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CS 482

Assignment 2: Relational Algebra + SQL

1. Show the names and ID's of all players whose play position is "center".

```
select Name, ID
from Player
where PlayPos = 'center';
```

$\Pi_{Name,\ ID}\ (\sigma_{PlayPos\ =\ 'Center'}(Player))$

2. Show the total points that player "Pistol Pete" has scored each year (assumer there is only one Pistol Pete).

```
select S.year, S.TotalPoints
from Stats S, Player P
where S.PlayerID = P.ID and P.name = 'Pistol Pete'
group by S.year;
```

$_{S.year}\ G_{S.TotalPoints}\ \Pi_{S.year,\ S.TotalPoints}(\sigma_{S.PlayerID\ =\ P.ID\ \wedge\ P.name\ =\ 'Pistol\ Pete'}\ (\rho_S(Stats)\ X\ \rho_P(Player))$

3. Show the names of every player who has played a game at "The Pit" and won (Result = "win")

```
select P.name
from Player P, Game, Play
where P.ID = Play.PlayerID and Play.GameID = Game.GameID
      and Game.PlayingVenue = 'The Pit' and Game.Result = 'win';
```

$\Pi_{P.name}\ (\sigma_{P.ID\ =\ Play.PlayerID\ \wedge\ Play.GameID\ =\ Game.GameID\ \wedge\ Game.PlayingVenue\ =\ 'The\ Pit'\ \wedge\ Game.Result\ =\ 'win'}\ (\rho_P(Player)\ X\ Game\ X\ Play))$

4. Find the games that players named “Pistol Pete” and “Lobo Louie” have played in, using set operators (UNION, INTERSECT, MINUS, etc…). Show the game’s date, venue, and result.

```
(select Game.Date, Game.Venue, Game.Result
 from Game, Player P, Play
 where Play.PlayerID = P.ID and P.Name = ‘Pistol Pete’
        and Play.GameID = Game.GameID)
intersect
(select Game.Date, Game.Venue, Game.Result
 from Game, Player P, Play
 where Play.PlayerID = P.ID and P.Name = ‘Pistol Pete’
        and Play.GameID = Game.GameID);
```

$$\Pi_{\text{Game1.Date, Game1.Venue, Game1.Result}} (\sigma_{\text{Play1.PlayerID = P1.ID} \wedge \text{P1.Name = ‘Pistol Pete’} \wedge \text{Play1.GameID = Game1.GameID}} (\text{Game} \times \rho_{P1} (\text{Player}) \times \text{Play})) \cap \Pi_{\text{Game2.Date, Game2.Venue, Game2.Result}} (\sigma_{\text{Play2.PlayerID = P2.ID} \wedge \text{P2.Name = ‘Lobo Louie’} \wedge \text{Play2.GameID = Game2.GameID}} (\text{Game} \times \rho_{P2} (\text{Player}) \times \text{Play}))$$

5. Find the names and IDs of players who have scored more points than the average player

```
select P.name, P.ID
from Player P, Stats S
where P.ID = S.PlayerID and S.TotalPoints > (select avg(TotalPoints)
        from Stats);
```

$$\text{Temp} \leftarrow G_{\text{avg(TotalPoints)(Stats)}}$$

$$\Pi_{\text{P.name, P.ID}} (\sigma_{\text{P.ID = S.PlayerID} \wedge \text{S.TotalPoints > Temp}} (\rho_P (\text{Player}) \times \rho_S (\text{Stats})))$$

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Part 2:

1. Show the names of members who borrowed books with title “Math”

```
select M.name
from members M, books, borrowed BR
where M.memb_no = BR.memb_no and BR.isbn = books.isbn and
books.title = 'Math';
```

2. Show the details of members whose name does not start with ‘J’.

```
select *
from members
where not (name like 'J%');
```

3. Find the numbers of books borrowed by each member and show them in descending order

```
select M.memb_no, count(B.isbn)
from members M, books B, borrowed BR
where M.memb_no = BR.memb_no and B.isbn = BR.isbn
group by M.memb_no
order by M.memb_no desc;
```

4. Show the details of members whose name contains ‘A’.

```
select *
from members
where name like '%A%';
```

5. Find the distinct publisher name of the book which has been borrowed by “Sam”.

```
select distinct (books.publisher)
from books, members M, borrowed BR
where M.name = 'Sam' and M.memb_no = BR.memb_no
and BR.isbn = books.isbn;
```