

Databases and Information Systems

Degree in Informatics Engineering

Unit 2.2: SQL Exercises

2019/2020



UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA

Table of Content

1 Introduction	1
2 The CINE (CINEMA) database	3
3 CINEMA database exercises	4
3.1 Queries using one single relation	4
3.2 Queries using more than one relation	6
3.3 Queries with subqueries	7
3.4 Queries with universal quantification	10
3.5 Queries with GROUP BY	11
3.6 Queries with different joins.....	13
3.7 Queries with set operations	15
3.8 Other queries	15
4 The MÚSICA (music library) database	17
5 MUSICA database exercises.....	19
5.1 Queries using one single relation	19
5.2 Queries using more than one relation	21
5.3 Queries with subqueries	22
5.4 Queries with universal quantification	23
5.5 Queries with Group By	23
5.6 Other queries	24
6 The BIBLIOTECA (book library) Database.....	27
7 BIBLIOTECA Database exercises	29
7.1 Queries using one single relation	29
7.2 Queries using more than one relation	30
7.3 Queries with subqueries	31
7.4 Queries with universal quantification	32
7.5 Queries with GROUP BY	34
7.6 Other queries	35
8 The CYCLING RACE database	37
9 CYCLING RACE database exercises	39
9.1 Queries using one single relation	39
9.2 Queries using more than one relation	40

9.3 Queries with subqueries	42
9.4 Queries with universal quantification	44
9.5 Queries with Group By	45
9.6 Other queries	48

1 INTRODUCTION

The main goal of these laboratory sessions is to learn to make queries in the SQL language. We will use the Oracle SQL Developer Tool.

The Data Manipulation Language included in Oracle SQL is based in the SQL/92 standard. In this part of the laboratory sessions we will use the SELECT statement to make queries.

This document includes exercises corresponding to several databases. After a brief presentation of each database, a set of queries is proposed. These queries are organized into six groups:

- Queries over one single relation.

These are the simplest queries and only one table is necessary to solve them.

- Queries over more than one relation.

This group includes queries that can be solved including more than one table in the FROM clause of the SELECT statement. The connections between these tables are established in the WHERE clause.

- Queries with subqueries.

This group includes queries that can be solved using a subquery in the WHERE clause.

- Queries with universal quantification.

These queries have a straightforward solution using a universal quantifier. Unfortunately Oracle SQL does not provide the universal quantifier operator, and we will have to represent the universal quantification in terms of negation and existential quantification. This transformation is as follows: “Every element E in set C has the property P” is equivalent to “There is **no** element E in set C which **does not have** the property P”. We propose to find solution to these queries by using the predicate NOT EXISTS.

- Queries with Group by.

The queries in this group require the use of the GROUP BY clause.

- Other queries.

This section includes general queries with different requirements.

Please, note that some queries can be solved in different ways, so it could be included in more than one group. You will find following all the queries the result (extension) to check with your answer: If the result is not the same, the query is wrong, but if the result is the same, the query might be right or might be wrong (a wrong query may sometimes give rise to a correct result).

We are using the following **notation** for the database schemas:

PK: Primary Key (*CP: Clave Primaria*): the set of attributes with this constraint forms the primary key.

UNI: Uniqueness constraint (*UNI: Restricción de unicidad*): the set of attributes with this constraint cannot be repeated.

FK: Foreign Key (*CAj: Clave Ajena*): the set of attributes with this constraint refers to corresponding attributes of the referred relation.

NNV: Not Null Value (*VNN: Valor no nulo*): the set of attributes with this constraint cannot be null.

Using dates in SQL

To avoid problems when using dates corresponding to several centuries, we strongly recommend to use four digits for representing years. This can be easily configured in SQL Developer: "Tools/Preferences/Databases/NLS/Date Format" DD/MM/RRRR

The **EXTRACT** function returns the day, month or year from a date. Let's consider that X='02/06/1965', then

- EXTRACT (DAY FROM X) returns 2;
- EXTRACT (MONTH FROM X) return 6;
- EXTRACT (YEAR FROM X) return 1965.

2 THE CINE (CINEMA) DATABASE

We are interested in storing the information of movies, actors, movies directors,... In order to do that, the following relational database has been designed:

PAIS (cod_pais:char(5), nombre:char(20))
PK:{cod_pais}
NNV:{nombre}

ACTOR (cod_act:char(5), nombre:char(70), fecha_nac:date, cod_pais:char(5))
PK:{cod_act}
NNV:{nombre, fecha_nac, cod_pais}
FK:{cod_pais} → Pais(cod_pais)

LIBRO_PELI (cod_lib:char(5), titulo:char(70), anyo:number, autor:char(80))
PK:{cod_lib}
NNV:{titulo, autor}

PELICULA (cod_peli:char(5), titulo:char(70), anyo:number, duracion:number,
cod_lib:char(5), director:char(70))
PK:{cod_peli}
NNV:{titulo, duracion}
FK:{cod_lib} → LIBRO_PELI(cod_lib)

GENERO (cod_gen:char(5), nombre:char(30))
PK:{cod_gen}

ACTUA (cod_act:char(5), cod_peli:char(5), papel:char(10))
PK:{cod_act, cod_peli}
NNV:{papel}
FK:{cod_peli} → Pelicula(cod_peli)
FK:{cod_act} → Actor(cod_act)

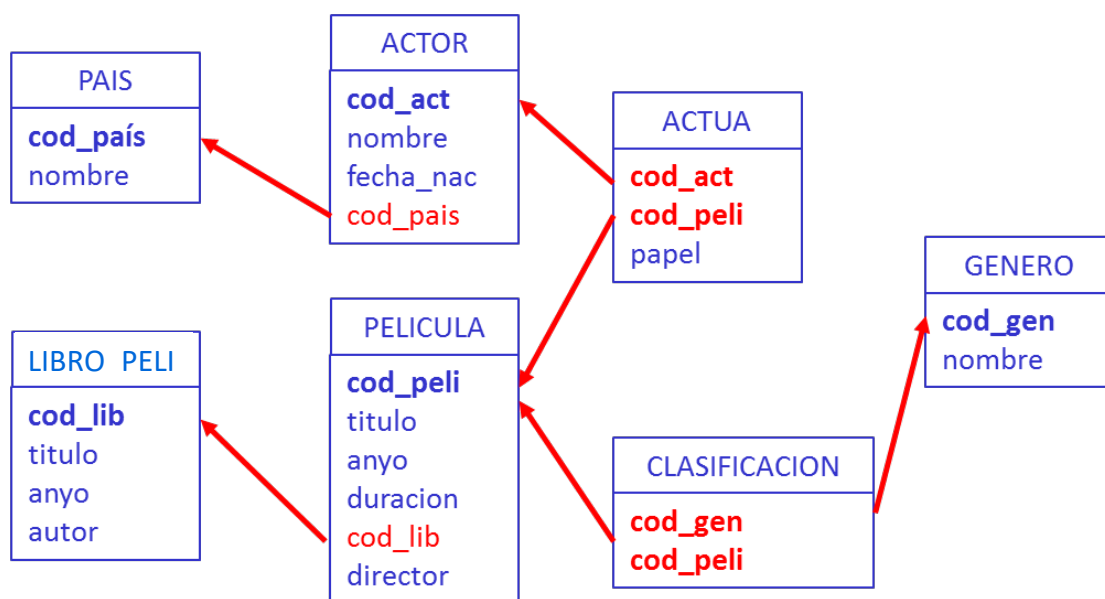
CLASIFICACION (cod_gen:char(5), cod_peli:char(5))
PK:{cod_gen, cod_peli}
FK:{cod_peli} → Pelicula(cod_peli)
FK:{cod_gen} → Genero(cod_gen)

Below is a brief explanation of the meaning of the different relations and their attributes.

- **Pais:**
 - *cod_pais*: country code.
 - *nombre*: name of the country.
- **Actor:**
 - *cod_act*: actor coder.
 - *nombre*: name of the actor.
 - *fecha_nac*: actor's date of birth.
 - *cod_pais*: code of the actor's country.
- **LIBRO_PELI:**

- *cod_lib*: book code.
- *titulo*: book title.
- *anyo*: publishing year of the book.
- *autor*: name of the author of the book.
- **Pelicula:**
 - *cod_peli*: movie code.
 - *titulo*: movie title.
 - *anyo*: release year of the movie.
 - *duracion*: length (in minutes) of the movie.
 - *cod_lib*: code of the book used for the movie (the movie is based on the book).
 - *director*: name of the movie director.
- **Genero:**
 - *cod_gen*: code of the genre.
 - *nombre*: name of the genre.
- **Actua:** The actor with code *cod_act* has performed the role *papel* in the movie with code *cod_peli*.
- **Clasificacion:** the movie with code *cod_peli* is classified in the genre with code *cod_gen*.

Below is a graphical representation of the “Cine” relational schema:



3 CINEMA DATABASE EXERCISES

3.1 Queries using one single relation

1. List the code of the countries with some actor in ascending order.

COD_P

ad63
 gg74
 hg45
 nb12
 rt89
 sd53
 sf15
 ty11
 we74
 zf58

10 filas seleccionadas

2. List the code and the title of the movies released before 1970 which are not based on a book. Sort the movies by the title.

COD_P TITULO

357L Cleopatra
 365N Cortina rasgada
 332D Dos hombres y un destino

3. List the code and name of the actors which name includes "John".

COD_A NOMBRE

A62 John Goodman

4. List the code and title of the movies with a length greater than 120 minutes, released in the 80's.

COD_P TITULO

365A Indiana Jones y la última cruzada

5. List the code and title of the movies based on a book, directed by a director with the last name 'Pakula'.

COD_P TITULO

856A El informe pelícano

6. How many movies are there with a length greater than 120 minutes released in the 80's?

COUNT (*)

1

7. How many movies have been classified in the genres with codes 'BB5', 'GG4', o 'JH6' ?

CUÁNTAS_PELIS

43

8. In which year was published the oldest book ?


```
AÑO
----
1877
```

9. What is the average length of the movies released in 1987?

```
DURACIÓN_MEDIA
-----
          119,5
```

10. What is the total length of the movies directed by 'Steven Spielberg'?

```
DURAN_MIN
-----
        296
```

3.2 Queries using more than one relation

11. List the code and title of the movies in which act an actor with the same name as the movie director (sorted by title).

```
COD_P  TITULO
-----
654J   Buenas noches, y buena suerte
778E   Sin perdón
455K   The monuments men
118E   Un mundo perfecto
```

12. List the code and title of the movies of the genre 'Comedia' (sorted by title).

```
COD_P  TITULO
-----
258S   Cuando Harry encontró a Sally
369F   Desayuno con diamantes
456G   El chip prodigioso
888T   El golpe
548J   Jamón, Jamón
147D   Los búfalos de Durham
874G   Los picapiedra
789B   The mexican
      8 filas seleccionadas
```

13. List the code and title of the movies based on a book published before 1950.

```
COD_P  TITULO
-----
159A   Ana Karenina
123V   Anna Karenina
159X   Anna Karenina
123N   Lo que el viento se llevó
123S   My Fair Lady
258M   Un tranvía llamado deseo
      6 filas seleccionadas
```

14. List the code and name of the countries in which were born the actors acting in movies of the genre 'Comedia' (sorted by name).

```
COD_P NOMBRE
-----
ad63  Bélgica
we74  España
sf15  USA
3 filas seleccionadas
```

3.3 Queries with subqueries

15. Write again a query for the exercises 11, 12, 13, and 14 using subqueries.
16. List the code and name of the actors born before 1950 who perform the role 'Principal' in some movie (sorted by name).

```
COD_A NOMBRE
-----
Z15   Al Pacino
D49   Audrey Hepburn
L54   Christopher Plummer
L59   Clint Eastwood
L45   Elizabeth Taylor
S56   Elke Sommer
J47   Gene Hackman
V88   George Peppard
J45   Harrison Ford
X45   Julie Andrews
J56   Marlon Brandon
D14   Martin Sheen
U88   Morgan Freeman
W34   Paul Newman
T44   Rex Harrison
F56   Richard Burton
M45   Richard Gere
E56   Robert de Niro
H45   Robert Redford
W32   Sean Connery
E45   Susan Sarandon
D01   Vivien Leigh
22 filas seleccionadas
```

17. List the code, title, and author of the books used in some movie released in the 90's (sorted by title).

COD_L	TITULO	AUTOR
GJ7	Ana Karenina	Leon Tolstoi
GJ6	El informe pelícano	John Grisham
UU4	El padrino	Mario Puzo
DF6	Entrevista con el vampiro	Anne Rice
LP9	Rita Hayworth y la redención de Shawshank	Stephen King

AR3 Vida de este chico
6 filas seleccionadas

Tobias Wolff

18. List the code, title, and author of the books not used in any movie.

COD_L	TITULO	AUTOR
FA6	La caída de los gigantes	Ken Follet

19. List the name of the genre (or genres) of the movies in which there is no actor acting (sorted by name).

NOMBRE

Animación
Aventuras
Drama

20. List the title of the books used in some movie with no actors from the country called 'USA' (sorted by title).

TITULO

Ana Karenina
Lo que el viento se llevó
Pigmalion
The sound of music

21. How many movies of the genre 'Comedia' are there with only one actor playing the role 'Secundario'?

COUNT (P.COD_PELI)

2

22. List the release year of the first movie in which the actor named 'Jude Law' performed the 'Principal' role.

ANYO

2001

23. List the code and name of the oldest actor (or actors).

COD_A	NOMBRE
K58	Stanley Holloway

24. List the code, name, and date of birth of the oldest actor born in 1940.

COD_A	NOMBRE	FECHA_NAC
C89	James Caan	26/03/1940

25. List the genre (or genres) of the longest movie.

NOMBRE

Bélica

Drama

Romance

26. List the code and title of the book used in the movies in which act actors from the country called 'España' (sorted by title).

COD_L TITULO

ZF4 Come, reza, ama

PP4 Desayuno en Tiffanys

DF6 Entrevista con el vampiro

27. List the title of the movies of more than one genre released before 1950 (sorted by title).

TITULO

Lo que el viento se llevó

28. List the number of movies with less than 4 actors.

COUNT (*)

68

29. List the directors who have directed more than 250 minutes (considering the length of all their movies).

DIRECTOR

Steven Soderbergh

Clint Eastwood

Steven Spielberg

Francis Ford Coppola

Guy Ritchie

30. List the year (or years) in which were born more than 3 actors.

AÑO

1954

1940

31. List the code and name of the youngest actor who has participated in a movie of the genre with code 'DD8'.

COD_A NOMBRE

S47 Kevin Costner

3.4 Queries with universal quantification

32. List the code and name of the countries with actors such that all the actors from that country were born in the XX century (sorted by name).

```
COD_P  NOMBRE
-----
hg45   Alemania
zf58   Australia
rt89   Austria
ad63   Bélgica
gg74   Canadá
nb12   Cuba
we74   España
sd53   Francia
sf15   USA
9 filas seleccionadas
```

33. List the code and name of the actors such that all their roles have been 'Secundario'. We are only interested in actors who have acted in some movie.

```
COD_A  NOMBRE
-----
E22    Diane Keaton
C89    James Caan
F77    José L. de Villalonga
Q47    Ludwig Donath
C15    Robert Duvall
K58    Stanley Holloway
6 filas seleccionadas
```

34. List the code and name of the actors who have appeared in all the movies directed by 'Guy Ritchie' (only if this director has directed at least one movie).

```
COD_A  NOMBRE
-----
A47    Robert Downey Jr.
A52    Jude Law
```

35. Write a query for the previous problem but using the director named 'John Steel'.

```
no se ha seleccionado ninguna fila
```

36. List the code and title of the movies with a length shorter than 100 minutes in which all the actors who have acted are from the same country.

```
COD_P  TITULO
-----
258S   Cuando Harry encontró a Sally
548J   Jamón, Jamón
654J   Buenas noches, y buena suerte
874G   Los picapiedra
```

951D Al caer el sol

37. List the code, title, and year of release of the movies in which some actor has acted, but only if all the actors of that movie were born before 1943.

COD_P	TITULO	ANYO
159X	Anna Karenina	1948
159D	Bajo sospecha	2000
357L	Cleopatra	1963
365N	Cortina rasgada	1966
369F	Desayuno con diamantes	1961
332D	Dos hombres y un destino	1969
888T	El golpe	1973
144H	El premio	1963
753N	La gata sobre el tejado de zinc	1958
123N	Lo que el viento se llevó	1939
123S	My Fair Lady	1964
778E	Sin perdón	1992
589B	Sonrisas y lágrimas	1965
258M	Un tranvía llamado deseo	1951

14 filas seleccionadas

38. List the code and name of all the countries if all the actors from that country have acted in at least one movie with a length greater than 120 minutes (sorted by name).

COD_P	NOMBRE
hg45	Alemania
rt89	Austria
ad63	Bélgica
gg74	Canadá
nb12	Cuba
ty11	UK

6 filas seleccionadas

3.5 Queries with GROUP BY

39. List the code and title of the book (or books) used in more than one movie. Include also how many movies have been based on that book.

COD_L	TITULO	CUÁNTAS
UU4	El padrino	3
GJ7	Ana Karenina	3

40. List for each genre with more than 5 movies, the code and the name of the genre, including the amount of movies of that genre and the average length of all that movies. (sorted by name). You can use the ROUND function.

COD_G	NOMBRE	CUÁNTAS	DUR_MEDI
-------	--------	---------	----------

DR5	Acción	8	138
DF2	Biografía	6	146
JJ9	Comedia	8	110
GG4	Crimen	18	132
BB5	Drama	38	134
KK4	Misterio	6	127
HH2	Romance	8	127

7 filas seleccionadas

41. List the code and title of the movies released after the 2000 year, and how many genres they have (if they have genre) sorted by title.

COD_P	TITULO	CUÁNTOS
159A	Ana Karenina	1
654J	Buenas noches, y buena suerte	2
145K	Camino a la perdición	3
465H	El código da Vinci	1
158S	Enemigo a las puertas	3
369J	Golpe de efecto	2
457P	Invictus	3
159U	Mi novio es un ladrón	1
326F	Mystic river	3
189G	Ocean's Thirteen	2
658G	Sherlock Holmes	3
452W	Sherlock Holmes: Juego de sombras	3
789B	The mexican	3
455K	The monuments men	3

14 filas seleccionadas

42. List the directors who have directed two (exactly 2) movies whose name contains the string 'George'.

DIRECTOR

George Roy Hill
George Clooney

43. List for each movie with some actor and classified in one (and only one) genre, the code, title and amount of actors who have acted in that movie.

COD_P	TITULO	CUÁNTOS
159A	Ana Karenina	2
159X	Anna Karenina	1
365N	Cortina rasgada	3
465H	El código da Vinci	1
475A	Filadelfia	3
753N	La gata sobre el tejado de zinc	2
159U	Mi novio es un ladrón	2
778E	Sin perdón	3
258M	Un tranvía llamado deseo	2

9 filas seleccionadas

44. List the code and name of all the countries with actors, indicating how many actors from that country

have acted in at least one movie from the 60's.

COD_P	NOMBRE	CUÁNTOS
hg45	Alemania	1
rt89	Austria	1
ad63	Bélgica	1
gg74	Canadá	1
we74	España	1
ty11	UK	4
sf15	USA	4

7 filas seleccionadas

45. List the code (or codes) and the genre (or genres) with most movies.

COD_G	NOMBRE
BB5	Drama

46. List the code/s, title/s and author/s of the book most used in movies.

COD_L	TITULO	AUTOR
UU4	El padrino	Mario Puzo
GJ7	Ana Karenina	Leon Tolstoi

47. List the code and name of the country which has most actors who have participated in exactly 2 movies.

COD_P	NOMBRE
sf15	USA

48. List the year (or years) in which more than 3 actors were born, indicating how many actors were born in that year.

AÑO	CUÁNTOS
1954	4
1940	4

49. Do again the query 36.

3.6 Queries with different joins

50. List for all the countries in the database, the code, name, and amount of actors in each country.

COD_P	NOMBRE	CUÁNTOS
hg45	Alemania	1
zf58	Australia	1
rt89	Austria	1


```

ad63  Bélgica          1
gg74  Canadá           1
nb12  Cuba             1
we74  España           5
sd53  Francia          1
hy76  Italia           0
ty11  UK               9
sf15  USA              38
11 filas seleccionadas

```

51. List the code and the title of all the books in the database published after 1980, and the amount of movies based on each book.

COD_L	TITULO	CUÁNTAS
GJ6	El informe pelícano	1
GH4	El código da Vinci	1
AR3	Vida de este chico	1
AE8	El color del dinero	1
FA6	La caída de los gigantes	0
LP9	Rita Hayworth y la redención de Shawshank	1
KS5	El factor humano	1
ZF4	Come, reza, ama	1

8 filas seleccionadas

52. List for all the countries in the database, the code, name and amount of actors from that country who have performed the "Secundario" role in some movie.

COD_P	NOMBRE	CUÁNTOS
hg45	Alemania	0
zf58	Australia	0
rt89	Austria	1
ad63	Bélgica	0
gg74	Canadá	0
nb12	Cuba	1
we74	España	3
sd53	Francia	0
hy76	Italia	0
ty11	UK	4
sf15	USA	16

11 filas seleccionadas

53. List for all the movies in the database longer than 140 minutes, its code, title, amount of genres and amount of actors acting in that movie.

COD_P	TITULO	GEN	ACT
123V	Anna Karenina	1	0
963L	Apocalypse now	0	4
666F	Atrápame si puedes	0	2
438S	Cadena perpetua	2	2
357L	Cleopatra	3	3
465H	El código da Vinci	1	1

856A	El informe pelícano	0	2
123X	El padrino	2	5
741G	El padrino II	2	4
741S	El padrino III	2	3
123N	Lo que el viento se llevó	3	1
123S	My Fair Lady	3	3
314G	Robin Hood, príncipe de ladrones	3	2
951L	Salvar al soldado Ryan	3	2
589B	Sonrisas y lágrimas	3	2
996H	Titanic	0	2
874F	Un domingo cualquiera	0	3
321N	Wyatt Earp	3	3
18 filas seleccionadas			

3.7 Queries with set operations

54. List the years, in ascending order, of all the years in which a book was published or a movie was released. We are only interested in years without the digit 9.

```

      ANYO
-----
      1877
      2000
      2001
      2002
      2003
      2004
      2005
      2006
      2007
      2008
      2010
      2011
      2012
      2013
      2014
15 filas seleccionadas

```

3.8 Other queries

55. List the name of the genre (or genres) of the longest movie.

```

COD_G  NOMBRE
-----
BB5    Drama
HH2    Romance
OI9    Bélica

```

56. List, for each actor born before 1948 who has acted in 2 or more movies in any role, the code, the name and the date of birth, indicating in how many movies he/she has performed the 'Principal' role.

```

COD_A  NOMBRE                      FECHA_NAC          CUANTOS_PRINCIP
-----

```

Z15	Al Pacino	25/04/1940	4
D49	Audrey Hepburn	04/05/1929	2
L59	Clint Eastwood	31/05/1930	3
E22	Diane Keaton	05/01/1946	0
L45	Elizabeth Taylor	27/02/1932	2
J47	Gene Hackman	30/01/1930	4
J45	Harrison Ford	13/07/1943	1
X45	Julie Andrews	01/10/1935	2
J56	Marlon Brandon	03/04/1924	3
U88	Morgan Freeman	01/06/1937	3
W34	Paul Newman	26/01/1925	8
T44	Rex Harrison	05/03/1908	1
E56	Robert de Niro	17/08/1943	2
C15	Robert Duvall	05/01/1931	0
H45	Robert Redford	18/08/1936	2
W32	Sean Connery	25/08/1930	2
E45	Susan Sarandon	04/10/1946	3
D01	Vivien Leigh	05/11/1913	3
18 filas seleccionadas			

4 THE MÚSICA (MUSIC LIBRARY) DATABASE

We are interested in storing the information of a music library: The CD's, the publishing companies, the recorded songs and who recorded them,... In order to do that, the following relational database has been designed:

CANCION(cod:integer,título:char(30),duración:real)

PK:{cod}

NNV:{título}

COMPANYIA(cod:char(3),nombre:char(30),dir:char(30),fax:char(10),
tfno:char(10))

PK:{cod}

NNV:{nombre}

DISCO(cod:char(3),nombre:char(30),fecha:date,cod_comp:char(3),
cod_gru:char(3))

PK:{cod}

FK:{cod_comp}→ COMPANYIA

NNV:{cod_comp}

FK:{cod_gru}→ GRUPO

NNV:{cod_gru}

ESTA(can:integer,cod:char(3))

PK:{can,cod}

FK:{can}→ CANCIÓN

FK:{cod}→ DISCO

GRUPO(cod:char(3),nombre:char(30),fecha:date,pais:char(10))

PK:{cod}

NNV:{nombre}

ARTISTA(dni:char(10),nombre:char(30))

PK:{dni}

NNV:{nombre}

CLUB(cod:char(3),nombre:char(30),sede:char(30),num:integer,
cod_gru:char(3))

PK:{cod}

FK:{cod_gru}→ GRUPO

NNV:{cod_gru}

NNV:{nombre}

PERTENECE(dni:char(10),cod:char(3),funcion:char(10))

PK:{dni,cod}

FK:{dni}→ ARTISTA

FK:{cod}→ GRUPO

Below is a brief explanation of the meaning of the different relations and their attributes.

Canción (song)

cod: song code (id).

título: Song title.

duración: Length of the song.

Companyia (company)

cod: record company (record label) code.

nombre: company name.

dir: Address of the company.

fax: Fax number of the company.

tfno.: Phone number of the company.

Disco (record)

cod: record code (id).

nombre: record name.

fecha: Publishing date.

cod_comp: Code of the record company which has published this record.

cod_gru: Code of the music group (band) which has recorded this record.

Está (is_in)

It stores what songs are included in each record, where “*can*” is the code of a song appearing in the record “*cod*”.

Grupo (group/band)

cod: Group (band) code.

nombre: Name of the group.

fecha: Date of the group foundation.

país: Country where the group was created.

Artista (artist)

dni: artist id.

nombre: name of the artist.

Club (fan club)

cod: fan club code (id).

nombre: name of the club.

sede: Address of the main office.

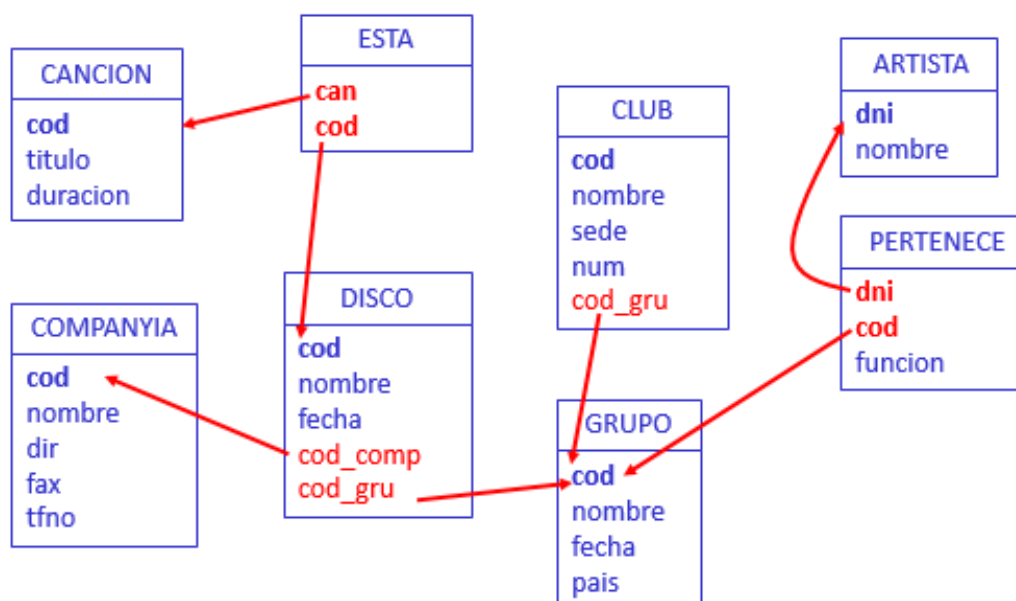
num: number of members of the club.

cod_gru: code of the group which the club is fan of.

Pertenece (belongs_to)

It contains the group members information: The artist “dni” is member of the group “cod” performing the function “funcion” (e.g. plays the guitar, sings,...).

Below is a graphical representation of the “Música” relational schema:



5 MUSICA DATABASE EXERCISES

5.1 Queries using one single relation

1. How many records are there?

```

COUNT (*)
-----
          18
1 fila seleccionada.
  
```

2. Show the names of the non-Spanish groups.

```

NOMBRE
-----
U2
Simple Minds
Mike + The Mechanics
Genesis
  
```

4 filas seleccionadas.

3. Show the title of the songs that are more than 5 minutes long.

TITULO

7 Deadly Sins

Lemon

So Cruel

Zooropa

4 filas seleccionadas.

4. List the different functions that can be performed in a group.

FUNCION

bajo

batería

guitarra

teclado

voz

5 filas seleccionadas.

5. List the name of the fan clubs and their size (number of members). The list must be sorted into ascending order according to the club size.

CLUB	TAMAÑO
-----	-----
FanMike	11
Implicado	25
Bonoculture	129
Waterfront	234
Presuntos	237
Che U2	239
Los Culpables	355
Jardin Botanico	357
Troglominds	999
The best mind	1413
u2foryou	1700
Mentes Fuertes	1984
Zoomania	2508
Machines	7789
Futuristas	9850
Fanaticgens	12002
Genefans	23412

17 filas seleccionadas.

6. Show the name and address (sede) of the clubs with more than 500 members.

NOMBRE	SEDE
-----	-----
Zoomania	33, Abbey Road
Machines	Calle 3, Lab 3
u2foryou	23, 11th Street

Troglominds	C/Lepe 22
Mentes Fuertes	Ramon y Cajal 14
The best mind	24, Homeround
Genefans	C/Visitacion 34
Fanaticgens	Av. H. Dominicos 155
Futuristas	C/Alboraya 10

9 filas seleccionadas.

5.2 Queries using more than one relation

7. List the name and address (sede) of the fan clubs of Spanish groups, and the name of the group which they are fans of.

NOMBRE	SEDE	NOMBRE
Jardin Botanico	203, Valencia 46004	Radio Futura
Presuntos	C/Albacete 12, bajo	Presuntos Implicados
Implicado	Torrejon de Ardoz 12	Presuntos Implicados
Los Culpables	C/Maria Cristina 67	Presuntos Implicados
Futuristas	C/Alboraya 10	Radio Futura

5 filas seleccionadas.

8. List the names of the artists that are member of any Spanish group.

NOMBRE

Carlos Torero
 Enrique Sierra
 J.L. Giménez
 Luis Auseron
 Nacho Maño
 Santiago Auseron
 Soledad Giménez

7 filas seleccionadas.

9. List the name of the records that contain some song that is more than 5 minutes long.

NOMBRE

Achtung baby
 Good news F.N. world
 Zooropa

3 filas seleccionadas.

10. List the title of the songs that have the same title that the record in which the song appears.

TITULO

Alma de blues
 De sol a sol
 Invisible touch
 Living years
 October

Ser de agua
 The unforgettable fi
 Word of mouth
 Zooropa
 Once upon a time
 10 filas seleccionadas.

11. Show the name and address of the companies which have recorded a record whose title begins with 'A'.

NOMBRE	DIR
-----	-----
WEA	L Hoyos 42
Island	67, JB St.

2 filas seleccionadas.

12. Show the id (dni) of the artists which are members of more than one group.

DNI

 8884566666

1 fila seleccionada.

5.3 Queries with subqueries

13. Show the name of the records recorded by the oldest group.

NOMBRE

 We can't dance
 Invisible touch
 Seconds out
 3 filas seleccionadas.

14. List the name of the records which have been recorded by groups with a fan club greater than 5,000 (more than 5,000 members)

NOMBRE

 Word of mouth
 Living years
 We can't dance
 Invisible touch
 Seconds out
 La ley del desierto
 La canción de Jperro
 filas seleccionadas.

15. Show the name of the club/s with the greatest number of fans. Do also indicate its number of fans.

NOMBRE	NUM
--------	-----

```
-----
Genefans                23412
1 fila seleccionada.
```

16. Show the title of the longest songs indicating also their length.

```
TITULO                DURACION
-----
7 Deadly Sins          6
Lemon                  6
So Cruel               6
Zooropa                6
4 filas seleccionadas.
```

5.4 Queries with universal quantification

17. List the name of the record companies that have not worked with Spanish groups.

```
NOMBRE
-----
Island
Virgin
ATLANTIC
PoliDiscos
PoliDiscos
5 filas seleccionadas.
```

18. List the name of the companies that have only worked with Spanish groups.

```
NOMBRE
-----
ARIOLA
WEA
2 filas seleccionadas.
```

19. List the name and address of the companies which have recorded all the records of some group.

```
NOMBRE                DIR
-----
ARIOLA                Aragon 204
ATLANTIC              12, E St.
Island                67, JB St.
Virgin                2, 23th St.
WEA                   L Hoyos 42
5 filas seleccionadas.
```

5.5 Queries with Group By

20. List the names of the Spanish groups and the total amount of their fans.

```
NOMBRE                FANS
-----
```

Presuntos Implicados	617
Radio Futura	10207

2 filas seleccionadas.

21. List the name and number of components of any group with more than 2 members.

NOMBRE	NUMERO
-----	-----
Genesis	3
Mike + The Mechanics	4
Presuntos Implicados	3
Radio Futura	4
U2	4

5 filas seleccionadas.

22. List the number of records of each group.

NOMBRE	DISCOS
-----	-----
U2	4
Simple Minds	4
Mike + The Mechanics	2
Genesis	3
Presuntos Implicados	3
Radio Futura	2

6 filas seleccionadas.

23. List the number of songs recorded by each company and the company address.

NOMBRE	CANCIONES	DIR
-----	-----	-----
ARIOLA	22	Aragon 204
ATLANTIC	54	12, E St.
Island	43	67, JB St.
PoliDiscos	0	Cami de Vera
PoliDiscos	0	Polynesia St.
Virgin	34	2,23th St.
WEA	31	L Hoyos 42

7 filas seleccionadas.

5.6 Other queries

24. List the name of the artists member of groups with a fan club greater than 500. The group must be from England.

NOMBRE

Adam Clayton
Adrian Lee
Bono
C. Burchill
Edge
Jim Kerr

Larry Jr.Mullen
M. Rutherford
P. van Hooke
Paul Young
Phil Collins
Tony Banks
12 filas seleccionadas.

25. Show the song titles included in any 'U2' record.

TITULO

4th of July
A sort of homecoming
Artitoestoy
Babyface
Bad
Daddys Goma pay for
Dirty day
Elvis Presley & USA
Even Better Than...
Fire
Fly
Gloria
I Fall Down
I Threw a Brick
Indian summer sky
Is That All
Lemon
Love is Blindness
MLK
Mysterious Ways
Numb
October
One
Price
Promenade
Rejoice
Scarlet
So Cruel
Some days are better
Stay
Stranger in a Land
The first time
The unforgettable fi
The wanderer
Tomorrow
Tryin to Throw...
Ultra Violet
Until The end...
Whos Gonna ride...
Wire
With a Shout
Zoo Station

Zooropa
43 filas seleccionadas.

26. List all the pairs of artists from two different Spanish groups such that the first one is a singer (función = 'voz') and the second one plays the guitar (función = 'guitarra'),

VOZ	GUITARRA
Soledad Giménez	Enrique Sierra
Santiago Auseron	J.L. Giménez

2 filas seleccionadas.

27. List the names of the artists which are members of more than one groups.

NOMBRE

M. Rutherford
1 fila seleccionada.

28. Show the name of the longest song if there is only one song with this length.

TITULO	DURACION
--------	----------

0 filas seleccionadas.

29. Show the tenth fan club in number of members (i.e. there must be only 9 above it). Do indicate the club size (number of members).

NOMBRE	NUM
Jardin Botanico	357

1 fila seleccionada.

30. List the name of the artists who play the bass (función='bajo') in only one group and also this group has more than 2 members.

NOMBRE

Adam Clayton
Luis Auseron
Nacho Maño
3 filas seleccionadas.

31. What is the name of the record company that has recorded more songs?

NOMBRE	CANCIONES
ATLANTIC	54

1 fila seleccionada.

6 THE BIBLIOTECA (BOOK LIBRARY) DATABASE

We are interested in maintaining the information of a home library. We have defined a relational database with the following schema:

```
AUTOR(autor_id: char(4), nombre: char(35), nacionalidad: char(20))
  PK: {autor_id}
  NNV: {nombre}

LIBRO(id_lib: char(10), titulo: char(80), año: integer, num_obras: integer)
  PK: {id_lib}

TEMA(tematica: char(20), descripcion: char(50))
  PK: {tematica}

OBRA(cod_ob: integer, titulo: char(80), tematica: char(20))
  PK: {cod_ob}
  FK: {tematica} → TEMA
  NNV: {titulo}

AMIGO(num: integer, nombre: char(60), telefono: char(10))
  PK: {num}
  NNV: {nombre}

LEER(num: integer, cod_ob: integer)
  PK: {num, cod_ob}
  FK: {num} → AMIGO
  FK: {cod_ob} → OBRA

ESTA_EN(cod_ob: integer, id_lib: char(10))
  PK: {cod_ob, id_lib}
  FK: {cod_ob} → OBRA
  FK: {id_lib} → LIBRO

ESCRIBIR(cod_ob: integer, autor_id: char(4))
  PK: {cod_ob, autor_id}
  FK: {cod_ob} → OBRA
  FK: {autor_id} → AUTOR
```

Below is a brief explanation of the meaning of the different relations and their attributes.

Autor (author): For each author the database stores his/her id (author_id), name (nombre) and nationality (nacionalidad).

Libro (book): For each book the database stores the book id (id_lib), title (titulo), if it has one, the year in which it was published, and the number of works (num_obras) that it contains.

Tema (topic): For each topic its id (tematica) and a short description (descripción) is stored.

Obra (work): For each work the database stores the work id (cod_ob), the title (titulo), and its topic (temática).

Amigo (friend): For each friend, her/his id (num), her/his name (nombre), and his/her phone number (teléfono) is stored.

Leer (read): A tuple in this relation represents that a friend (num) has read a work (cod_ob)

Esta_en (is_in): A tuple in this relation represents that a work (cod_ob) is included in a book (id_lib).

Escribir (has_written): A tuple in this relation represents that an author (autor_id) has written a work (cod_ob).

Additionally, the following properties must be satisfied:

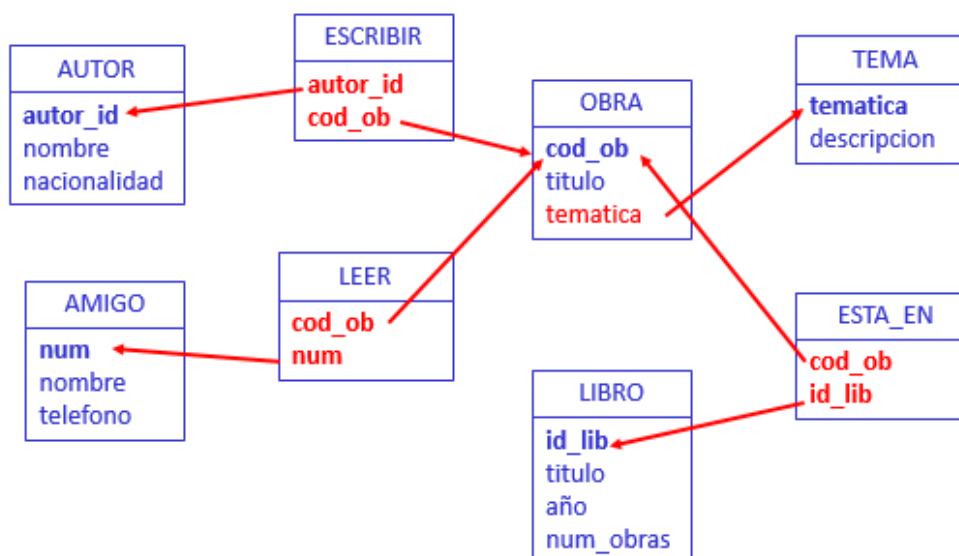
- The value of the attribute *num_obras* in the “libro” relation must be equal to the number of tuples in “Esta_en” for the book.
- Every book contains at least one work.
- If a book has a title and it only contains one work, the title of the book matches the title of the work.

Interpretation of the relational schema BIBLIOTECA

In order to understand the reality represented by the precious relational schema, answer the following questions:

- Why do we need the relations *Libro* y *Obra* ? Could we define only one of both?
- How many authors can write a work? How many works can be written by one author? Could there be one author who has not written any work? And a work with no author?
- Could there be a friend who has not read any work? How could be stored the information of a friend who has read the same work several times?

Below is a graphical representation of the “Biblioteca” relational schema:



7 BIBLIOTECA DATABASE EXERCISES

7.1 Queries using one single relation

1. List the name of the authors from 'Argentina'.

NOMBRE

Bioy Casares, Adolfo
Borges, Jorge Luis
Cortázar, Julio
3 filas seleccionadas.

2. List the work titles containing the word 'mundo'.

TITULO

Un mundo feliz
El ahogado más hermoso del mundo
2 filas seleccionadas.

3. List the id of the books published before 1990, containing more than one work. Show the numbers of woks contained in each book

ID_LIB NUM_OBRAS

LIB-000187 2
1 filas seleccionadas.

4. How many books are in the database such that we know the year in which they were published?

LIB_AÑO

92
1 fila seleccionada.

5. How many books contain more than one work? Use the attribute *num_obras*.

MÁS_1_OB

30
1 fila seleccionada.

6. List the id of the books published in 1997 with no title

ID_LIB

LIB-000045
LIB-000046
LIB-000048
LIB-000310
LIB-000311
LIB-000424

6 filas seleccionadas.

7. List all book titles alphabetically in descendant order (ignore the books with no title).

TITULO

 Vuelva usted mañana y otros artículos
 Vox
 Tres pastiches victorianos
 Todos los cuentos. EL balneario y las ataduras
 Sherlock Holmes. Obras completas III
 Sherlock Holmes. Obras completas II
 Sherlock Holmes. Obras completas I
 Relatos que me asustaron
 Raymon Chandler. Obras selectas II
 Raymon Chandler. Obras selectas I
 Pequeños cuentos misóginos
 Narraciones extraordinarias
 Lo infinitamente pequeño
 La mano parda y otros relatos
 La increíble y triste historia de la cándida Eréndida y su abuela
 desalmada
 Inglés-Español, VOX
 Francés-Español, Sopena
 Doce cuentos peregrinos
 Cuentos juveniles
 Cuentos de la taberna del ciervo blanco
 Cuentos
 Clásicos de Grecia y Roma
 Blanco en azul
 Algunos cuentos chilenos
 24 filas seleccionadas.

8. Calculate how many works are included in the books published between 1990 and 1999.

OBRAS

 127
 1 fila seleccionada.

7.2 Queries using more than one relation

9. Calculate how many authors have written a work with the word "ciudad" in the work title.

AUTORES

 4
 1 fila seleccionada.

10. List the title of the works written by 'Camús, Albert'.

TITULO

 El extranjero
 1 fila seleccionada.

11. Who is the author of the work titled 'La tata'?

NOMBRE

Martín Gaité, Carmen
 1 fila seleccionada.

12. List the name of the friends who have read some work written by the author with id 'RUKI'.

NOMBRE

Isabel Peiró García
 Eloy Prim Gros
 2 filas seleccionadas.

13. List the name and the book id of the books with a title and containing more than one work. Don't use the *num_obras* attribute.

ID_LIB TITULO

...
 21 filas seleccionadas.

7.3 Queries with subqueries

14. List the author and title of the works written by only one author, additionally the author must be French (nacionalidad='Francesa').

TITULO	NOMBRE
-----	-----
Bella del señor	Cohen, Albert
El método Montignac	Montignac, Michel
Madame Bovary	Flaubert, Gustave
La hierba roja	Vian, Boris
Con las mujeres no hay quien pueda	Vian, Boris
Que se mueran los feos	Vian, Boris
Escupiré sobre vuestras tumbas	Vian, Boris
El lobo hombre	Vian, Boris
El extranjero	Camús, Albert
Bosquejo de una teoría de las emociones	Sartre, Jean-Paul
El amante	Duras, Marguerite
Ana, soror...	Yourcenar, Marguerite
Opus nigrum	Yourcenar, Marguerite
Los amotinados de la "Bounty"	Verne, Jules
14 filas seleccionadas.	

15. How many authors are there in the database such that they have written no work?

SIN_OBRA

3

1 fila seleccionada.

16. List the name of the authors counted in the previous query.

NOMBRE

Peris Rossi, Cristina

Apollinaire, Guillaume

García Hortelano, Juan

3 filas seleccionadas.

17. List the name of the Spanish authors (nacionalidad "Española") who have written two or more works.

NOMBRE

...

18 filas seleccionadas.

18. List the name of the Spanish authors who have written some work included in two or more books.

NOMBRE

Valera, Juan

1 fila seleccionada.

19. List the title and id of the works with more than one author.

COD_OB

TITULO

151 El quinto jinete

170 A escullar

2 filas seleccionadas.

7.4 Queries with universal quantification

20. List the names of the friends who have read all the works written by 'RUKI' (author id).

NOMBRE

Isabel Peiró García

1 fila seleccionada.

21. List the names of the friends who have read all the works written by 'GUAP' (author id).

No se ha seleccionado ninguna fila

22. List the names of the friends who have read all the works written by some author (included in the AUTOR table).

NOMBRE

```
-----  
Isabel Peiró García  
Yolanda Milanés Cuba  
2 filas seleccionadas.
```

23. Solve the previous query showing the name of the author.

```
NOMBRE_AMIGO          NOMBRE_AUTOR  
-----  
Isabel Peiró García    Maalouf, Amin  
Yolanda Milanés Cuba   Vian, Boris  
Isabel Peiró García    Kipling, Rudyard  
3 filas seleccionadas.
```

24. List the name of the friends who have only read works written by 'CAMA' (author id).

```
NOMBRE  
-----  
Pepe Pérez Pérez  
1 filas seleccionadas.
```

25. List the name of the friends who have only read works written by 'GUAP' (author id).

No se ha seleccionado ninguna fila

26. List the name of the friends who have only read works written by one author.

```
NOMBRE  
-----  
Pepe Pérez Pérez  
Eloy Prim Gros  
Yolanda Milanés Cuba  
3 filas seleccionadas.
```

27. Solve the previous query showing the name of the author.

```
NOMBRE_AMIGO          NOMBRE_AUTOR  
-----  
Eloy Prim Gros         Kipling, Rudyard  
Pepe Pérez Pérez       Martín Gaité, Carmen  
Yolanda Milanés Cuba   Vian, Boris  
3 filas seleccionadas.
```

28. List the name of the friends who have read all the works written by some author but have not read any work written by other author. Show also the name of that author.

```
NOMBRE_AMIGO          NOMBRE  
-----  
Yolanda Milanés Cuba   Vian, Boris  
1 fila seleccionada.
```

7.5 Queries with GROUP BY

29. List the title and the book id of the books with a title and containing more than one work. (use “Group by” clause).

```
ID_LIB  TITULO
-----
```

```
...
21 filas seleccionadas.
```

30. List the name of the friends who have read more than 3 works indicating the total amount of works that he/she has read.

```
NOMBRE                                CUANTAS
-----                                -
Isabel Peiró García                  7
Yolanda Milanés Cuba                 5
2 filas seleccionadas.
```

31. List the topics and number of works that use that topic. Do not show the topics that are not used in any work.

```
TEMATICA                            NUM_OBRAS
-----                            -
Antropología                        4
Artículo                           57
Aventuras                           2
Biografía                           6
Ciencia Ficción                     6
Clásico                             14
Cocina                              10
Cuento                             164
Experiencias                        1
Filosofía                           3
Histórica                           16
Intriga                             1
Inventada                           1
Juvenil                             18
Lógica                              3
Misterio                            60
Mitología                           1
Negra                               23
Novela                              139
Poesía                              9
Teatro                              7
Viajes                              10
22 filas seleccionadas
```

32. List, for all the topics in the database, the attribute “tematica” and the number of works using that topic.

```
TEMATICA                            NUM_OBRAS
-----                            -
Antropología                        4
```

Artículo	57
Aventuras	2
Biografía	6
Ciencia Ficción	6
Clásico	14
Cocina	10
Cuento	164
Diccionario	0
Ensayo	0
Experiencias	1
Filosofía	3
Histórica	16
Intriga	1
Inventada	1
Juvenil	18
Lógica	3
Misterio	60
Mitología	1
Negra	23
Novela	139
Poesía	9
Teatro	7
Viajes	10
24 filas seleccionadas	

33. List the name of the author (or authors) who has written the most works.

NOMBRE

Pla, Josep

1 fila seleccionada.

34. List the less used nationality.

NACIONALIDAD

Alemana

Checa

Colombiana

Danesa

Griega

Mejicana

6 filas seleccionadas.

35. List the name of the friend who has read the greatest amount of works.

NOMBRE

Isabel Peiró García

1 fila seleccionada.

7.6 Other queries

36. List the title and the id of the books that have a title and contain only one work.

TITULO

No se ha seleccionado ninguna fila

37. From the previous query can be deduced that the books with only one work have no title. Assuming that its title is the one given by the work that the book contains, list all the book titles stored in the database independently of the number of works that they have.

TITULO

...
301 filas seleccionadas.

38. List the name of the friends who have read some work written by 'CAMA' (author id).

NOMBRE

Pepe Pérez Pérez
Isabel Peiró García
Isidro Catalá Ferrer
3 filas seleccionadas.

39. List the name of the friends who have read no work written by 'CAMA' (author id).

NOMBRE

Marina Sánchez Vidal
Eloy Prim Gros
Yolanda Milanés Cuba
Félix Díaz Drac
4 filas seleccionadas.

40. List the name of the friends who have read no work written by 'CAMA' (author id) but that have read some work.

NOMBRE

Eloy Prim Gros
Yolanda Milanés Cuba
2 filas seleccionadas.

41. List the name of the friend (or friends) who have read the most works. Don't use the "Group by" clause.

NOMBRE

Isabel Peiró García
1 fila seleccionada.

8 THE CYCLING RACE DATABASE

We are interested in storing the information of a cycling race (such as the Tour de France, Il Giro di Italia, or La Vuelta a España). In order to do that, the following relational database has been designed:

TEAM(teamname:char(25),director:char(30))
PK:{teamname}

CYCLIST(cnum:integer, name:char(30), age:integer, teamname:char(25))
PK:{cnum}
FK:{teamname}→ TEAM
NNV:{teamname}
NNV:{name}

STAGE(stagenum:integer, km:integer, departure:char(35), arrival:char(35),
cnum:integer)
PK:{stagenum}
FK:{cnum}→ CYCLIST

JERSEY(code:char(3), type:char(30), prize:integer, color:char(25))
PK:{code}

CLIMB(climbname:char(30), height:integer, category:char(1),
slope:real, stagenum:integer, cnum:integer)
PK:{climbname}
FK:{stagenum}→ STAGE
FK:{cnum}→ CYCLIST
NNV:{stagenum}

WEAR(stagenum:integer, code:char(3), cnum:integer,)
PK:{stagenum,code}
FK:{stagenum}→ STAGE
FK:{cnum}→ CYCLIST
FK:{code}→ JERSEY
NNV:{cnum}

In order to clarify the schema, we describe the meaning of each attribute:

Attribute description:

TEAM

teamname: name of the team.

director: name of the team director.

CYCLIST

cnum: cyclist number assigned to the cyclist during the race.

name: cyclist name.

age: age of the cyclist.

teamname: name of the cyclist team.

STAGE

stagenum: stage number (in the race).

km: How many kilometers the stage has.

departure: name of the city where the stage starts.

arrival: name of the city where the stage finish.

cnum: number of the cyclist who has won the stage.

CLIMB

climbname: name of the climb.

height: maximum height in the climb.

category: category of the climb: 1ª/primera (first), especial (special),

slope: steeper slope of the climb (in %).

stagenum: stage number where the climb is.

cnum: number of the cyclist who has won the climb.

JERSEY

code: code of the jersey.

type: indicates the prize level of the jersey.

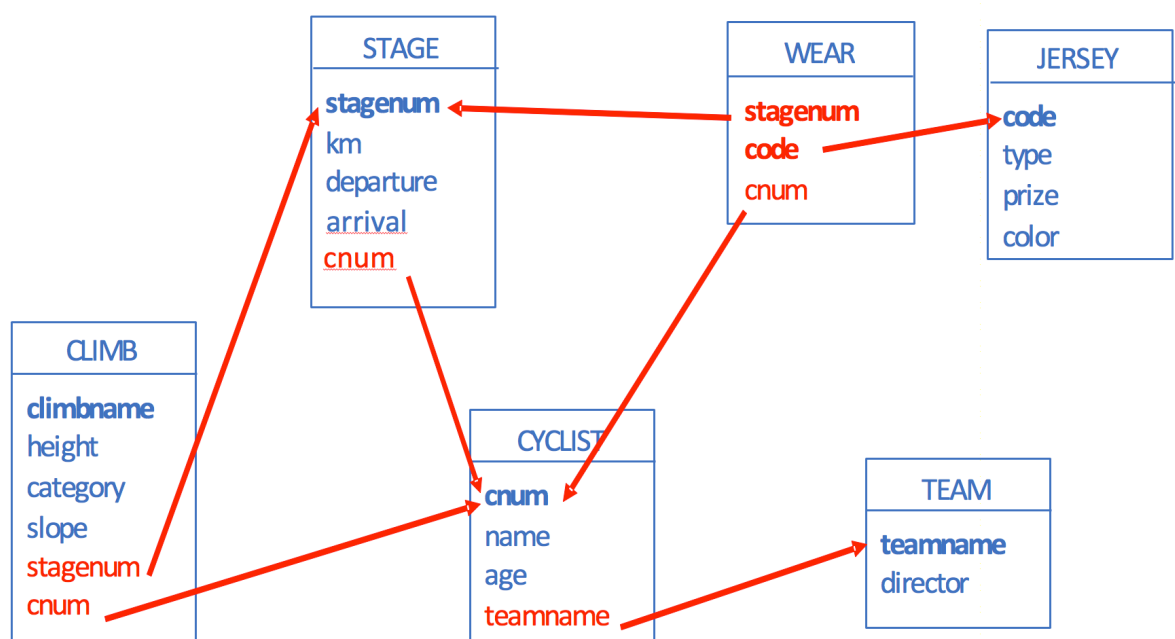
color: color of the jersey.

prize: how much money the cyclist wins if he finishes the race wearing this jersey.

WEAR

The cyclist with number '*cnum*' has worn the jersey identified by '*code*' at the stage with number '*stagenum*'.

Below is a graphical representation of the "Cycling Race" relational schema:



9 CYCLING RACE DATABASE EXERCISES

9.1 Queries using one single relation

1. List the code, the type, the color and the prize of all the jerseys in the database.

COD	TYPE	COLOR	PRIZE
MGE	General	Amarillo	8000000
MMO	Montaña	Blanco y Rojo	2000000
MMS	Mas Sufrido	Estrellitas moradas	2000000
MMV	Metas volantes	Rojo	2000000
MRE	Regularidad	Verde	2000000
MSE	Sprints especiales	Rosa	2000000

6 filas seleccionadas.

2. List the cyclist number and the name of the cyclists whose age is equal or lower than 25.

CNUM	NAME
38	Javier Palacin
41	Rolf Aldag
46	Agustin Sagasti
49	Eugeni Berzin
66	Enrico Zaina
98	Eleuterio Anguita

6 filas seleccionadas.

3. List the name and the height of all the climbs of category 'E' (special).

CLIMBNAME	HEIGHT
Arcalis	2230
Cerler-Circo de Ampriu	2500
Coll de Ordino	1980
Cruz de la Demanda	1850
Lagos de Covadonga	1134
Sierra Nevada	2500

6 filas seleccionadas.

4. List the value of the stagenum attribute for those stages with "departure" and "arrival" in the same city.

STAGENUM
1
8
18

3 filas seleccionadas.

5. How many cyclists are there in the database?

CYCLISTS

```

      100
1 fila seleccionada.

```

6. How many cyclists are there who are more than 25 years old?

```

COUNT (*)
-----
      94
1 fila seleccionada.

```

7. How many teams are there?

```

COUNT (*)
-----
      22
1 fila seleccionada.

```

8. List the average age of all the cyclists.

```

AVG (AGE)
-----
    29,89
1 fila seleccionada.

```

9. List the minimum and maximum height of the climbs.

```

MIN (HEIGHT) MAX (HEIGHT)
-----
      565      2500
1 fila seleccionada.

```

9.2 Queries using more than one relation

10. List the name and the category of the climbs won by cyclists from the 'Banesto' team.

```

CLIMBNAME                                C
-----
Alto del Naranco                        1
Coll de la Comella                      1
Navacerrada                            1
Puerto de Alisas                       1
Puerto de la Morcuera                   2
Puerto de Navalморal                   2
Sierra Nevada                          E
7 filas seleccionadas.

```

11. List the name of each climb, also showing the number (stagenum) and the kilometers of the stage in which the climb is.

```

CLIMBNAME                                STAGENUM      KM
-----
Alto del Naranco                        10           200
Arcalis                                10           200

```

Cerler-Circo de Ampriu	11	195
Coll de la Comella	10	200
Coll de Ordino	10	200
Cruz de la Demanda	11	195
Lagos de Covadonga	16	160
Navacerrada	19	190
Puerto de Alisas	15	207
Puerto de la Morcuera	19	190
Puerto de Mijares	18	195
Puerto de Navalmoral	18	195
Puerto de Pedro Bernardo	18	195
Sierra Nevada	2	180
14 filas seleccionadas.		

12. List the name and the director of the teams having at least one cyclist of age greater than 33.

TEAMNAME	DIRECTOR

Amore Vita	Ricardo Padacci
Banesto	Miguel Echevarria
Bresciali-Refin	Pietro Armani
Carrera	Luigi Petroni
Gatorade	Gian Luca Pacceli
Kelme	Álvaro Pino
Mapei-Clas	Juan Fernandez
Navigare	Lonrenzo Sciacchi
TVM	Steveens Henk
Telecom	Morgan Reikcard
10 filas seleccionadas.	

13. List the name of the cyclists with the color of each jersey that they have worn.

NAME	COLOR

Alessio Di Basco	Rosa
Alex Zulle	Amarillo
Alfonso Gutiérrez	Rojo
Alfonso Gutiérrez	Verde
Armand de las Cuevas	Estrellitas moradas
Bruno Leali	Rojo
Claudio Chiappucci	Blanco y Rojo
Davide Cassani	Rojo
Dimitri Konishev	Rojo
Eddy Seigneur	Estrellitas moradas
Gianni Bugno	Blanco y Rojo
Giorgio Furlan	Rosa
Jean Van Poppel	Rosa
Jesus Montoya	Blanco y Rojo
Laurent Jalabert	Verde
Marco Saligari	Rojo
Mario Cipollini	Rosa
Melchor Mauri	Amarillo
Melchor Mauri	Blanco y Rojo
Miguel Induráin	Amarillo

Miguel Induráin	Blanco y Rojo
Miguel Induráin	Rojo
Miguel Induráin	Rosa
Miguel Induráin	Verde
Mikel Zarrabeitia	Amarillo
Mikel Zarrabeitia	Blanco y Rojo
Pedro Delgado	Amarillo
Pedro Delgado	Blanco y Rojo
Per Pedersen	Rosa
Stefano della Santa	Rojo
Tony Rominger	Amarillo

31 filas seleccionadas.

14. List the name of a cyclist and the number of the stage such that the cyclist has won the stage and has worn the yellow jersey ('jersey' with color = 'Amarillo') at least once.

NAME	STAGENUM
Miguel Induráin	1
Miguel Induráin	8
Pedro Delgado	10
Pedro Delgado	19
Pedro Delgado	20
Tony Rominger	17

6 filas seleccionadas.

15. List the value of the stagenum attribute of the stages which do not start in the same city where the previous stage finished.

STAGENUM
4
7
8
10
12
15
17
18
20

9 filas seleccionadas.

9.3 Queries with subqueries

16. List the value of the attribute stagenum and the departure city for those stages with no climb.

STAGENUM	DEPARTURE
1	Valladolid
3	Salamanca
4	Almendralejo
5	Córdoba
6	Granada

```

      7 Baza
      8 Benidorm
      9 Benidorm
     12 Benasque
     13 Zaragoza
     14 Pamplona
     17 Cangas de Onis
     20 Segovia
     21 Destilerias Dyc
14 filas seleccionadas.

```

17. List the average age of the cyclists who have won a stage.

```

AVG (AGE)
-----
      30,5625
1 fila seleccionada.

```

18. Select the name of the climbs with a height greater than the average height of all the climbs.

```

CLIMBNAME
-----
Arcalis
Cerler-Circo de Ampriu
Coll de Ordino
Cruz de la Demanda
Navacerrada
Puerto de la Morcuera
Sierra Nevada
7 filas seleccionadas.

```

19. List the name of the departure and the arrival cities of the stages where the steepest climbs are located.

```

DEPARTURE                                ARRIVAL
-----
Igualada                                Andorra
1 fila seleccionada.

```

20. List the cyclist number and the name of the cyclists who have won the highest climb.

```

CNUM      NAME
-----
      9 Massimo Podenzana
     26 Mikel Zarrabeitia
2 filas seleccionadas.

```

21. List the name of the youngest cyclist.

```

NAME
-----
Eugeni Berzin
1 fila seleccionada.

```

22. List the name of the youngest cyclist who has won at least one stage.

NAME

Vladislav Bobrik

1 fila seleccionada.

23. List the name of the cyclists who have won more than one climb.

NAME

Pedro Delgado

1 fila seleccionada.

9.4 Queries with universal quantification

24. List the value of the stagenum attribute for those stages such that all the climbs in them are more than 700 meters high.

STAGENUM

2
11
16
18
19

5 filas seleccionadas.

25. List the name and the director of the teams such that all their cyclists are more than 25 years old.

TEAMNAME

DIRECTOR

Amore Vita Ricardo Padacci
Banesto Miguel Echevarria
Bresciali-Refin Pietro Armani
Carrera Luigi Petroni
Castorama Jean Philip
Gatorade Gian Luca Pacceli
Jolly Club Johan Richard
Kelme Álvaro Pino
Lotus Festina Suarez Cuevas
Mapei-Clas Juan Fernandez
Mercatone Uno Ettore Romano
Motorola John Fidwell
Navigare Lorenzo Sciacchi
ONCE Manuel Sainz
Seguros Amaya Minguez
TVM Steveens Henk
Wordperfect Bill Gates
17 filas seleccionadas.

26. List the cyclist number and the name of the cyclists such that all the stages they have won are more than 170 km long (i.e. they have only won stages longer than 170 km).

CNUM

NAME

```

-----
      8 Jean Van Poppel
     10 Mario Cipollini
     12 Alessio Di Basco
     22 Giorgio Furlan
     36 Gian Matteo Fagnini
     65 Pascal Lino
     83 Hernan Buenahora
     86 Juan Martinez Oliver
     93 Bo Hamburger
9 filas seleccionadas.

```

27. List the name of the cyclists who have won all the climbs in one stage and have also won the stage.

```

NAME
-----
Pedro Delgado
1 fila seleccionada.

```

28. List the name of the teams such that all their cyclists have worn some jersey or have won some climbs.

```

TEAMNAME
-----
Castorama
1 fila seleccionada.

```

29. List the code and the color of those jerseys which have only been worn by cyclists of the same team.

```

COD  COLOR
---  -----
MMS Estrellitas moradas
1 fila seleccionada.

```

30. List the name of those teams such that their cyclists have only won climbs of category = 1.

```

TEAMNAME
-----
Carrera
Gatorade
2 filas seleccionadas.

```

9.5 Queries with Group By

31. List the value of the 'stagenum' attribute of those stages which have climbs, also indicating how many it has.

STAGENUM	NUM_PUERTOS
2	1
10	4
11	2
15	1
16	1

18 3
19 2

7 filas seleccionadas.

32. List the name of the teams which have cyclists, indicating how many cyclists there are in the team.

TEAMNAME	CYCLIST
Amore Vita	3
Artiach	7
Banesto	11
Bresciali-Refin	4
Carrera	3
Castorama	2
Euskadi	2
Gatorade	4
Gewiss	8
Jolly Club	2
Kelme	7
Lotus Festina	3
Mapei-Clas	7
Mercatone Uno	8
Motorola	3
Navigare	5
ONCE	5
Seguros Amaya	3
TVM	6
Telecom	4
Wordperfect	3

21 filas seleccionadas.

33. List the name of all the teams, indicating how many cyclists there are in each team.

TEAMNAME	CYCLIST
Amore Vita	3
Artiach	7
Banesto	11
Bresciali-Refin	4
Carrera	3
Castorama	2
Euskadi	2
Gatorade	4
Gewiss	8
Jolly Club	2
Kelme	7
Lotus Festina	3
Mapei-Clas	7
Mercatone Uno	8
Motorola	3
Navigare	5
ONCE	5
PDM	0
Seguros Amaya	3

TVM	6
Telecom	4
Wordperfect	3

22 filas seleccionadas.

34. List the director and the name of the teams which have more than 3 cyclists and with an average age lower or equal to 30.

DIRECTOR	TEAMNAME
-----	-----
Ettore Romano	Mercatone Uno
José Pérez	Artiach
Lonrenzo Sciacchi	Navigare
Manuel Sainz	ONCE
Moreno Argentin	Gewiss
Morgan Reikcard	Telecom

6 filas seleccionadas.

35. List the name of the cyclists who have won one or more stages and belong to a team which has more than five cyclists. Please also indicate how many stages each cyclist has won.

NAME	STAGE
-----	-----
Bo Hamburger	1
Gert-Jan Theunisse	1
Gian Matteo Fagnini	1
Giorgio Furlan	1
Hernan Buenahora	1
Juan Martinez Oliver	1
Mario Cipollini	1
Miguel Induráin	2
Pedro Delgado	3
Tony Rominger	1
Vladislav Bobrik	1

11 filas seleccionadas.

36. List the name of the teams and the average age of the cyclists of those teams who have the highest average age of all the teams.

TEAMNAME	MEDIA
-----	-----
Amore Vita	32
Gatorade	32

2 filas seleccionadas.

37. List the director of the teams whose cyclists have worn jerseys (of any type) more days than the rest.
Note: each tuple in the *Wear* relation indicate that a cyclist has worn a jersey one day.

DIRECTOR

Miguel Echevarria

1 fila seleccionada.

9.6 Other queries

38. List the code and the color of the jersey which has been worn by some cyclist who hasn't won any stage.

```
COD  COLOR
---  -----
MGE  Amarillo
MMO  Blanco y Rojo
MMS  Estrellitas moradas
MMV  Rojo
MRE  Verde
MSE  Rosa
6 filas seleccionadas.
```

39. List the value for the 'stagenum' attribute, the departure city and the arrival city of the stages longer than 190 km. and with at least two climbs.

```
STAGENUM      DEPARTURE      ARRIVAL
-----
      10 Igualada      Andorra
      11 Andorra      Estación de Cerler
      18 Ávila      Ávila
3 filas seleccionadas.
```

40. List the cyclist number and the name of the cyclists who have not worn all the jerseys worn by the cyclist with number 20.

```
CNUM      NAME
-----
...          ...          /* All except 1 and 20*/
98 filas seleccionadas.
```

41. List the cyclist number and the name of the cyclists who have worn at least one of the jerseys worn by the cyclist with number 20.

```
CNUM      NAME
-----
      1 Miguel Induráin
      16 Dimitri Konishev
      17 Bruno Leali
      27 Laurent Jalabert
      33 Stefano della Santa
      42 Davide Cassani
      48 Marco Saligari
7 filas seleccionadas.
```

42. List the cyclist number and the name of the cyclists who have not worn any of the jerseys worn by the cyclist with number 20.

```
CNUM      NAME
-----
```

```
...          ...          /*All numbers except 1,16,17,20,27,33,42 and 48*/
92 filas seleccionadas.
```

43. List the cyclist number and the name of the cyclists who have worn all the jerseys worn by the cyclist with number 20.

```
CNUM      NAME
-----
          1 Miguel Induráin
1 fila seleccionada.
```

44. List the cyclist number and the name of the cyclists who have worn exactly the same jerseys as the cyclist with number 20.

```
CNUM      NAME
-----
0 filas seleccionadas.
```

45. List the cyclist number and the name of the cyclist who has worn the same jersey during more kilometers than any other cyclist, and also indicate the color of this jersey.

```
CNUM      NAME                                COLOR
-----
          20 Alfonso Gutiérrez                Verde
1 fila seleccionada.
```

46. List the cyclist number and the name of the cyclists who have worn three types of jersey less than the jerseys worn by the cyclist with number 1.

```
CNUM      NAME
-----
          20 Alfonso Gutiérrez
          30 Melchor Mauri
          26 Mikel Zarrabeitia
           2 Pedro Delgado
4 filas seleccionadas.
```

47. List the value of the stagenum attribute and the length of the stages (in km) which have climbs.

```
STAGENUM      KM
-----
           2      180
          10      200
          11      195
          15      207
          16      160
          18      195
          19      190
7 filas seleccionadas.
```