

# CSE 462 : SQL

Name: \_\_\_\_\_

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\*\*\*\*\* Solved in class, on February 11, 2011. \*\*\*\*\*

1. Consider the relation schema  $Employee(name, dept)$  and the non-equivalent queries below. (Appeared on the first test of the Summer 2010 semester. Reasoning about NULL is not required and has been provided in the answers below for completeness.)

-- Query #1:

```
(SELECT name FROM Employee)
EXCEPT
(SELECT name FROM Employee WHERE dept <> 'Accounting');
```

-- Query #2:

```
SELECT E1.name FROM Employee E1
WHERE E1.dept NOT IN
  (SELECT E2.dept FROM Employee E2
   WHERE E1.name <> E2.name AND E2.dept <> 'Accounting');
```

a) Briefly explain what each query computes. (Detailed explanations provided for your reference. The short answers were sufficient for full points.)

Short answer. Query #1 returns the names of all employees whose department is either Accounting or NULL.

Detailed explanation. The top subquery returns ALL employee names. The bottom subquery returns the names of all employees whose department is neither Accounting nor NULL. The condition  $dept \neq 'Accounting'$  in the where condition evaluates to UNKNOWN when a tuple  $t$  has the dept component assigned NULL and thus every such  $t$  is not returned by the subquery.

Short answer. Query #2 returns the names of all employees whose department is Accounting as well as those from departments having a single employee. No employees associated with a NULL department are returned.

Detailed explanation. The query returns ALL employee names, except those whose departments are returned by the subquery. Note that if  $E1.dept$  is NULL then the WHERE clause of the outer query returns UNKNOWN and the employee name is not returned. Condition  $E1.Name \neq E2.Name$  guarantees that the subquery returns the department of E1 only if there exists another employee who works in the same department as E1. Condition  $dept \neq 'Accounting'$  further requires that the department must be different than Accounting (and also not NULL).

b) Write a query equivalent to Query #1 which does not involve a subquery.

```
SELECT name
FROM Employee
WHERE dept = 'Accounting' OR dept IS NULL;
```

c) Provide two non-trivial relation instances for  $Employee$ , one for which the queries return the same tuples and one for which they return different tuples. Show which tuples are returned in each case. (15)

name	dept	
John	Management	Both queries return an empty relation.
Jane	Management	

name	dept	
John	Management	Query #1 returns an empty relation, Query #2 returns {"John"}.