

$$\begin{array}{l}
 r: \begin{array}{c} A \textcircled{B} \\ \hline 1 \quad 2 \end{array} \quad s: \begin{array}{c} A \quad B \\ \hline 3 \quad 4 \\ \hline 1 \quad 2 \end{array} \\
 r \bowtie s \\
 = \begin{array}{c} A \quad B \\ \hline 1 \quad 2 \end{array} \\
 r - s \\
 = \emptyset \\
 \hline
 r \cap s = r \bowtie s
 \end{array}$$

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r:	<u>SID</u>	S:	<u>SID</u>	<u>CID</u>
1	DB1		1	DB1
1	DB2	-	2	DB1
1	DB3		3	DB1
			4	DB2
			3	DB2
			1	DB2
			3	DB3
			3	DB4

$$\begin{array}{l}
 S \div r \\
 \hline
 SID \\
 1 \\
 3
 \end{array}$$

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from to

Berlin	Paris
Zurich	Prag
LA	Beijing
Paris	LA
⋮	⋮

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~~$$\exists x, y, z. R(x, y, z)$$~~

$$\exists x, y. R(x, y, z) \equiv \pi(c)R$$

$$\{ z \mid \exists x, y. R(x, y, z) \}$$

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$$\pi[A] \sigma[B=S] R \equiv$$

	<u>A</u>	<u>B</u>
	1	5
	1	6

$$\pi[A] R \equiv \{ x \mid \exists y. R(x, y) \}$$

$$\{ x \mid \exists y. (R(x, y) \wedge y=S) \}$$

$$\{ x \mid R(x, 5) \}$$

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$$\sigma[A=B] R$$

$$\{ x \mid R(x, x) \}$$

$$R \bowtie S$$

$$\{ x, y, z \mid R(x, y) \wedge S(y, z) \}$$

$$R \cup S$$

$$\{ x, y \mid R(x, y) \vee S(x, y) \}$$

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$$\begin{array}{l} \underline{R} \quad \underline{A} \quad \underline{B} \quad \underline{S} \quad \underline{A} \quad \underline{B} \\ \{A, B \mid R(A, B) \wedge \neg S(A, B)\} \\ R \div T \quad \underline{R} \quad \underline{A} \quad \underline{B} \quad \underline{T} \quad \underline{B} \\ \{x \mid \forall \underline{y} T(y) \rightarrow R(x, y)\} \end{array}$$

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