
Meng Tianao



1) count (playerid) (⚡ birthYear > ' ' ∨ birthMonth = ' ' ∨ birthDay > ' ' (Master))

2). ① count (playerid) (⚡ playerid (Hall of Fame))

② $\pi_{t_1.category, t_2.dead, t_3.alive, t_1.total, t_1.fraction} (t_1 \bowtie_{t_1.category = t_2.category} t_2 \bowtie_{t_2.category = t_3.category} t_3)$

$\rho_{t_1(category, fraction, total)} (\pi_{category, fraction, total} (Hall\ of\ Fame)) ;$

$fraction \leftarrow category \text{ } g \text{ } count (playerID) (\pi_{playerID} (Hall\ of\ Fame)) /$

$count (playerID) (\pi_{playerID} (Hall\ of\ Fame)) ;$

$total \leftarrow count (playerID) (\pi_{playerID} (Hall\ of\ Fame)) ;$

$\rho_{t_2(category, dead)} = \pi_{category, dead} (Hall\ of\ Fame \bowtie_{Hall\ of\ Fame.playerID = Master.playerID} Master) ;$

$dead \leftarrow category \text{ } g \text{ } count (playerID)$

$(\pi_{playerID} \text{ } \rho_{deathDay \neq '' \wedge deathMonth \neq '' \wedge deathYear \neq ''} (Hall\ of\ Fame \bowtie_{Hall\ of\ Fame.playerID = Master.playerID} Master)) ;$

$\rho_{t_3(category, alive)} = \pi_{category, alive} (Hall\ of\ Fame \bowtie_{Hall\ of\ Fame.playerID = Master.playerID} Master) ;$

$alive \leftarrow category \text{ } g \text{ } count (playerID)$

$(\pi_{playerID} \text{ } \rho_{deathDay = '' \wedge deathMonth = '' \wedge deathYear = ''} (Hall\ of\ Fame \bowtie_{Hall\ of\ Fame.playerID = Master.playerID} Master)) ;$

3) ① 6
$$\rho_{\text{rownums} \geq 0 \wedge \text{rownums} \leq 3} \left(\pi_{t_2.\text{nameFirst}, t_2.\text{nameLast}, t_2.\text{nameGiven}, t_1.\text{total}} \left(\pi_{t_1.\text{total}} \left(t_1 \bowtie_{t_1.\text{playerID} = t_2.\text{playerID}} t_2 \right) \text{desc} \right) \right)$$

$$\rho_{t_1(\text{playerID}, \text{total})} \left(\pi_{\text{playerID}, \text{total}} \left(\text{Salaries} \right) \right);$$

$$\text{total} \leftarrow \text{playerID} \quad g \quad \text{Sum}(\text{salary}) \left(\text{Salaries} \right);$$

$$\rho_{t_2(\text{playerID}, \text{nameFirst}, \text{nameLast}, \text{nameGiven})} \left(\pi_{\text{playerID}, \text{nameFirst}, \text{nameLast}, \text{nameGiven}} \left(\text{Master} \right) \right);$$

② players only

$$\rho_{\text{rownums} \geq 0 \wedge \text{rownums} \leq 3} \left(\pi_{t_2.\text{nameFirst}, t_2.\text{nameLast}, t_2.\text{nameGiven}, t_1.\text{total}} \left(\pi_{t_1.\text{total}} \left(t_1 \bowtie_{t_1.\text{playerID} = t_2.\text{playerID}} t_2 \right) \text{desc} \right) \right);$$

$$\text{player} \leftarrow \pi_{\text{playerID}} \left(\text{Master} \right) - \pi_{\text{playerID}} \left(\text{Managers} \right);$$

$$\rho_{t_1(\text{playerID}, \text{total})} \left(\pi_{\text{playerID}, \text{total}} \left(\text{Salaries} \bowtie_{\text{player.playerID} = \text{Salaries.playerID}} \right) \right);$$

$$\text{total} \leftarrow \text{playerID} \quad g \quad \text{Sum}(\text{salary}) \left(\text{Salaries} \right);$$

$$\rho_{t_2(\text{playerID}, \text{nameFirst}, \text{nameLast}, \text{nameGiven})} \left(\pi_{\text{playerID}, \text{nameFirst}, \text{nameLast}, \text{nameGiven}} \left(\text{Master} \right) \right);$$

(3) Managers only

$$6_{rownums \leq 50 \wedge rownums \leq 3} \left(\Pi_{t_2.nameFirst, t_2.nameLast, t_2.nameGiven, t_1.total} \left(\Pi_{t_1.total} (t_1 \bowtie_{t_1.playerID = t_2.playerID} t_2) desc \right) \right);$$

$$manager \leftarrow \Pi_{playerID} (Managers);$$

$$P_{t_1(playerID, total)} \left(\Pi_{playerID, total} (Salaries \bowtie_{manager.playerID = Salaries.playerID}) \right);$$

$$total \leftarrow playerID \quad g \quad Sum(salary) (Salaries);$$

$$P_{t_2(playerID, nameFirst, nameLast, nameGiven)} \left(\Pi_{playerID, nameFirst, nameLast, nameGiven} (Master) \right);$$

(3) other.

$$6_{rownums \leq 50 \wedge rownums \leq 3} \left(\Pi_{t_2.nameFirst, t_2.nameLast, t_2.nameGiven, t_1.total} \left(\Pi_{t_1.total} (t_1 \bowtie_{t_1.playerID = t_2.playerID} t_2) desc \right) \right);$$

$$player \leftarrow \Pi_{playerID} (Master) - \Pi_{playerID} (Managers);$$

$$manager \leftarrow \Pi_{playerID} (Managers);$$

$$other \leftarrow \Pi_{playerID} (Master) - player - manager;$$

$$P_{t_1(playerID, total)} \left(\Pi_{playerID, total} (Salaries \bowtie_{other.playerID = Salaries.playerID}) \right);$$

$$total \leftarrow playerID \quad g \quad Sum(salary) (Salaries);$$

$$P_{t_2(playerID, nameFirst, nameLast, nameGiven)} \left(\Pi_{playerID, nameFirst, nameLast, nameGiven} (Master) \right);$$

4) $\pi_{t_1.HR}(t_1);$

$P_{t_1 \subseteq \text{playerID}, \text{player_HR}}(\pi_{\text{playerID}, \text{player_HR}}(\text{Batting}));$

$\text{player_HR} \leftarrow \text{playerID} \text{ } g \text{ } \text{Sum}(\text{HR}) \subseteq \text{Batting};$

$t_1.HR \leftarrow \text{AVG}(\text{player_HR})(t_1);$

5)

$\pi_{t_1.HR}(\sigma_{\text{player_HR} \geq 1}(t_1));$

$P_{t_1 \subseteq \text{playerID}, \text{player_HR}}(\pi_{\text{playerID}, \text{player_HR}}(\text{Batting}));$

$\text{player_HR} \leftarrow \text{playerID} \text{ } g \text{ } \text{Sum}(\text{HR}) \subseteq \text{Batting};$

$t_1.HR \leftarrow \text{AVG}(\text{player_HR})(t_1);$

6) $\rho_{t_1(\text{playerID}, \text{player-HR})}(\pi_{\text{playerID}, \text{player-HR}}(\text{Batting}))$;

$t_1.\text{player-HR} \leftarrow \text{playerID} \text{ } g \text{ } \text{Sum}(\text{HR})(\text{Batting})$;

$\rho_{t_3(t_1.\text{playerID})}(\pi_{t_1.\text{playerID}}(\sigma_{t_1.\text{player-HR} > \text{AVG-HR}(t_1)}))$;

$\rho_{t_2(\text{playerID}, \text{player-HR})}(\pi_{\text{playerID}, \text{player-HR}}(\text{Batting}))$;

$t_2.\text{player-HR} \leftarrow \text{playerID} \text{ } g \text{ } \text{Sum}(\text{HR})(\text{Batting})$;

$\text{AVG-HR} \leftarrow \pi_{\text{HR}}(t_2)$;

$\text{HR} \leftarrow \text{playerID} \text{ } g \text{ } \text{AVG}(t_2.\text{player-HR})(t_2)$;

$\rho_{t_4(\text{playerID}, \text{player-SHO})}(\pi_{\text{playerID}, \text{player-SHO}}(\text{Pitching}))$;

$t_4.\text{player-SHO} \leftarrow \text{playerID} \text{ } g \text{ } \text{Sum}(\text{SHO})(\text{Pitching})$;

$\rho_{t_6(t_4.\text{playerID})}(\pi_{t_4.\text{playerID}}(\sigma_{t_4.\text{player-SHO} > \text{AVG-SHO}(t_4)}))$;

$\rho_{t_5(\text{playerID}, \text{player-SHO})}(\pi_{\text{playerID}, \text{player-SHO}}(\text{Pitching}))$;

$t_5.\text{player-SHO} \leftarrow \text{playerID} \text{ } g \text{ } \text{Sum}(\text{SHO})(\text{Pitching})$;

$\text{AVG-SHO} \leftarrow \pi_{\text{SHO}}(t_5)$;

$\text{SHO} \leftarrow \text{playerID} \text{ } g \text{ } \text{AVG}(t_5.\text{player-SHO})(t_5)$;

$\pi_{\text{Good-player}}(t_3 \bowtie_{t_3.\text{playerID} = t_6.\text{playerID}} t_6)$;

$\text{Good-player} \leftarrow \text{Count}(t_6.\text{playerID})(t_3 \bowtie_{t_3.\text{playerID} = t_6.\text{playerID}} t_6)$;