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OSU CS 340
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Assignment 3

1. Select the make_name and model_name of all vehicles which have a first production year of 1976

$$\Pi_{\text{Make.make\_name, Model.model\_name}}\left(\sigma_{\text{Model.first\_production\_year=1976}}\left(\left(Model \bowtie_{\text{Model.model\_id = Vehicle.fk\_model\_id}} Vehicle\right) \bowtie_{\text{Vehicle.fk\_make\_id = Make.make\_id}} Make\right)\right)$$

2. Select the make_name and model_name of all vehicles with the color name Blue

$$\Pi_{\text{Make.make\_name, Model.model\_name}}$$
$$($$
$$\sigma_{\text{Color.name="Blue"}}$$
$$((((Model \bowtie_{\text{Model.model\_id = Vehicle.fk\_model\_id}} Vehicle)$$
$$\bowtie_{\text{Vehicle.fk\_make\_id = Make.make\_id}} Make)$$
$$\bowtie_{\text{Inventory.fk\_vehicle\_id = Vehicle.vehicle\_id}} Inventory)$$
$$\bowtie_{\text{Color.color\_id = Inventory.fk\_color\_id}} Color)$$
$$)$$

3. Select the make_name, model_name and incentive amount for all vehicles with a dealer type incentive

$$\Pi_{\text{Make.make\_name, Model.model\_name, Incentive.amount}}$$
$$($$
$$\sigma_{\text{Incentive.type="Dealer"}}$$
$$((((Model \bowtie_{\text{Model.model\_id = Vehicle.fk\_model\_id}} Vehicle)$$
$$\bowtie_{\text{Vehicle.fk\_make\_id = Make.make\_id}} Make)$$
$$\bowtie_{\text{Venhicle\_Incentive.fk\_vehicle\_id = Vehicle.vehicle\_id}} Vehicle\_Incetive)$$
$$\bowtie_{\text{Incentive.incentive\_id = Vehicle\_Incentive.fk\_incentive\_id}} Incentive)$$
$$)$$

4. Convert the following query to relational algebra

```
SELECT Player.id, Team.name, City.name
FROM Player
INNER JOIN Team
ON Player.team_id = Team.id
INNER JOIN City
ON Team.city_id = City.id
WHERE Player.score = 100;
```

$$\Pi_{\text{Player.id, Team.name, City.name}}$$
(
$$\sigma_{\text{Player.score}=100}$$
$$((\mathit{Player} \bowtie_{\text{Player.team\_id} = \text{Team.id}} \mathit{Team})$$
$$\bowtie_{\text{Team.city\_id} = \text{City.id}} \mathit{City})$$
)

5. For problem 3 above, convert your relational algebra query into a SQL query.

```
SELECT Make.make_name, Model.model_name, Incentive.amount
FROM Model
INNER JOIN Vehicle
ON Vehicle.fk_model_id = Model.model_id
INNER JOIN Make
ON Vehicle.fk_make_id = Make.make_id
INNER JOIN Vehicle_Incentive
ON Vehicle_Incentive.fk_vehicle_id = Vehicle.vehicle_id
INNER JOIN Incentive
ON Incentive.incentive_id = Vehicle_Incentive.fk_incentive_id
WHERE Incentive.type = 'Dealer'
```