

## Assignment 2 (Distributed Database Systems) (due Thursday, July, 31, 2003)

1. (5.4) Simplify the following query, expressed in SQL, on one example database using the given primary keys:

```
SELECT EMP
FROM ABC
WHERE EMP = 'Smith'
AND NOT(PAGE = 'P1' OR DATE = 12)
AND PNO = 'P1'
AND DATE = 12
```

2. (5.7) Assume that relation *PRICE* and *ABC* are horizontally fragmented as follows:

```
PRICE =  $\sigma_{\text{price} < 100}(\text{PRICE})$ 
PRICE =  $\sigma_{\text{price} > 100}(\text{PRICE})$ 
```

```
ABC =  $\sigma_{\text{price} < 100}(\text{ABC})$ 
ABC =  $\sigma_{\text{price} > 100}(\text{ABC})$ 
ABC =  $\sigma_{\text{price} < 100}(\text{ABC})$ 
```

Transform the following query into a reduced query or fragment, and determine whether it is better than the given query:

```
SELECT EMP, PRODUCT
FROM ABC, PRICE
WHERE A.SUPPLY = PRICE.PNO
AND PRICE = 'CASH'AM'
```

3. (5.6) Consider the following join graph:



and the attribute values (available in *T* and *T*). Apply the RED-1 algorithm with  $T_{\text{RHS}} = R$  and  $T_{\text{LHS}} = L$ .

Table 1

id	val
R1	1000
R2	1000
R3	2000
R4	1000

Table 2

Command	val	type
W.L.	00	0.0
W.L.	00	0.1
W.L.	00	0.2
W.B.	00	0.0
W.B.	00	0.1

4) (10 pts) Which of the following schedules are conflict equivalent? (Ignore the commit (C) and abort (A) commands.)

- (1) = (W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>) (R<sub>1</sub>W<sub>2</sub>R<sub>1</sub>) (C) (W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>) (C) (R<sub>2</sub>W<sub>1</sub>) (C)  
 (2) = (R<sub>1</sub>W<sub>2</sub>R<sub>1</sub>W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>) (W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>) (C) (C) (C)  
 (3) = (R<sub>1</sub>W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>) (C) (W<sub>2</sub>W<sub>1</sub>) (C) (C)  
 (4) = (R<sub>1</sub>W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>) (C) (W<sub>2</sub>W<sub>1</sub>W<sub>2</sub>W<sub>1</sub>) (C)