

For Project Checkpoint 02, you were asked to come up with three additional interesting queries that your database can provide. Give what those queries are supposed to retrieve in plain English, as relational algebra and then as SQL. Your queries should include joins and at least one should include an aggregate function, and they should be the same as the queries you outlined for Worksheet 02. If you were instructed to fix the queries in Checkpoint 02, make sure you use the fixed queries here.

4.1 Find the names, Bios, and Date of Births of all EMPLOYEES who are also PATRONS

$$\text{PAT\_EMP\_IDs} \leftarrow \text{PATRON} \bowtie_{\text{PatronID}=\text{EmployeeID}} \text{EMPLOYEE}$$

$$\text{PAT\_EMP\_INFO} \leftarrow \text{PAT\_EMP\_IDs} \bowtie_{\text{ID}=\text{PersonID}} \text{PERSON}$$

$$\pi_{\text{Name,DOB,Bio}}(\text{PAT\_EMP\_INFO})$$

SELECT Name, Bio, DOB  
 FROM Person, Patron, Employee  
 WHERE Person.PersonID = Patron.PersonID AND Person.PersonID =  
       Employee.PersonID AND Patron.PersonID = Employee.PersonID

Expected Output:

Tyler Fuerst	Hello Test	Apr-28-1999
Emma Fuerst	Nursing Student	Jun-05-1998
John Kennedy	POTUS	NULL
Rihanna	NULL	NULL
Joe Schmoe	NULL	Aug-25-1560
Michael Shot	NULL	NULL
Michael Taught	NULL	NULL
Michael Yacht	NULL	NULL
Michael Knot	NULL	NULL
Michael Not	NULL	NULL
Michael Pot	NULL	NULL
Michael Plot	NULL	NULL
Michael Snot	NULL	NULL
Michael Slot	NULL	NULL
Michael Squat	NULL	NULL
Michael Thought	NULL	NULL
Michael Wrought	NULL	NULL
Michael Train-of-thought	NULL	NULL
Michael Montserrat	NULL	NULL
Michael Ocelot	NULL	NULL

#### 4.2 Find all the EMPLOYEE names at a given LIBRARY BRANCH

```
GIVEN_BRANCH ←  $\sigma_{name="Branch Name"}$  LIBRARY_BRANCH  
BRANCH_LPER ← GIVEN_BRANCH * LIBRARY_PERSON  
EMP_AT_BRANCH ← BRANCH_LPER * EMPLOYEE  
EMP_BRANCH_PER ← EMP_AT_BRANCH * PERSON  
 $\pi_{Name}$ (EMP_BRANCH_PER)
```

```
SELECT P.Name As EmpName  
FROM Employee AS E, LibraryPerson AS LP, LibraryBranch AS LB, Person AS P  
WHERE P.PersonID = LP.PersonID AND LP.PersonID = E.PersonID AND  
      LP.BranchNo = LB.BranchNo
```

Expected Output:

Michael Shot  
Michael Yacht  
Michael Not  
Michael Taught  
Michael Knot

#### 4.3 Find the name and bio of the DIRECTOR(s) who made MOVIEs that a kid under 13 can watch without parental supervision.

```
IMMATURE ←  $\sigma_{Maturity\_Rating < 13}$  MOVIE  
IMMATURE_DIRECTOR ← IMMATURE  $\bowtie_{DirectorID=PersonID}$  DIRECTOR  
IMMATURE_PERSON ← IMMATURE_DIRECTOR * PERSON  
 $\pi_{Name, Bio}$ (IMMATURE_PERSON)
```

```
SELECT Name, Bio  
FROM Movie AS M, Director AS D, Person AS P  
WHERE (M.MaturityRating = 'PG' OR M.MaturityRating = 'G') AND  
      M.DirectorID = D.PersonID AND P.PersonID = D.PersonID
```

Expected Output:

Dwight Toot	NULL
Dwight Fruit	NULL
Dwight Loot	NULL
Dwight Moot	NULL
Michael Dot	NULL
Michael Fought	NULL