CS 122A: Introduction to Data Management – Spring 2016, UC Irvine

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Homework 5: More SQL (Hands-On) (100 points)

1. [10 pts] For each Pilot, list his/her pid and duration of the maximum actual flight duration he/she has operated.

a) [7pts] SQL

SELECT pid, MAX(TIMESTAMPDIFF(SECOND, actual_departure_datetime,

actual_arrival_datetime)) as maxduration

FROM Flight NATURAL JOIN Pilot_Operates_Flight

GROUP BY pid

b) [3pts] Results

pid	maxduration
990201	43320
990202	43320
990203	39720
990204	41520
990205	39720
990206	43320

2. [10 pts] For every Lounge, count the number of customers who have ordered from the lounge and have an American Express card. An American Express card is 15 digits long, while a Visa card is 16 digits long. Use function len() or length() to get the length of a string.

a) [7 pts] SQL

SELECT O.lid , COUNT(O.cid)

FROM DishOrder O , Credit_Card C

WHERE length(c.card_number) = 15 AND O.cid = C.cid

GROUP BY O.lid

b) [3 pts] Results

lid	cnt
212	2
213	1
314	1

3. [10 pts] Find ids of customers who have purchased from at least one lounge in every airport, and their total amount of all orders (for each customer) is above \$100.

a) [7 pts] SQL

SELECT C.cid

FROM (SELECT cid, sum(total_amount) as total_Orders_Amount

FROM Customer NATURAL JOIN DishOrder

GROUP BY cid) as C

WHERE C.total_Orders_Amount > 100 AND NOT EXISTS (SELECT IATA_code

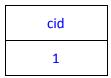
FROM Airport

WHERE IATA_code NOT IN (SELECT DISTINCT IATA_code

FROM Airport A ,Lounge L, DishOrder O

WHERE A.IATA_code = L.airport_IATA_code AND L.lid = O.lid AND O.cid = C.cid))

b) [3 pts] Results



4. [10 pts] Find Flights who have been fully booked, i.e., their total number of reservations is equal to its capacity.

a) [7 pts] SQL

SELECT R.flight_number , R.projected_departure_datetime

FROM (SELECT flight_number , projected_departure_datetime, SUM(quantity) as reserved_seats

FROM Customer_Reserves_Flight

GROUP BY flight_number, projected_departure_datetime) AS R, Flight F, Airplane A

WHERE F.aiplane_registration_number = A.registration_number AND F.flight_number = R.flight_number AND F.projected_departure_datetime = R.projected_departure_datetime AND A.capacity = R.reserved_seats

b) [3 pts] Results

flight_numbe r	projected_departure_datetime
N124	10/7/2015 8:21:00
U987	7/7/2015 10:23:00

5. [10 pts] Currently, deleting a customer does not automatically delete the associated credit cards of the customer being deleted. Add a SQL constraint for the "Credit_card" table such

that if a customer is deleted, his/her credit cards are also deleted. (We only want the statement to add the constraint, and you don't need to repeat the original "CREATE TABLE" statement.)

ALTER TABLE Credit_card ADD FOREIGN KEY (cid) REFERENCES Customer(cid) ON DELETE CASCADE;

6. [15 pts] Write and execute a CREATE VIEW statement to create a view named Flights_offered_view that shows distinct flight numbers with their departure and destination airports. The view has the following schema:

Flights_offered_view (flight_number, departure_airport_IATA_code, arrival_airport_IATA_code).

CREATE VIEW Flights_offered_view (flight_number, departure_airport_IATA_code, arrival_airport_IATA_code) AS

SELECT DISTINCT flight_number , departure_airport_IATA_code , arrival_airport_IATA_code FROM Flight

- 7. [5 pts] Can updates be performed on the view above? Justify your answer. No, Because of the use of DISTINCT so the corresponding record(s) are unknown.
- 8. [10 pts] Write a SQL GRANT statement to give a user named "futurecustomer" read access (and only read access) to the Flights_offered_view. The user should also be allowed to give the same privilege to other users.

GRANT SELECT ON Flights_offered_view TO 'futurecustomer' WITH GRANT OPTION;

9. [10 pts] Create a trigger that will update the "total_amount" in the relation DishOrder whenever a dish, with its quantity, is added to that order. The trigger will increment "total_amount" by the amount "dish price * quantity". Make sure the trigger is executed when a new row is inserted in the relation DishOrder_Contains_Dish. Write CREATE TRIGGER statement between "DELIMITER \$\$" and "DELIMITER;".

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DELIMITER $$

CREATE TRIGGER calucate_total_amount

AFTER INSERT ON DishOrder_Contains_Dish

FOR EACH ROW

BEGIN

UPDATE DishOrder
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SET total_amount = total_amount + NEW.quantity * (SELECT price FROM Dish WHERE
NEW.lid = lid AND NEW.name = name)
WHERE oid = NEW.oid;
END$$
DELIMITER;
```

10. [10 pts] Consider a relation scheme R(M,N,L,P,Q,R,S) with the following functional dependencies: $M \rightarrow N$, $NL \rightarrow PQ$, $MQR \rightarrow S$. Prove $MLR \rightarrow PS$ is also true.

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ML \rightarrow NL ......(1)

ML \rightarrow PQ ......(2)

MLR \rightarrow PQR ......(3)

MLR \rightarrow MLPQR ......(4)

MLR \rightarrow MQR ......(5)

MLR \rightarrow S ......(6)

MLR \rightarrow P ......(7)

MLR \rightarrow PS ......(8)
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