

# Databases and Information Systems

Degree in Informatics Engineering

## Unit 2.2: SQL Exercises

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## 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:

**CS\_PAIS**(cod\_pais:char(5), nombre:char(20))  
CP:{cod\_pais}  
VNN:{nombre}

**CS\_ACTOR**(cod\_act:char(5), nombre:char(70), fecha\_nac:date, cod\_pais:char(5))  
CP:{cod\_act}  
VNN:{nombre, fecha\_nac, cod\_pais}  
CAj:{cod\_pais} → CS\_Pais(cod\_pais)

**CS\_LIBRO**(cod\_lib:char(5), titulo:char(70), anyo:number, autor:char(80))  
CP:{cod\_lib}  
VNN:{titulo, autor}

**CS\_PELICULA**(cod\_peli:char(5), titulo:char(70), anyo:number, duracion:number, cod\_lib:char(5), director:char(70))  
CP:{cod\_peli}  
VNN:{titulo, duracion}  
CAj:{cod\_lib} → CS\_Libro(cod\_lib)

**CS\_GENERO**(cod\_gen:char(5), nombre:char(30))  
CP:{cod\_gen}

**CS\_ACTUA**(cod\_act:char(5), cod\_peli:char(5), papel:char(10))  
CP:{cod\_act, cod\_peli}  
VNN:{papel}  
CAj:{cod\_peli} → CS\_Pelicula(cod\_peli)  
CAj:{cod\_act} → CS\_Actor(cod\_act)

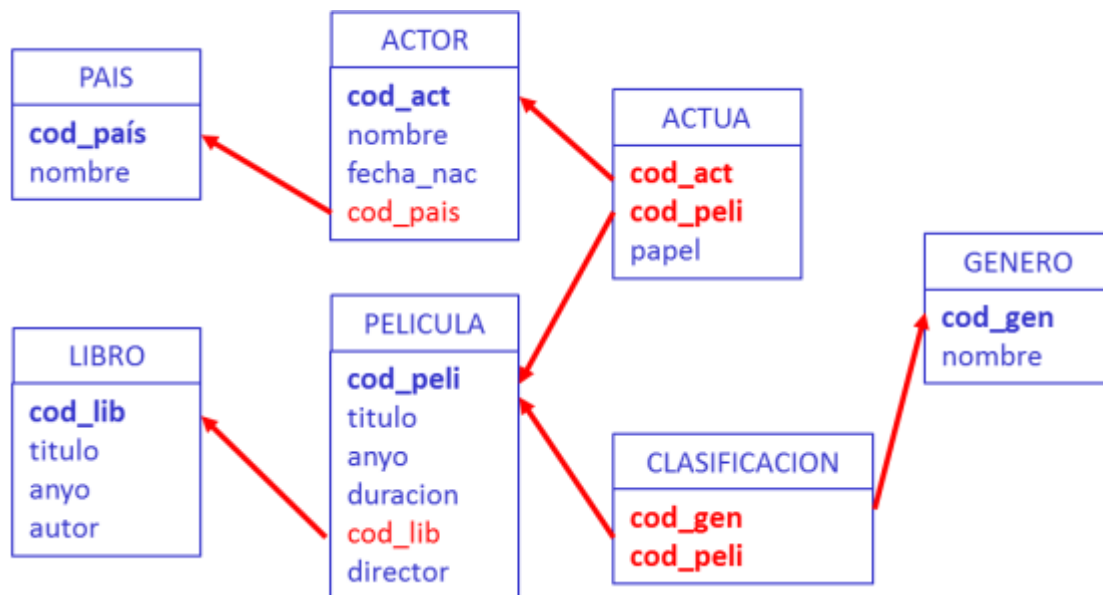
**CS\_CLASIFICACION**(cod\_gen:char(5), cod\_peli:char(5))  
CP:{cod\_gen, cod\_peli}  
CAj:{cod\_peli} → CS\_Pelicula(cod\_peli)  
CAj:{cod\_gen} → CS\_Genero(cod\_gen)

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

- **CS\_Pais:**
  - *cod\_pais*: country code.
  - *nombre*: name of the country.
- **CS\_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.

- **CS\_Libro:**
  - *cod\_lib*: book code.
  - *titulo*: book tittle.
  - *anyo*: publishing year of the book.
  - *autor*: name of the author of the book.
- **CS\_Pelicula:**
  - *cod\_peli*: movie code.
  - *titulo*: movie tittle.
  - *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.
- **CS\_Genero:**
  - *cod\_gen*: code of the genre.
  - *nombre*: name of the genre.
- **CS\_Actua:** The actor with code *cod\_act* has performed the role *papel* in the movie with code *cod\_peli* en.
- **CS\_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	Tobias Wolff

6 filas seleccionadas

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 tittle of the book used in the movies in which act actors from the country called 'España' (sorted by tittle).

COD\_L TITULO

-----

ZF4 Come, reza, ama

PP4 Desayuno en Tiffanys

DF6 Entrevista con el vampiro

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

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 has acted some actor, 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:entero,título:char(30),duración:real)

CP:{cod}

VNN:{título}

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

CP:{cod}

VNN:{nombre}

**DISCO**(cod:char(3),nombre:char(30),fecha:date,cod\_comp:char(3),  
cod\_gru:char(3))

CP:{cod}

CAj:{cod\_comp}→ COMPANYIA

VNN:{cod\_comp}

CAj:{cod\_gru}→ GRUPO

VNN:{cod\_gru}

**ESTA**(can:entero,cod:char(3))

CP:{can,cod}

CAj:{can}→ CANCIÓN

CAj:{cod}→ DISCO

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

CP:{cod}

VNN:{nombre}

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

CP:{dni}

VNN:{nombre}

**CLUB**(cod:char(3),nombre:char(30),sede:char(30),num:entero,  
cod\_gru:char(3))

CP:{cod}

CAj:{cod\_gru}→ GRUPO

VNN:{cod\_gru}

VNN:{nombre}

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

CP:{dni,cod}

CAj:{dni}→ ARTISTA

CAj:{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.

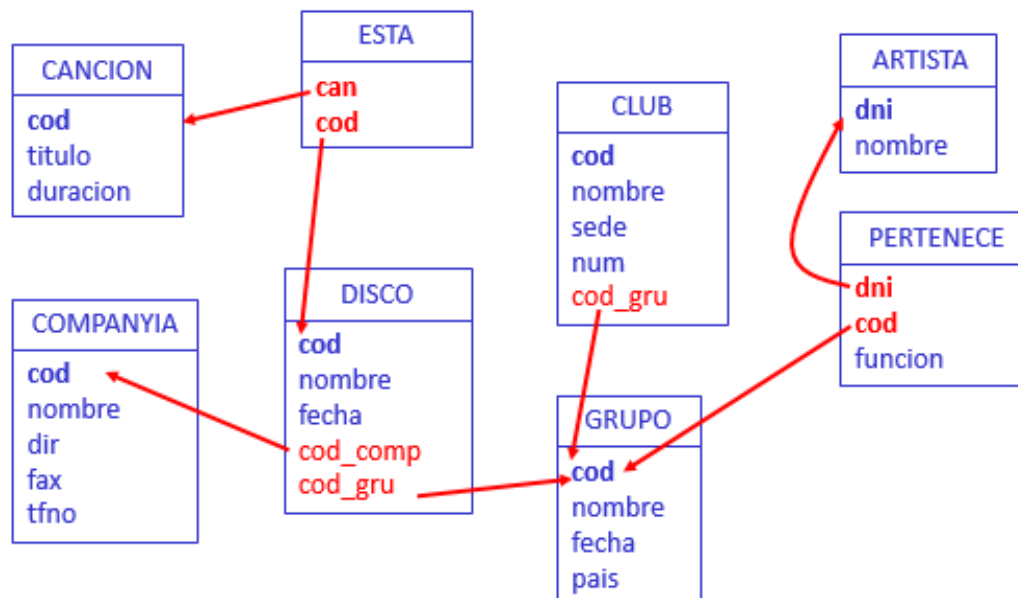
*num*: number of members of the club.

*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

- How many records are there?

```

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

- 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))
  CP: {autor_id}
  VNN: {nombre}

LIBRO(id_lib: char(10), titulo: char(80), año: entero, num_obras: entero)
  CP: {id_lib}

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

OBRA(cod_ob: entero, titulo: char(80), tematica: char(20))
  CP: {cod_ob}
  CAj: {tematica} → TEMA
  VNN: {titulo}

AMIGO(num: entero, nombre: char(60), telefono: char(10))
  CP: {num}
  VNN: {nombre}

LEER(num: entero, cod_ob: entero)
  CP: {num, cod_ob}
  CAj: {num} → AMIGO
  CAj: {cod_ob} → OBRA

ESTA_EN(cod_ob: entero, id_lib: char(10))
  CP: {cod_ob, id_lib}
  CAj: {cod_ob} → OBRA
  CAj: {id_lib} → LIBRO

ESCRIBIR(cod_ob: entero, autor_id: char(4))
  CP: {cod_ob, autor_id}
  CAj: {cod_ob} → OBRA
  CAj: {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 bought, 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:

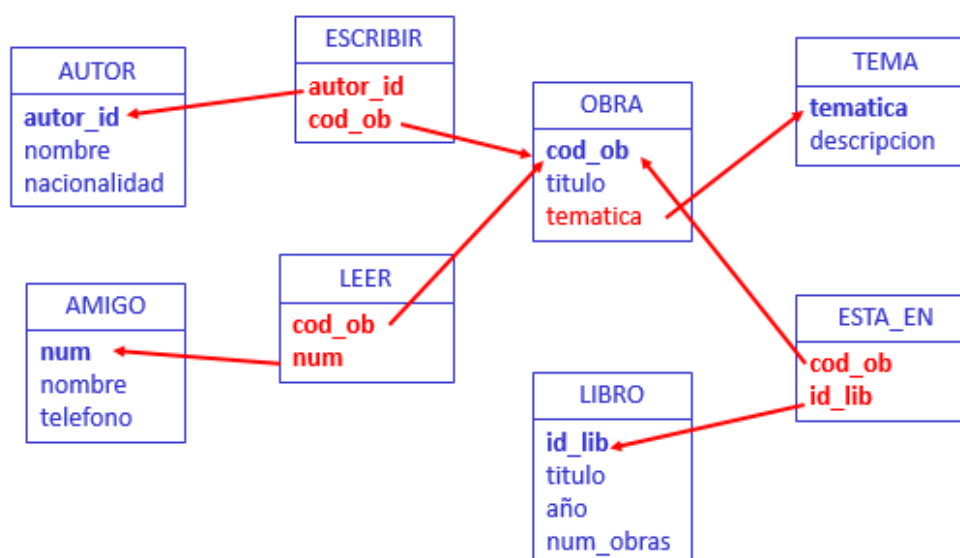
- The value of the attribute *num\_obras* in the “libro” relation must be equal to the number of tuples in “Esta\_en” for the book.
- Every book contains at least one work.
- If a book has a title and it only contains one work, the title of the book matches the title of the work.

### 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 bought?

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 tittle

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 DEPARTAMENTO (DEPARTMENT) DATABASE

We are interested in storing the information of the teaching duties of the DSIC Department of the UPV. In order to do that, we have defined a relational database with the following schema:

**CENTRO** (ccen:char(6), nmcen:char(100))  
CP:{ccen}

**PROFESOR** (nip:entero, ap1:char(20), ap2:char(20), nom:char(20), ctg:char(5),  
ccen:char(6), doctor:char(1), hded:real, area:char(3),  
grupo\_inv:char(10))  
CP:{nip}  
CAj:{ccen}→Centro  
CAj:{grupo\_inv}→Grupo\_inv(cgi)

**TITULACION** (ctit:char(6), nomtit:char(45))  
CP:{ctit}

**ASIGNATURA** (ccen:char(6), ctit:char(6), casg:char(3), cu:char(2),  
nmasg:char(45), resp:entero, udo:char(3), nprofvig:entero,  
caracter:char(2), gt:entero, gp:entero, ct:real, cp:real,  
nalm:entero, area:char(3), ciclo:entero)  
CP:{ccen, ctit, casg}  
CAj:{ccen}→Centro Borrado en cascada  
CAj:{resp}→Profesor f(resp) = nip Borrado en cascada  
CAj:{ctit}→Titulacion Borrado en cascada  
CAj:{udo}→Udocente Borrado en cascada

**GRUPO\_INV** (cgi:char(10), nombre:char(100), responsable:entero,  
grupo\_princ:char(10))  
CP:{cgi}  
CAj:{responsable}→Profesor(nip) Borrado en cascada  
CAj:{grupo\_princ}→Grupo\_inv(cgi)  
VNN:{nombre, responsable}

**DOCENCIA** (ccen:char(6), ctit:char(6), casg:char(3), nip:entero, gtp:real,  
gpp:real)  
CP:{ccen, ctit, casg, nip}  
CAj:{ccen, ctit, casg}→Asignatura Borrado en cascada  
CAj:{nip}→Profesor Borrado en cascada

**UDOCENTE** (udo:char(3), nudoc:char(40), resp:entero)  
CP:{udo}  
CAj:{resp}→Profesor(nip)

**VIGILA\_EXAMEN** (conv:entero, ccen:char(6), ctit:char(6), casg:char(3),  
nip:entero)  
CP:{conv, ccen, ctit, casg, nip}  
CAj:{nip}→Profesor Borrado en cascada  
CAj:{ccen, ctit, casg}→Asignatura Borrado en cascada



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

Relation:

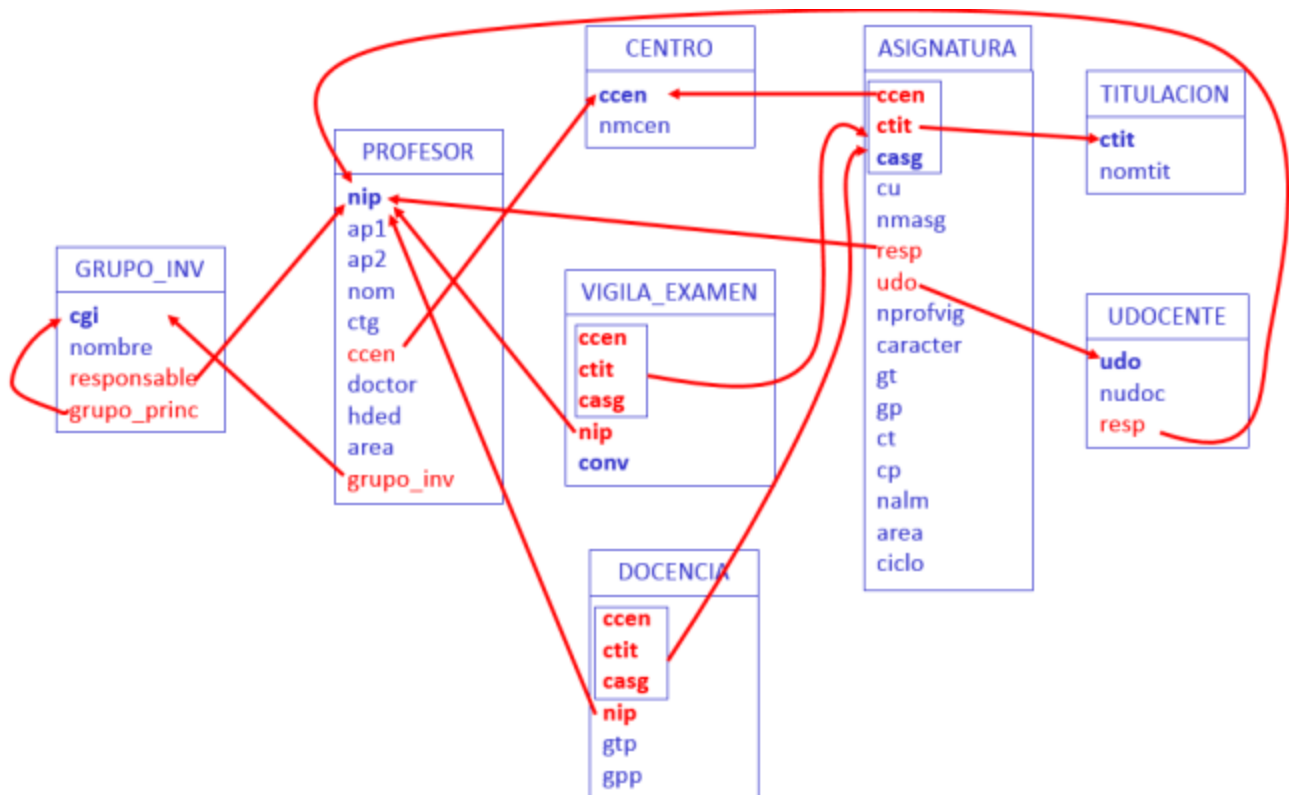
- **CENTRO (Centre):** Centres where the department teaches at least one subject.
- **TITULACION (Degree):** Degree with at least one subject of the department..
- **PROFESOR (Lecturer) :** Faculty member.
- **ASIGNATURA (Subject):** Subject taught by a faculty member of the department
- **GRUPO\_INV (Research Group):** Research groups of the department.
- **DOCENCIA (Teaching):** Relation between lectures and subjects.
- **UDOCENTE (Teaching Group):** Teaching groups
- **VIGILA\_EXAMEN (Exam Supervision):** A faculty member supervises some exams.

Attributes:

- **CENTRO (Centre)**
  - **ccen:** Centre code
  - **nmcen:** Name of the centre.
- **TITULACION (Degree)**
  - **ctit:** Degree code.
  - **nomtit:** Degree Name.
- **PROFESOR (Lecturer):**
  - **nip:** Lecturer id.
  - **ap1:** First surname
  - **ap2:** Second surname.
  - **nom:** Name.
  - **ctg:** Category (tenure).
  - **ccen:** Centre.
  - **doctor:** Ph.D. (1=yes, 2=no).
  - **hded:** Lecture effort in hours.
  - **area:** Area (from a list of areas included in a classification system).
  - **grupo\_inv:** Research group.
- **ASIGNATURA (Course)**
  - **ccen:** Centre code
  - **ctit:** Degree code.
  - **casg:** Course code.
  - **cu:** Academic year and semester.
  - **nmasg:** Subject name.
  - **resp:** Course director (lecture id).
  - **udo:** Teaching group in which the course is included.
  - **nprofvig:** Number of lecturers required for the exam supervision (It is not a derivattted attribute).
  - **character:** The course can be OB= obligatoria (compulsory), TR= troncal (core), OP= optativa (elective))
  - **gt:** Number of groups for theoretical session.

- **gp**: Number of groups for laboratory sessions.
- **ct**: Number of credits for theoretical sessions (for each group).
- **cp**: Number of credits for laboratory sessions (for each group).
- **nalm**: Number of students enrolled in the course/subject.
- **area**: Teaching area.
- **ciclo**: Level (1-3).
- **GRUPO\_INV (Research group)**
  - **cgi**: Research group code.
  - **nombre**: Research group name.
  - **responsable**: Head of the research group.
  - **grupo\_princ**: Main research group (this research subgroup is part of the main research group).
- **DOCENCIA (Teaching)**
  - **(ccen, ctit, casg)**: Course code.
  - **nip**: Lecturer id.
  - **gtp**: Number of theoretical groups assigned to the lecturer.
  - **gpp**: Number of laboratory groups assigned to the lecturer.
- **UDOCENTE (Teaching group)**
  - **udo**: Teaching group code.
  - **nudoc**: Name of the teaching group.
  - **resp**: Head of the teaching group.
- **VIGILA\_EXAMEN (Exam Supervision)**
  - **conv**: Semester.
  - **(ccen, ctit, casg)**: Course code,
  - **nip**: Lecturer id.

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



## 9 DEPARTAMENTO DATABASE EXERCISES

### 9.1 Other queries

- List the name (ap1,ap2,nom) of the lecture/s teaching the lowest number of credits.

AP1	AP2	NOM
-----	-----	-----
Castillo	Serra	Alfredo

1 fila seleccionada.

- How many courses are there in which the course director is not teaching any credit in that course?

NUM
-----
72

1 fila seleccionada.

- Show the name of the courses of the centre 'ETSINF', and degree 'II' which need more lectures for the exams supervision.

NMASG
-----

Ingeniería de la Programación  
Lenguajes y Paradigmas de la Programación

2 filas seleccionadas.

4. List the name of the course and name of the course director (ap1,nom) for each course with more than 6 theoretical groups.

NMASG	AP1	NOM
-----	-----	-----
Holgura UD Programación	Wun	Máximo
Bases de Datos	Caballero	Alejandro
Introducción a la Inform. y a la Programación	Calvo	Sava
Informática	Granell	José
Holgura Responsabilidad Asignaturas Grandes	Aroca	Héctor
Tesis de master	Pardo	Alexandro
Tesis de master	Herrero	Viviana
Tesis de master	Gutiérrez	Sara
Tesis	Luis	Isaac
Holgura UD Desarrollo del Software	Gorrís	Celia
Metodología y Tecnología de la Programación	Ramírez	Monica
Holgura UD Programación Básica	Montés	Tadeusz
Programación	Ruiz	Enrique
Proyecto Fin de Carrera	Ochando	Alfonso
Estructuras de Datos y Algoritmos	Izquierdo	Angel

15 filas seleccionadas.

5. List the name of the research groups with no lecturers.

NOMBRE  
-----  
Grupo de Planificación y Scheduling  
Tecnología Informática  
Programación Lógica e Ingeniería del Software  
3 filas seleccionadas.

6. List the name (ap1, ap2, nom) of the Ph.D. faculties who are not members of any research group.

AP1	AP2	NOM
-----	-----	-----
Aguilar	Almiñana	Enric
Alabarta	Salvador	Amancio
Alonso	Monteagudo	David
Ariguel	Fay	Gustavo
...		
Vila	Quilis	Carmen
Vilar	Palop	Mario
Zafra	Galisteo	Yaiza

55 filas seleccionadas.

7. List the code and name of the centres with no lectures and no courses.

CCEN NMCEN

-----  
 EUITAG E.U. de Ingeniería Técnica Agrícola  
 ETSIA E.T.S. de Ingenieros Agrónomos  
 2 filas seleccionadas.

8. List the name of the research groups whose head is also head of a teaching group. Indicate also the name of the lecturer.

NOMBRE	AP1	NOM
Teoría de Lenguajes, Computabilidad y Criptografía	Rocha	Julio

1 fila seleccionada.

9. List the centre code, the degree code and the course name of the courses included in the teaching group whose head is 'Pedro Parcet Lorente'.

CCEN	CTIT	NMASG
DSIC	HO_UD	Holgura UD Máster IARFID
MAS	MIARFI	Programación Gráfica
MAS	MIARFI	Planificación de Sistemas Inteligentes de TR
...		
MAS	MIARFI	Lingüística Computacional
MAS	MIARFI	Métodos Estadísticos en Tecn. del Lenguaje
MAS	MIARFI	Negociación y Confianza en Sistemas Multiagen

38 filas seleccionadas.

10. List the name (ap1, ap2 y nom) of the faculties teaching in the 'Grado en Ing. Inform.' degree of the 'ETSINF' centre.

AP1	AP2	NOM
Cubillo	Prefasi	Carmelo
Calvo	Mollá	Sava
Galisteo	Risueño	Ana
Limorti	Díez	Blas
Cárdeno	Gaspar	Carmen
Montagud	Salvador	Marc
Wun	Sancho	Máximo
Ruiz	Verdet	Enrique
Valentín	Soriano	Paula
Sorli	Hernandez	Aitor
Nieves	Jarl	Guillem
Nácher	Andújar	Celia
Esteban	Tarrega	Xavier
Artola	Molino	Ricardo
Delgado	Cervantes	Camilla
Dolz	Eyob	Marlon
Izquierdo	Alarcon	Angel

17 filas seleccionadas.

11. List the code (ccen, ctit, casg) of the courses such that the lecturer 'Escobedo' (first surname) has been the supervisor of some exam of the course.

```

CCEN    CTIT    CASG
-----
ETSINF II      RN
MAS     MIARFI TA
MAS     MIARFI ARN
3 filas seleccionadas.

```

12. List the code, name and head name (ap1, ap2 y nom) of the research groups which are main groups of other subgroups.

```

CGI      NOMBRE                                     AP1      NOM
-----
GTI  Tecnología Informática                       Parcet  Pino
PLIS Programación Lógica e Ingeniería del Software Lozano  Silvia
2 filas seleccionadas.

```

13. List, for each research group with lecturers, the name of the group and the number of lecturers that are members of the group.

```

NOMBRE                                     PROFS
-----
Bases de Datos, Razonamiento Automático y Lenguaje Natural      8
Inteligencia Artificial                                           16
Sistemas Distribuidos                                             6
Grupo de Reconocimiento de Formas y Tecnología del Lenguaje     11
Grupo de Métodos de Producción de Software                       8
Grupo de Computación Paralela                                     16
Modelado Conceptual Orientado a Objetos y Bases de Datos         5
Informática Gráfica                                              10
Teoría de Lenguajes, Computabilidad y Criptografía              8
Reconocimiento de Formas e Inteligencia Artificial               10
Extensiones de la Programación Lógica                            12
11 fila seleccionada.

```

14. List, for each centre with more than 100 lecturers, the code of the centre and the number of degrees offered by the centre.

```

CCEN    TITULACIONES
-----
ETSINF 7
1 fila seleccionada.

```

15. List, for each faculty category, the category, how many credits are taught by those lecturers, and how many lecturers are in that category.

```

CTG    CREDITOS                                     PROFS
-----
ASO3   19,2                                           7
ASO4   13,41                                          3
ASO6   90,65                                          21
AYDOC  38,3                                           6
BFPI   3                                              7
BFPU   0                                              12
COLAB  4,5                                           9

```

```

CONTD 176,96      17
CU      139,35     14
PCOL    61,9       7
TEU     334,13     28
TU      577,45     58
12 filas seleccionadas.

```

16. List the name (ap1, ap2, nom) of the lectures in the area 'CC' who do not supervise any course that he/she is not teaching.

AP1	AP2	NOM
-----	-----	-----
Cortes	Maria	Rubén
Nieves	Jarl	Guillem
Martí	Chorda	Alfredo
Ribera	Pascual	Marcos
Aznar	Gutiérrez	Francesc
Sanmartin	Hurtado	Yaiza
Carbonell	Villarin	Rubén
Sorli	Hernandez	Aitor
Beristain	Solano	Rafael
Miret	Hernández	Jorge
Fernandez-Calvillo	Piles	Rafael
Gutiérrez	Lairón	Sara

12 filas seleccionadas.

17. List the code and name of the research groups in which all their lecturers have a Ph.D. (Do not show the research groups with no lecturers)

CGI	NOMBRE
-----	-----
PRHLT	Grupo de Reconocimiento de Formas y Tecnología del Lenguaje
TLCC	Teoría de Lenguajes, Computabilidad y Criptografía
OCMDB	Modelado Conceptual Orientado a Objetos y Bases de Datos
SIG	Informática Gráfica

4 filas seleccionadas.

18. List the code and name of the teaching groups with courses in all the centres whose name includes the string 'Inform'.

UDO	NUDOC
---	-----
CNU	Computación Numerica
COM	Computación
DSW	Desarrollo Software
IAR	Inteligencia Artificial
IGR	Informática Gráfica y Multimedia
PBA	Programación Básica
PRG	Programación
SIN	Sistemas Informacion
SIS	Sistemas

9 filas seleccionadas.

19. List the code and name of the teaching groups with course in only one centre.

UDO NUDOC

DOC Doctorado

MAS Masteres del DSIC

SIC DSIC

3 filas seleccionadas.

20. List the code (ccen,ctit,casg) of the courses in which some lecturer is teaching more than 2 laboratory groups or more than 2 theoretical groups. Indicate also the lecturer id and the total amount of credits taught by the lecturer in that course.

CCEN	CTIT	CASG	NIP	CREDITOS
ETSINF	II	PFC	1234	2,3
ETSINF	II	PFC	2782	2,3
ETSINF	II	PFC	237338	2,3

...

MAS	MISMFS	TES	425226	4
MAS	MCPD	TES	2424	2,7
MAS	MCPD	TES	3534	2,5

39 filas seleccionadas.

21. List the name (ap1, ap2, nom) of the lecturers supervising exams in more than one teaching group.

AP1	AP2	NOM
Albiñana	Lucán	Carla
Alvarez	Pozo	Saul
Ariguel	Fay	Gustavo

...

Vilar	Palop	Mario
Yusá	Vidaurre	Albert
Zafra	Galisteo	Yaiza

86 filas seleccionadas.

22. List the code (ccen, ctit, casg) and the name of the courses whose name include the string 'Datos'. Indicate also the name (ap1, nom) of the lectures teaching that course.

CCEN	CTIT	CASG	NMASG	AP1	NOM
EPSA	ITIG	APB	Desarrollo de Aplicaciones de Bases de Datos	Chamorro	Felipe
EPSA	ITIG	BDA	Bases de Datos	Chamorro	Felipe
...					
MAS	MCALSI	GI	Gestión de Información: Migración de Datos	Leiva	Nicolás
MAS	MCPD	GVD	Gestión y Visual. de Datos en Comp. Cient.	Carbonell	Rubén
MAS	MISMFS	ISD	Integración Semántica de Datos	Ponz	Marta

81 fila seleccionada.

23. List the code of the teaching groups indicating how many courses are in the teaching group such that the courses are taught by more than four lecturers (only if there are more than one course).

UDO NUM

PBA 10

DOC 1



SIC 1  
 MCP 1  
 PFC 1  
 COM 4  
 SIS 3  
 MIA 2  
 MIS 1  
 SIN 5  
 CNU 4  
 PRG 9  
 IAR 2  
 GAN 3  
 DSW 6  
 IGR 2  
 16 filas seleccionadas.

24. List the code and name of all the research groups stored in the database indicating how many lecturers are in each research group.

CGI	NOMBRE	PROFS
DB	Bases de Datos, Razonamiento Automático y Lenguaje Natural	8
ELP	Extensiones de la Programación Lógica	12
GCP	Grupo de Computación Paralela	16
GPS	Grupo de Planificación y Scheduling	0
GTI	Tecnología Informática	0
GTI-IA	Inteligencia Artificial	16
OOCMDB	Modelado Conceptual Orientado a Objetos y Bases de Datos	5
OOM	Grupo de Métodos de Producción de Software	8
PLIS	Programación Lógica e Ingeniería del Software	0
PRHLT	Grupo de Reconocimiento de Formas y Tecnología del Lenguaje	11
RFIA	Reconocimiento de Formas e Inteligencia Artificial	10
SiDi	Sistemas Distribuidos	6
SIG	Informática Gráfica	10
TLCC	Teoría de Lenguajes, Computabilidad y Criptografía	8

14 filas seleccionadas.

25. List the code and name of all the centres stored in the database and how many lecturers with a Ph.D. are in the centre.

CCEN	NMCEN	DOCS
_	Sin centro asignado	7
ADE	Facultad de Administración y Direc. de Empresas	0
DSIC	Dpto. Sistemas Informáticos y Computación	6
EPSA	E. Politécnica Superior de Alcoy	3
EPSP	E. Politécnica Superior de Gandia	5
ETSCCP	E.T.S. de Ingenieros de Caminos, Canales y Puertos	0
ETSIA	E.T.S. de Ingenieros Agrónomos	0
ETSID	E.T.S. de Ingeniería del Diseño	1
ETSII	E.T.S. de Ingenieros Industriales	5
ETSINF	E.T.S. de Ingeniería Informática	110
ETSIT	E.T.S. de Ingenieros de Telecomunicación	2
ETSITG	E.T.S. de Ingeniería Geodésica, Cartográfica y Topográfica	0
EUITAG	E.U. de Ingeniería Técnica Agrícola	0
MAS	Master Oficiales	0
RECT	Rectorado	0

15 filas seleccionadas.

26. List the name (ap1, ap2, nom) of the lecturers teaching all the courses of a teaching group.

AP1	AP2	NOM
-----	-----	-----
Caballero	Mondejar	Alejandro
Pedrerá	Arraez	Antony
Calvo	Mollá	Sava
Alegre	Rocha	Moises
Gorrís	Arastey	Celia
Beristain	Solano	Rafael
Quintero	Benito	Yaiza
Ramírez	Torres	Monica
Ruiz	Verdet	Enrique
Izquierdo	Alarcon	Angel

10 filas seleccionadas.

27. List the code (ccen,ctit,casg) and the name of all the courses stored in the database which are in a teaching group with more than 50 courses. Indicate for each course how many lecturers are teaching that course.

CCEN	CTIT	CASG	NMASG	TOTAL
-----	-----	-----	-----	-----
ADE	LADE	OFI	Ofimática para ADE	0
ETSID	IAREO	Inr	Informática Aplicada (aeronáutico)	0
...				
ETSII	GITI	INF	Informática	10
ETSII	SGITI	INF	SD Informática	10

52 filas seleccionadas.

28. List the name (ap1, ap2, nom) of all the lecturers with a Ph.D. who are head of a teaching group. Indicate also how many courses with more than 2 theoretical credits are taught by the lecturer.

AP1	AP2	NOM	ASIGS
-----	-----	-----	-----
Yudici	Cosme	Alexandro	0
Miret	Hernández	Jorge	1
Solano	Bonora	Sava	4
Herrero	Sáez	Viviana	2
Gorrís	Arastey	Celia	1
Castelló	Pedros	Sergio	2
Perez	Alejo	Gracia	2
Parcet	Lorente	Pedro	2
Calvo	Margaix	Mario	3
Rocha	Piles	Julio	4
Leiva	Luna	Nicolás	5
Aroca	Ginestar	Héctor	1
Urgessa	Saez	Pablo	7
Yusá	Vidaurre	Albert	2
Quintero	Benito	Yaiza	2

15 filas seleccionadas.

29. List the code and name of all the research groups stored in the database indicating how many lecturers with a Ph.D. and how many without a Ph.D. are there in the research group

CGI	NOMBRE	DOCS	NODOCS
DB	Bases de Datos, Razonamiento Automático y Lenguaje Natural	6	2
ELP	Extensiones de la Programación Lógica	9	3
GCP	Grupo de Computación Paralela	10	6
GPS	Grupo de Planificación y Scheduling	0	0
GTI	Tecnología Informática	0	0
GTI-IA	Inteligencia Artificial	15	1
OOCMDB	Modelado Conceptual Orientado a Objetos y Bases de Datos	5	0
OOM	Grupo de Métodos de Producción de Software	6	2
PLIS	Programación Lógica e Ingeniería del Software	0	0
PRHLT	Grupo de Reconocimiento de Formas y Tecnología del Lenguaje	11	0
RFIA	Reconocimiento de Formas e Inteligencia Artificial	9	1
SiDi	Sistemas Distribuidos	4	2
SIG	Informática Gráfica	10	0
TLCC	Teoría de Lenguajes, Computabilidad y Criptografía	8	0

14 filas seleccionadas.

30. List the code (ccen, ctit, casg) of all the courses stored in the database, indicating the total amount of credits taught by lecturers. If one course is not taught by anyone, the number of credits must be 0.

CCEN	CTIT	CASG	TOTAL
ADE	GAP	IDA	0
ADE	GGAP	IAP	9
ADE	LADE	INF	7, 8
. . .			
MAS	MISMFS	TSD	0
MAS	MISMFS	TSW	3
MAS	MPD	ACO	2

310 filas seleccionadas.

31. How many centers have fewer courses than lecturers ?

CENTROS
4

1 fila seleccionada.

32. Show the code (ccen, ctit, casg) and name of the course with the greatest number of lecturers.

CCEN	CTIT	CASG	NMASG
ETSINF	II	PFC	Proyecto Fin de Carrera

1 fila seleccionada.

33. List the name (ap1, ap2, nom) of each member of any research group with more than seven members. Indicate also in how many centres the lecturer is teaching.

AP1	AP2	NOM	CENTROS
Alegre	Rocha	Moises	3
Alvarez	Pozo	Saul	3
Anton	Alvaro	Roberto	2
. . .			

Wun	Sancho	Máximo	2
Yudici	Cosme	Alexandro	1
Yusá	Vidaurre	Albert	3

99 filas seleccionadas.

34. List the code (ccen, ctit, casg) and the name of the elective courses with the greatest number of exam supervisors.

CCEN	CTIT	CASG	NMASG
------	------	------	-------

-----

ETSINF	GIINF	PRG	Programación
--------	-------	-----	--------------

1 fila seleccionada.

35. List the name (ap1, ap2, nom) of the teachers teaching more than 20 credits.

AP1	AP2	NOM
-----	-----	-----

-----

Ferrero	Puertes	Pino
Beristain	Solano	Rafael
Barón	López	Enrique
Montés	Robles	Tadeusz
Artola	Molino	Ricardo
Carmona	Navalón	David

6 filas seleccionadas.

36. List the center code, the degree code, and the course code of the course/s with the greatest number of credits for theoretical sessions.

CCEN	CTIT	CASG
------	------	------

-----

ETSINF	SGIINF	IIP
ETSINF	SGIINF	PRG

2 filas seleccionadas.

37. Calculate the number of lecturers with no research group.

PROFS

-----

329

1 fila seleccionada.

38. List the name (ap1, ap2, nom) of the lecturers teaching courses in the 'II' degree, in the center 'ETSINF' such that the course has more than 70 students enrolled.

AP1	AP2	NOM
-----	-----	-----

-----

Casamayor	Millet	Ricard
Mateu	Cosme	Eva
Aznar	Gutiérrez	Francesc
...		
Aroca	Ginestar	Héctor
Fuambuena	Carbonell	Héctor
Albiñana	Lucán	Carla

21 fila seleccionada.

39. List the name (ap1, ap2, nom) of the Ph.D. lecturers teaching courses in the 'ETSINF' center.

AP1	AP2	NOM
-----	-----	-----
Albiñana	Lucán	Carla
Alegre	Rocha	Moises
Alvarez	Pozo	Saul
...		
Verdet	Gomez	Jorge
Vilar	Palop	Mario
Zafra	Galisteo	Yaiza

106 filas seleccionadas.

40. List the centre code, degree code, and code of the courses included in the teaching group whose head surname is 'Parcet', but only if the head is supervising at least one exam of that course.

CCEN	CTIT	CASG
-----	-----	----
MAS	MIARFI	PIA

1 fila seleccionada.

41. List the name of the courses of the 'Grado en Ing. Inform.' (name) degree of the centre 'ETSINF' (code).

NMASG
-----
Introducción a la Inform. y a la Programación
Programación

2 filas seleccionadas.

42. List, for each centre, the centre code, the number of lecturers and the number of degrees in the centre.

CCEN	PROFS	TITULACIONES
-----	-----	-----
—	59	0
ADE	0	4
DSIC	84	2
EPSA	12	3
EPSC	8	6
ETSCCP	3	7
ETSIA	0	0
ETSID	1	9
ETSII	6	9
ETSINF	168	7
ETSIT	2	4
ETSITG	1	3
EUITAG	0	0
MAS	0	8
RECT	2	0

15 filas seleccionadas.

43. List, for each teaching group with at least one course, the teaching group code, the name (ap1, ap2, nom) of its head and the number of courses in the teaching group.

UDO	AP1	AP2	NOM	ASIGS
ALC	Yudici	Cosme	Alexandro	18
CNU	Yusá	Vidaurre	Albert	14
COM	Rocha	Piles	Julio	10
. . .				
SIC	Aroca	Ginestar	Héctor	1
SIN	Leiva	Luna	Nicolás	18
SIS	Quintero	Benito	Yaiza	12

18 filas seleccionadas.

44. List, for each teaching group with 2 or more courses, the teaching group code, the name (ap1, ap2, nom) of the head of the group and the number of lecturers teaching some theoretical group of courses in that teaching group.

UDO	AP1	AP2	NOM	PROFS
ALC	Yudici	Cosme	Alexandro	8
CNU	Yusá	Vidaurre	Albert	12
COM	Rocha	Piles	Julio	11
. . .				
PRG	Wun	Sancho	Máximo	22
SIN	Leiva	Luna	Nicolás	21
SIS	Quintero	Benito	Yaiza	16

15 filas seleccionadas.

45. Show the number of courses with more theoretical credits than laboratory credits and that are taught by at least one non-Ph.D. lecturer.

ASIGS  
-----  
99  
1 fila seleccionada.

46. List the code (ccen, ctit, casg) and name of the compulsory courses ('OB'), and their number of different exam supervisors (only if the number of exam supervisors of the course is greater or equal to 1).

CCEN	CTIT	CASG	NMASG	ASIGS
ADE	LADE	INF	Introducción a la informática	3
EPSP	GTU	IG	Informática de Gestión	3
ETSCCP	GIC	PMN	Conocim. básicos de prog. y métodos numéricos	5
. . .				
ETSINF	LD	EDA	Estructuras de datos y Algoritmos	1
ETSINF	LD	FDP	Fundamentos de Programación	1
MAS	MISMFS	MDI	Modelado, Diseño e Imp. de Servicios Web	1

17 filas seleccionadas.

47. List the last names and name (ap1, ap2, nom) of the lecturers teaching the greatest number of courses.

AP1	AP2	NOM
-----	-----	-----

Casamayor                      Millet                      Ricard  
1 fila seleccionada.

48. Show the code and name of the centres with the lowest number of 'CU' (category) lecturers.

```
CCEN      NMCEN
-----
_         Sin centro asignado
ADE       Facultad de Adiministración y Direc. de Empresas
DSIC      Dpto. Sistemas Informáticos y Computación
EPSA      E. Politécnica Superior de Alcoy
EPSG      E. Politécnica Superior de Gandia
ETSCCP    E.T.S. de Ingenieros de Caminos, Canales y Puertos
ETSIA     E.T.S. de Ingenieros Agrónomos
ETSID     E.T.S. de Ingeniería del Diseño
ETSII     E.T.S. de Ingenieros Industriales
ETSIT     E.T.S. de Ingenieros de Telecomunicación
ETSITG    E.T.S. de Ingeniería Geodésica, Cartográfica y Topográfica
EUITAG    E.U. de Ingeniería Técnica Agrícola
MAS       Master Oficiales
RECT      Rectorado
14 filas seleccionadas.
```

49. List the last names and name (ap1, ap2, nom) of the lecturers supervising exams of the 'DBD' course, of the 'ETSINF' centre (code), of the 'ITIG' degree.

```
AP1          AP2          NOM
-----
Vazquez      Angulo      Alba
Vara         Munuera    Marina
Casamayor    Millet      Ricard
Ayora        Forteza    Modesto
Mollá        Gurrea     Héctor
5 filas seleccionadas.
```

50. Show the code and name of the research groups with no main group.

```
CGI          NOMBRE
-----
GCP          Grupo de Computación Paralela
PLIS         Programación Lógica e Ingeniería del Software
RFIA         Reconocimiento de Formas e Inteligencia Artificial
SiDi        Sistemas Distribuidos
GTI          Tecnología Informática
TLCC         Teoría de Lenguajes, Computabilidad y Criptografía
PRHLT       Grupo de Reconocimiento de Formas y Tecnología del Lenguaje
7 filas seleccionadas.
```

51. Show the name (ap1, ap2, nom) of the lecturers with no exam supervision assigned.

```
AP1          AP2          NOM
-----
Abadías      Gutiérrez   Constantino
Abellán      Roman       Andres
```

Adalid	Montserrat	Marc
. . .		
Vizcarro	Barrachina	Cristina
Wun	Canto	Francesc
Yudici	Cosme	Alexandro

269 filas seleccionadas.

52. Show the lecturer id, his/her category, and the total amount of groups taught by the lecturer who teaches the greatest number of groups..

NIP	CTG	GRUPOS
-----		
2782	TU	19,3

1 fila seleccionada.

53. Show the name (ap1, ap2, nom) of the lecturers teaching all the courses in a degree. The degree must have at least one course.

AP1	AP2	NOM
-----	-----	-----
Agut	Fortea	Joan
Alvarez	Pozo	Saul
Anton	Alvaro	Roberto
. . .		
Urgessa	Saez	Pablo
Valiño	Limorti	Joan
Yusá	Vidaurre	Albert

54 filas seleccionadas.

54. Show the code and name of the centres with no courses.

CCEN	NMCEN
-----	
ETSIA	E.T.S. de Ingenieros Agrónomos
EUITAG	E.U. de Ingeniería Técnica Agrícola
RECT	Rectorado
	Sin centro asignado

4 filas seleccionadas.

55. List the name of all the centres indicating how many lecturers are in the centre.

NMCEN	PROFS
-----	
Dpto. Sistemas Informáticos y Computación	84
E. Politécnica Superior de Alcoy	12
E. Politécnica Superior de Gandia	8
E.T.S. de Ingeniería del Diseño	1
E.T.S. de Ingeniería Geodésica, Cartográfica y Topográfica	1
E.T.S. de Ingeniería Informática	168
E.T.S. de Ingenieros Agrónomos	0
E.T.S. de Ingenieros de Caminos, Canales y Puertos	3
E.T.S. de Ingenieros de Telecomunicación	2
E.T.S. de Ingenieros Industriales	6
E.U. de Ingeniería Técnica Agrícola	0



Facultad de Adiministración y Direc. de Empresas	0
Master Oficiales	0
Rectorado	2
Sin centro asignado	59
15 filas seleccionadas.	

56. List the code and name of the teaching groups with courses in all the centres whose name contains the string 'Inform'.

UDO NUDOC

-----

CNU Computación Numerica	
COM Computación	
DSW Desarrollo Software	
IAR Inteligencia Artificial	
IGR Informática Gráfica y Multimedia	
PBA Programación Básica	
PRG Programación	
SIN Sistemas Informacion	
SIS Sistemas	
9 filas seleccionadas.	

57. List the name of the research groups such that all their lecturers have a category different from 'TEU'.

NOMBRE

-----

Grupo de Reconocimiento de Formas y Tecnología del Lenguaje	
1 fila seleccionada.	

## 10 THE CICLISMO ( CYCLING RACING) 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:

**EQUIPO** (nomeq:char(25),director:char(30))  
CP:{nomeq}

**CICLISTA** (dorsal:entero,nombre:char(30),edad:entero,nomeq:char(25))  
CP:{dorsal}  
CAj:{nomeq} → EQUIPO  
VNN:{nomeq}  
VNN:{nombre}

**ETAPA** (netapa:entero,km:entero,salida:char(35),llegada:char(35),  
dorsal:entero)  
CP:{netapa}  
CAj:{dorsal} → CICLISTA

**MAILLOT** (codigo:char(3),tipo:char(30),premio:entero,color:char(25))  
CP:{codigo}

**PUERTO** (nompuerto:char(30),altura:entero,categoria:char(1),  
pendiente:real,netapa:entero,dorsal:entero)  
CP:{nompuerto}  
CAj:{netapa} → ETAPA  
CAj:{dorsal} → CICLISTA  
VNN:{netapa}

**LLEVAR** (dorsal:entero,netapa:entero,codigo:char(3))  
CP:{netapa,codigo}  
CAj:{netapa} → ETAPA  
CAj:{dorsal} → CICLISTA  
CAj:{codigo} → MAILLOT  
VNN:{dorsal}

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

### Attribute description:

#### **Equipo (team)**

*nomeq*: name of the team.

*director*: name of the team coach.

#### **Ciclista (racing cyclist)**

*dorsal*: cyclist number assigned to the cyclist during the race.

*nombre*: cyclist name.

*edad*: age of the cyclist.

*nomeq*: name of the cyclist team.

### **Etapas (stage)**

*netapa*: stage number (in the race).

*km*: How many kilometers the stage has.

*salida*: name of the city where the stage starts (departure).

*llegada*: name of the city where the stage finish (arrival).

*dorsal*: number of the cyclist who has won the stage.

### **Puerto (mountain pass)**

*nompuerto*: name of the mountain pass.

*altura*: maximum height in the pass.

*categoría*: category of the pass: 1ª/primera (first), especial (special), ....

*pendiente*: mean steeper slope of the pass (in %).

*netapa*: stage number where the mountain pass is climbed.

*dorsal*: number of the cyclist who has won the mountain pass ("puerto")

### **Maillot (Jersey)**

*codigo*: code of the maillot.

*tipo*: indicates the prize level of the maillot.

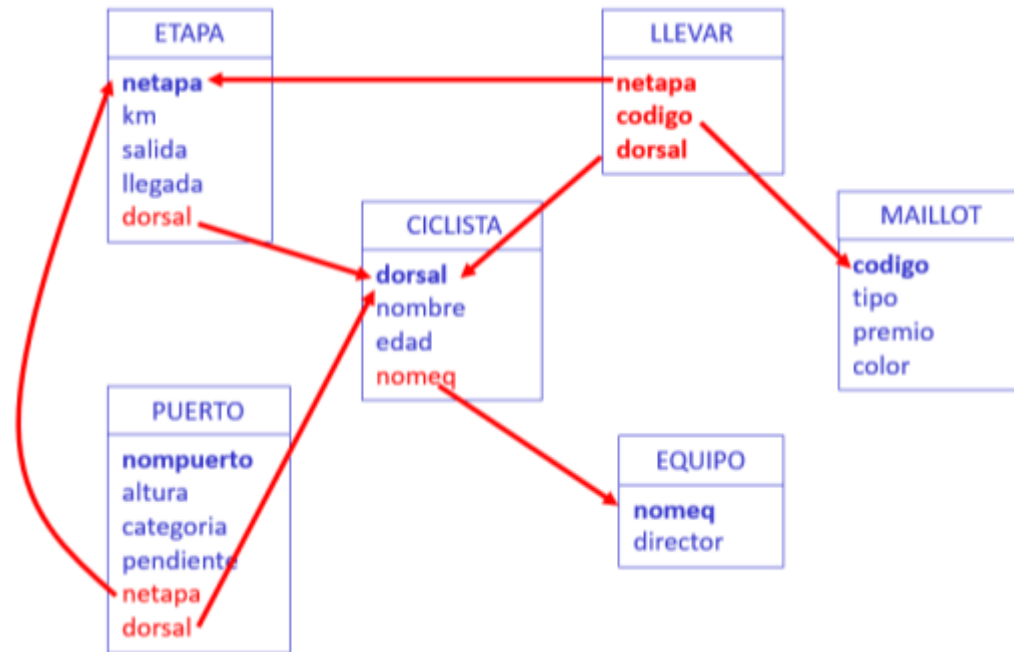
*color*: color of the prize.

*premio*: how much money the cyclist wins if he finishes wearing this jersey.

### **Llevar (Wear)**

The cyclist with number '*dorsal*' has worn the maillot identified by '*codigo*' at the stage with number '*netapa*'.

Below is a graphical representation of the "Ciclismo" relational schema:



## 11 CICLISMO DATABASE EXERCISES

### 11.1 Queries using one single relation

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

COD	TIPO	COLOR	PREMIO
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 (*dorsal*) and the name of the cyclists whose age is equal or less than 25 years old.

DORSAL	NOMBRE
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 mountain passes ("puerto") of category 'E' (special).

NOMPUERTO	ALTURA
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 netapa attribute for those stages with departure ("salida") and arrival ("llegada") in the same city.

```
NETAPA
-----
      1
      8
     18
3 filas seleccionadas.
```

5. How many cyclists are there in the database?

```
COUNT (*)
-----
     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 (EDAD)
-----
    29,89
1 fila seleccionada.
```

9. List the minimum and maximum height of the mountain passes ("puerto").

```
MIN (ALTURA) MAX (ALTURA)
-----
      565      2500
1 fila seleccionada.
```

## 11.2 Queries using more than one relation

10. List the name and the category of the mountain passes ("puerto") won by cyclists from the 'Banesto' team.

NOMPUERTO	C
-----	-
Alto del Naranco	1
Coll de la Comella	1
Navacerrada	1
Puerto de Alisas	1
Puerto de la Morcuera	2
Puerto de Navalmoral	2
Sierra Nevada	E

7 filas seleccionadas.

11. List the name of each mountain pass, also showing the number (netapa) and the kilometers of the stage in which the mountain pass is ("puerto").

NOMPUERTO	NETAPA	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 coach (director) of the teams having at least one cyclist of more than 33 years old.

NOMEQ	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 (maillot) that they have worn.

NOMBRE	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 ('maillot' with color = 'Amarillo') at least once.

NOMBRE	NETAPA
-----	-----
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 netapa attribute of the stages which do not start in the same city where the previous stage finished.

NETAPA

```

-----
      4
      7
      8
     10
     12
     15
     17
     18
     20
9 filas seleccionadas.

```

### 11.3 Queries with subqueries

16. List the value of the attribute netapa and the departure city for those stages with no mountain passes.

```

NETAPA      SALIDA
-----
      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(EDAD)
-----
    30,5625
1 fila seleccionada.

```

18. Select the name of the mountain passes ("puerto") with a height greater than the average height of all the mountain passes.

```

NOMPUERTO
-----
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 of the stages where the steepest mountain passes (“puerto”) are located.

SALIDA	LLEGADA
Igualada	Andorra

1 fila seleccionada.

20. List the cyclist number (dorsal) and the name of the cyclists who have won the highest mountain passes (“puerto”).

DORSAL	NOMBRE
9	Massimo Podenzana
26	Mikel Zarrabeitia

2 filas seleccionadas.

21. List the name of the youngest cyclist.

NOMBRE
Eugeni Berzin

1 fila seleccionada.

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

NOMBRE
Vladislav Bobrik

1 fila seleccionada.

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

NOMBRE
Pedro Delgado

1 fila seleccionada.

## 11.4 Queries with universal quantification

24. List the value of the netapa attribute for those stages such that all the mountain passes (“puertos”) in them are more than 700 meters high.

NETAPA
2
11
16
18
19

5 filas seleccionadas.

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

NOMEQ	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	Lonrenzo Sciacchi
ONCE	Manuel Sainz
Seguros Amaya	Minguez
TVM	Steveens Henk
Wordperfect	Bill Gates

17 filas seleccionadas.

26. List the cyclist number (dorsal) 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).

DORSAL	NOMBRE
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 mountain passes ("puerto") in one stage and have also won the stage.

NOMBRE
Pedro Delgado

1 fila seleccionada.

28. List the name of the teams such that all their cyclists have worn some jersey ('maillot') or have won some mountain pass.

NOMEQ
-------

Castorama  
1 fila seleccionada.

29. List the code and the color of those jerseys ('maillots') 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 mountain passes of category = 1.

NOMEQ  
-----  
Carrera  
Gatorade  
2 filas seleccionadas.

## 11.5 Queries with Group By

31. List the value of the 'netapa' attribute of those stages which have mountain passes, also indicating how many it has.

NETAPA	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.

NOMEQ	CICLISTAS
-----	-----
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.

NOMEQ	CICLISTAS
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 coach ('director') and the name of the teams which have more than 3 cyclists and with an average age lower or equal to 30.

DIRECTOR	NOMEQ
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 belong to a team which has more than five cyclists and have also won one or more stages. Please also indicate how many stages he has won.

NOMBRE	ETAPAS
--------	--------

```

-----
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.

```

NOMEQ          MEDIA
-----
Amore Vita          32
Gatorade            32
2 filas seleccionadas.

```

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

```

DIRECTOR
-----
Miguel Echevarria
1 fila seleccionada.

```

## 11.6 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          (Goes on ...)
MSE  Rosa
6 filas seleccionadas.

```

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

```

NETAPA      SALIDA      LLEGADA
-----
          10 Igualada      Andorra
          11 Andorra      Estación de Cerler

```



DORSAL	NOMBRE	COLOR
20	Alfonso Gutiérrez	Verde

1 fila seleccionada.

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

DORSAL	NOMBRE
20	Alfonso Gutiérrez
30	Melchor Mauri
26	Mikel Zarrabeitia
2	Pedro Delgado

4 filas seleccionadas.

47. List the value of the netapa attribute and the length of the stages (in km) which have mountain passes.

NETAPA	KM
2	180
10	200
11	195
15	207
16	160
18	195
19	190

7 filas seleccionadas.