

Jason Less
404-640-158
10/9/17
CS 143, Benito

Homework #1

$R - S \Rightarrow$	A	B	C	$S - R \Rightarrow$	A	B	C
	4	5	6		2	5	4
	1	2	6				

$(R - S) \cup (S - R) \Rightarrow$	A	B	C
	4	5	6
	1	2	6
	2	5	4

$R \bowtie_{R.A \leq S.C \wedge R.B \leq S.D} S \Rightarrow$	A	R.B	S.B	C	D
	1	2	2	4	6
	3	4	8	4	6
	1	2	8	6	8
	3	4	8	6	8
	5	6	8	6	8
	1	2	7	5	9
	3	4	7	5	9

③ Customer (customer-name, street, city)

Branch (branch-name, city)

Account (customer-name, branch-name, account-number)

- (a) $\Pi \text{customer-name} (\sigma \text{branch-name} = \text{'Region12'} (\text{Account}))$
- (b) $\Pi \text{customer-name} (\sigma \text{R1.city} < \text{R2.city} \wedge \text{R1.branch-name} = \text{R2.branch-name} (\text{pri}(\text{Branch}) \times \text{pri}(\text{Customer} \bowtie \text{Account})))$
- (c) $\Pi \text{branch-name} (\text{Branch}) - \Pi \text{branch-name} (\text{Account})$
- (d) $\Pi \text{customer-name} (\text{Customer}) - \Pi \text{customer-name} (\sigma \text{branch-name} = \text{'Region12'} (\text{Account}))$
- (e) $\Pi \text{customer-name} (\text{Customer}) - \Pi \text{customer-name} (\Pi \text{customer-name} (\text{Customer}) \times \Pi \text{branch-name} (\sigma \text{City} = \text{'Los Angeles'} (\text{Branch})) - \Pi \text{customer-name, branch-name} (\text{Account}))$
- (f) $\Pi \text{customer-name} (\text{Customer}) - \Pi \text{R1.customer-name} (\sigma \text{R1.branch-name} < \text{R2.branch-name} \vee \text{R1.account-number} > \text{R2.account-number}) \wedge \text{R1.customer-name} < \text{R2.customer-name} (\text{pri}(\text{Account}) \times \text{pri}(\text{Account})))$

(4) Student (sid, GPA)

$\Pi_{sid}(\text{Student}) - \Pi_{sid}(\sigma_{R1.\text{GPA} > R2.\text{GPA}} \wedge R1.\text{sid} < R2.\text{sid} (\rho_{R1}(\text{Student}) \times \rho_{R2}(\text{Student})))$

(5) (3.a)

```
select customer-name  
from Account  
where branch-name = 'Region12'
```

(3.b)

```
select R1.customer-name  
from R1 as branch, R2 as customer natural join Account  
where R1.city = R2.city and R1.branch-name = R2.branch-name
```

(3.c)

```
select branch-name  
from Branch;  
except  
(select branch-name  
from Account);
```

(3.d)

```
select customer-name  
from Customer;  
except  
(select customer-name  
from Account  
where branch-name = 'Region(2)');
```

(3.e)

```
select distinct R1.customer-name  
from Account as R1  
where not exists (  
(select branch-name  
from branch  
where city = 'Los Angeles');  
except  
(select R2.branch-name  
from Account as R3, Account as R2  
where R3.account-number = R2.account-number and  
R1.customer-name = R3.customer-name);  
);
```

From last

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Homework # ((cont))

(5) (3.f) Select R1.customer-name

from Account as R1

where unique (

select R2.customer-name

from Account as R2

where R1.customer-name = R2.customer-name and

R1.student-number = R2.student-number

).

(4) (Select s_id

from Student),

except

(select R1.s_id

from Student as R1, Student as R2

where R1.GPA > R2.GPA and R1.s_id = R2.s_id

).