

作業2 參考解答

page 49, Exercise 4.1 (a) to (c)

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

(1) Algebraic expression

```
<latex>\pi_{\text{model}}(\sigma_{\text{speed} \geq 3.0}(\text{PC}))</latex>
```

(2) Linear notation

```
<latex>R:=\sigma_{\text{speed} \geq 3.0}(\text{PC})</latex>
<latex>\text{Answer}:=\pi_{\text{model}}(R)</latex>
```

(b) Which manufacturers make laptops with a hard disk of at least 100GB?

(1) Algebraic expression

```
<latex>\pi_{\text{maker}}(\text{Product} \bowtie (\sigma_{\text{hd} \geq 100}(\text{Laptop})))</latex>
```

(2) Linear notation

```
<latex>L:=\sigma_{\text{hd} \geq 100}(\text{Laptop})</latex>
<latex>\text{Answer}:=\pi_{\text{maker}}(\text{Product} \bowtie L)</latex>
```

(c) Find the model number and price of all products (of any type) made by manufacturer B.

(1) Algebraic expression

```
<latex>\pi_{\text{model}, \text{price}}(\sigma_{\text{maker}=B}(\text{Product} \bowtie (\pi_{\text{model}, \text{price}}(\text{PC}) \cup
\pi_{\text{model}, \text{price}}(\text{Laptop}) \cup \pi_{\text{model}, \text{price}}(\text{Printer}))))</latex>
```

(2) Linear notation

```
<latex>R1:=\pi_{\text{model}, \text{price}}(\text{PC})</latex>
<latex>R2:=\pi_{\text{model}, \text{price}}(\text{Laptop})</latex>
<latex>R3:=\pi_{\text{model}, \text{price}}(\text{Printer})</latex>
<latex>R4:=R1 \cup R2 \cup R3</latex>
<latex>R5:=\sigma_{\text{maker}=B}(\text{Product} \bowtie R4)</latex>
<latex>\text{Answer}:=\pi_{\text{model}, \text{price}}(R5)</latex>
```

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