

Questions to be discussed: 2(a) to (e).

1. Given the tables R and S shown below, compute the output of each of the following queries.

- (a) **select * from R natural join S;**
- (b) **select * from R inner join S on R.A = S.A;**
- (c) **select * from R left outer join S on R.A = S.A;**
- (d) **select * from R right outer join S on R.A = S.A;**
- (e) **select * from R full outer join S on R.A = S.A;**

R					S			
X	A	Y	B	Z	A	B	C	D
0	10	0	9	2	17	1	20	100
30	8	0	5	1	4	2	40	200
60	4	1	3	3	4	3	30	100
90	0	0	4	5	8	5	60	500

2. This question is based on the same database schema as Tutorial 3, Question 2.

Customers (cname, area)
 Restaurants (rname, area)
 Pizzas (pizza)
 Sells (rname, pizza, price)
 Likes (cname, pizza)

Answer each of the following queries using SQL. Remove duplicate records from all query results.

- (a) For each restaurant, find the price of the most expensive pizzas sold by that restaurant. Exclude restaurants that do not sell any pizza.
- (b) For each restaurant that sells some pizza, find the restaurant name and the average price of its pizzas if its average price is higher than \$22. Use the **HAVING** clause in your answer.
- (c) Write another answer for part (b) without using the **HAVING** clause.
- (d) For each restaurant R that sells some pizza, let $totalPrice(R)$ denote the total price of all the pizzas sold by R . Find all pairs $(R, totalPrice(R))$ where $totalPrice(R)$ is higher than the average of $totalPrice()$ over all the restaurants.
- (e) Find the customer pairs $(C1, C2)$ such that $C1 < C2$ and they like exactly the same pizzas. Exclude customer pairs that do not like any pizza. Do not use the **EXCEPT** operator in your answer.
- (f) For each restaurant R , increase the prices of its pizzas by $x\%$ as follows:
 - $x = 20$ if R is located in 'Central',
 - $x = 10$ if R is located in 'East',
 - $x = 5$, otherwise.