Assignment3

July 31, 2016

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1) Select the **CommonName** and **FoodType** Name of all pairs of **Fish** and **FoodTypes** that are compatible. This means a single **Fish** may appear several times (once for each kind of food it can eat).

$$\pi_{Fish.CommonName,FoodTypes.Name}((Fish \bowtie_{Fish.FishId=FishDiet.Fish} FishDiet) \bowtie_{FishDiet.Food=FoodTypes.FoodId} FoodTypes)$$

2) Select the CommonName and ScientificName of all **Fish** in **TankInstances** of TankSize 60.

$$\pi_{Fish.CommonName,Fish.ScientificName}(\sigma_{TankInstance.TankSize=60}((Fish \bowtie_{Fish.FishId=FishInstance.FishType} FishInstance) \bowtie_{FishInstance.TankInstance=TankInstance.TankInstanceId} TankInstance))$$

3) Select all of the **FoodType** Names that can be used to feed at least one **FishInstance** in the **TankInstance** with TankInstanceId of 44.

$$\pi_{FoodTypes.Name}(\sigma_{TankInstance.TankInstanceId=44}(((FoodTypes \bowtie_{FoodTypes.FoodId=FishDiet.Food} FishDiet) \bowtie_{FishDiet.Fish=Fish.FishId} Fish) \bowtie_{Fish.FishId=FishInstance.FishType} FishInstance))$$

4) Select all **FishInstance** FishInstanceId which are in a tank that is not compatible for them. In other words, if the **Fish** TankType is not the same as the TankType of the **TankInstance** a **FishInstance** is in, it is in an incompatible tank.

$$\pi_{FishInstance.FishInstanceId}(\sigma_{Fish.TankType!=TankInstance.TankType}(((FishInstance \bowtie_{FishInstance.TankInstance=TankInstance.TankInstanceId} TankInstance) \bowtie_{TankInstance.TankType=TankTypes.TankId} TankTypes) \bowtie_{TankTypes.TankId=Fish.TankType} Fish))$$

5) Convert the following into 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 = 200;

$$\pi_{Player.id,Team.name,City.name}(\sigma_{Player.score=200}((Player \bowtie_{Player.team\_id=Team.id} Team) \bowtie_{Team.city\_id=City.id} City))$$