

Questions

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

```

 $\pi_{mk.make\_name, mdl.model\_name} ($ 
   $\sigma_{mdl.first\_production\_year=1976} ($ 
    # on the joined table relating make and model, which holds 1st year
    Vehicle  $\bowtie$  vehicle.fk_model_id = mdl_model_id mdl <- Model
  )
   $\bowtie$  vehicle.fk_make_id = mk.make_id mk <- Make
)

```

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

```

 $\pi_{mk.make\_name, mdl.model\_name} ($ 
   $\sigma_{c.name = "Blue"} ($ 
    # on table of vehicle, inventory, color
    (((mdl <- Model  $\bowtie$  mdl_model_id = vehicle.fk_model_id Vehicle)
       $\bowtie$  vehicle.vehicle_id = i.fk_vehicle_id I <- Inventory)
       $\bowtie$  i.fk_color_id = c.color_id c <- Color)
  )
   $\bowtie$  vehicle.fk_make_id = mk.make_id mk <- Make
)

```

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

```

 $\pi_{make\_name, model\_name, amount} ($ 
   $\sigma_{incentive.type = "dealer"} ($ 
    ((model  $\bowtie$  model.model_id = vehicle.vehicle_id Vehicle)
       $\bowtie$  vehicle.vehicle_id = vehicle_incentive.fk_vehicle_id Vehicle_Incentive)
       $\bowtie$  vehicle_incentive.fk_incentive_id = incentive.incentive_id Incentive
    )
     $\bowtie$  vehicle.fk_make_id = make.make_id Make
  )
)

```

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;
```

```
 $\pi_{\text{player.id, team.name, City.name}} ($   

 $\sigma_{\text{Player.score} = 100} ($   

 $(\text{Player} \bowtie_{\text{Player.team\_id} = \text{Team.id}} \text{Team})$   

 $\bowtie_{\text{Team.city\_id} = \text{City.id}} \text{City}$   

 $)$   

 $)$ 
```

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

```
SELECT mk.make_name, m.model_name, mwi.amount FROM Model m
INNER JOIN
    (SELECT mdl.model_id, mdl.model_name, v.fk_make_id, i.amount FROM Model mdl
    INNER JOIN Vehicle v ON mdl.model_id = v.fk_model_id
    INNER JOIN Vehicle_Incentive vi ON v.vehicle_id = vi.fk_vehicle_id
    INNER JOIN Incentive i ON vi.fk_incentive_id = i.incentive_id
    WHERE i.type = "dealer") AS mwi
    ON m.model_id = mwi.model_id
INNER JOIN Make mk ON mk.make_id = mwi.fk_make_id;
```