For all problems, use the following schema:

Musician(**id**, first\_name, last\_name, instrument, band\_id)  
Band(**id**, name, years\_together)  
Show(**id**, venue\_id, date)  
Played\_in(***band\_id***, ***show\_id***)  
Venue(**id**, name, address)  
Album(**id**, name, year, band\_id, genre\_id)  
Genre(**id**, name, description)  
Song(**id**, name, album\_id)

Primary keys are in bold, foreign keys are in italics.

For each problem, write a query once using relational algebra, and again using SQL. Each problem is worth two possible points (one for each language), for a total of 30 possible points.

You can apply the points you receive to any past assignment or exam, distributed in any way you'd like, without going over the maximum points for that assignment or exam. The EC points cannot be saved for the final exam.

Problems:

1. Find the names of bands who have played together at least once.

select Band.name

from Played\_in as p, Band as b

where p.band\_id = b.id

1. Find the names of bands who have played together more than once.

select Band.name

from (

select Band.\*

from Played\_in as p, Band as b,

where p.band\_id = b.id

) as b1

where count(b1) > 1;

1. Find the names of all songs that come from an album that fits into the genre "rock".

select Song.name

from Album as a, Song as s, Genre as g

where a.genre\_id = g.id and s.album\_id = a.id and g.name = "rock"

1. Find the ids of bands who have a member with the first name "John".

select Band.id

from Band as b, Musician as m

where m.band\_id = b.id and m.first\_name = "John";

1. Find the names of all albums by bands who have played at the venue "The Hi-Dive".

select Album.name

from Album as a, Show as s, Played\_in as p, Band as b, Venue as v

where a.band\_id = b.id and p.band\_id = b.id and p.show\_id = s.id

and s.venue\_id = v.id and v.name = "The Hi-Dive";

1. Find the names of all songs by bands who have played at "The Gothic" and at "The Hi-Dive".

select name

from (

select Song.\*

from Album as a, Band as b, Song as s, Played\_in as p, Venue as v

where p.band\_id = b.id and a.band\_id = b.id and s.album\_id = a.id

and s.venue\_id = v.id and v.name = "The Gothic"

) as Gothic,

(

select Song.\*

from Album as a, Band as b, Song as s, Played\_in as p, Venue as v

where p.band\_id = b.id and a.band\_id = b.id and s.album\_id = a.id

and s.venue\_id = v.id and v.name = "The Hi-Dive"

) as Hi-Dive,

where Gothic.id = Hi-Dive.id;

1. Find the names of albums that fit in the genre "Reggae" by bands containing a member whose instrument is "Saxophone".

select Album.name

from Album as a, Genre as g, Band as b, Musician as m

where a.band\_id = b.id and a.genre\_id = g.id and m.band\_id = b.id

and m.instrument = "Saxophone" and g.name = "Reggae";

1. Find the name of bands who have been together 4 or more years, AND who have an album with more than 10 songs.

Select name

From bands b, albums a, song s

Where b.id = a.band\_id And s.album\_id = a.id And

1. Find the names of the musicians in all bands who played at "The Gothic" on 01-02-2018.

Select m. first\_name, m.last\_name

From musicians m, bands b, Venue v, Show s, Played\_in p

Where m.band\_id=b.id and s.venue\_id = v.id and p.band\_id = p.show\_id and v.id = "The Gothic" and s.date = "01-02-2018"

10. Find the names of all the venues that have hosted shows with a band that put out an album that fits into the genre "Pop".

11. Find the descriptions of all genres for albums put out by the band "The Databases".

12. Find the names of all bands that have a member who plays "Guitar", OR have a member that plays "Keyboard".

13. Find the id of all shows that includes a band who has been together more than 5 years.

14. Find the instruments of all members of bands who have played at "The Bluebird".

15. Find the names of all genres for albums put out by bands who played at "The Gothic".