CS 486/586 Introduction to DBMS
Fall 2021

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Assignment 3 – Subqueries, Views
Due: Friday, Oct 22 11:59PM on Canvas

Please note the following:
- do this assignment in groups of 2.
- ensure that each group member's name is listed on the assignment to ensure credit
- submit your assignment in PDF format
- turn in your completed assignment on Canvas, one submission per group
- 100 points total

This assignment is partially based on the Spy relational database. Information about this database and information about how to access it is on the Database Info Page. (http://web.cecs.pdx.edu/~maier/db_resources/db.htm)

Part I - Subqueries (60 pts)
This part of the assignment is based on the Spy relational database. For each statement below, write a SQL query to find the answer to that question. Show the query, first 5 rows of the result relation, and row count. Use subqueries for all answers in this section.

Hint: You can use subqueries in the FROM clause and the HAVING clause.

Example subquery in the FROM clause:
SELECT MAX(cityaverages.avsal)
FROM (SELECT AVG(salary) AS avsal
FROM agent
GROUP BY city) AS cityaverages;

Example subquery in the HAVING clause:

SELECT city, avg(salary)
FROM agent
GROUP BY city
HAVING 2*COUNT(agent_id) > ALL(SELECT COUNT(agent_id)
                                              FROM agent
                                              GROUP BY city);

1) List the name of the mission with the lowest mission_id. (5 points)
Solution:
SELECT name, mission_id
FROM mission
WHERE mission_id = (SELECT MIN(mission_id) FROM mission);

```
fall2021db78=> SELECT name, mission_id
fall2021db78-> FROM mission
fall2021db78-> WHERE mission_id = (SELECT MIN(mission_id) FROM mission);
   name    | mission_id
-----------+------------
 Third Age |          1
(1 row)
```

2) List the agents (agent_id, first, last) who have been on a 'Presidential' mission that succeeded. (10 points)
Solution:
SELECT agent_id, first, last FROM agent
WHERE agent_id IN
(SELECT DISTINCT t.agent_id
FROM mission m, securityclearance s, teamrel t
WHERE m.mission_status ='success' AND m.access_id = s.sc_id AND s.sc_level='Presidential' AND m.team_id =t.team_id)
ORDER BY agent_id;

Total number of rows: 142

```
agent_id |   first   |      last
---------+-----------+-----------------
       1 | Nick      | Black
       3 | Mathew    | Cohen
       4 | Jim       | Cowan
      20 | George    | Jones
      25 | Jim       | Maier
      39 | Nicolas   | Barnard
      48 | Bill      | Bellegarde
      55 | John      | House
      61 | Matt      | Song
      70 | George    | Yang
      80 | Mathew    | Hakanson
      83 | Jason     | Amezcua
      84 | George    | Cohen
      85 | Nick      | Coeckx
      87 | Tim       | Brock
```

3) Find the skill and the number of people, that the most people have that skill(s). (15 points)

Solution:

```
SELECT s.skill,
     r2.count
FROM skill s,

 (SELECT skill_id,
      count(skill_id)
  FROM skillrel
  GROUP BY skill_id
  HAVING count(skill_id) =
    (SELECT max(r.count)
     FROM
       (SELECT skill_id,
           count(skill_id)
        FROM skillrel
        GROUP BY skill_id ORDER BY count DESC) AS r)) AS r2
WHERE s.skill_id = r2.skill_id;
```

```
   skill    | count
------------+-------
 Locksmith |    48
(1 row)
```

Part II - Views (40 pts)

4) Write an SQL view definition that displays agent names(first, last), the affiliation they belong to and the description of the affiliation(s). Show your view definition and the first 5 rows returned when you SELECT * from the view, and the row count. (5 points)
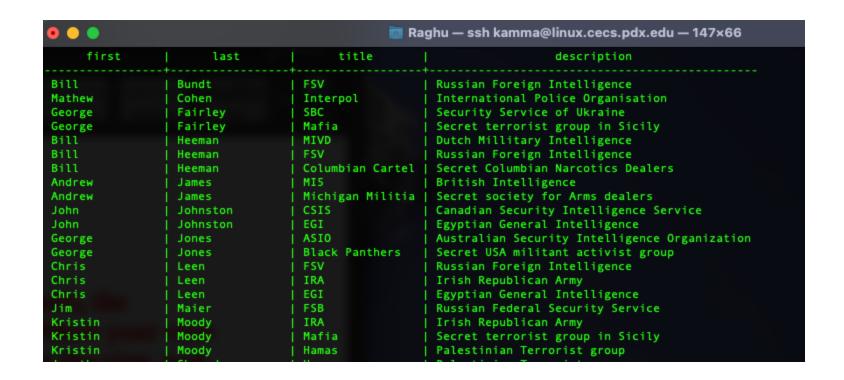
-----creating a view------
CREATE VIEW agentaff AS
SELECT a.first, a.last, aff.title, aff.description
FROM affiliation aff
INNER JOIN affiliationrel afr ON aff.aff_id=afr.aff_id
INNER JOIN agent a ON afr.agent_id = a.agent_id;

----calling the view------
SELECT * from agentaff;

Total number of rows: 954 rows

first	last	title	description
Bill	Bundt	FSV	Russian Foreign Intelligence
Mathew	Cohen	Interpol	International Police Organisation
George	Fairley	SBC	Security Service of Ukraine
George	Fairley	Mafia	Secret terrorist group in Sicily
Bill	Heeman	MIVD	Dutch Millitary Intelligence
Bill	Heeman	FSV	Russian Foreign Intelligence
Bill	Heeman	Columbian Cartel	Secret Columbian Narcotics Dealers
Andrew	James	MI5	British Intelligence
Andrew	James	Michigan Militia	Secret society for Arms dealers
John	Johnston	CSIS	Canadian Security Intelligence Service
John	Johnston	EGI	Egyptian General Intelligence
George	Jones	ASIO	Australian Security Intelligence Organization
George	Jones	Black Panthers	Secret USA militant activist group
Chris	Leen	FSV	Russian Foreign Intelligence
Chris	Leen	IRA	Irish Republican Army
Chris	Leen	EGI	Egyptian General Intelligence
Jim	Maier	FSB	Russian Federal Security Service
Kristin	Moody	IRA	Irish Republican Army
Kristin	Moody	Mafia	Secret terrorist group in Sicily
Kristin	Moody	Hamas	Palestinian Terrorist group

5) Write an SQL view definition that displays unique mission (name), the team(name) that performed this mission and the text of the missions security clearance level (access id) and description. Show your view definition and the first 5 rows returned when you SELECT * from the view, and the row count. (5 points)

Solution:

-----creating a view------
CREATE VIEW unique_mission AS
SELECT DISTINCT mission.name AS mission_name,
        team.name AS team_name,
        securityclearance.sc_level AS Security_Level,
        securityclearance.description AS Sec_Level_Description,
        securityclearance.sc_id AS SecClr_Id
FROM mission
JOIN securityclearance ON mission.access_id =securityclearance.sc_id
JOIN team ON mission.team_id = team.team_id;

----calling the view------
SELECT * FROM unique_mission;

Total number of rows: 404 rows

mission_name	team_name	security_level	sec_level_description	secclr_id
Great Darkness	Rolaids	Classified	Second lowest clearance	6
Narcguest	Oink	Majestic	Second highest level of access	2
Black Land	Renegade	Unclassified	Lowest level of clearance	7
Kuduk	Leadphut	Majestic	Second highest level of access	2
Narsil	Timebomb	Top Secret	Fourth highest level of access	4
Mount Doom	Boat Team 3	Secret	Fifth highest level of access	5
Labin	Rimspeed	Presidential	Highest level of access	1
Sarn Gebir	SpecialForces	Presidential	Highest level of access	1
Pelargir	Blue Dagger	Majestic	Second highest level of access	2
Cair Andros	Cyclone	Classified	Second lowest clearance	6
Nowbourn	Rolaids	Classified	Second lowest clearance	6
Sharku	Roadkill	Top Secret	Fourth highest level of access	4
Mithlond	Blunt	Magellon	Third highest level of access	3
Grayhame	Rolaids	Classified	Second lowest clearance	6
Orcs	Boat Team 1	Presidential	Highest level of access	1
Underhill	Roadkill	Majestic	Second highest level of access	2
Crossroads	FlyOnTheWall	Magellon	Third highest level of access	3
Sindarin	Boat Team 4	Secret	Fifth highest level of access	5
Tuckborough	Giraffe	Presidential	Highest level of access	1
Delving	Vikings	Majestic	Second highest level of access	2
Hidden Land	FlyOnTheWall	Unclassified	Lowest level of clearance	7
Dome of Stars	Oink	Majestic	Second highest level of access	2
Palantiri	Boat Team 4	Top Secret	Fourth highest level of access	4
Gandalf	FlyOnTheWall	Unclassified	Lowest level of clearance	7