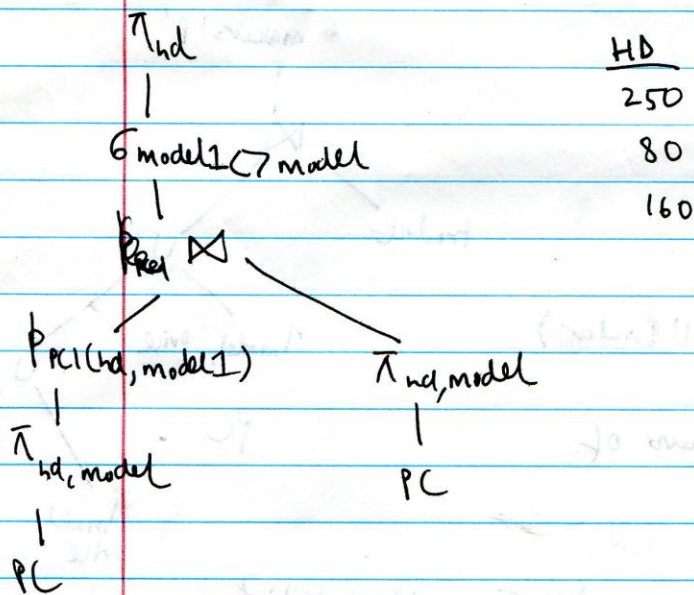
$\{ \pi_{\text{maker}} (\pi_{\text{model}} (\text{PC}) \bowtie \pi_{\text{maker, model}} (\text{Product})) \}$

~~Product~~

Common Mistake:  $\sigma_{\text{type} = \text{PC AND type} < \text{PC Laptop}}$



(f)  $\pi_{hd} \{ \sigma_{\text{model1} < \text{model}} \left( \left( \sigma_{\text{PC}(hd, \text{model1})} \left( \pi_{hd, \text{model1}}^{(PC)} \right) \right) \right) \} \bowtie \pi_{hd, \text{model}}^{(PC)}$





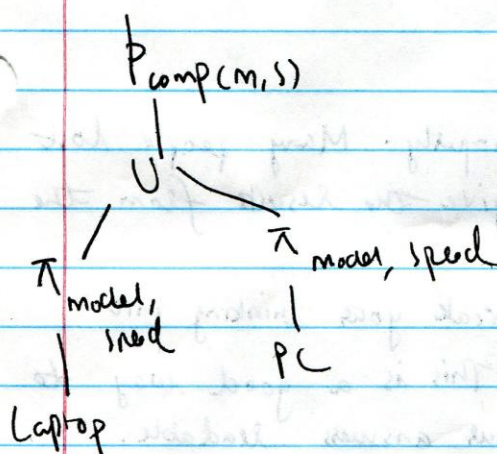
$$(i) \quad \text{Comp}(M, S) := \rho_{\text{Comp}(M, S)} (\bar{\pi}_{\text{model, speed}}^{\text{Laptop}} \cup \bar{\pi}_{\text{model, speed}}^{\text{PC}})$$

$$\underline{R(MI)} := \pi_{MI} [\text{Comp} \bowtie_{SI \leq S} \rho_{\text{Comp}(MI, SI)} (\text{Comp}(MI, SI))]$$

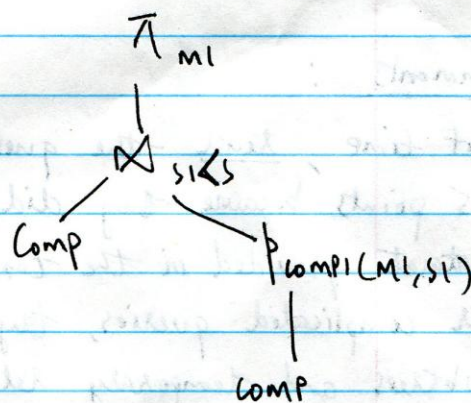
$$\underline{\text{Answer}(\text{Maker})} := \pi_{\text{maker}} [\{ \rho_{L(\text{model})} \pi_{\text{mg}} (\text{Comp}(M, S)) \}$$

$$\left. \begin{array}{c} \neg \rho(R) \\ R(\text{model}) \end{array} \right] \bowtie \pi_{\text{maker, model}} (\text{Product})]$$

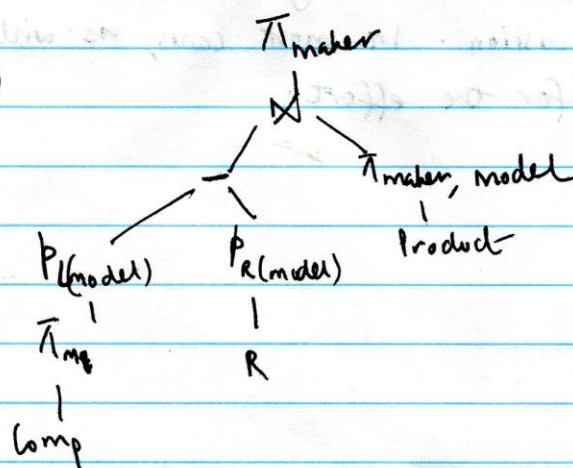
Comp(M, S)



R(MI)



Answer(Maker)



Maker
B

5.1.3

Set

15

16

14

18

Bag

15

16

14

16

15

15

14

18

Comments :

- ① Next time, read the question properly. Many people lost 2.5 points because they did not give the results from the dataset provided in the textbook.
- ② For complicated queries, try to break your thinking into subtrees and temporary relations. This is a good way to 'debug' your solution and makes your answers readable.
- ③ Attempt every question. In most cases, we will give you partial credit for the effort.