CSCI-B 561 ADVANCED DATABASE CONCEPTS
Assignment 1

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Solutions

1. Training in a Basketball Camp.

   Consider the following RDB schema of a basketball development league:

   Players (pid, name, height, age, university, ARP(Average Rating Points))
   Camps (cid,name,credit)
   Take (pid,cid,season,year,rating)
   The ratings will be letters, e.g A+, A,....
   RatingPoints(rating,points)
   This table maps a letter rating to a point in the scale of 0-10. For example, (A-, 8.7) is a tuple in it.
   RequiredCamps(university,cid)
   This table records the required camps a player must take before being drafted by NBA/WNBA
   Squad(qid,cid,season,practice,rating)
   InSquad(qid,pid)

   Write queries in SQL as required and note that you will be graded based on whether your queries are correct and simple.

   (a) Find the players who come from the same university, and have taken the same camp and are in the same squad with a player named 'Karl-Anthony Towns Jr.'. Return the name, height, and ARP of these players.

   Answer:
   SELECT x.university, y.name, z.qid FROM PLAYERS x, CAMPS y, SQUAD z, (SELECT p.university, c.cid, s.qid FROM PLAYERS p, CAMPS c, SQUAD s where p.name='Karl-Anthony Towns Jr.') m WHERE x.university= p.university and y.cid=c.cid and z.qid= s.qid

   (b) Find the players who have never taken any camps that are not required by his/her university.

   Answer:
   SELECT p.name FROM PLAYERS p INNER JOIN CAMPS c ON p.name=c.name INNER JOIN RequiredCamps rc ON p.university= rc.university AND c.cid=rc.cid

   (c) A player can head for the draft from his/her university if he/she has taken camps of a total number of 90 credits or more, with an ARP > 5.0, and has taken all required camps. Please nd the pid and name of the players who can go to the draft.

   Answer:

SELECT x.pid and x.name FROM PLAYERS x, CAMPS y WHERE x.name= ALL(SELECT p.name FROM PLAYERS p INNER JOIN CAMPS c ON p.name=c.name INNER JOIN RequiredCamps rc ON p.university= rc.university AND c.cid=rc.cid) AND c.credit > 90 AND p.ARP > 5.0

2. Simple Trade
   Given the table Trade (commodity, price, quantity)

   (a) Transform the following query using only "SELECT", "FROM", and "WHERE".

   SELECT commodity, sum(quantity) AS TotalSales
   FROM Trade
   WHERE price > 100000
   GROUP BY commodity
   HAVING sum(quantity) > 30000

   Answer:
   SELECT DISTINCT commodity, (SELECT SUM(quantity) FROM Trade x INNER JOIN Trade y where x.commodity=y.commodity) AS TotalSales FROM Trade WHERE price > 100000 AND TotalSales > 30000

   (b) Do you think any SQL query written using 'GROUP BY' and 'HAVING' clauses can be transformed to a query which only uses 'SELECT', 'FROM', and 'WHERE'? Please explain your answer.

   Answer:
   Yes, a query written using GROUP BY and HAVING can be transformed using SELECT, FROM AND WHERE. The solution is to use Nested Queries. To eliminate the usage of GROUP BY, the keyword DISTINCT can be used to represent only unique column names. Then by using the nested queries to select only those values which have satisfied the constraints and by using the AND operator, the whole query can be transformed, as shown above.

References

(a) w3schools.com — SQL Tutorials

(b) www.stackoverflow.com

(c) www.databasejournal.com

(d) www.mysqltutorial.org