Relational Algebra

1. Using the Salaries table, select playerid, yearid and salary

Answer :

π playerid, yearid, salary (Salaries)

2. Modify the query in #1 so it also shows a monthly salary (salary divided by 12)

Answer :

π playerid, yearid, (salary/12) as the monthly salary (Salaries)

3. Select the Team Name, PlayerID and Salary from the Teams and Salary tables for all players with salaries over $1 million dollars. Hint: Make sure you include all the columns required to successfully join the Teams and Salaries tables

Answer :

π name, playerid, salary (σ salary > $1 million (salary $\bowtie$ team))

4. Using the appropriate Set Operator (ex: UNION, JOIN) and the MASTER and APPEARANCES tables, list the playerid, full name (nameFirst and nameLast) and the teamid of players who were in the appearances table for 2000 but not for 2001

Answer :

C 1 :

σ playerid (master) = Appearance.playerid $\wedge$ yearid=2000

(Master × Appearance)

C 2 :

σ playerid (master) = Appearance.playerid $\wedge$ yearid=2001

(Master × Appearance)

C 3 : C 1 - (C 2 $\cap$ C 2)

π playerid, (nameFirst and nameLast) as fullname, teamid (C 3)

5. Modify the query in #4 to use the appropriate Set Operator to show players who were in the appearances table for 2000 and 2001

Answer :

C 1 :

$$\sigma \text{ master.playerid} = (\text{Master} \times \text{Appearance})$$

$$\text{Appearance.playerid} \wedge \text{yearid=2000}$$

C 2 :

$$\sigma \text{ master.playerid} = (\text{Master} \times \text{Appearance})$$

$$\text{Appearance.playerid} \wedge \text{yearid=2001}$$

C 1 $\cap$ C 2

6. Using the Salaries table, calculate the average salary by teamid.

Answer :

$$\text{teamid } \mathcal{G} \text{salary (Salaries)}$$

7. Using the Master and Salaries tables, write a query that first and last names of players whose salaries were between $80,000.00 and $90,000.00 and the years their salary was in the range.

Answer :

C 1 : $(\sigma \text{ salaries.playerid} = \text{master.playerid} (\text{Salaries} \times \text{Master}))$

C 2 : $\pi_{\text{playerid, firstname, lastname}} (\sigma_{\text{salary} > 80000 \wedge \text{salary} < 90000} (r1))$

8. Using the Managers, Hall of Fame and Master tables, write a query that returns the playerid, firt and last name for all managers of AllStar teams that are also in the Hall of Fame

Answer :

C 1 : $(\sigma \text{ HallofFame.playerid} = \text{Managers.playerid} (\text{HallofFame} \times \text{Managers}))$

C 2 : $\pi_{\text{playerid, firstname, lastname}}$ (σ r1.playerid = Master.playerid(r1 × Master))

9. Determine the playerIDs, salaries and names of players who played for the Yankees in 2006 that were paid more than the average salary of the New York Mets for the same year. You will need to use the Master and Salaries tables. The Teamid for the Yankees is NYA and the teamid for the Mets is NYM

Answer :

C 1 : σ teamid = 'NYM' (teamid $\mathcal{G}$ avg (salary) (Salaries)) $\wedge$ yearid = 2006

C 2 : $\pi_{\text{playerid, salary}}$ ($\sigma_{\text{teamid = 'NYA'} \wedge \text{yearid = 2006} \wedge \text{salary} > C 1}$ (Salaries))

10. Using the Appearances and Hall of Fame tables, write a query that shows the player who play only for the NY Yankees and are in the Hall of Fame.

Answer :

π_{playerid} (σ teamid = 'NYA' $\wedge$ Appearance.playerid = HallofFame.playerid (Appearance × HallofFame))