Intro to Databases
EECS 116

Assignment 3
Working with Relational Algebra Queries

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1 Questions

1. Find the ids and names of all image sensors that support resolution '2048×1080'.

2. Find the ids and names of all the rooms that have not been assigned to anyone.

3. Find all the ids of meeting rooms in DBH which are having capacity more than 35.

4. Find all the activities and their confidence values, which were captured by the sensor with sensorID = 123.

5. Find list of sensors and the number of events associated with the sensor. (You can use extended relational algebra operators of group by and aggregation if you need.)

6. Find the ids and names of all the sensors that have not collected any observations since the date "04/20/2016".

2 Answers

2.1 Problem 1

$\pi_{[id,name]}(\sigma_{[resolution="2048x1080"]}(ImageSensor) \bowtie_{[ImageSensor.sid=Sensor.sid]} Sensor)$

2.2 Problem 2

π[loid,name] ((Room) $\bowtie$[Room.loid=LocationObject.loid] (LocationObject)) - π[loid, name]bid((Room) $\bowtie$[Room.loid=LocationObject.loid] (LocationObject)) $\bowtie$[Room.loid=AssignedTo.loid] (AssignedTo))

2.3 Problem 3

π[loid](σ[capacity > 35]((σ[name=DBH](Building) $\bowtie$[Building.bid=PartOf.bid] PartOf) $\bowtie$[PartOf.loid=Room.loid] (Room)))

2.4 Problem 4

π[activity,confidence] ((Event) $\bowtie$[Event.eid=DerivedFrom.eid] (σ[sid=123](DerivedFrom)))

2.5 Problem 5

γ[sid, COUNT(eid)] ((Event) $\bowtie$[Event.eid=DerivedFrom.eid] (DerivedFrom))

2.6 Problem 6

π[sid,name](σ[tstamp $\leq$ "2016-04-20 00:00:00"]((Sensor) $\bowtie$[Sensor.sid=RawTemperature.sid] (RawTemperature)))

$\cup$

π[sid,name](σ[tstamp $\leq$ "2016-04-20 00:00:00"]((Sensor) $\bowtie$[Sensor.sid=RawImage.sid] (RawImage)))

$\cup$

π[sid,name](σ[tstamp $\leq$ "2016-04-20 00:00:00"]((Sensor) $\bowtie$[Sensor.sid=RawGPS.sid] (RawGPS)))