

2

$$1) \pi_{name} \left( \left( \pi_{liquors} \left( \sigma_{month=december} \left( \sigma_{county=Polk} (sales) \right) \cap \left( \sigma_{county=LINN} (sales) \right) \right) \right) \right) \mid x \mid_{sale.id=liquors.id} \text{ liquors}$$

2)  $\pi$

$$\pi_{manufacturers} \left( \left( \pi_{liquors} \left( \sigma_{month=jan} \left( \sigma_{county=Polk} (sales \mid x \mid_{id=liquors.id}) \right) \right) \right) \mid x \mid_{sale.id=liquors.id} \left( \pi_{liquors} \left( \sigma_{month=jan} \left( \sigma_{county=Polk} (sales \mid x \mid_{id=liquors.id}) \right) \right) \right) \right)$$

3.

1)  $\pi_{B,D}(T2) =$

B	D
x	c
y	a
x	a

2)  $T2 \times \pi_A(T2)$

A	A	B	D
1	1	x	c
2	3	y	a
2	3	x	a
3	1	x	c
3	3	y	a
3	3	x	a

3.  $T1 \mid x \mid_{T1.C=T2.D} T2 =$

A	B	C	A	B	D
1	x	A	3	y	A
2	x	A	3	x	A

4.  $T1 - (T1 - T2)$

$T1 - T2 = T1$

$T1 - T1 = \text{empty table}$

A	B	C	A	B	D
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6.  $T2 \mid x \mid (\sigma_{D=x}(T2)) = T1 \mid x \mid \text{empty table} = \text{empty table}$

A	B	C	D
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